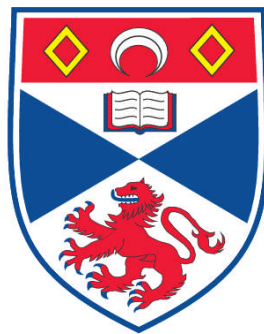


THE TRANSCENDENTAL STRUCTURE OF THE WORLD

Ralf M. Bader

A Thesis Submitted for the Degree of PhD
at the
University of St. Andrews



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THE TRANSCENDENTAL STRUCTURE
OF THE WORLD

Ralf M. Bader

Ph.D. dissertation
University of St Andrews

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ABSTRACT

This dissertation provides a systematic account of the metaphysics of transcendental idealism. According to the proposed theory, appearances are understood as intentional objects, while phenomena are considered as logical constructs that are grounded in noumena, whereby the grounding relation can be modelled by means of a co-ordinated multiple-domain supervenience relation. This framework is employed to provide a vindication of metaphysics, by giving dual-level explanations that explain how the world can have ontological structure, making intelligible the applicability of metaphysical concepts, such as unity, persistence, causation and mind-body interaction, to the empirical realm. The key claim that is advanced in the dissertation is that in order to be realists we have to be transcendental idealists. In particular, transcendental arguments are provided that establish that if realism about science, metaphysics and ethics is to be possible, then (i) the world must have a transcendental structure that integrates the fragmented perspective-dependent spatio-temporal frameworks into a unified perspective-independent space-time manifold, (ii) space and time must be forms of intuition that give rise to correspondences between appearances and phenomena, making it the case that we can have non-trivial scientific knowledge of the world, and (iii) we must have a priori concepts, namely the mathematical and dynamical categories, that allow us to cognise the empirical as well as ontological structure of the world. The ‘fact of experience’ as well as the ‘fact of reason’ are then brought in to strengthen the case for scientific, metaphysical and moral realism, thereby warding off the threat of nihilism. Moreover, a refutation of the more attractive versions of scepticism and idealism is provided, namely of those versions that claim that a subject’s representations or episodes of awareness can be temporally ordered even though they deny or doubt the existence of a law-governed external world. The conclusion then is that a realist stance is to be adopted and that we should consequently accept transcendental idealism and hold that the world has a transcendental structure.

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To my parents

Contents

Introduction	I
1 Appearances	7
1.1 The process of intuition	7
1.1.1 Inner and outer intuition	10
1.1.2 Reflexive awareness	11
1.2 Appearances as intentional objects	14
1.2.1 The temporality of representations	15
1.2.2 The reality of representations	18
1.3 Perspectival fragmentalism	20
1.4 The status and nature of appearances	23
1.4.1 Subjectivity and intersubjectivity	23
1.4.2 Emergent intentional inexistents	25
1.4.3 Ontologically amorphous appearances	27
2 Phenomena	29
2.1 Constructing phenomena	29
2.1.1 Perspective-independent space-time	33
2.2 Phenomena and appearances	35
2.2.1 Intensive and extensive magnitudes	38
2.2.2 Intensive magnitudes as powers?	41
2.2.3 Scientific structuralism	43
2.3 Noumena as grounds of phenomena	49
2.3.1 Determination and dependence	51
2.3.2 Multiple-domain supervenience	53
2.3.3 Domain co-ordination	55
2.3.4 Transcendent and transcendental properties	59
2.4 The reducibility of phenomena	61
2.4.1 The status of phenomena	63
2.4.2 Reducing phenomenal relations	65
2.4.3 Antinomial worries	68
2.4.4 Epiphenomenal phenomena	71

3	Transcendental structure	73
3.1	Grounding ontological structure	73
3.1.1	Unity	77
3.1.2	Causation	81
3.1.3	Mind-body interaction	82
3.2	Dual-level explanations	85
3.2.1	Fundamental explanations	86
3.2.2	Fact-defective potential explanations	87
3.2.3	Answering ‘how-possible questions’	90
3.3	Transcendental arguments	93
3.3.1	The possibility of experience and morality	96
3.3.2	Supporting the antecedent	99
3.3.3	Refuting idealism and scepticism	101
	Conclusion	105
	Bibliography	109

Introduction

To be a realist one has to be a transcendental idealist.

The world has a transcendental structure, a structure that it derives from the noumenal realm. Without this structure, the world would be ontologically amorphous and would not even constitute a unified spatio-temporal manifold. Accordingly, there would not be an objective world and experience as well as science would consequently be impossible. Moreover, this lack of ontological structure would undermine the possibility of metaphysics and would imply that the metaphysical presuppositions of ethics would not be met. The possibility of science, metaphysics and ethics thus all crucially depend on the transcendental structure of the world.

SCIENTIFIC REALISM: For there to be an objective world, for there to be a unified spatio-temporal manifold, there must be transcendental structure. This structure is necessary for connecting the fragmented perspective-dependent spatio-temporal frameworks, thereby giving rise to a unified perspective-independent physical space-time manifold (cf. 2.1.1). The transcendental structure of the world consequently provides us with an objective world that can be the subject of scientific investigation and hence provides the subject matter of science. Additionally, if we are to gain knowledge of the world, if we are to have access to objective facts, then there must be substantive correspondences between appearances and phenomena, there must be certain features to which we have direct access and that are shared by the subjective objects of which we are immediately aware and the intersubjective objects investigated by science. These correspondences are provided by the forms of intuition. Intuitive form, that is spatio-temporal form, is required to yield non-trivial objective content, since logical form can only underwrite cardinality claims. The forms of intuition consequently allow us to discover the structure of the empirical world by providing us with non-logical relations that do not need to be implicitly defined and in terms of which scientific theories can be stated, making objective knowledge possible and allowing science to be non-trivial (cf. 2.2.3).

METAPHYSICAL REALISM: For metaphysics to be possible, there must be ontological structure that can be cognised by us. This requires there to be transcendental structure since the phenomenal realm is ontologically amorphous when considered on its own and can only be said to be structured in relation to the noumenal realm that grounds it. By accepting non-empirical grounds of phenomena we can make room for non-empirical features at the phenomenal level that provide this realm with ontological structure (cf. 3.1). In addition, if we are to cognise these non-empirical features, we need to have the requisite conceptual resources, namely a priori categories. There must be non-empirical concepts that allow us to latch onto the non-empirical features and cognise ontological structure. Finally, we must be able to provide transcendental arguments, if we are to identify metaphysical constraints that the world must satisfy, thereby enabling us to identify its metaphysical structure (cf. 3.3). All of these conditions for vindicating metaphysics can be met by accepting a noumenal realm that grounds phenomena and by accepting that we have pure concepts of the understanding, namely the categories.

MORAL REALISM: For moral requirements to be objectively valid and applicable to us, the metaphysical presuppositions of ethics must be satisfied. In particular, if we are to understand ourselves as unified agents who persist through time, who can be efficacious by acting on maxims that we have freely incorporated and who can be responsible for our deeds, then we must be able to accommodate a substantive conception of the self, as well as an intelligible notion of causal efficacy that can feature in agent causation. Since these presuppositions require there to be transcendental structure, it follows that being a moral realist equally requires one to be a transcendental idealist (cf. 3.2 & 3.3.1).

Transcendental idealism thus makes room for transcendental structure and thereby vindicates science, metaphysics and ethics, allowing us to be realists about these domains. In particular, it allows us to claim that science is non-trivial and reveals to us the structure of the world, that the world is not ontologically amorphous but has ontological structure that can be cognised and discovered by us, as well as that we are bound by categorical moral requirements, can act freely and be genuinely responsible for our actions.

Since its initial formulation by Kant, there has been much debate as to the nature, cogency and merit of transcendental idealism. This dissertation proposes a systematic understanding of the metaphysics of transcendental idealism. It provides a description of the fundamental ontology that it implies, giving an account of the different kinds of objects that exist, the status that they possess and the relations that hold between them. This analysis follows the epistemic order, be-

ginning with what is subjectively given, namely appearances, and then moving on to what exists intersubjectively, namely phenomena. This ontology will then be utilised for providing dual-level explanations and transcendental arguments.

Since this is a project in systematic metaphysics, it is rather explorative and speculative in nature. It attempts to provide a sketch of a metaphysical system and identify its main contours. A great deal of emphasis will be placed on the explanatory power that the system possesses and the problems it can solve. This, of course, means that many details still need to be filled in and that many assumptions and presuppositions still need to be defended, but these tasks will have to wait for other occasions.

While this project has a distinctly Kantian character in virtue of the starting-point from which it begins, as well as in virtue of some of the principles, distinctions and methods to which it appeals, it is not an exercise of exegesis. Instead, it is an attempt at a critical and systematic reconstruction of transcendental idealism. I believe that transcendental idealism has live philosophical currency and can solve a number of important philosophical problems. I take Kant's work as a point of departure, rather than treating it as the analysandum. Since I am not engaging in textual or historical analysis, I would like this work to be judged not on interpretative grounds, but purely on its philosophical merits.

The starting-point of this dissertation is the assumption that space and time are forms of intuition and that there exists a mind-independent reality (the noumenal world) that has a causal impact on us (noumenal affection). To say that space and time are forms of intuition is to say that space and time are mental frameworks that result from the constitution of our minds. They are our contribution to the world and are not mind-independent features of reality.

It is important to note that the mind-dependence of space and time is restricted to intuitive space and time and not to formal or physical space and time. These types of space and time (as well as space-times) are not forms of intuition but have a different status.

FORMAL: Formal spaces and times are abstract mathematical structures that are axiomatically specified and that hold of all those things that satisfy the axioms. The non-logical terms appearing in the axioms (such as point, line or plane) are improper concepts that are implicitly defined by the axiomatic system. Accordingly, there is no connection to anything outside the system, there is nothing to which the system has to conform and coherence is the only criterion that an axiomatic system has to satisfy.

PHYSICAL: Physical space-times are relational structures within which empirical objects are embedded. As we will see below, we can distinguish between perspective-dependent spatio-temporal structures and perspective-independent physical space-time. Neither the perspective-dependent nor

the perspective-independent structures are forms of intuition. They are rather logical complexes that are constructed out of the spatio-temporal relations of intuitive space and time.

INTUITIVE: While formal space and time are not in any sense distinctively spatial or temporal, but hold of anything satisfying the axioms, intuitive space and time are characterised by distinctively spatial and temporal features. They are subjective mental frameworks that allow us to represent and order the contents of awareness. They are the frameworks that structure our perception and representation of reality.¹

It should be noted that none of the arguments put forward in this dissertation rely on intuitive space and time having any particular structural properties, but only on them being forms of intuition that have some structure or other. I do believe, however, that intuitive space is in fact Euclidean and that this can be established on the basis that (i) Euclidean space is the only space that allows for non-isometric similarity mappings, and that (ii) pure intuition allows us to construct geometrical shapes by following general rules or schemata, the application of which is invariant across all spatial regions, thereby not only giving rise to a requirement of free rotation which implies a Riemannian geometry, as well as a requirement of free mobility which implies a Riemannian geometry of constant curvature, but also a requirement of free construction which implies a Riemannian geometry of constant curvature that is globally Euclidean.

The existence of intuitive space and time is simply taken for granted and no direct support is provided for this assumption. It should be noted, however, that the following considerations speak in favour of this assumption: (i) it allows us to make sense of synthetic a priori knowledge of the global structure of intuitive space and time, of the global structure of perspective-dependent physical spatio-temporal frameworks as well as of the infinitesimally Euclidean local structure of perspective-independent physical space-time (cf. 2.1.1), (ii) it allows us to make room for objective knowledge since the Newman problem establishes that logical structure is not sufficient for yielding non-trivial content and that we need spatio-temporal structure that must be accessible to intuition (cf. 2.2.3), (iii) it allows us to avoid the Antinomies (cf. 2.4.3), (iv) it allows us to develop a metaphysical system that has vast explanatory power and enables us to underwrite the metaphysical presuppositions of Kantian ethics (cf. 3.1 & 3.2), (v) it allows us to give transcendental arguments and gain synthetic a priori knowledge of the ontological structure of reality (cf. 3.3).

¹Intuitive space and time are accordingly to some extent analogous to what are frequently described in contemporary discussions as phenomenal space and time.

CHAPTER 1: Given that space and time are subjective forms of intuition, it follows that there are subjective spatio-temporal frameworks populated by subjective objects of which we are immediately aware and with which we are acquainted, namely appearances. These objects are intentional objects that arise as a result of the process of intuition. Noumenal affection provides a manifold of intuition to noumenal selves that is then processed. The processing of the information contained in this manifold is guided by the forms of intuition and can be broken down into three sub-processes, namely imposition, selection and translation. Spatio-temporal frameworks are imposed by us. The information provided by noumenal affection is selected for compatibility with these forms and the selected information is then translated into the frameworks. That is, we translate a selected manifold into imposed forms of intuition.

On the proposed account, representational media are noumenal and intentionalities are sui generis subjective entities that are immanent to acts of awareness. This view is required to respond to various challenges concerned with the temporality and reality of representations. Once we accept the ideality of the forms of intuition we have to deal with the problem of making sense of the temporality and reality of representations. On the one hand, it seems as if representations are in time, which is problematic since temporality would then not merely be a feature of the way things are represented to be but would pertain to how things really are. Time would consequently be real rather than ideal. On the other hand, it seems that whilst we can reduce various aspects of the world to representations, representations themselves cannot be reduced in this way but have to be considered to be transcendentally real. The solution to these problems requires us to adopt an intentional object view of appearances that is combined with the claim that the representational medium through which the intentional object is given is itself noumenal.

CHAPTER 2: In addition to the subjective realms made up of intentionalities that are peculiar to particular subjects, there is also an intersubjective empirical realm, consisting of the intersubjective correlates of appearances, namely phenomena. The phenomenal world is objective for us and we can discover its structure by means of scientific investigation. It is empirically real since it is determined jointly by the absolutely real noumenal realm and the intersubjective forms of intuition. The matter of phenomena is absolutely objective, whilst the forms of intuition are mind-dependent features that are essentially shared by cognitive beings like us and are consequently objective for us. While noumena are absolutely objective and while appearances are only subjectively objective, phenomena are intersubjectively objective.

Phenomena are not emergent existents but are logical constructs that have translated noumenal information as elements. We have an informational manifold that encapsulates noumenal properties and that enters into a constructive

process leading to a logical complex. Accordingly, the phenomenal realm embodies translated noumenal information. Phenomena and noumena encapsulate the same information, once in a translated form and once in its pure original variant. The phenomenal realm is hence dependent on the noumenal realm since it is nothing other than an informational manifold that results from a process which takes noumenal information as its input. The noumenal realm is thus the ground of the phenomenal realm and phenomena are reducible to noumenal features via the forms of intuition. This dependence relation can be captured in quasi-formal terms. In particular, we can use co-ordinated multiple-domain supervenience relations to model the determination and dependence relations between noumena and phenomena, whereby the co-ordination relation is to be identified with the process of intuition.

CHAPTER 3: The fact that phenomena are grounded in noumena allows us to provide dual-level explanations that explain metaphysical features of phenomena in terms of features of their underlying noumenal grounds. Such explanations identify explanatory connections between the different realms, that owe their existence to the grounding relation. In this way we can make room for non-empirical properties and provide ontological structure to the phenomenal realm. While the phenomenal realm fails to be structured intrinsically, it turns out to be structured in relation to noumena.

Once these metaphysical features have been made intelligible, we can appeal to theoretical and practical transcendental arguments to show that these features are necessary preconditions of the possibility of experience and morality, respectively. Since only transcendental idealism permits us to make intelligible the preconditions of experience and morality, it follows that one must either reject the reality of experience and morality or accept transcendental idealism. While transcendental realists accept the antecedents of the conditionals established by these transcendental arguments, they lack the requisite explanatory resources to account for the consequents. Accordingly, we can see that we either have to deny the antecedents and be nihilists and sceptics or accept transcendental idealism. This then shows that in order to be realists we have to be transcendental idealists.

Chapter I

Appearances

The world reveals itself to us in perception. It reveals itself to us not as it is in itself but only as it appears to us. By means of perception we become aware of what the world is like for us. That of which we are aware is a world of appearances and not a world of things in themselves. This is due to the fact that perception/intuition has two components. On the one hand, there is that which derives from the world (the manifold, the matter). On the other, there is that which derives from us (the forms). What is conveyed to us by the world is the manifold of intuition. What is provided by us is the forms of intuition. Together, form and matter determine what the world is like for us. Together, they determine that of which we are aware. This means that the forms of intuition mediate our awareness of the world, ensuring that we are aware only of appearances (matter-in-form) and not of things in themselves. Given that all our awareness is mediated by our forms of intuition, it follows that our awareness is restricted to appearances and that we lack direct access to things-in-themselves. We are always only given matter-in-form and never the matter as it is in itself.

I.1 The process of intuition

“[E]xperience is not a free composition, but rather a translation into the diction of space and time of a text framed in another idiom”
(Findlay: 1981, p. 34).

In intuition, the world provides matter that is subjected to forms. Appearances result from a process in which the noumenal self translates selected input provided by noumenal affection into imposed frameworks. This process begins with noumenal affection, whereby a subject is provided with a manifold of intuition. This manifold is then taken up, ordered, processed and synthesised in accordance with the forms of intuition. The output of this process consists of noumenal representations that have ordered and structured contents and of which we can

become aware in a temporal manner by means of an act of reflexive awareness. The processing of the manifold can be broken down into three component sub-processes, namely (1) imposition, (2) selection, and (3) translation.

The structure of the mind is characterised by certain mental frameworks, namely by the forms of intuition. These frameworks are imposed on the manifold of intuition. The imposition of the frameworks explains why we have a distinction between noumena, on the one hand, and appearances as well as phenomena, on the other. This is the distinction between things that exist in themselves independently of our conditions of experience and things that result from the interaction between the forms of intuition and the manifold of intuition. It is because we impose the form of intuition on the manifold that we can distinguish between, on the hand, the manifold as it is in itself and, on the other, the translated manifold that is ordered in the forms of intuition. Since the forms of intuition are mere forms of intuition and consequently do not apply to the manifold as it is in itself, it follows that the matter that has been translated into these forms is transcendently ideal when it is considered as matter-in-form.

Given that these frameworks are imposed on the manifold, it follows that there is a selection process which involves selecting those features of the manifold that are translatable into the frameworks that our minds impose. All the information contained in the manifold that is incommensurable with our forms of intuition and that cannot fit into the translation function is filtered out. That is, a selection or filtering process takes place insofar as only those aspects of the manifold that are compatible with the frameworks and that can be translated into them are processed.

It is important to note that we do not impose properties, but only impose frameworks into which the information contained in the manifold of intuition is translated. We neither impose properties on objects, nor do objects simply happen to conform to the conditions under which we can represent them. Instead, they happen to be constituted in such a way that it becomes possible for us to translate the information that they provide into our frameworks. We do not make them conform, but we impose the frameworks into which this information happens to be translatable. We do not filter or select only those things which have the properties that conform to our conditions of representation. Instead, we impose our frameworks, select those things that are amenable to translation and then translate the selected manifold into these frameworks.

The selection process explains the possibility of transcendent (as opposed to transcendental) objects and properties. A transcendent property is either a property that does not contribute to the manifold of intuition and is not reflected therein, or it is a property that provides a manifold that is incompatible with the forms of intuition and is not amenable to translation. The manifold provided by the latter kind of transcendent property gets filtered out and does not play any role in the process by which phenomena arise. Transcendental properties, on the

contrary, provide information that is amenable to translation and that belongs to that part of the manifold which is processed and translated into our frameworks. Transcendental objects then are objects that have transcendental properties that play a role in determining what the world is like for us, by giving rise to a manifold that is amenable to translation, while transcendent objects are objects that only have transcendent properties.

The filtering that results from the imposition of the forms of intuition thus makes room for the possibility of transcendent objects and properties. These transcendent properties include properties, such as freedom, that cannot be experienced, but which we must nonetheless posit from a practical point of view. Though we do not have knowledge of them, there is room for the possibility of their existence and this room is provided by opening up the possibility of noumenal reality going beyond transcendental reality, that is, by allowing for the logical possibility of transcendent reality.

Information contained in the manifold that is compatible with the forms of intuition is translated into these forms. The selected manifold is translated and ordered in space and time. This translation turns the manifold provided by noumena, i.e. the matter of intuition, into appearances, i.e. matter-in-form. The translation function explains why intuition is not arbitrary but reveals what the world is like for us. While the structure of the mind prescribes that outer objects must have a spatial location, a temporal location and an intensive magnitude, the mind does not arbitrarily determine these properties but is constrained by the noumenal object. The structure of the mind provides spatio-temporal frameworks and determines that phenomena must be spatial and temporal, but noumena then determine what the particular spatio-temporal relations are. While we ensure that phenomena are in space and time, noumena ensure the particular way in which they are in space and time.

We do not randomly construct the spatial and temporal properties of appearances and do not represent things in a way that does not have any basis in how noumena are, but are constrained by the objects. The relation between appearances and noumenal objects is marked by necessity, as it is the objects that stop our appearances from being arbitrary but make them the way they are, thereby providing objectivity to them. Yet, this does not imply that transcendental objects have spatial and temporal properties. It is not the case that the noumenal objects are in space and time independently of our mental activities and that we simply intuit their spatial and temporal properties. Rather, the manifold provided by the objects is somehow intrinsically ordered, without it having any spatial or temporal properties. This intrinsic ordering is then translated into our forms of intuition, by which process the matter of the manifold, i.e. the information contained therein, is turned into the world of appearances.

Accordingly, the properties of appearances are not in any way fake. They are not imposed by us onto the object. Instead of being imposed by us, the

properties derive from the manifold of intuition and are objectified for us by our forms of experience since they are translated into these frameworks. It is only subjective additions and transformations that are peculiar to particular subjects that are imposed, such as secondary properties and properties that are imagined or hallucinated. Only these properties of appearances are fake and lack reality.

1.1.1 Inner and outer intuition

This schematic account of the process of intuition applies to both outer and inner intuition. The distinction between outer intuition and inner intuition is concerned with the source of the manifold of intuition, distinguishing between a scenario in which the manifold is provided by an object that is distinct from the self and a case in which the manifold derives from the self itself.

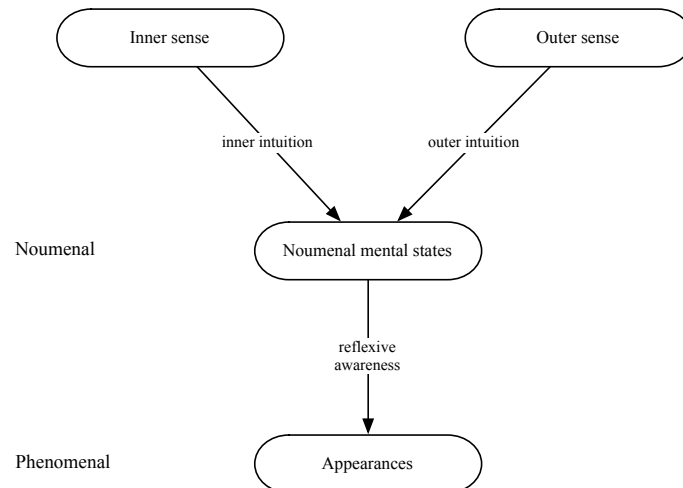
In the case of outer intuition, it is a noumenal object that affects the noumenal self and provides it with a manifold of intuition. The form of intuition that is imposed and into which this manifold is translated is the form of outer intuition, namely space. This process yields a spatially ordered content. In the case of inner intuition, it is the noumenal self that affects itself and provides itself with a manifold of intuition. The form that is imposed and into which this manifold is translated is the form of inner intuition, namely time. This process yields a temporally ordered content. Thus, in each case, we have a manifold of intuition that is provided to the noumenal self. This manifold is then processed either by the form of outer sense, if the manifold derives from an object that is transcendently external, or by the form of inner sense, if the manifold is due to the noumenal self itself. We then end up with a noumenal mental state with an ordered and processed content.¹

By means of a reflexive act of awareness the self can become aware of the contents of its representations. This process activates the representation leading to the emergence of an appearance, that is, of an intentional object that is immanent to the act of awareness. These intentionalia are the immediate objects of our awareness. They are subjective objects that exist for the subject and with which only the subject is acquainted.

This allows us to provide a dual-level account of the content of the mind. As regards the noumenal level, it is inner and outer intuition that determine or produce the noumenal mental states, the modifications of the noumenal mind. It is by means of apperception that we can then gain a reflexive awareness of the content of noumenal mental states, bringing this content to the level of con-

¹It might seem objectionable to claim that noumenal representations have spatial and temporal content. Yet, this is not problematic since nothing in the noumenal realm is in space or time. It simply is the case that the content of noumenal representations is spatially and temporally structured. Moreover, we only know representations as they appear to us and do not know what their content is like independently of the form of inner sense. All we know is that the content is structured in such a way as to appear to us thus and so.

sciousness.² Appearances are thus the result of a two-stage process. In the case of outer appearances the manifold is first translated to yield a spatial representational content and is afterwards temporalised when the self becomes reflexively aware of the content of that representation. In the case of inner appearances the manifold is first translated to yield a temporal representational content and is then temporalised as a result of an act of reflexive awareness.



1.1.2 Reflexive awareness

Apperception is reflexive awareness of the content of representations. By means of apperception, the mind reflects on its own representations. As a result, it does not become aware of these representations, but rather via them becomes aware in a temporalised manner of the intentional content of the representations. When we are aware, we are aware not of the representation itself but of that which is represented. We are aware of the intentional object that is represented and not of the mental entity that is doing the representing. In order for us to be aware of the representation, it would have to feature as the object of another representation. It itself would have to be represented in a representing. Accordingly, representations do not feature in the content of awareness. They are not the things of which we are aware. Instead, we are aware of the intentional objects that these representations represent. The immediate objects of awareness are thus intentional objects rather than the representational media through which these intentional objects are given.

²This kind of apperception is empirical in nature and has to be distinguished from transcendental apperception. The latter is consciousness of the activity of the determining self. The former is consciousness of the temporalised content of noumenal mental states.

Though there is a mediating state, i.e. a representation, we are nonetheless immediately aware of the content of our representations. This is because we are not aware of the content by being aware of the medium, but are aware of the content via the medium. As a result, intentional objects are the immediate objects of awareness. It is not the case that we are aware of the mediating state and then via it of the intentional object. Rather, awareness is only of the intentional object. The intentional object is given through the medium, rather than in the medium. Instead of being in the medium, it is in the awareness. The intentional object is immanent to the act of awareness, while this awareness is achieved through the representational medium since the object is given through the content of the representation.

Given that apperception is subject to the form of inner sense, it follows that our awareness of the content of the noumenal representations is mediated by the form of inner sense. Accordingly, we are not aware of the content of the representation as it is in itself, but are only aware of it as it is mediated by this form, as it appears to us. That is, the content of the representational medium is mediated when it is apperceived and it is this mediated content which forms the content of our awareness and which is immanent to the act of awareness. This means that apperception produces a temporalised awareness of the representational content of noumenal mental states.

The intentional objects that result from this process can be both inner and outer. We have an inner appearance if the noumenal mental state is the result of inner intuition, and we have an outer appearance if the noumenal mental state was produced by outer intuition. Accordingly, both internal and external objects are immediate objects of perception, given that 'internal' and 'external' are taken in the empirical and not the transcendental sense.³ When we are aware of an external object, it is not simply the case that we have a representation of an external object. Instead, we are immediately aware of an external object existing in space. This is possible because external objects are mind-dependent intentional objects that exist in subjective spatio-temporal frameworks. As a result, we have direct access to the external world, even though this external world is a subjective world, given that space and time are subjective mental frameworks.

While all representational media through which appearances are given are noumenal, it is important to note that some appearances are themselves representations. These are inner appearances that result from the reappropriation of mental content by means of inner intuition. In such cases, the appearance of which we are aware is a phenomenal representation. The noumenal representation itself has a representation as its objects, i.e. its content is another representation. Such a noumenal representation results from inner intuition understood as reappropriation, whereby a mental state becomes the object of another mental

³An object is external in the empirical sense if it exists in space. It is external in the transcendental sense if it is distinct from the subject.

state. A mental state had by the self is reappropriated and becomes the object of an inner intuition.

We thus have to distinguish between two notions of inner sense. First, there is that whereby we become reflexively aware of the contents of our noumenal representations. This kind of empirical apperception does not produce any representations, any noumenal entities with representational content, but is that by means of which we become aware of the content of the representations we have. Instead of producing new representations, it produces a temporalised awareness of the content of noumenal representations. Second, there is that whereby we reappropriate mental states. This process of reappropriation produces noumenal representations by inwardly intuiting a representation that we already have. We can then become reflexively aware of the content of these noumenal representations, which amounts to becoming aware of inner appearances. In short, we can distinguish between inner sense as the reflexive awareness of the content of noumenal mental states and inner sense as the reappropriation of mental states.

Both forms of inner sense are subject to time. In the case of apperception, it is the contents of noumenal representations that are temporalised, whereas in the case of inner intuition, it is the contents of phenomenal representations that are ordered in time.

Apperception involves the temporalised awareness of the contents of noumenal representations. By means of apperception we become reflexively aware of the content of noumenal representations and this awareness is subject to time. Reflexive awareness produces a temporalised awareness of the intentional objects insofar as it makes us aware of appearances as existing 'now', whereby the temporal determination 'now' applies to both inner and outer appearances. That is, we are aware of spatial objects as well as of our phenomenal representations as existing 'now' since these are the contents of the noumenal representations that are being apperceived.

While the phenomenal representations of which we are aware are assigned the temporal position 'now' by apperception, their content is temporally ordered as a result of the process of intuition. Phenomenal representations are higher-order representations and their content is ordered in time as a result of having the form of intuition imposed on the manifold that is inwardly intuited. That is, inner intuition results in higher-order representations that have temporally ordered content. This temporal ordering of the contents of phenomenal representations is analogous to the way in which the manifold of outer intuition is ordered in space. In the case of space, it is the contents of noumenal representations that are spatialised by assigning spatial positions and relations to the intentional objects of these representations. In the case of time, it is the contents of phenomenal representations that are temporalised by assigning temporal positions and relations to the (higher-order) intentional objects of these representations.

Given this understanding of reappropriation, it follows that there are higher-

order representations. That is, there are representations which represent things that represent further things. These are noumenal representations that have phenomenal representations as their intentional objects, which in turn have other objects as their intentional objects.⁴ Such higher-order representations may seem to be problematic since there appears to be an “absurdity . . . in the idea that one item can be an object of awareness to another that is itself merely an intention-alium [*sic*]. That would be like saying the figments of my dreams have dreams of their own” (van Cleve: 1999, p. 273 footnote 26). While it seems wrong to say that dreams can have dreams, it does not appear to be problematic to say that one can dream having dreams. The higher-order dreams must be contained in the lower-order dreams had by the subject. There can be no free-floating or autonomous dreams. Similarly, there can be no free-floating or autonomous intentionality. That is, the original noumenal representation must represent other things as representing things.

Making time the form of awareness of the intentional content of noumenal representations allows us to make sense of the temporality of outer objects. Given that time is the form of inner sense, it would seem to follow that only the objects of inner sense are ordered in time. Accordingly, it would be difficult to explain how objects of outer sense can be in time. Given that outer objects are objects of outer and not of inner sense, it would seem to be unclear how one can claim that they are in time. Time would then apply only to phenomenal representations of outer objects, rather than to outer objects themselves.

By claiming that time is the form of the reflexive awareness of the content of noumenal representations, we can avoid these unpalatable consequences. Insofar as time is a feature of awareness, it pertains directly to all those things of which we are aware. Thus, since reflexive awareness is subject to time, it follows that everything of which we are aware is in time. Since we are aware of the intentional objects of our representations and since these intentional objects are appearances, it follows that all appearances are in time. This applies equally to inner as well as to outer appearances.

1.2 Appearances as intentional objects

The account we have developed so far can be summarised as follows. The noumenal self is affected and provided with a manifold of intuition. This manifold is processed to yield a noumenal representation, a mental state or modification of the mind. Apperception then leads to awareness of the temporalised content of the mental states. Thus, representations are noumenal mental states that arise as a result of noumenal affection, while the intentional objects which they represent

⁴This obviously presupposes that appearances that are representations can have intentionality. This presupposition can be defended by means of an analogy, namely that pictures within pictures can represent something in the same way that pictures themselves are representational.

and of which can become aware are appearances.

The reason for regarding representational media as being noumenal and for treating appearances as intentional objects is that we would otherwise not be able to deal with two structurally analogous challenges that would undermine the whole of transcendental idealism. The first problem concerns the temporality of representations, while the second problem concerns the reality of representations. These problems show that the representational media through which the objects of awareness are given have to be noumenal. The objects that are given through them and of which we are immediately aware then need to be considered as intentional objects. These intentional objects emerge when the noumenal mental states are activated by a reflexive act, leading to an awareness of the intentional objects. The intentionalia are immanent to the act of awareness, whereby our awareness is essentially temporal given that time is the form of inner sense.

1.2.1 The temporality of representations

One of the most serious challenges to transcendental idealism is the objection that time cannot be ideal and a mere form of intuition since intuitions or representations change which implies that their change is real, which in turn requires time to be real. This objection was already formulated in the 1770s by Mendelssohn, Lambert and Schultz⁵ in response to Kant's claim in the Inaugural Dissertation of 1770 that "*Time is not something objective and real, nor is it a substance, nor an accident, nor a relation. Time is rather the subjective condition which is necessary, in virtue of the nature of the human mind, for the co-ordinating of all sensible things in accordance with a fixed law. It is a pure intuition*" (2:400).

More carefully, the objection runs as follows. Appearances are represented to stand in spatio-temporal relations. But what about the representations themselves? Do representations exist in time, or are they merely represented to be existing in time? It seems that we face a dilemma. On the one hand, we can accept that representations are only represented to be in time. In this case we need further representations doing the representing, leading us to an infinite regress or a vicious circle. On the other hand, we can accept that representations are actually in time and change in time. In this case, however, we are committed to viewing time as more than a form of intuition.⁶

⁵J. H. Lambert's criticisms are to be found in a letter to Kant from 13. October 1770, as well as in a review of Herz's defence of Kant's Inaugural Dissertation. M. Mendelssohn's objection is in a letter to Kant dated 25. December 1770. J. Schultz put forward a similar objection in his review of the Inaugural Dissertation, which was published in the *Königsbergische gelehrte und politische Zeitungen* in two parts (Vol. 94, Friday 22. November 1771 and Vol. 95, Monday 25. November 1771).

Kant tried to respond to these criticisms in the Transcendental Aesthetic (cf. A36-41/B53-58).

⁶The same problem is also noted by McTaggart at the end of his article on the unreality of time. "And how are we to deal with the appearance itself? If we reduce time and change to

To deal with this problem, we need to claim that representations are noumenal and therefore outside of time. While appearances are represented to be temporal and are represented to be changing in time, representations themselves are not in time and do not change. Only the intentional objects of these representations are in time because they are represented to be in time, because we are aware of them in a temporal manner. Since we can be aware of both inner and outer appearances, and since inner appearances are representations, it follows that we can be aware of representations that are in time. These representations, however, are merely phenomenal representations that are intentional objects of atemporal noumenal representations. In other words, it is not that which is doing the representing that is in time, but only that which is represented that is in time, which in these cases happen to be phenomenal representations.

If things are represented as being in time, without the representations being in time, then we need a distinction between the representations and that which they represent. This is a conclusive reason for rejecting a sense-datum approach since the sense-datum is the mental item of which we are aware. Instead, we should accept an intentionalist approach, whereby we have representations which represent things to us. Mental states are representational media that have intentionality. The intentional objects which these mental states represent are the appearances of which we are aware. Representations have intentional objects and in being aware of a representation one is aware of the intentional object.

The source of the problem can be clarified by considering the case of space. According to transcendental idealism, x is next to y iff x is represented as being next to y . This means that the represented x is next to the represented y , but it does not mean that x and y in themselves are spatially related. In the temporal case, x is prior to y iff x is represented as being prior to y . This means that the represented x is prior to the represented y . But, again, it does not mean that x and y in themselves are temporally related.

The spatial case is not problematic because representations themselves are not spatial. The represented objects are represented to occupy spatial locations, while representations themselves are not intuitively taken to be spatial entities. Accordingly, we can reduce space and spatial properties to something non-spatial, namely features of representations. Spatiality will then simply be a feature of the way things are represented to be and not of how they really are.

In the case of time we need to make sure that the represented objects are represented to occupy temporal locations, without the representations themselves having temporal locations. The problem of the temporality of representations arises because it seems that representations themselves are temporal, that they exist in time and change in time. Accordingly, it would seem that we cannot

appearance, must it not be to an appearance which changes and which is in time, and is not time, then, shown to be real after all?" (McTaggart: 1908, p. 474)

treat time as an appearance, as merely a feature of the way we represent the world. Since representations themselves are intuitively taken to be temporal entities, it would seem to follow that temporality cannot be reduced to a feature of the way things are represented to be. Instead, it would have to be a feature of how things really are.

Thus, the difference between space and time is that while representations themselves do not seem to be spatial entities, they do seem to be temporal entities. This ensures that we can unproblematically reduce space to representations since these are non-spatial. Time, however, does not appear to be reducible in a similar way due to the apparent temporality of representations.

This apparent temporality of representations needs to be denied. We have to deny that representations are temporal entities that exist and change in time. Instead, we have to claim that representations, understood as modifications of the mind, are noumenal and thus not in time. Only appearances are in time. This means that only appearances of representations, that is, phenomenal representations, are in time, not the representations themselves. It is only the contents of representations that are placed in the temporal framework, not the representations themselves.⁷ We do not place representations in time, but that which they represent. That which is represented is structured in space and time. We are aware of intentional objects as spatial and temporal. They appear thus to us. They are arranged and ordered in the mental frameworks.

By making time the form of awareness, we are able to deal with the problem of the temporality of representations. Time is merely a feature of the way we represent the world, without representations themselves being in time. It is only the intentional objects of which we are aware that are in time. The intentional objects are spatial and temporal, but this does not mean that the mental entities that function as the representational media are in time, which would be impossible given that they are noumenal. While representations qua mental entities are outside of time, the contents of awareness are in time. It is not representations that change but the contents of awareness. Things are represented as changing, rather than there being representations that change.

Given that noumenal states do not change, the question arises as to how intentionalia can change. They can only change insofar as they are represented as undergoing changes (cf. van Cleve: 1999, Chapter 5). On this picture one can still account for representations being represented to be changing, namely insofar as one is not concerned with noumenal representations or mental states, but with phenomenal representations that are the intentional objects of noumenal representations. These phenomenal representations can be represented to be changing. We can represent ourselves as having different phenomenal representations at dif-

⁷The same holds for the spatial framework since it is the contents of representations that are spatially ordered, not the representations themselves.

ferent times. This is why Kant is right in saying that we only know ourselves as we appear and that an appreciation of this point is crucial for answering the objection against the subjectivity of time. We need to make representations into appearances if they are allowed to change, that is, into intentional objects and not into noumenal mental entities or states.

Thus, time is a modification of how we perceive and represent things, not of how things are. Time is not a feature of absolute reality, but is only a subjective form of sensibility. It applies not to representations, but to our awareness of representations. As Wittgenstein said, the self is not part of the world but is the limit of the world (cf. Wittgenstein: 1974, §5.632 & §5.641). The self is the self with its representations since representations are modifications of the self. The world is the spatio-temporal phenomenal world. Neither self nor representations are spatio-temporal. Instead, the spatio-temporal world appears to the self, it is the content of its representations.⁸

1.2.2 The reality of representations

A similar problem to that concerned with the temporality of representations regards the reality of representations. When reducing appearances to representations, the question quickly arises what the status of representations is. It seems that they themselves cannot similarly be reduced, which would imply that they cannot be appearances.

This problem was already raised by H. A. Pistorius who claimed that it was difficult for him “to convince himself that the sensations that are given in time are equally mere phenomena as the intuitions given in space, because he could not overcome the difficulty that as soon as our inner sensations or representations would have to be not things in themselves but appearances, nothing other than appearance would be there and no real object would remain to which something would appear” (Pistorius: 1784, p. 345). It is not clear “how it is possible to think that representations, which we always have to presuppose as real or as things in themselves if one wants to explain how an appearing is possible, can themselves be mere appearance and what that then is whereby and wherein this appearance exists?” (Pistorius: 1784, pp. 345-346)

More precisely, we want to say that objects in space and time are not things in themselves but are merely inner as well as outer appearances. This can be achieved quite straightforwardly when dealing with outer objects. Such objects can be treated as appearances that are somehow reduced to representations. They are objects that appear in the representations. There being an outer object that

⁸As a result, no awareness or consciousness is to be found in the phenomenal world. Instead, the world is to be found inside the awareness. We can only find the correlates of consciousness, not consciousness itself.

appears to us, amounts to us having a representation of an outer object. The problem now is that inner objects, i.e. representations, do not seem to be reducible in this way, thereby threatening to undermine the claim that they are merely appearances and not things in themselves. This appears to give rise to a dilemma.

On the one hand, we cannot claim that representations are appearances. This is because they would have to be reduced to other representations. There would have to be further representations wherein they would appear. But these further representations would then have to be reduced as well. As a result, we would end up with an infinite regress or a vicious circle.

On the other hand, we cannot claim that representations are not appearances. This is because representations are in time. Since time is a mere form of intuition, it follows that that which is in time is transcendently ideal. Hence, representations are transcendently ideal and consequently have to be appearances. Moreover, it seems that we are aware of our representations and have knowledge of them. Since we are ignorant of noumena, it would again seem to follow that representations have to be appearances.

To solve this problem we need to claim again that there are both noumenal and phenomenal representations. The former are atemporal and unknown, while the latter are temporal and known. More precisely, we need to understand representations as being real in order to make sense of appearances. Something appears because there is a representation in which it appears. This means, however, that the representations themselves cannot be appearances. Accordingly, we have to accept that the representations through which things appear are real existents. This, in turn, requires us to accept that representational media are noumenal, while that which appears through them by an act of reflexive awareness is phenomenal.

While it is true that representations are at some level irreducible, this is not problematic since irreducibility only applies to noumenal representations. Consequently, the irreducibility claim does not conflict with the fact that phenomenal representations are appearances that exist in time. Phenomenal representations are nothing but intentional objects of noumenal representations. They are temporal appearances, while the noumenal representations through which they appear are atemporal real existents.

Moreover, this does not undermine the claim that we are ignorant of noumena. We only know the contents of the noumenal representations as they are mediated by the forms of intuition and do not know those noumenal representations themselves. We are not aware of the representations themselves but only of the content of the representations as this content appears to us having been mediated by the form of inner sense. Since awareness of the representational content results from empirical apperception and is thus necessarily temporal, it follows that we do not know the content as it is in itself but only as it appears to us. It is because aware-

ness is mediated by time that the intentional objects of noumenal representations are heterogeneous from the contents of the noumenal representations. Given this heterogeneity, we cannot gain knowledge of noumenal representations from our knowledge of their temporalised intentional objects.

We can thus avoid the dilemma by noting that some representations are appearances and some representations are noumenal. On the one hand, by claiming that we have noumenal representations, we can avoid the objection of an infinite regress or a vicious circularity. In this way we can reduce all appearances to transcendently real and irreducible noumenal representations. On the other, by claiming that we have phenomenal representations, we can avoid the objection of temporalising noumena and rendering them knowable. In this way we can allow for the temporality and knowability of those representations of which we are aware.

All of this ties in with Kantian anti-Cartesianism. No priority is given to the inner realm. Instead, the inner and the outer are seen to be on a par. The inner is only privileged in the sense that that which is transcendently in me is directly known, which means that we epistemically privilege the subjective over the objective. That is, the world of appearances is revealed to us by empirical apprehension, resulting in a direct acquaintance with this subjective world. Within this subjective world, however, no distinction of status is made between the inner and the outer. Only the transcendently inner is privileged over the transcendently outer. The empirically inner and the empirically outer are treated in the same way. Our knowledge of inner objects is of the same kind as that of outer objects. In both cases we only know the appearances and in both cases these appearances are known immediately.

1.3 Perspectival fragmentalism

Our access to the world is essentially perspectival. We always view the world from a particular perspective. We are aware of things as happening ‘now’ and as being located relative to ‘here’. A perspective is a here-now occupied by a subject – it is an I-here-now.⁹ Since appearances are subjective objects that have the features that they are represented to have, it follows that appearances are essentially perspectival and have an ineliminable indexical aspect.

Not only are appearances perspectival, they are also fragmented. The different perspectives that a subject occupies, as well as the different contents of which the subject is aware, are not ordered and do not stand in relations to each other. In particular, they do not stand in spatial or temporal relations to each other and thus do not constitute a temporal or spatial order.¹⁰ This fragmentation follows

⁹The subject has to be understood as the transcendental and not the empirical subject.

¹⁰For the rest of this section, we will ignore the spatial aspect and only focus on the temporal

from the ideality of time. Since time applies only to the content of awareness and since all content is represented as existing 'now', it follows that all temporal determinations, that result from time being the form of apperception, are 'now' determinations. Everything is happening 'now'. Since there is a plurality of different now's, none of which is privileged, we can see that this is not a version of presentism, whereby only the privileged present exists. Instead, all these different now's exist and are equally real, which means that we are dealing with a version of fragmentalism.¹¹ Since the only temporal determination resulting from the form of awareness is the determination 'now', and since things are temporal only to the extent to which they are represented to be temporal, we can see that all these things that are happening at their respective now's are fragmented and do not stand in temporal relations to each other. The different now's do not constitute a temporal order and do not belong to a common extended temporal framework.

More precisely, since time is a form of intuition that is imposed on the content of awareness, it follows that awareness itself is not temporal and does not occur in time. Only the content of awareness is placed in time. Time itself is part of the content of awareness, namely the form of the content, rather than being the medium in which awareness takes place. Put differently, temporal operators are within the scope of awareness and qualify that of which one is aware, rather than it being the case that awareness is within the scope of the temporal operators and that these operators qualify the awareness itself and not only its content.

Given the perspectival nature of intuition, we are aware of appearances as existing 'now'. We are aware of the contents of our noumenal representations as occurring in the present. Since awareness is not in time, it follows that there is not a time at which one is aware. Hence, it is not the case that at t : I am aware of x as happening 'now' and that at t' : I am aware of y as happening 'now'. Rather, temporality qualifies the different contents of awareness. Accordingly, I am (atemporally) aware of x as happening 'now' and aware of y as happening 'now', without it being the case that I am aware of x and y as happening 'now' since these now's are different. Being 'now' or being present attaches to all these different contents.

All of these contents are real for the subject and all of them are happening at their respective now's. The different now's attaching to the contents of which a subject is aware all exist for that subject. Each of these fragmented now's is equally real, rather than there being some privileged now. Since the different contents of which a subject is aware are only represented as occurring 'now' and are not represented as standing in temporal relations, it follows that they are not temporally ordered. Accordingly, one cannot say that content x is earlier than content y or that y is earlier than x . There simply are no facts about temporal orderings or temporal relations amongst representings, amongst our appearances.

aspect.

¹¹For a discussion of fragmentalism, cf. Fine: 2005, chapter 8.

The different now's are not ordered but fragmented.

Even though our appearances are not temporally ordered, we can represent temporal orders by means of higher-order representations. That is, it is only the contents of our higher-order representations that are temporally ordered, and it is by means of such representations that we can represent different things as happening at different times and as standing in temporal relations. Such representations allow us to represent x as being earlier than y . In this way, temporal orderings pertain to the contents of our higher-order representations. First-order representations are temporal insofar as we are aware of them as occurring 'now'. Yet, an extended temporal framework only comes into play when we are concerned with higher-order representations. These representations go beyond the 'now'. Since the contents of such higher-order representations can be assigned temporal locations that differ from that of the occurrence of the representing itself, they allow us to step outside the particular temporal perspective that is occupied when the representing occurs. In this way, they allow us to represent temporal orderings amongst the contents of different such temporal perspectives, amongst different now's. They can integrate and order these now's into a common framework, thereby representing an extended temporal order.

Thus, we do not have temporal relations amongst first-order intentional objects (appearances). Instead, temporal relations only pertain to the representational contents of second-order representations. Given that appearances do not stand in temporal relations, it follows that these representations of temporal orderings cannot strictly speaking reflect an objective temporal ordering. There are no temporal relations amongst the appearances to which such higher-order representations could correspond. Accordingly, representations of temporal orderings would seem to turn out to be arbitrary and lack criteria of correctness.

Though appearances are not temporally ordered, representations of temporal orderings can nevertheless be well-founded. Whether they are well-founded does depend on matters of fact, but not on temporal matters of fact. Our representations of temporal orderings do not have to match an objective temporal ordering since such an ordering does not strictly speaking exist. Instead, they have to reflect objective priority/dependency relations amongst the events. The temporal relations which feature in the content of higher-order representations should correspond to the priority/dependency relations amongst the events that are being represented. Thus, there exist a plurality of times, a plurality of now's. These, however, do not stand in earlier/later relations to each other and are not temporally ordered. Instead, our ordering of them has to reflect priority/dependency relations. These priority/dependency relations then determine which earlier/later representations are well-founded.

Accordingly, we can see that different now's are connected even though they are not connected by means of temporal relations. There are facts about how we should represent temporal orderings, about how we should order the contents

of our higher-order representations. In particular, the temporal ordering of the contents of higher-order representations should reflect the dependency ordering amongst the events that are represented by these higher-order representations. Representations of temporal orders can be well-founded if they accurately reflect the dependency order amongst the contents. Accordingly, it is not just a brute fact that we should represent x as being earlier than y . Instead, there is something that makes it the case that we should represent x and y in this order, rather than another order. What makes this the case is that y depends on x . We should represent x as being followed by y because this temporal ordering respects the dependency ordering amongst the events. Hence, even though it is not the case that x is earlier than y , we should nevertheless represent x as being earlier than y since this way of representing the relation between x and y is well-founded and reflects an objective fact.¹²

1.4 The status and nature of appearances

The outcome of the process of intuition is the world of appearances of which we are aware. Appearances are matter-in-form. They are the result of translating the selected manifold into imposed forms. Given that each subject has his or her own mental frameworks within which that person's manifold is ordered, it follows that that which is translated into these forms is equally subject-dependent. Put differently, since intuitive space and time are subjective, it follows that those things of which we are immediately aware and which are ordered in our spatio-temporal frameworks, i.e. appearances, are subjective entities. They are private entities that only exist for the subject that is aware of them, the subject in whose subjective spatio-temporal framework they are located. Whilst fragmentalism holds for the appearances of which a subject is aware, relativism holds for the appearances of different subjects. Appearances only exist relative to the subject that has them and do not exist for other people. Their existence or being is subject-relative and is so to speak not intersubjectively available.

1.4.1 Subjectivity and intersubjectivity

It should be noted that though appearances are subjective objects, in the sense that their existence is dependent on the particular subjects that are aware of them, they can nonetheless be intersubjectively objective insofar as their features are determined not by peculiarities pertaining to particular subjects but only by features

¹²We have just seen that, strictly speaking, there is no objective representation-independent temporal or spatio-temporal order. Instead, what we have are facts about how we should represent spatio-temporal orderings. There are facts about which representations of spatio-temporal orderings are well-founded. For the remainder of this dissertation, I will be speaking loosely about the 'objective spatio-temporal order' to refer to these well-foundedness facts.

that are essentially shared. Put differently, even though their existence is subject-dependent, they are not purely subjective in the sense of only having secondary qualities, but can have primary qualities that correspond to what the world is like for us.

This means that we need to distinguish the subjective into that which is dependent on particular minds, in which case it is merely subjective, and that which is dependent on features that are essentially shared by all minds of a certain kind, in which case it is intersubjectively objective. That is, some subjective features are shared by all selves of a certain kind, namely the forms of intuition and the forms of thought. These forms are subjective in the sense that they inhere in and derive from the subject. They are, however, intersubjectively objective since they are essentially shared by all subjects of that kind. Other subjective features, on the contrary, are not essentially shared in this way but are peculiar to particular subjects and any sharing of these features is accidental.

The distinction between necessarily and contingently shared features allows us to distinguish between primary and secondary qualities. While primary qualities are those qualities that are empirically real, secondary qualities are those qualities that are empirically ideal, whereby to be empirically real is to be intersubjectively objective and to be empirically ideal is to be merely subjective. Thus, while primary qualities are empirically real and depend only on mind-dependent features that are necessarily shared, secondary qualities are empirically ideal and depend on mind-dependent features that vary between different cognitive subjects.

This account does not simply reduce to the problematic idea that “secondaries vary with observer and circumstance whereas the primaries are constant” (van Cleve: 1999, p. 170). It is not a claim about the phenomenology of secondary qualities, but a claim about the source of the qualities. It is a claim that is concerned with the question whether particular qualities derive from us and, if so, whether they non-accidentally derive in the same way from all of us or whether there can be differences between different subjects. That is, we are concerned with the question whether the mind-dependent source of the qualities is essentially shared.

The difference between primary and secondary qualities thus results from the generality of the kind of epistemic subject to which they are relativised. Primary qualities are relative to our forms of intuition and are thus objective for us. This intersubjectivity is not based on accidental agreement. It is not based on what people simply happen to agree on, what beliefs or representations they happen to share, but instead on features that are necessarily shared. Secondary qualities, on the contrary, are relative to subjects with certain sensory systems and are consequently subjective. They do not arise from shared features that are intersubjectively objective but from contingent peculiarities of sensory systems that are peculiar to particular subjects or only accidentally shared. Primary and secondary qualities thus have different sources and hence differ in ontological status.

1.4.2 Emergent intentional inexistents

Not only are appearances subjective objects, they are also intentional objects. In particular, they are intentional objects that emerge and that inexist. The reason why we should accept the inexistence of intentionalia, rather than denying them any substantive ontological status, is that this allows us to recognise the undeniable reality that must be granted to the immediate objects of our awareness. The reality of the manifest image, of the given, of the immediate objects of awareness, of that with which one is presented is too manifest and too immediate to be deniable. If we are to respect the manifest reality of appearances, we need to countenance different forms of existence, in particular some kind of intentional inexistence. We need to commit ourselves to there being different kinds of existence, different ways of being. Real existence can then be seen to be applicable to noumena, while intentional inexistence applies to appearances.

Unlike phenomena, appearances are not mere logical constructs or logical complexes but have some form of actual being. Since they are intentional objects, they only have a lesser form of being than that enjoyed by noumena. Unlike a noumenal mental state, an appearance is not a real existent or modification of a real existent. Instead, it is an intentional existent – a thing that exists in being represented. Moreover, unlike phenomena, they are emergent entities. They come into existence when the relevant episodes of awareness obtain since they are immanent to the awareness. They are not reducible to the representational media, but feature as irreducible constituents of representings. While intentionalia inexist and have being, they are nonetheless not fundamental entities but are rather merely derivative entities. This is because they exist in virtue of there being an act of awareness of which these intentionalia are the contents. They are constituents of the episodes of awareness in which they feature since they are nothing other than the contents of those episodes of awareness. Intentional objects are thus to be understood as emergent entities that result from representings. They are subjective objects or private entities that inexist.

Intentionalia are usually considered to be fully fledged objects insofar as they are understood either as the ordinary objects that are intended or as fully fledged intentional objects that may be non-existent or only inexistent. Since we have argued that intentional objects result from representational media and since representations are partial, we have to reject these traditional accounts and instead consider intentional objects as partial and not fully determinate objects. Intentionalia result from partial representations, given that we represent the world from a particular point of view, and are consequently themselves only partial. Appearances are thus not fully determinate objects but are intentional objects of partial representations.¹³

¹³In this respect they are like fictional objects since such objects only have those features the fiction attributes to them or those which are entailed by the fiction, while it is indeterminate what other properties they have. For example, if a fiction is about a human person, then it will follow

The intentional object is represented by the representation and depends for its existence on the representation. More precisely, the existence of an intentional object is dependent on the representing, that is, on the representation joined with apperception. This is because intentional objects require not only the representational medium, the determination of the mind. They also require there to be apperception by means of which the subject becomes aware of the content of the noumenal representation. The representational medium needs to be activated by means of reflexive awareness in order for the intentional object to emerge. This implies that the intentional object only exists insofar as the subject is aware of it. Since the act of reflexive awareness gives rise to the intentional object rather than producing awareness of a pre-existing intentional object, it follows that this object is immanent in the act of awareness, rather than in the representational medium. Its inexistence is consequently dependent on the awareness in which it is immanent. This means that intentional objects are neither immanent nor transcendent to the noumenal representation in the ordinary sense. The intentional object does not exist within the noumenal representation, nor does it exist independently of that representation. Rather, it is immanent to the act of awareness. The representation is the medium through which a temporalised awareness of the intentional object is achieved, whereby that object is not separated from the awareness. Thus, it is immanent in the mental act of awareness which arises via the representational medium, but not immanent in that medium itself.¹⁴

Intentional objects are entities that emerge out of representings. Since the representing only creates the intentional object and not the phenomenon to which this intentional object corresponds, we can still make sense of the idea that representations represent independently given objects, rather than creating the objects that they represent. Thus, the representation presents an intentional object to the subject, whereby this intentional object corresponds to a phenomenon since it has a phenomenon as its intersubjective correlate. Accordingly, we still have an independently given object, namely the phenomenon that is represented by us. It simply is the case that this object is not the immediate object of awareness. Rather, what we are immediately aware of is the intentional object and this intentional object is immanent to the act of awareness and consequently dependent on the episode of awareness, on the particular representing in which it features.

that this fictional object will have a height. However, while it possesses the determinable of having a height, it lacks a determinate height as long as this is not specified by the fiction.

¹⁴Accordingly, we should accept something along the lines of Brentano's early understanding of intentional objects. On this view, intentional objects are immanent and exist within the mental act. This is opposed to a Husserlian view whereby the intentional object is separated from the intending act.

1.4.3 Ontologically amorphous appearances

Appearances result from translating the manifold of intuition that is provided by the world into the forms of intuition. What we are aware of is a spatio-temporal distribution of qualitative features that can be understood as phenomenological intensive magnitudes. The world of appearances thus consists of extensive and intensive magnitudes. Extensive magnitudes are spatio-temporal extensions, while intensive magnitudes are qualitative features. In other words, we have sensory qualities spread out in space and time. The only structure that is inherent in the world of appearances is spatio-temporal structure. Spatio-temporal difference grounds the distinctness of the qualitative features since these are partially individuated by their spatio-temporal locations. While qualitative features are structured in this way, there is no ontological structure. The distinctness of objects and the spatio-temporal boundaries of objects are not given to us and do not feature in the world of appearances. We are only given the distinctness of qualitative features, but how these features are to be aggregated to constitute objects is in no way settled.

This means that intentional objects are not reasonably well-defined entities corresponding to what we take to be ordinary objects. We do not have a plurality of representations at any moment of time, representing different but contemporaneous intentional objects. Intuition does not represent individual objects. We are not given individual objects in perception. Instead, an intuition simply represents there being certain qualitative features located in certain spatio-temporal regions. It represents the unindividuated and undifferentiated qualitative characteristics of the phenomenal world. They are unindividuated in the sense that they are not attributed to any individual objects. They are not taken to be identical to or to be parts of substantive synchronic or diachronic entities. Rather than attributing features to objects, it is merely represented that certain qualitative features are distributed in a certain spatio-temporal manner. Accordingly, what is represented can be captured by a purely adverbial account. That is, what is represented is along the lines of 'it is redly there'.

The world of appearances is ontologically amorphous and lacks ontological structure. Appearances lack unity and do not classify as substantive individual objects. That which is represented contains no unities, no boundaries, no bundles, no objects. Not only are no unified objects to be found in the world of appearances, other ontological structure is missing as well. No causality and no modality are to be found there either. The world of appearances is accordingly completely devoid of ontological structure. All that is given to us is the way things are for a particular subject at a particular time. Things simply are as they are represented by intuition and intuition does not represent causal or modal properties and relations. Since the world of appearances is to be identified with the intentional objects of which a subject is aware, it follows that the features of the intentional objects exhaust the features of that world. Since intentional objects only possess

those features that have been specified by the representation and of which we are aware, it follows that this world only possesses those features that are given to us. Since only intensive and extensive magnitudes are given to us, we can conclude that the world of appearances does not possess any ontological structure.

This understanding of intuition is in conflict with a widely accepted view regarding the singularity of intuition. It is generally claimed that intuitions pick out different objects, that each intuition is a singular and immediate representation of a particular object. This view is mistaken if it is understood in such a way that there is supposed to be one intuition for each ‘ordinary object’. It is mistaken because intuition does not carve up the manifold for us. Intuition lacks the resources to do so. More precisely, carving up the manifold requires us to employ the dynamical categories, in particular the category of substance, and these dynamical categories are not involved in intuition but only in judgement.

Nonetheless, we can still accommodate the singularity of intuition insofar as intuition is singular with respect to time-slices. The manifold received at each time-slice is treated as a unity, rather than as a collection of individual objects to each of which we stand in a singular relation. We have one outer intuition at each moment of time, rather than a plurality of such intuitions. There is one intuition per time-slice, rather than one intuition per unified phenomenal object.¹⁵ Intuition does not carve up the manifold for us – this we must do ourselves.¹⁶

¹⁵It should be noted that this account only applies to outer intuition. It is the outer manifold that is treated as a unity. This manifold, however, is distinguished from inner manifolds.

¹⁶Kant’s commitment to the unity of time-slices of the manifold can be found at A99: “Every intuition contains in itself a manifold which can be represented as a manifold only in so far as the mind distinguishes the time in the sequence of one impression from another; for each representation, *in so far as it is contained in a single moment*, can never be anything but ABSOLUTE UNITY” (emphasis added). A similar view can be identified in the form of Carnap’s ‘Elementarerlebnisse’ which he takes to be indivisible unities (cf. Carnap: 1928, §§67-68).

Chapter 2

Phenomena

In addition to the subjective worlds of appearances that are made up of intentional objects and that only exist for particular subjects, there is also an intersubjective world of phenomena that is made up of logical constructs and that exists for everyone with our forms of intuition. This world is grounded in the noumenal sphere and is as such objective for us, i.e. for cognitive beings with our forms of intuition. The objects to be found in the phenomenal world are the intersubjective correlates of appearances. This intersubjective world is objective for us and functions as the subject matter of scientific inquiry and it is its structure that we discover by means of scientific investigation.

2.1 Constructing phenomena

Phenomena are intersubjective objects. They are the objects with which scientific investigation is concerned. Unlike appearances, phenomena are not emergent inexistents but are instead logical complexes that are constructed out of noumenal information. In particular, it is translated noumenal information that functions as the elements in the logical complexes. This translated information corresponds to that which is objective in our representations. The phenomenal realm thus embodies information contained in the manifold of intuition that has been transformed by the forms of intuition, which means that the existence of the empirical intersubjective realm can be reduced to the obtaining of facts concerning the forms of intuition and the manifold of intuition made available by noumena.

Phenomena are constructed out of the manifold of intuition. Phenomena, like appearances, consist of both matter and form. They are matter-in-form. Their two components are, on the one hand, the forms of intuition and, on the other, the matter of intuition. The forms of intuition are space and time. They are our subjective mental frameworks which we use for ordering and representing objects. The forms are our contribution to the phenomenal realm. The matter of intuition, on the contrary, is not contributed by us since it is the manifold

of intuition that derives from noumenal objects. The information contained in this manifold is translated into the forms of intuition. We thereby end up with a spatio-temporal manifold that consists of spatio-temporally ordered translated information.

Since phenomena encapsulate information, in a translated form, that is provided by noumena, it follows that the noumenal realm is the ground of the phenomenal realm and that the latter exists in virtue of the former. The phenomenal and noumenal spheres stand in an asymmetric relation that involves the dependence of phenomena on noumena. The phenomenal realm is dependent on the noumenal realm since it is nothing other than an informational manifold that is structured by the forms of intuition and that results from a process which takes information provided by noumena as its input.

The phenomenal and noumenal realms consequently encapsulate the same information in different ways. Rather than having one object or entity that is considered in two different ways or that has two different sets of properties, we have one set of information that is embodied in different ways. This means that noumena and phenomena are connected insofar as they embody or encapsulate the same information, yet they differ insofar as this information is embodied by them in two different ways. In the case of noumena, this information is embodied by the noumenal properties. In the case of phenomena, this information features as the translated matter of logical constructs that have a spatio-temporal form that derives from the forms of intuition.¹

In other words, we do not have one thing that is both spatio-temporal and non-spatio-temporal. Rather, we have non-spatio-temporal entities which instantiate certain properties. Facts about these objects and their properties are encapsulated as the contents of the informational manifold that features as the input of the constructive process that translates the given information into our frameworks, resulting in spatio-temporal logical complexes.

The same information thus features in two different frameworks and is present

¹The relation between the information transmitted in the manifold and the noumenal categorical grounds that give rise to this manifold seems to admit of two possible models. Either (i) the manifold may in some sense reflect, resemble or correspond to the categorical ground, or (ii) the manifold, though resulting from the categorical ground, does not reflect the categorical ground. A helpful analogy here is the distinction between primary and secondary qualities. Primary qualities do resemble their categorical grounds, whereas this is not the case when it comes to secondary qualities. Similarly, the information which is translated to yield phenomena may or may not correspond to the categorical grounds. In the former case, the categorical noumenal properties do not just give rise to the manifold, but they themselves enter into the manifold and are reflected in the manifold. In the latter case, these properties would only give rise to the manifold without being reflected therein. Both accounts are conceivable and there does not seem to be anything to which we can appeal to settle the question whether the relation should be construed along the lines of the primary or the secondary qualities model, that is, whether the untranslated manifold that gives rise to the phenomena resembles or corresponds to the noumenal categorical grounds.

in two different way. In one case, it is embodied in the noumenal objects and properties. Here the information is pure and reflects absolute reality. In the other case, it is the matter of a spatio-temporal informational manifold that characterises the intersubjective nature of our experiences and that describes the structure and content of empirical reality. Here the information is no longer pure, but is processed by the forms of intuition and reflects only our spatio-temporal phenomenal reality.

Given this understanding of phenomena, we can see that the one-world v. two-world debate is to some extent misguided. Since phenomena are logical constructs, it is neither the case that they are objects that can be identical to noumena, nor is it the case that they form a distinct class of entities that constitute a world. This means that, in a sense, we trivially end up with a non-identity view, but contrary to the common understanding this does not imply a two-worlds view. Rather than ending up with the non-identity of distinct objects, the only real objects that we have are noumenal objects. Phenomena, though distinct from noumena, are not real objects but only logical complexes. Thus, we can agree with van Cleve that we only have one world since phenomena are not real objects that constitute a world, but that we nonetheless have two domains of discourse (cf. van Cleve: 1999, p. 150).

While the one-world v. two-world debate is somewhat misguided, there is an important question regarding the relation between noumena and phenomena in the vicinity. Instead of asking about the identity or non-identity of phenomena and noumena, the real question that we should investigate is how noumenal information is related to phenomenal information. As we have seen, these informational manifolds have the same matter but differ in form.

Depending on whether we are concerned with appearances or phenomena, we can discern different ways in which this informational manifold enters into the process whereby it is translated into the spatio-temporal frameworks. On the one hand, there is the case in which a subject is affected and provided with information. Here the information is in some way transmitted from the object to the cognitive subject², which can then process and synthesise the information, resulting in modifications of the mind of which the subject can become reflexively aware by means of apperception. Intentional objects of which we are immediately aware then emerge upon the activation of noumenal mental states by reflexive awareness. In other words, representations are produced by means of intuition and these representations give rise to appearances when the subject becomes aware of the content of these representational media.

On the other hand, when we consider the logical construction of phenom-

²Noumenal affection does not necessarily require two distinct objects. The affection relation can hold between two parts or aspects of the same object as is for instance the case when the noumenal self affects itself, resulting in an inner intuition.

ena, the information enters into the construction process without there being some relation between subject and object. All that is required is that the object exists and that it possesses its properties. Given that these properties are instantiated, it follows that there exists information that encapsulates these properties. This information can then function as the material that is translated to yield the elements of a logical complex. In being translated, this information is mediated by the forms of intuition.

Thus, appearances are intentional objects, while phenomena are logical constructs. Both arise via the process of intuition. In the one case, there is an actual cognitive process, while in the other case there is merely a logical construction. Both times we have a manifold that is processed via the forms of intuition. Both processes deal with the same information and involve the same forms. They differ insofar as the former has subjective additions and transformations, given that subjects view the world from a particular point of view and given that there are subjective cognitive characteristics that are peculiar to particular subjects which affect their sensations, while the latter is restricted to that which is objective and intersubjective.

In other words, they differ because appearances are determined not only by the manifold of intuition and the forms of intuition but also by peculiarities of the sensory systems of particular subjects. Unlike in the case of phenomena, there is no unique appearance associated with a given manifold of intuition. Put differently, unlike in the case of the constructive process that yields phenomena, we do not have a unique translation function that gives rise to appearances. Rather, we are here dealing with actual cognitive processes that can vary amongst subjects due to differences in the sensibilities they possess. While phenomena are uniquely determined by the manifold, in the case of appearances the manifold can interact with sensibility in different ways since different subjects can vary in sensibility, whereby these variable features of our sensibility are the features that are not essentially shared.³ Different subjects can have different ‘reactions’ to the same input, thereby ensuring that the output can vary amongst subjects.

We can thus see that the phenomenal world is a logical construct. It is an informational manifold that is dependent on the forms of intuition and on the manifold of intuition. The phenomenal world exists atemporally and arises atemporally. The phenomenal manifold is simply given and exists statically – there is no point in time at which it comes into existence. The world simply is there, it exists simpliciter and it depends simpliciter on the noumenal realm.

³Kant calls this the “particular constitution of sense in the subject” (A28).

2.1.1 Perspective-independent space-time

Given the perspectival nature of intuition, the phenomena constructed by translating the noumenal information into our forms of intuition do not constitute a unified intersubjective spatio-temporal world. Instead, they give us perspective-dependent intersubjective spatio-temporal frameworks. They give us perspectival accounts of the world and capture what the world is like from particular perspectives (from different here-now's). Such perspectival accounts deal with spatio-temporal frameworks corresponding to our forms of intuition that are centred on particular perspectives, which means that the frameworks inherit their properties from those of the intuitive spatio-temporal framework.

The content of each framework is intersubjective since it is determined by the manifold of intuition together with the translation function pertaining to the forms of intuition. Such a perspectival account describes what is objectively the case from a particular perspective and captures facts about what the world is like from that perspective. It specifies what the world is objectively like for us from a particular point of view and does not contain any of the subjective transformations and additions that are characteristic of appearances.⁴ If someone were to view the world from this perspective, then that in his or her perception which would correspond to this perspectival account would be objective, while the rest (e.g. the qualitative character of phenomenological intensive magnitudes) would be merely subjective. In particular, while the intensive magnitudes of appearances are subjective secondary qualities that are partially a function of the particular constitution of the subject whose appearances they are, the contents of the intersubjective perspective-dependent frameworks do not depend on any particularities of subjects but only on the shared forms of intuition. This means that the contents of such perspective-dependent frameworks are characterised by physical intensive magnitudes rather than by phenomenological intensive magnitudes.

While intuitive as well as perspective-dependent spatio-temporal frameworks are fragmented, perspective-independent space-time is unified. The perspective-independent structure is the system of orders that incorporates and integrates all the different perspectives. It achieves this by abstracting from perspectival features and instead only includes those features that remain invariant under changes of perspectives. The content of perspective-independent physical space-time is accordingly invariant content that holds in all perspectives. Non-perspectival accounts of empirical reality are thus concerned with those facts that hold from all points of view.⁵ To get a perspective-independent characterisation of the empir-

⁴What the world is like from a point of view accordingly also excludes inner intuition and only deals with manifolds provided by outer intuition, since only they are intersubjectively available.

⁵Perspective-independence is to be understood not in terms of perspective-transcending facts but in terms of perspective-invariant facts. Such facts are invariant under changes of perspectives and hence hold in all perspectives. Put differently, the perspective-independent point of view is the point of view from nowhere in particular.

ical world, to end up with a comprehensive and unified spatio-temporal manifold that incorporates the totality of such phenomenal facts, we have to bring in ontological structure to connect the perspective-dependent frameworks. The different perspectives (here-now's) have to be ordered and put together to yield a perspective-independent space-time manifold.

The ordering on the different perspectives is imposed by the transcendental structure of the world. Since perspectives are fragmented and do not stand in spatio-temporal relations to each other, we need to appeal to non-spatio-temporal structure to put together the different here-now's. Empirically, we establish this ordering by connecting the contents of different perspectives. Yet, ontologically the ordering of perspectives is determined by the metaphysical relations that obtain amongst the different perspectives. In particular, it is the ontological structure specified in terms of substance, causation and reciprocity that fixes the ordering. By making possible re-identification, substance allows us to connect different time-slices and specify world-lines. Causation specifies priority/dependency relations that give rise to an asymmetric diachronic ordering, such that if x depends on y , then y is earlier x . Finally, reciprocity allows for synchronic ordering. Together, they determine the continuous causal paths which fix the topological facts of the perspective-independent space-time.

It should be noted that this account of the perspective-independent world is compatible with our claim that science proceeds solely by appealing to the mathematical categories and does not make use of dynamical categories, such as the categories of substance and causation. *Prima facie*, there may seem to be an incompatibility since science makes claims about spatio-temporal relations amongst events, yet the account we have just given grounds such relations in metaphysical structure that can only be cognised by means of the dynamical categories. However, though ontological structure is required to ground objective and well-founded representations of spatio-temporal orderings, it is not necessary to appeal to ontological structure to arrive at such representations. In particular, we can appeal to the spatio-temporal content of our representations to construct a spatio-temporal ordering. Ontological structure is not required for constructing such orderings but is required for grounding the objectivity and well-foundedness of the orderings.

In other words, we can construct a spatio-temporal ordering by means of the contents of our representations. This ordering can then be used in scientific investigation to identify functional relationships amongst events of different kinds. The goal of science consists in formulating functional relationships that reflect the independently given ontological relationships amongst the different events. These ontological relations ground the objective spatio-temporal ordering, to which our constructed ordering should correspond. By appealing to the functional relationships discovered by science, we can try to get better and better approximations of this objective ordering.

While the perspective-dependent spatio-temporal frameworks inherit their structure from intuitive space and time, the structure of perspective-independent space-time need not correspond to that of our intuitive frameworks. Unlike in the case of the perspectival structures, in this case we are not dealing with a spatio-temporal structure that is determined by intuitive space and time. It should be noted though that this structure is nonetheless specified in terms of the intuitive spatio-temporal structure, given that intersubjective physical space-time is constructed out of the different perspective-dependent spaces. This implies that the structure of perspective-independent space-time only needs to correspond to that of our intuitive spatio-temporal frameworks in the limit, i.e. the structures coincide locally. This means that knowledge of perspective-independent physical space-time is mostly synthetic a posteriori and that only some structural features are known a priori. This is because the perspective-independent space will always coincide with the perspective-dependent space in the limit, which implies that in the limit the former has the same structure as the latter. Since the latter is Euclidean, the former is Euclidean in the limit, i.e. infinitesimally Euclidean. Put differently, if the Euclidean nature of intuitive space is granted, then we can have synthetic a priori knowledge not only of intuitive space but can also know a priori that physical space will be locally, i.e. infinitesimally, Euclidean, even though it need not be globally Euclidean. This is due to the fact that they coincide in the limit, which means that physical space will locally have the same properties as intuitive space.⁶ Thus, while we know the global structure of perspective-dependent physical space and time a priori since it coincides with that of intuitive space and time, we only have a priori knowledge of the local structure of perspective-independent physical space-time since we can know a priori only that they coincide in the limit.

2.2 Phenomena and appearances

Phenomena and appearances stand in a correspondence relation, even though there is no causal or reductive relation between them. This may, *prima facie*, seem to be problematic since it is difficult to understand how they can correspond to each other if there are no substantial metaphysical relations that connect them. Since they are neither reduced to each other, nor considered to stand in any causal relations to each other, it may be questioned what the correspondence amounts to and in virtue of what particular phenomena count as corresponding to particular appearances.

To deal with this problem, we can appeal to the transcendental or noumenal object to give a criterion as to which appearances correspond to which phenom-

⁶For other arguments to the effect that we have synthetic a priori knowledge of the locally Euclidean character of physical space cf. Carnap: 1922 & Weyl: 1923, Introduction.

ena. Instead of being connected via a causal or reductive relation, they are connected via their noumenal grounds. In particular, they correspond to each other insofar as their matter derives from the same source. Appearances and phenomena that correspond to each other have a common reductive basis since the existence of both can be explained in the same way, namely by appealing to the existence of the relevant kind of noumenal information. This information then yields either phenomena or appearances insofar as the information is either conceived of as input into a constructive process or as input for a cognitive process.

Thus, despite the fact that phenomena are not constructed out of appearances, these two kinds of objects are nonetheless connected, which means that we do not end up with two entirely separate and detached realms. Since phenomena are reduced to that which makes appearances possible, it turns out that appearances and phenomena are on an equal footing. It is not the case that one is reduced to the other or that one causes the other. Instead, they have the same reductive basis, which implies that certain features of one correspond to certain features of the other. In particular, phenomena and appearances are connected insofar as phenomena correspond to that which is objective in appearances, thereby making it the case that phenomena classify as the intersubjective correlates of appearances.

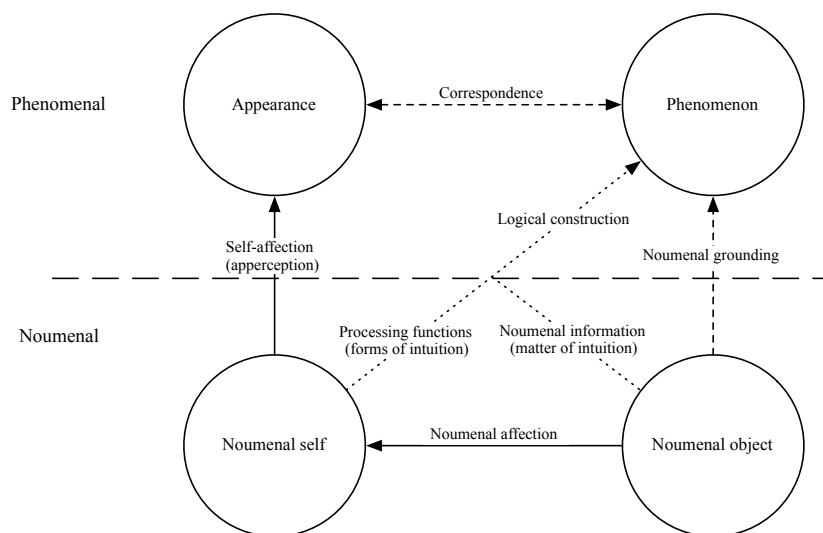
While different subjects cannot be immediately aware of the same phenomenal object since we only directly perceive appearances and these objects are private objects, the appearances perceived by different individuals can nevertheless correspond to the same phenomenon if their matter derives from the same source. These different appearances are numerically distinct, but they nonetheless correspond to the same phenomenon and have the same phenomenon as their correlate.

Moreover, the two are connected insofar as the existence of phenomena implies that there is noumenal information that could be transmitted as the manifold of intuition by noumenal affection. This in turn implies that there are phenomena iff there are available intuitions. Phenomena are not reduced along phenomenalistic lines to available intuitions. Instead, phenomena are reduced to that which makes intuitions available. Available intuitions and phenomena therefore always go together.

For there to be a phenomenon, for there to be a filled region of intersubjective space-time, is for there to be physical intensive magnitudes associated with certain space-time points. For there to be such physical intensive magnitudes is for the manifold of intuition that is made available by noumenal objects to be such that when transformed into a spatio-temporal framework, these physical intensive magnitudes are to be found at these space-time points.

Equivalently, for there to be such physical intensive magnitudes is for there to be available perceptions that involve qualitative features that have as their objective constituents these intensive magnitudes and which locate these qualitative features in spatio-temporal regions that correspond to the intersubjective space-

time points at which the magnitudes are to be found. Put differently, since an appearance is a subjective spatio-temporal region across which qualitative features are distributed, a phenomenal object correspond to an appearance if the intensive physical magnitudes corresponding to the phenomenological intensive magnitudes of the appearance are distributed across the corresponding spatio-temporal region in intersubjective space and time.



The world of appearances differs from the world of phenomena when we have a dissonance between how things are for the subject, how the subject's representations represent reality as being and how the intersubjective empirical reality really is. This dissonance can either concern what objects exist (ontological misrepresentation) or what properties really are instantiated by those things that do exist (ideological misrepresentation).⁷

Ontological misrepresentation occurs in case the subjective world contains things that are not part of intersubjective reality. The things that are restricted to the world of appearances and have no corresponding objects in the world of phenomena are intentional objects that do not have their matter provided by a manifold of intuition that derives from a noumenal object that is distinct from the subject. They are merely subjective objects and only exist for the subject representing them. Examples of such subjectively existing intentional objects are hallucinations, dreams and imaginings.

Ideological misrepresentation occurs when the properties of objects in the world of appearances do not match up with the properties of the correlates of those objects in the world of phenomena. Such differences in properties between

⁷The terms ontological and ideological misrepresentation are due to Fine (cf. Fine: 2005, p. 267).

the intentional object and its phenomenal correlate result when subjective features are added to the object or when objective features are misrepresented, that is, when the manifold of intuition is subjected to subjective additions and transformations that are peculiar to particular subjects. Examples of such subjective properties of intentional objects are secondary qualities, as well as various properties attributed to objects as a result of illusions.

2.2.1 Intensive and extensive magnitudes

Phenomena do not completely correspond to appearances since the manifold of intuition embodied in appearances gets subjected to various subjective transformations and additions, such as the imposition of secondary qualities. Phenomena only correspond to the intersubjective and objective features of appearances. That is, what does belong to phenomena are the intersubjective correlates of the subjective secondary qualities. Rather than attributing the qualitative features of appearances to phenomena, we attribute to them the properties that objectively correspond thereto, namely the physical intensive magnitudes that are correlated with the relevant phenomenological intensive magnitudes.

In the construction of phenomena there is no place for anything that is merely subjective and only the objective and intersubjective features are taken into consideration. The objective features are the features of noumenal objects, whereas the intersubjective features are the forms of intuitions which are shared by all observers like us. Unlike appearances, phenomena are empirically objective and do not depend upon particular subjects but only on the intersubjectively shared forms of intuition.

Whatever is in the phenomenal world has a formal component that is determined by the forms of intuition. These forms function as filters insofar as what is incompatible with them cannot be experienced and is consequently excluded from the phenomenal realm. Being an object of a possible experience thus requires that the manifold of intuition be amenable to the translation and transformation functions that characterise these forms. In short, something is an object of a possible experience, or rather an object of a possible intuition, if it is compatible with the forms of intuition, if its matter can be ordered in a spatio-temporal framework. There is accordingly nothing in the phenomenal realm that is incompatible with our forms of intuition.

Since the forms of intuition are spatio-temporal forms, it follows that the properties featuring in the phenomenal realm are either spatio-temporal properties or modes of spatio-temporal properties. We have spatio-temporal extensions as well as qualitative characteristics modifying these spatio-temporal extensions. In short, phenomena, like appearances, have extensive and intensive magnitude.

While characterising the extensive magnitudes of perspective-dependent phenomena is unproblematic, problems arise when focusing on their intensive magnitudes. As regards extensive magnitudes, there is a straightforward correspon-

dence between appearances and phenomena since they have the same form, given that both the world of appearances as well as the world of phenomena are determined by the forms of intuition. Since extensive magnitudes are modes of spatio-temporal extension, no problems arise and phenomena can straightforwardly be treated as correlates of appearances in this respect, which means that the spatio-temporal features of appearances can correspond to those of phenomena.

Intensive magnitudes, however, pose a problem. These magnitudes are concerned with the reality that occupies the spatio-temporal framework, the reality that fills space. Since the intensive magnitudes of appearances are secondary qualities and are as such subjective, they cannot correspond to the intensive magnitudes of intersubjective phenomena. Put differently, since the qualitative features that are distributed over the subjective spatio-temporal framework are all secondary qualities, and since phenomena are intersubjective entities that do not possess any merely subjective features, such as secondary qualities, the question arises as to how we are to understand intensive magnitudes in the case of phenomena.

If we take away secondary qualities, we seem to be left with an empty spatio-temporal framework. Giving an account of the intersubjective correlates of the subjective intensive magnitudes of appearances thus amounts to the problem of filling in space. We cannot use the qualitative features of appearances since these are subjective. What then can we appeal to in order to characterise the phenomenal world if we cannot appeal to these qualitative features?

On an optimistic view these features can ultimately be revealed and our ignorance is temporary and can be overcome. “The ‘something real in space’ must, it seems, retain its mystery until its true nature is revealed by sophisticated scientific-philosophical inquiry” (Wilson: 1984, p. 170). This optimism is, however, misguided since it is impossible for epistemic agents like ourselves to identify the inner nature of the real in space. The intensive magnitudes of phenomena are only known to us via the relational structures within which they are embedded. These relational features are all that science can tell us about the filling of space. Science does not tell us what these magnitudes are, what their intrinsic nature is, but only in what relations they stand to each other and to subjective sensations. We can only identify relational features, but what the phenomenal realm is like intrinsically is unknown to us. Since it is in principle impossible for us to be acquainted with its intrinsic nature, the inner natures of physical intensive magnitudes turn out to be inscrutable for us.⁸

⁸The problem of accounting for intrinsic intensive magnitudes is analogous to the problem faced by Carnap when he tried to constitute the intersubjective world. The problem, which formed the basis of Quine’s critique, is that once we get to the intersubjective realm, it no longer seems to be possible to give explicit definitions anymore. Instead, we have to appeal to other methods, such as defining or identifying physical features by the roles they play. While this is problematic for a Carnapian who wants to construct a pure constitutional system, we are able to make use of such implicit definitions.

While appearances have phenomenological intensive magnitudes, phenomena have physical intensive magnitudes. Physical intensive magnitudes are the intersubjective features that correspond to the qualitative features of sensations. They are the intersubjective properties that correspond to the phenomenological intensive magnitudes of appearances and that are distributed across the intersubjective spatio-temporal framework.

In order to give positive support for positing such intensive magnitudes and in order to gain a better understanding of them, we need to look at the role that they play. Phenomenal features are the empirically objective correlates of features of appearances. Physical intensive magnitudes are the correlates of the qualitative features of appearances since both the physical and the phenomenological features derive from the manifold of intuition. While the former solely derive from the manifold and the forms of intuition, the latter are rendered impure due to subjective transformations and additions. Accordingly, we can give ontological support for accepting physical intensive magnitudes. We can appeal to our understanding of phenomena as matter translated into form. Phenomenal reality amounts to matter-in-form, which is equivalent to intuitions minus what is subjective in appearances. Physical intensive magnitudes are therefore whatever is left over once what is subjective has been subtracted. They are the residue that remains after the subjective qualitative features of appearances have been filtered out. This means that our understanding of phenomena as logical constructs that supervene on noumena via a mediated supervenience relation commits us to attributing physical intensive magnitudes to the phenomenal realm.

To recap, the phenomenal world is the intersubjective correlate of the world of appearances. This account gives rise to the problem of how to conceive of the real in space, given that the qualitative features of appearances are subjective. We have argued that physical intensive magnitudes are the correlates of the phenomenological intensive magnitudes. These physical magnitudes are not the causes of the qualitative features, but instead correspond to them. They are their objective correlates and count as the real in space. They give rise to the difference between there being something and there not being anything, to the difference between filled space and empty space. We thus have a phenomenal world which can be characterised in terms of extensive and intensive magnitudes, whereby there is a correspondence between subjective and intersubjective spatio-temporal structures, as well as a correspondence between physical intensive magnitudes and the intersubjective features of phenomenological intensive magnitudes.

Phenomena can accordingly be characterised in two ways. On the one hand, one can consider actual and possible intuitions and filter out the subjective additions and transformations, focusing only on what is objective and intersubjective in those intuitions. In other words, the intersubjective phenomenal objects can be gained by filtering out what is subjective in intuitions that are had or could be had by the relevant cognitive subjects. On the other hand, one can side-step

representations and only focus on the manifold of intuition not as it appears to a subject after it has been transformed and modified in various ways, but consider that manifold on its own and then only apply the intersubjective transformations that derive from the forms of intuition. In other words, since the empirical world is jointly determined by noumenal properties and forms of intuition, the intersubjective phenomena can be identified by subjecting what is objective to the intersubjective transformation procedures.

2.2.2 Intensive magnitudes as powers?

Given that intensive magnitudes correspond to secondary qualities, it might be suggested that we can give a causal reading of this relation. On this kind of approach, phenomena are considered to be the causes of appearances and physical intensive magnitudes are considered to be the causal grounds of the secondary qualities of our sensations. Such an account may be motivated by the observation that appearances arise when a manifold of intuition is provided to the self by noumenal affection and that this affection relation is a kind of causal relation. Accordingly, it might be suggested that the correspondence relation between appearances and phenomena supervenes on the causal noumenal affection relation between noumenal objects and noumenal selves. Hence, it might be argued that we can understand the correspondence relation as a causal relation and that we can understand the physical intensive magnitudes as the causes of the phenomenological magnitudes.

This suggestion, however, is problematic since treating intensive magnitudes as causal powers only provides a relational characterisation of these magnitudes and does not give a description of the categorical bases underlying the causal powers. A causal account would not reveal to us their inner natures. It would not inform us of their categorical features. Accordingly, it would only be a partial and incomplete characterisation of these magnitudes that would have to be supplemented. This means that the causal reading of the correspondence relation is not able to replace the account we have given, but can at best supplement this account. Moreover, since the phenomenal realm is not intrinsically causally structured but only contains structure in relation to its grounds, the causal characterisation would not only be a supplementary characterisation but also a subordinate characterisation.

In response, it might be suggested that these magnitudes are bare dispositions and that they should be treated as mere causal powers, rather than as possessing causal powers in addition to their categorical natures. The magnitudes would then be identified with their causal powers and would be exhausted by their causal profiles. This would ensure that a causal characterisation would not miss out anything and hence would not be partial and incomplete.

This revised account, however, is to be rejected as well since the manifold out of which phenomena are constructed is not dispositional. While noumenal selves

receive this manifold as a result of a causal relation, this does not imply that the matter of this manifold is dispositional in nature. The account that treats phenomenal properties as bare dispositions thus has the problematic consequence that it implies that no information is transmitted, that no information is encapsulated in the manifold of intuition by noumenal affection, that the manifold does not have any matter that can be processed by the cognitive subject. Accordingly, advocates of this model are not able to give an explanation as to why affection gives rise to spatio-temporally ordered sensations. They simply posit a disposition, rather than give an explanatory account that appeals to the manifold as providing information to the subject as input which is processed according to the forms of intuition to yield a certain output. It seems clear that the latter kind of story is required by transcendental idealists given their understanding of cognitive processing, in particular their understanding of how space and time feature in intuition. Thus, while objects can have a disposition to give rise to sensations or a disposition to provide a manifold of intuition, it does not seem possible for the manifold itself to be dispositional. The manifold is not dispositional in nature since it contains information that can be processed by us.

Moreover, the dispositional account is problematic, given that phenomena are intersubjective correlates of appearances and give that appearances have categorical intrinsic properties, namely phenomenological intensive magnitudes that are not dispositional in nature. Since phenomena correspond to what is objective in appearances, it follows that we can go from appearances to phenomena by filtering out everything that is merely subjective. However, subtracting the subjective features of the categorical intrinsic properties of appearances does not suddenly yield a dispositional power. The intersubjective correlate of a subjectively transformed categorical intrinsic property should itself be a categorical intrinsic property and not a dispositional property.

Furthermore, since phenomena fail to be intrinsically causally structured, it would follow that if phenomena were considered in isolation from their grounds, then there would not be anything left. That is, since causal structure is only had in relation to noumenal grounds and since, according to the proposal we are considering, causal structure exhausts the phenomenal realm, it would follow that there would not be anything that could be characterised independently of the grounds. Since a scientific description of the world neither appeals to noumenal grounds nor to features that are had only in relation to such grounds, but rather provides a description of the world that only appeals to empirically accessible features, it would follow from identifying intensive magnitudes with bare dispositions that the world would not contain any features that could be described by science. Put differently, it would follow that there would not be any 'real' in space that could be characterised by means of scientific concepts. This is because science does not employ metaphysical concepts, in particular it does not make use of the dynamical but only the mathematical categories, which means that a scientific account

of the empirical world does not appeal to the notion of a causal power but only characterises empirically accessible facts in terms of functional relationships and regularities.

Accordingly, we can see that the intensive magnitudes of phenomena are not dispositional in nature and are not exhausted by their causal profiles. To characterise these magnitudes, we need to provide a non-relational characterisation. Though causal powers can be attributed to the magnitudes if they have the right kinds of grounds, they are not exclusively causal or dispositional and causal characteristics do not exhaust the nature of these intensive magnitudes. Instead, they have a non-dispositional nature that requires a non-causal characterisation or specification. As a result, we should reject accounts of transcendental idealism that commit us to an ontology of forces and a dynamical theory of matter. Such views mistakenly consider intensive magnitudes to be purely dispositional. Instead of having such pure powers or forces, what 'fills' space and what is distributed across space are categorical intensive magnitudes, the inner natures of which are unknown to us.

Thus, physical intensive magnitudes are not in the first place dispositional properties. They are not pure powers or tertiary qualities, but only have causal powers in virtue of having certain grounds. Accordingly, no causal notions are required for an empirical description of the phenomenal world and we can consistently maintain that this world lacks ontological structure when we are abstracting from noumenal grounds. In short, the empirical world, if it is considered on its own, is ontologically amorphous in the same way as the phenomenological world. We have a spatio-temporal distribution of physical intensive magnitudes that are not metaphysically structured. This ontologically unstructured distribution can be fully captured by an adverbial understanding and no appeal to metaphysical concepts is required. In particular, no reference to objects or causal powers needs to be made to give a scientific characterisation of the empirical world.

2.2.3 Scientific structuralism

Scientific investigation allows us to discover what the world is like for us, what is objectively the case for us. It begins with what is subjective, namely appearances, and then attempts to filter out the subjective additions and transformations that are due to the peculiar nature of the cognitive subjects, in order to identify what is objective for us, what is intersubjectively objective. In this process it leaves aside the intrinsic nature of our experiences. This qualitative nature is merely subjective and thus does not feature in an objective description of the world. It is merely ostensible and not communicable. Accordingly, science is only concerned with the structural features of our experiences (cf. Carnap: 1928, §16). These structural features are independent of the particular constitution of sense of a subject, which implies that they are invariant under transformations of the observers. These features are objective for us and are preserved even when ob-

servers are varied.⁹ This means that scientific investigation reveals the empirical structure of the phenomenal world. Science tells us about the structure of the phenomenal world and discovers what relations obtain.

We do not have access to the intrinsic nature of physical intensive magnitudes. We only know the relational features of the phenomenal world, we only know its structure. More precisely, what we know is the structure of instantiations of intensive magnitudes. This is because only structure is empirically accessible to us. The intrinsic intensive magnitudes are inscrutable and hidden from us. We only know their subjective counterparts that appear to us as secondary qualities. Since these secondary qualities are subjective, only the relational structures within which they are embedded count as objective. Since we only know the relational facts of the phenomenal world, we only know the phenomenal world up to isomorphism, which means that anything that has the same structure and is accordingly isomorphic is indistinguishable for us.

While secondary qualities are subjective and vary amongst observers, spatio-temporal structure is invariant and connects appearances and phenomena. Insofar as science describes what the world is like for us, what is objectively the case and insofar as the only objective thing we know is spatio-temporal structure, it follows that scientific theories are specified in terms of spatio-temporal structure. Scientific claims are thus structural claims and science is possible because the spatio-temporal structures of the world of appearances and of the perspective-dependent world of phenomena correspond to each other. This correspondence relation obtains because the forms of both worlds are determined by the forms of intuition. Given that the spatio-temporal structure amongst our representations is isomorphic to the structure of the empirical world, we can discover the objective structure of the phenomenal world. It is because of this correspondence relation that we can gain knowledge about the intersubjective empirical world. The objective structure of the world is understood in terms of extensive magnitudes. These extensive magnitudes are spatio-temporal magnitudes. Given that the forms of intuition structure both appearances and phenomena, we can find out about the relational structure of physical intensive magnitudes by investigating the relational structure of phenomenological intensive magnitudes. Thus, we can see that transcendental idealism enables us to explain how scientific investigation allows us to discover the empirical structure of the phenomenal world and that we can accordingly be realists about the structural descriptions of scientific theories.

Since we accept a version of epistemic structural realism, we have to deal

⁹In the case of perspective-dependent spatio-temporal frameworks, we assess what is invariant under transformations of the observer (holding fixed the forms of intuition), whilst in the case of the perspective-independent space-time we assess an extended range of transformations by also looking at the features that are invariant under transformations of the perspective of observers.

with the Newman problem. This problem states that structuralism makes scientific claims trivial since they reduce to mere cardinality claims. This is because a purely structural description only states that there are objects $x_1 \dots x_n$ that stand in relations $R_1 \dots R_n$, exhibiting a particular structure. Such a description implicitly defines the theoretical terms, thereby capturing the idea that we only know the formal and structural properties of properties and relations, without knowing the properties and relations themselves. However, since nothing is known about these relations and properties other than that they exhibit this structure, it follows that this description can be satisfied by any collection with the right cardinality (cf. Newman: 1928, p. 144 & Demopolous and Friedman: 1985). That is, if we existentially quantify over all theoretical terms and replace them by variables of the right kind, then all theories that are empirically adequate will be equivalent and truth will reduce to empirical adequacy, thereby bringing it about that the only claim being made about the world is a cardinality claim. This would render scientific knowledge almost trivial and undermine scientific realism. According to scientific realism, true scientific theories are supposed to tell us what the world is like, yet empirically adequate theories only tell us what the world looks like.

Transcendental idealism allows us to overcome this problem and enables us to claim that scientific knowledge is not trivial. This is because the forms of intuition are structuring principles of both appearances and phenomena. Both appearances and phenomena are structured by the forms of intuition, which implies that there are significant correspondences between the realms. In particular, the forms of intuition ensure that we have a correspondence between the spatio-temporal structures of the two realms, whereby the spatio-temporal relations are directly accessible to us. As a result, spatio-temporal structure can connect appearances with phenomena. This then allows us to accept an impure version of structuralism, according to which science makes claims about spatio-temporal structures. We do not have to accept a pure version of structuralism since spatio-temporal structures are independently defined and do not need to be Ramseyfied. Accordingly, we do not just make claims about abstract structure, but about spatio-temporal structure, that is, about concrete physical structure.

It is only pure forms of structuralism that are untenable because of their inability to deal with the Newman problem. This is because the Newman problem states that it is trivial to say that all we know is abstract structure. A Ramsey sentence reduces to a mere cardinality claim when we quantify over all theoretical predicates and relations. Accordingly, logical form is not sufficient to yield non-trivial objectivity (as is evidenced by the failure of the *Aufbau*). Abstract logical or mathematical structure is not enough and needs to be supplemented by concrete intuitive structure. Logical form must be supplemented by spatio-temporal form. In order to ensure that structural descriptions are not trivial, we need to bring in intuitive form thereby making it the case that spatio-temporal relations are not implicitly defined by the theory but are independently fixed by intuitive space and

time. It is by being stated in terms of these intuitively accessible spatio-temporal relations that the structural claims can acquire significance. By keeping certain relations fixed we can significantly reduce the number of theories satisfying the Ramsey sentence. As a result, it will no longer be the case that any theory that is empirically adequate and attributes the right cardinality to the world will satisfy the structural description. In this way, we can impose external constraints that a theory must satisfy that go beyond the cardinality of the entities over which the theory ranges. It is these constraints that add further content and provide substance to scientific claims, making it the case that true scientific theories really do tell us what the world is like. Thus, it is not trivial to say that science discovers the spatio-temporal structure of the world since this is concrete structure and not merely abstract structure.

We have just shown how the sharing of relations that are accessible to intuition and the resulting correspondence between the spatio-temporal structures of appearances and phenomena makes science possible. Since these correspondences only hold in the case of the perspective-dependent spatio-temporal frameworks and not in the case of the perspective-independent physical space-time, it may seem that only our knowledge of the former can be saved from triviality but not our knowledge of the latter. However, while it is true that the structure of perspective-independent space-time is not determined by the forms of intuition, but by the ordering that the transcendental structure of the world imposes on the fragmented perspectives, this does not undermine our solution to the Newman problem regarding scientific knowledge of the perspective-independent phenomenal world.

While the correspondence between the spatio-temporal structures of appearances and phenomena allows us to overcome the Newman problem and make science possible, the connection between perspective-dependent and perspective-independent frameworks makes room for sufficient flexibility to allow for the structure of the physical world to be discovered by science and to differ from that of our intuitive spatio-temporal frameworks. Since science discovers this structure, it follows that the spatio-temporal relations in terms of which theories about the perspective-independent world are stated are not fixed by the forms of intuition but are defined by the theories. Whilst they are defined by scientific theories, they are not defined solely in terms of abstract logical and mathematical relations, but partly in terms of the concrete spatio-temporal relations that characterise appearances and perspective-dependent phenomena. The concrete physical structure of perspective-dependent phenomena, which is known to us via the concrete structure of appearances, thus permits us to gain non-trivial knowledge of perspective-independent structure. As soon as we are dealing with perspective-dependent structure, we are already at the level of the intersubjective phenomenal world and beyond the world of subjective appearances. This means that we have

already made the jump to the intersubjective world, which implies that we are beyond the requirement of empirical adequacy.

In other words, scientific claims about the perspective-independent structure of the world can have genuine content since this structure is directly connected to and specified in terms of the concrete perspective-dependent structure, which in turn corresponds to the structure of our forms of intuition to which we have immediate access and which does not need to be implicitly defined by the scientific theory. That is, even though perspective-independent structure is not intuitive structure, it is nevertheless connected to intuitive structure in an adequate manner for it to count as concrete structure and for it to be partially defined in terms of the intuitively accessible relations. Accordingly, theories about perspective-independent structure are not specified purely in terms of logical and mathematical structure, but in terms of concrete physical structure and hence must satisfy constraints that go beyond empirical adequacy and cardinality conditions.

It should be noted that the solution to the Newman problem that we have developed cannot be adopted by transcendental realists. In particular, it is not possible to simply replace the claims we have made about intuitive space and time by claims regarding phenomenal space and time. This is because transcendental realists cannot explain the requisite correspondences between phenomenal space and time, on the one hand, and physical space-time, on the other. Unless the spatio-temporal relations correspond to each other, it is not possible to appeal to them to impose constraints that scientific theories have to satisfy that go beyond empirical adequacy. Transcendental idealists have no problems in this regard since the spatio-temporal structures of appearances and (perspective-dependent) phenomena are both fixed by the forms of intuition, thereby ensuring that they necessarily conform to each other. The forms to which we have direct access structure both appearances and phenomena and thus bring it about that the requisite correspondences obtain. Unless transcendental realists are able to give an explanation as to why phenomenal space and time are in necessary harmony with the structure of the physical world, they are not able to appeal to phenomenal space and time to solve the Newman problem.

Moreover, if one wants to grant that science can discover the structure of physical-space time as well as that this structure may be different from that of phenomenal or intuitive space and time and yet appeal to spatio-temporal structure to solve the Newman problem, then one needs to distinguish between perspective-dependent and perspective-independent spatio-temporal frameworks and directly connect phenomenal or intuitive space and time to the former but not the latter. Otherwise, one cannot explain how it is possible for science to discover the structure of physical space-time despite the fact that the theory is stated in terms of intuitive spatio-temporal relations. Yet, it seems that transcendental realists cannot accommodate the requisite distinction between perspective-dependent and

perspective-independent spatio-temporal frameworks, which shows again that one has to be a transcendental idealist to be a scientific realist.

Thus, the fact that space and time are forms of intuition allows us to connect appearances and phenomena and thereby get from the structure of the former to that of the latter. At the same time, the transcendental ideality of space and time prevents us from getting from the structure of phenomena to that of noumena since there is no spatio-temporal continuity between these realms. Accordingly, we can reject Russell's claim that noumenal ignorance is compromised since noumena can be understood as forming "a world having the same structure as the phenomenal world, and allowing us to infer from phenomena the truth of all propositions that can be stated in abstract terms and are known to be true of phenomena" (Russell: 1920, p. 61; also cf. Schlick: 1979, p. 104).

Given the transcendental ideality of space and time it follows that there is no spatio-temporal correspondence between the realms, preventing us from getting from the structure of phenomena to that of noumena. As a result, the noumenal structure that could be inferred from phenomenal structure could only be understood as abstract mathematical structure, rather than as concrete spatio-temporal structure, ensuring that the structure of the phenomenal world could at most allow us to identify the cardinality of the noumenal domain. Unless concrete relations could be identified and suitably connected to known phenomenal relations, any collection of the right cardinality would have the relevant abstract structure, making this kind of knowledge almost trivial. Yet, even this knowledge of the cardinality of the noumenal domain is ruled out and there is no guarantee that the noumenal and phenomenal realms have the same cardinalities. Indeed, given the possibility of transcendent properties and objects any isomorphism claim is almost certain to be false. Transcendent objects do not play any role in grounding experience and thereby ensure that the noumenal realm has additional structure that is not reflected in phenomena. As a result, the structure of phenomena should not be expected to be isomorphic to the structure of noumenal reality, undermining any cardinality claim.

It might be suggested that instead of an isomorphism claim about the relation between phenomena and noumena, we can make an embeddability claim by specifying a sub-set of the noumenal realm, namely the realm consisting of transcendental objects, that stands in an isomorphism relation to the phenomenal realm. We could thereby make cardinality claims about transcendental objects, while lacking knowledge of the noumenal sphere within which the transcendental objects are embedded. This, however, would still be problematic since we do not know how to individuate the members of the domains and since we are ignorant of the translation function that connects the transcendental realm to the phenomenal realm. There are a number of plausible principles of individuation even when it comes to individuating the members of the phenomenal domain.

We could appeal to filled spatio-temporal points, logical complexes, or bounded phenomenal objects. With respect to noumena, things are even less certain. The members of the domain could be analogues of points, they could be noumenal objects, aspects of such objects or something altogether different. Given noumenal ignorance, the individuation of noumena is best characterised indirectly via the process of intuition, i.e. via the co-ordination relation. Since this relation could be a many-one, one-many, many-many or variably polyadic relation, there is no guarantee that we can identify any isomorphisms and any cardinality claim turns out to be unfounded.

Thus, while there is a non-arbitrary connection between the phenomenal and noumenal realms, and while phenomena somehow correspond to and are manifestations of noumena, any isomorphism or embeddability claim is inappropriate. Instead of making such claims, we should argue that there is a co-ordinated multiple-domain supervenience relation, without specifying the precise character of the co-ordination relation. We only specify this relation functionally insofar as it is equivalent to the translation function. However, we do not specify the particular input-output relation. This allows for sufficient flexibility to allow not just for one-one determination or correspondence as would be required for an isomorphism, but also for one-many, many-one, many-many and variably polyadic relations.

This method only guarantees isomorphisms if we take the units of individuation, which are then mapped by the isomorphisms, as being equivalent to the input and output variables of the translation function. In this way, there would be one output for each input, guaranteeing a one-one relation. This, however, does not say anything about whether these inputs and outputs are simple or complex or whether they can be given more fine-grained individuations. In particular, the individuation principles for the different domains might well turn out to be completely different. This would bring it about that we would have disparate units for the two domains, thereby undermining the significance of the isomorphism claim. Thus, there is no reason to assume that the correct individuation principles imply a one-one function that gives rise to an isomorphism between phenomena and transcendental objects, which implies that we are ignorant of the cardinality of the transcendental realm as well. Accordingly, we can infer the structure of phenomena from the structure of appearances since both of these realms are structured by the forms of intuition and it is because of this that science is possible. However, we cannot make similar inferences when it comes to the relation between phenomena and noumena.

2.3 Noumena as grounds of phenomena

Phenomena are logical complexes that have translated noumenal information as their elements. They can be considered as informational manifolds that result

when noumenal information is translated in accordance with the process of intuition. This means that it is the process of intuition that connects the two realms and ensures that the phenomenal realm is grounded in the noumenal realm. It is via this process that the phenomenal realm comes into existence. Noumena provide the matter which is transformed in this process to yield phenomena. As a result, the phenomenal realm is determined by and dependent on the noumenal realm as regards both its existence and its determinations. This dependence relation can be captured in quasi-formal terms. In particular, we can use coordinated multiple-domain supervenience relations to model the determination and dependence relations between noumena and phenomena.

Supervenience relations allow us to model dependence and determination relations since such relations concern the dependent-variation of properties and accordingly hold if two families of properties are functionally connected. They consequently allow us to give a precise account of the determination and dependency relations that are implicated in grounding relations and capture in a quasi-formal manner the extensional aspects of grounding relations.¹⁰

The project of giving a quasi-formal account of the relation between noumena and phenomena may be questioned given that we are ignorant of noumena. It is reasonable to ask whether we can say anything more than just that there is some supervenience relation or other. Our ignorance of noumena seems to preclude the possibility of giving an informative account of this relation. While these doubts are understandable, we will see that there are good grounds for optimism. In particular, we can begin by noting that we do have knowledge of phenomena and that this knowledge of one of the relata of the grounding relation allows us to specify certain features of that relation. Moreover, even though we do lack positive knowledge of the determinations of noumena, we nonetheless know that noumena exist and we have some negative knowledge insofar as we know what noumena are not, namely that they are not spatial and temporal entities. A further consideration is that we have a relatively modest goal insofar as we do not want to specify the precise characteristics of the supervenience relation but only specify the key formal features of that relation. We want to specify the nature of that relation, in particular what the relata are, what strength the relation has, what its logical properties are, what kind of properties or entities it connects and what the nature of the connection is.

We can make quite significant progress in determining these kinds of formal characteristics of the supervenience relation. In particular, we can know that we are concerned with a multiple-domain, rather than a single-domain, supervenience relation since noumena and phenomena are distinct entities that possess

¹⁰It is important to note that there is an additional hyperintensional aspect involved in the grounding relation. This is a specifically metaphysical aspect that cannot be captured by supervenience relations. “We take *ground* to be an explanatory relation: if the truth that P is grounded in other truths, then they *account* for its truth; P’s being the case holds *in virtue of* the other truths’ being the case” (Fine: 2001, p. 16).

different properties and that can be found in different domains. We also know that it is a mediated and co-ordinated supervenience relation since the noumenal and phenomenal domains are connected by the process of intuition. That is, particular noumenal features are connected to particular phenomenal features via the translation functions that derive from the forms of intuition (whether this function has a fixed adicity or is variably polyadic is left open). As regards the logical characteristics of the relation, we know that the relation is irreflexive, given that it is a relation that connects distinct individuals in different domains. Additionally, we know that the base properties are restricted to transcendental properties since it is only these properties that play any role in yielding phenomena – the others are not compatible with the forms of intuition and are accordingly filtered out.

In short, we know that the grounding relation can be modelled by a mediated, multiple-domain supervenience relation that is irreflexive and that connects both non-relational and relational phenomenal features to non-relational and relational transcendental features. In what follows, these characteristics of the grounding relation, as well as of the associated supervenience principle, will be justified and discussed in more detail.

2.3.1 Determination and dependence

Noumena determine phenomena and phenomena depend on noumena. While phenomena are grounded in noumena, noumena themselves are ultimately ungrounded. Noumena are absolutely real, whereas phenomena are only real for us. Though some noumena might be grounded in other noumena, it is never the case that phenomena ground noumena. The ultimate ground of every fact whatsoever is to be found in the noumenal sphere. The chain of conditions that connects something that is conditioned to its conditions does not terminate in the phenomenal realm. The unconditioned can only be found in the noumenal realm. Noumena are the conditions for phenomena and the chain of conditions terminates in the noumenal realm. This is because the chain from conditioned to conditions in the phenomenal realm is itself conditioned given that it is grounded. So the noumenal terminus of the grounding chain is not to be found as a first member of the chain of conditions from which the others follow. Instead, it stands outside that chain, making it possible in the first place.¹¹

Not only are the properties of phenomena determined by noumena, the very existence of the phenomenal realm is dependent on the noumenal realm. This is because phenomena are derivative entities that are constructed out of the translated manifold of intuition. Without noumena there would not be any manifold of intuition, and there would consequently not be anything that could serve as

¹¹For an account as to why we are justified in expecting the grounding relation to give rise to a lower-bounded partial ordering, consisting of chains of conditions that terminate in ultimate grounds cf. Fine: 2001, p. 27 footnote 38.

an element in a phenomenal logical complex. Phenomena are not independent existents, but are rather dependent and derivative entities. Accordingly, it is not just the case that the properties of objects within the phenomenal domain are supervenient. Rather, the domain itself is supervenient.¹² Given this relation between phenomena and noumena, we can infer from there being phenomena that there are noumena. For there to be constructions there must be something out of which they are constructed. There must be things that can feature as the elements of the logical complexes.¹³

Thus, noumena determine both the existence and the determinations of phenomena – that they exist and how they exist. This connection can be captured by strong supervenience relations. A-properties supervene on B-properties iff B-indiscernibility implies A-indiscernibility. We are dealing with a strong supervenience relation if this implication holds even if the objects that are indiscernible with respect to B-properties are to be found in different worlds. A strong determination relation is not just a relation that holds within worlds but also across worlds. It thereby rules out cross-world variation in A-properties amongst objects that are indiscernible in B-properties.

Supervenience principles can have different modal strengths, depending on the range of worlds for which they hold. In particular, we can distinguish between logical supervenience, which holds in all possible worlds such that B-indiscernibility unrestrictedly implies A-indiscernibility, and nomological supervenience, which holds in possible worlds where certain bridge laws obtain such that B-indiscernibility implies A-indiscernibility only in that restricted range of worlds.

Since phenomena are logical complexes, it follows that logical supervenience characterises the relation between noumena and phenomena. Phenomena are not emergent entities that require bridge laws to come into existence. All that is required for the existence of phenomena is the existence of the relevant kinds of noumena. We need nothing more than noumena to get phenomena since they are logical complexes that have as their elements translated information provided by noumena. In other words, noumenal properties exhaust the supervenience base and the supervenience relation holds with logical necessity.

It might be objected that the forms of intuition play a role analogous to that of bridge laws and that the supervenience claim should thus be restricted in such a way as to hold only in cases where the forms of intuition are present. However, as will be argued below (cf. 2.4.1), the forms of intuition mediate the supervenience

¹²This kind of connection is what Kim calls ‘existence supervenience’. “There is no world in which individuals of D_1 exist but in which individuals of D_2 do not” (Kim: 1993, p. 114).

¹³The same connection also holds for appearances. If there is an appearance, then there is something that grounds the existence of that appearance. We cannot have appearances without things in themselves. This is because appearances are nonexistent intentional objects and nonexistent objects require something wherein they can exist, namely the reflexive awareness of a noumenal representation.

nience relation, rather than entering into the supervenience base. For there to be phenomena, no actual observers with the human forms of intuition are required. The forms of intuition enter into the logical construction of phenomena as a mediation relation independently of whether or not there are any beings in that world that actually possess these forms.

Only when it comes to appearances, do the forms of intuition play a role in the supervenience base because they are then relevant in producing that upon which appearances supervene, namely the noumenal mental states.¹⁴ Since appearances are the immediate objects of awareness of cognitive beings with the human forms of intuition, it follows that there must be actual observers with the relevant forms of intuition if there are to be appearances.

There is thus an important difference in the way in which appearances and phenomena depend on the forms of intuition. Since appearances are emergent inexistents they are dependent on the conditions of emergence. Phenomena, on the contrary, are logical complexes and are therefore in a way nothing over and above the elements out of which they are constructed.

2.3.2 Multiple-domain supervenience

Ordinary supervenience relations concern the dependent-variation of different families of properties instantiated by the same objects. Such relations require that objects that are indiscernible in terms of subvening properties are also indiscernible in terms of supervening properties. This understanding of supervenience is not adequate for capturing the grounding relation between noumena and phenomena since the subvening and supervening properties are instantiated by distinct things that are to be found in different domains. As a result, we have to appeal to multiple-domain supervenience relations. Phenomenal properties supervene on noumenal properties even though these properties have different exemplifiers. Two distinct and disjoint domains are involved in the supervenience relation in such a way that indiscernible distributions of properties in the subvening domain give rise to indiscernible distributions in the supervening domain.

In the case of single-domain supervenience relations, A-properties supervene on B-properties iff B-indiscernibility implies A-indiscernibility. Two distributions are indiscernible with respect to B-properties if there is a B-preserving isomorphism. A mapping Γ counts as such a property-preserving isomorphism iff any x in D_1 has any B-property F if and only if the object to which x is mapped

¹⁴More precisely, we can identify two roles played by the forms of intuition. On the one hand, they play a role in bringing about a noumenal mental state with a spatial or temporal representational content, depending on whether we are dealing with representations of outer or inner objects. On the other hand, the form of inner sense, understood as reflexive awareness, plays a role in leading to the emergence of a temporalised intentionale that is immanent to the act of awareness.

by Γ in D_2 also has F .¹⁵ Thus, A-properties supervene on B-properties iff all B-preserving isomorphisms are A-preserving. The problem now is to determine what it means for there to be supervenience relations connecting distributions in different domains. In particular, we face the problem of specifying the relation between the mappings in the different domains. When dealing with a single domain, we can simply specify that every B-preserving mapping is an A-preserving mapping. This, however, cannot be done when dealing with a plurality of domains since we then have a plurality of mappings.

This means that we need to find some way to connect the domains and thereby connect the mappings. According to transcendental idealism, the two domains are co-ordinated and connected, rather than being independent of each other. Consequently, the mappings should not be independent of each other. This condition can be satisfied by appealing to co-ordination relations that allow us to identify the images of members of one domain in the other domain. Such co-ordination relations allow us to connect the mappings of the members of one domain with the mappings of their images in the other domain.

We can then say that supervenience holds iff every property-preserving mapping on the subvening level is such that the images of the mapped objects are also indiscernible. To state this properly we need to specify the notion of an associated mapping.

ASSOCIATED ISOMORPHISM A mapping of members of the supervening domain Γ' from D_S onto D_{S^*} counts as an associated mapping of a mapping of members of the subvening domain Γ from D_B onto D_{B^*} , if it is the case that if any collection of members $x_1 \dots x_n$ from D_B is mapped onto $x_1^* \dots x_n^*$ from D_{B^*} by Γ , then Γ' maps the images of $x_1 \dots x_n$ under R in D_S , i.e. $y_1 \dots y_n$, onto the images of $x_1^* \dots x_n^*$ under R in D_{S^*} , i.e. $y_1^* \dots y_n^*$.

This notion then allows us to specify strong global multiple-domain supervenience relations, whereby the associated mappings of all B-preserving isomorphisms must be A-preserving isomorphisms if A-properties are to supervene on B-properties.¹⁶

¹⁵If the set of B-properties should include irreducibly plural properties, then the notion of B-indiscernibility must be supplemented by the condition that any plurality of xx 's has any plural B-property F iff the image of the plurality under Γ also has F (whereby the image of a plurality is the plurality of the images of the members of the plurality).

¹⁶This strong version can be distinguished from a weak version, whereby every B-preserving isomorphism must only have some associated A-preserving isomorphism, yet since the weak version fails to track interesting dependence and determination relations we can set this version aside.

WG-MDS for all worlds w and w^* , every B-preserving mapping of the members of the subvening domains of w and w^* has an associated A-preserving mapping of the members of the supervening domains of w and w^* .

These co-ordinated versions differ only if the co-ordination relation fails to be unique, i.e. if $x_1 \dots x_n$ has a plurality of images under R in the supervening domain. In such cases, a particular

SG-MDS for all worlds w and w^* , every B-preserving mapping of the members of the subvening domains of w and w^* is such that all its associated mappings of the members of the supervening domains of w and w^* are A-preserving.

Put differently:

A-properties supervene on B-properties iff for all worlds w and w^* , every mapping Γ of objects in the subvening domains of w and w^* that is such that any x or plurality of xx 's has any B-property F if and only if the object or plurality to which x or the xx 's are mapped by Γ also has F is also such that any image under R of x or of the xx 's has any A-property G if and only if any image under R of the object or plurality to which x or the xx 's are mapped by Γ also has G .

We saw earlier how phenomena arise as a result of the process of intuition. This process features in our supervenience analysis insofar as it provides the co-ordination relation that connects the domains and insofar as it restricts the supervenience base by selecting a subset of the noumenal realm, namely the transcendental as opposed to transcendent realm. These features will be explored in more detailed in the following two sub-sections.

2.3.3 Domain co-ordination

The supervenience relation that characterises the relation between the noumenal and phenomenal realms is a co-ordinated supervenience relation. The phenomenal sphere is not holistically determined by the noumenal sphere. Instead, the determination is more fine-grained insofar as it connects different objects featuring in the two domains. Particular phenomena are grounded in particular noumena. We can model this feature of the grounding relation by incorporating a co-ordination relation (R) into our supervenience principle. This relation allows us to connect the domains in a non-holistic manner, by connecting particular members of the different domains. Such a co-ordination relation is not too restrictive since the mere condition that it connects members of the domains does not determine whether a one-one, one-many, many-one, many-many or variably polyadic connection holds.

The role of the co-ordination relation becomes particularly clear when considering the multiple-domain supervenience version of individual as opposed to global supervenience:

Phenomenal properties supervene on noumenal properties relative to co-ordination relation R just in case for any collections of phenomenal objects

mapping of the subvening domain will have a plurality of associated mappings, allowing us to distinguish between a weak version of multiple-domain supervenience that requires only that one of these associated mappings be A-preserving and a strong version that requires that all of them be A-preserving.

$x_1 \dots x_n$ and $y_1 \dots y_n$ that have images under R and any worlds w and w^* , if $R|x_1 \dots x_n$ in w is indiscernible with respect to noumenal properties from $R|y_1 \dots y_n$ in w^* , then $x_1 \dots x_n$ in w is indiscernible with respect to phenomenal properties from $y_1 \dots y_n$ in w^* .

In the preceding section we gave technical reasons why a co-ordination relation is required when dealing with multiple-domain supervenience. Now we have seen that there is independent philosophical motivation for accepting such a relation insofar as it is required to make sense of non-holistic determination and dependence relations between the noumenal and phenomenal realms. Moreover, there is a good candidate relation for connecting the domains to which we can appeal, namely the translation function of the process of intuition.

The forms of intuition thus feature in the supervenience relation insofar as they are built into the co-ordination relation. Domains are co-ordinated when there is some relation between the members of the different domains that allows us to identify the objects in the supervening domain that correspond to particular subvening objects or collection of such objects. This enables us to connect the mappings of the different domains that are used for assessing for property-preserving isomorphisms. In our case, this relation is the translation function. This function translates the matter provided by noumena into phenomenal properties, allowing us to identify the phenomenal 'images' of the noumenal entities.¹⁷ The fact that we do impose certain frameworks into which the information contained in the manifold of intuition is translated ensures that noumena and phenomena are co-ordinated and that the supervenience relation is mediated. The particular translation functions associated with these frameworks then determine the precise nature of this mediation, the way in which the co-ordination takes place.

Supervenience holds if B-indiscernibility implies A-indiscernibility. In other words, if the base properties are distributed in the same way, then the supervening properties must also be distributed in the same way. When trying to apply this to the grounding relation the problem arises that we need to give an account of how to individuate distributions of subvening properties. We seem to get into trouble due to our ignorance of noumena. This lack of knowledge seems to preclude the possibility of giving an adequate specification of the individuation of noumenal property distributions.

Put differently, to assess for indiscernibility we appeal to property-preserving isomorphisms. This, however, requires us to specify noumenal mappings and it is not clear at all what the members of the domain are that should be mapped.

¹⁷When there is a one-many co-ordination relation that connects one phenomenal feature to a plurality of noumenal features, there will not be a unique noumenal feature that is the image of x and that can be mapped. Instead, the image of x will be a collection of features and one has to assess the collection for indiscernibility by mapping its members. The same holds, *mutatis mutandis*, for many-one and many-many relations.

These could be noumenal objects, certain aspects of such noumenal objects, or some other individuating characteristic such as noumenal analogues of spatio-temporal positions. There seems to be no way for us to provide an exhaustive list of the possible candidates, nor any principled way to decide between them. We simply do not know how to individuate noumenal grounds.

This problem can be solved by appealing to the co-ordination relation. All that is required is that there is some co-ordination between phenomenal and noumenal entities or items. Whether the latter turn out to be objects or aspects of objects or something altogether different can be completely left open. Rather than providing a direct characterisation of the way in which noumenal property distributions are individuated, we should characterise this individuation indirectly by means of the co-ordination relation. We can do this by providing an account of the individuation of phenomenal property distributions and then let the co-ordination relation pick out the noumenal analogues of these individuating features.

In other words, we can give an indirect account that specifies how to individuate phenomenal properties and then appeals to the images of these individuating features. In this way, we can indirectly identify the relevant unit of analysis which individuates the distribution of noumenal properties. Hence, all we need to do is to give an adequate account of the individuation of distributions of phenomenal properties. The co-ordination relation will then take care of specifying in an indirect manner the corresponding noumenal individuating features.

How then are phenomenal property distributions to be individuated, and what are the members of the distributions which are mapped when assessing for property-preserving isomorphisms? Two candidates suggest themselves, namely (i) spatio-temporal points and (ii) phenomenal objects. Given that ontological structure derives from the noumenal realm, and given that there do not exist any bounded and unified individual objects at the phenomenal level when this level is considered on its own, it follows that we should not use a substantive notion of objecthood in characterising property distributions. Accordingly, we should either use a non-substantive notion of objecthood or appeal to spatio-temporal distributions. It turns out that these two options are equivalent since, according to the minimal understanding of objects, phenomenal objects can be understood as filled spatio-temporal regions.¹⁸ An object in this minimal sense is a collection of properties local to a spatio-temporal region. Properties are distributed across regions and objects are then identified with these filled regions.¹⁹ We can thus see

¹⁸These minimal objects are contrasted with ontologically substantive phenomenal objects, with phenomenal substances, which require the properties that are bundled into a minimal object to be bounded and unified as a result of being adequately grounded.

¹⁹This minimal understanding of an object has close analogues in field theories as well as in supersubstantialistic theories. Transcendental idealism allows us to reap the benefits of this minimal notion of an object without incurring the costs that this notion brings with it in the context of these other theories. For example, while field theories as well as supersubstantialistic theories

that individuating in terms of the minimal notion of objecthood, whereby a phenomenal object is considered as a filled spatio-temporal region, actually coincides with individuating in terms of spatio-temporal structures of property instantiations. Hence, we should not use a metaphysically significant notion of an object in characterising property distributions, but should rather claim that supervenience holds if we have indiscernible filled spatio-temporal regions, given that the images of those regions are indiscernible.

Once we accept that the realms are connected in this way, it may be wondered why we cannot gain knowledge of noumena by means of our knowledge of phenomena. Given that phenomena and noumena correspond to each other and stand in these co-ordinated supervenience relations, it should be possible to identify the noumenal counterparts of phenomena. Given that there is this metaphysical connection between the realms, it would seem that there should also be an epistemological connection.

This epistemological connection is prominent in Leibniz's notion of 'expression'. "What is common to all these expressions is that we can pass from a consideration of the properties of the expression to a consideration of the properties expressed" (quoted in Langton: 1998, p. 80). As has been mentioned previously, phenomena express noumena insofar as they are manifestations of noumena. More precisely, they are temporalised and spatialised manifestations. We have a co-ordinated supervenience relation which is based on certain translation and filtering processes. Given these translation processes, it follows that there is no perfect mirroring relation between the realms. Moreover, since these processes are intersubjective, it follows that one realm is not merely to be understood as involving confused perception of the other (cf. 2.4.2).

While we do have this manifestation relation, we are unable to pass from considerations of phenomena to considerations of noumena due to our cognitive limitations. These limitations are various and impose a strict boundary on our knowledge. The kind of knowledge that is ruled out by these considerations is positive knowledge of the determinations of noumena. There is no problem in claiming that we have negative knowledge. For instance, we do know that noumena are not in space and time. There is also no problem claiming that we have knowledge of formal properties and higher-order properties. For example, we do know that noumena are self-identical and that they possess properties. In short, because of various cognitive limitations, we are ignorant of the positive

have the problematic consequence of making all minimal objects modally rigid, we can account for the modal flexibility of minimal objects. This can be without undermining the modal rigidity of spatio-temporal regions since transcendental idealism provides us with two ways of individuating objects, namely (i) in terms of their phenomenal features, and (ii) in terms of their noumenal grounds. Only the former way coincides with the rigid way of individuating spatio-temporal regions. The latter version is independent of spatio-temporal characteristics, thereby providing us with the requisite flexibility.

determinations of noumena.

To begin with, we are not able to acquire knowledge of the noumenal realm because we lack intuitions of noumena. Moreover, we lack the conceptual resources to determinately capture the noumenal realm. All we have in order to think noumena are the unschematised categories. These categories, however, are rather abstract. They only allow us to think certain quite formal features of noumena. That is, we have no grasp of noumena, except to the extent to which they fall under the pure and unschematised categories. Since these categories are quite general and do not fully determine an object, the most we can say is that noumenal features and objects instantiate some kind of order that possesses certain formal features. The precise nature of this ordering, however, is unknown to us and not conceivable by means of our conceptual repertoire.

Additionally, there are worries regarding the multiple realisability of phenomenal roles that undermine any attempt to make inferences about noumena. Even when we do know that there must be a role filler, our knowledge is restricted to knowing that the role is filled by something or other, but we never know what exactly it is that fills the role. Multiple things could fill this role and there is no way for us to single out the actual role filler. In a sense, our ignorance is ineffable, to borrow Lewis's phrase, since we do not even know what the different options are (cf. Lewis: 2009, pp. 215-216). That is, we do not even know what the different possible realisers are.

Even if there were only one possible candidate for filling the role, we would not know what would be filling the role and would not be able to characterise this unique realiser. This is because we are neither acquainted with the realiser, nor can we identify it by appealing to the inverse of the translation function since we lack knowledge of the way the mediation relation works and are not able to reverse engineer the process whereby phenomena arise. Accordingly, we would lack the conceptual resources to give a transparent specification of the realiser and could only specify it opaquely as whatever it is that fulfils the role in question.²⁰

Thus, even though phenomena are manifestations of noumena and stand in a co-ordination relation to them, we are not able to make any determinate inferences about the latter from the former. At most, we can treat them as indications of what noumenal reality might be like.

2.3.4 Transcendent and transcendental properties

So far, we have indiscriminately referred to the noumenal sphere as constituting the supervenience base of the phenomenal sphere. By appealing to the process of intuition, we can give a more fine-grained account of the base properties as well as of the subvening domain. This process allows us to distinguish between

²⁰The distinction between transparent and opaque specifications is due to Foster (cf. Foster: 1982, p. 62).

various kinds of noumenal properties and restrict the set of subvening properties to a proper sub-set of the noumenal properties. In particular, it is the selection function of the process of intuition that is responsible for demarcating the transcendental properties and for restricting the supervenience base. Given the way the selection function works, it follows that the supervenience base is restricted to transcendental properties. That is, phenomenal properties supervene only on a sub-set of the properties of the noumenal realm, namely on transcendental rather than transcendent properties.

More precisely, the selection function determines which properties count as transcendent properties, namely those that provide a manifold that is incompatible with the forms of intuition. In addition, properties that are inert and do not give rise to a manifold at all also classify as transcendent properties. These transcendent properties do not enter into the process of intuition and are in that respect irrelevant to the genesis of the phenomenal sphere. They are consequently also irrelevant to the supervenience relation that models the grounding relation between noumena and phenomena. Since they do not affect phenomena insofar as phenomena do not immediately depend on them and are not determined by them, they do not belong into the supervenience base.

There may, of course, be relations amongst objects or properties within the noumenal realm, that would make some, or maybe even all, transcendental properties dependent on certain transcendent properties. This would, for instance, be the case if everything were to be ontologically dependent on God. That is, for all we know, it might be the case that there are internal or external necessary connections in the noumenal realm. These connections would make it the case that any nomologically or logically possible world (depending on what kind of necessity is involved in the necessary connections) that contains the transcendental properties would also contain those transcendent properties that are connected to transcendental properties by means of these connections.

This, however, does not affect the supervenience principle which states that indiscernibility in terms of transcendental properties implies indiscernibility in terms of phenomenal properties. It will still be the case that if the same transcendental properties are instantiated, then the same phenomenal properties will also be instantiated. All it does imply is that it might be nomologically or logically impossible to have a world that contains an isolated duplicate of the transcendental realm. In other words, it might not be possible to have a duplicate of the transcendental realm without there being transcendent properties of certain kinds (if we have generic dependencies) or without there being particular transcendent properties (if we have rigid dependencies).

In order to get a supervenience principle that takes the restriction of the supervenience base into account, we have to assess for indiscernibility with respect to transcendental properties. $R|x_1 \dots x_n$ and $R|y_1 \dots y_n$ have to be indiscernible only with respect to transcendental properties in order for indiscernible phenomenal

properties to arise, rather than having to be indiscernible with respect to noumenal properties in general. Accordingly, as long as $R|x_1 \dots x_n$ and $R|y_1 \dots y_n$ are indiscernible in terms of transcendental properties, x and y must be indiscernible with respect to phenomenal properties, even if $R|x_1 \dots x_n$ and $R|y_1 \dots y_n$ differ in transcendent properties, since indiscernibility in terms of transcendental properties suffices for making objects B-indiscernible given that transcendent properties are excluded from the supervenience base.

All the subvening properties are members of the set of transcendental properties. As a result, the co-ordination relation R connects phenomenal objects and properties to a sub-set of the noumenal realm, namely the transcendental realm. This means that any $R|x_1 \dots x_n$ is an object with transcendental properties. Objects that only have transcendent properties do not feature in the subvening domain since they do not ground phenomena.

Phenomenal properties supervene on transcendental properties relative to co-ordination relation R just in case for any collections of phenomenal objects $x_1 \dots x_n$ and $y_1 \dots y_n$ that have images under R and any worlds w and w^* , if $R|x_1 \dots x_n$ in w is indiscernible with respect to transcendental properties from $R|y_1 \dots y_n$ in w^* , then $x_1 \dots x_n$ in w is indiscernible with respect to phenomenal properties from $y_1 \dots y_n$ in w^* .

Alternatively:

Phenomenal properties supervene on transcendental properties relative to co-ordination relation R just in case for any worlds w and w^* , every mapping Γ of transcendental objects from w and w^* that preserves transcendental properties is such that all its associated mappings of phenomenal objects from w and w^* preserve phenomenal properties.

These supervenience claims reflect all the features of the grounding relation that we have discussed, insofar as they are (i) irreflexive, (ii) strong cross-world supervenience claims, that (iii) hold with logical necessity for all worlds, (iv) connecting properties across multiple domains, whereby (v) the domains are co-ordinated and whereby (vi) we assess the indiscernibility of supervenience bases in terms of transcendental properties.

2.4 The reducibility of phenomena

While reductive accounts of the empirical realm usually involve phenomenalistic reductions whereby sense-data or something of the like constitute the reductive base, we are able to appeal to a noumenal reductive base. In this way we can side-step the various problems that befall phenomenalistic reductions. Given that phenomena are logical constructs that are noumenally grounded, it follows that we can give a reductive account of phenomena. We can reduce phenomena

to noumenal features via the forms of intuition. In particular, we can construct empirical objects out of noumenal information by means of the transformation functions that derive from the forms of intuition. Phenomena then are nothing over and above the translated informational manifold and are accordingly completely reducible.

Accordingly, transcendental idealists are not involved in the project of giving translations of physical-object statements to statements about experiences or sense-perceptions or any other such semantic reduction or linguistic project. The reduction neither tries to reduce objects to actual or available representations, nor tries to reduce physical-language statements to statements about sensory experiences. Since we do not construct the empirical world out of experienceable items, such as sense-data, representations or intentionalia, the theory does not classify as phenomenalistic. Rather than being constructed out of representations, phenomena are constructed out of that which gives rise to representations, that which makes representations and experience possible, namely the matter of intuition and the forms of intuition. We thereby do not end up with phenomenalism, but with a logical construction view. Phenomena are logical complexes and the reduction is 'noumenalistic', rather than phenomenalistic. Such an ontological view provides a metaphysical reduction of objects, rather than a linguistic or analytic reduction of physical-object statements to statements regarding experience.

Despite not being a phenomenalistic project, it nonetheless classifies as an idealist account of the empirical realm. This is because of the ideality of the forms of intuition, which establish the heterogeneity of the noumenal and phenomenal realms. Transcendental idealism combines a reductive theory of objects with the view that space and time are mere forms of intuition.²¹ It is this combination that ensures that the theory classifies as a type of idealism, namely a transcendental or formal idealism.

Since the forms of intuition are our contributions and derive from the structure of our minds, it follows that everything that is permeated by these forms of intuition does not belong to reality as it is in itself. Since phenomena are matter-in-form they inherit the ideality of their forms and thus classify as being transcendently ideal. That is, since the form is transcendently ideal insofar as it does not apply to things in themselves, it follows that the matter that is in the form, while it is considered as matter-in-form, is also transcendently ideal. Nonetheless, phenomena are empirically real because the matter is absolutely objective and because the forms are intersubjectively objective.

Put differently, the untranslated matter of phenomena is transcendently real

²¹This theory is also combined with an understanding of the categories as pure concepts of the understanding that structure our thought and experience. However, the categories matter with regard to idealism only to the extent that the ideality of the forms of intuition is presupposed. More precisely, we only contribute space and time, while the categories simply allow us to capture something that is already there (cf. 3.1).

since it derives from the noumenal realm, while the forms of intuition are transcendently ideal since they are our contribution to the phenomenal world, yet are empirically real and objective for us since they are essentially shared by us. This implies that the translated matter is empirically real and transcendently ideal. It is transcendently ideal because it is something transcendently real that is translated into a transcendently ideal framework. Since the framework is transcendently ideal, it follows that that which features therein is also transcendently ideal, as long as it is considered in its translated form. It is empirically real because the untranslated matter is transcendently real and because the forms are empirically real. Thus, phenomena are empirically real with regard to form and matter, but transcendently ideal with regard to form and translated matter.

In this way we get transcendental idealism without material idealism. The way that form affects matter does not imply that we get the ideality of matter, but only the ideality of matter-in-form. Since matter is only given to us in form, it follows that matter as known to us is ideal. While matter-in-form is ideal, matter as it is in itself independently of the forms of intuition is mind-independent. Transcendental idealism “leaves free from ideality everything not specifically dependent on space and time, such as even the matter of representation as such” (Ameriks: 2006, p. 73).

Given that the subjectivity of the forms of intuition plays such a crucial role, it is so important to establish that the neglected alternative is properly neglected and that the forms of intuition really are merely forms of intuition and do not also apply to things in themselves.²² In support of this view, it can be argued that space and time are mental frameworks and that mental frameworks which are essentially mind-dependent cannot adequately resemble non-mental frameworks that are mind-independent (cf. Allison: 2004, pp. 128-132). In addition to considerations stemming from the Antinomies, this appeal to the heterogeneity of the frameworks strongly supports the claim that space and time are mere forms of intuition that are restricted to the phenomenal realm.

2.4.1 The status of phenomena

Logical constructs are virtual objects that only exist in a manner of speaking. They are nominal subjects of predication rather than emergent existents. They are not emergent ontological entities, but instead can be fully reduced. While phenomena are logical constructs in Russell’s sense or logical complexes as understood by Carnap, it is important to note that we have to give a metaphysical reading of these notions in terms of facts rather than statements. For example, Carnap distinguishes between a sum and a logical complex, claiming that the former is

²²The ‘neglected alternative’ is usually associated with Trendelenburg who claimed that showing that space and time are forms of intuition is compatible with space and time also applying to things in themselves, which would imply that Kant neglected the view that space and time might both be forms of intuition and mind-independent features of objective reality.

composed of its elements, while the latter does not stand in a parthood relation to its elements but instead is related to its elements in such a way that all statements about the complex can be transformed into statements about the elements (cf. Carnap: 1928, §4). We can adapt this account by making facts regarding logical complexes reducible to facts about their elements. The existence of a complex then consists in nothing over and above the obtaining of its elements.

Thus, empirical objects are logical constructs that can be reduced to noumenal information via the forms of intuition. The phenomenal realm is determined by the matter of intuition together with the forms of intuition. Matter and form jointly determine the features of the phenomenal realm. This implies that phenomena are mind-independent to the extent to which they depend on the matter of intuition and mind-dependent to the extent to which they depend on the forms of intuition. In particular, phenomena depend for their existence on the matter, whilst they partly depend for their determinations on the forms.

The existence of noumena implies the existence of noumenal information. The existence of such information, in turn, implies the existence of phenomena. This is because phenomena are logical constructs that have as their elements translated noumenal information. In short, the existence of phenomena logically follows from the existence of the right kind of noumenal information. Since we are dealing with logical constructs, no actual cognitive processing is required and there is no need for there to be any cognitive beings with these forms of intuition. Though phenomena are in a certain sense mind-dependent, given that they depend on the forms of intuition, the sense in which they are mind-dependent is, however, rather minimal since the existence of phenomena does not even require the actual existence of cognitive subjects. All we need for there to be phenomena is for there to be a manifold of intuition and this requires only the existence of actual noumenal objects. This is because the forms of intuition mediate the supervenience relation, given that they act as co-ordination functions, rather than being part of the supervenience base.

While the forms of intuition do feature in the supervenience relation that connects noumena and phenomena, they do not feature in the supervenience base but rather mediate the supervenience relation. We do not reduce phenomena to the conjunction of noumena and forms of intuition, but rather reduce phenomena to noumena via the forms of intuition. Conversely, we generate phenomena out of noumena via forms of intuition, rather than out of the conjunction of noumena and forms of intuition. The forms mediate the relation between noumena and phenomena by specifying the selection, filtering and translation processes that are applied to the manifold of intuition, instead of being ingredients in the reductive base. This mediation does not require the actual existence of cognitive beings with these forms of intuition. The translation and transformation functions that characterise the forms of intuition can mediate the supervenience relation without there existing a subject that has these forms. All that is necessary for the

existence of phenomena is the supervenience base.

Accordingly, transcendental idealism is committed to the claim that if one “were to take away the thinking subject, the whole corporeal world would have to disappear, as this is nothing but the appearance in the sensibility of our subject and one mode of its representations” (A383; also cf. A42/B59). This is true if one is concerned with the world of appearances. The subjective spatial and temporal frameworks and all the objects therein are dependent as regards their existence on the subjects. However, it does not hold for phenomena and the constructed intersubjective spatio-temporal framework wherein they exist since their existence is not dependent on representations at all. To make phenomena vanish one would have to remove not the subject but the noumenal object.

2.4.2 Reducing phenomenal relations

We have argued that phenomena are grounded in noumena and that the former are reducible to the latter via the forms of intuition. To this it may be objected that there are irreducible relations at the phenomenal level, that certain phenomenal relations are non-supervenient and that this implies that we cannot consider all aspects of the phenomenal realm to be supervenient.

The irreducibility of phenomenal relations would indeed undermine the claim that the phenomenal sphere supervenes on the noumenal sphere. Yet, while there is a sense in which certain phenomenal relations are indeed irreducible, this turns out to be unproblematic since they are reducible in another sense. More precisely, there are phenomenal relations, such as spatio-temporal relations, which cannot be reduced to the intrinsic properties of their relata. These relations occupy a fundamental position within the ontological inventory of the phenomenal realm. This is unproblematic since the fact that something is not reducible to phenomenal properties does not imply that it is not reducible tout court. Though they cannot be reduced to any other phenomenal items, these relations are reducible to noumenal features. While they do not supervene on phenomenal properties, they do supervene on noumenal features.²³

There is nothing that precludes there being noumenal relations that can feature in the supervenience base of the phenomenal realm. While it might be the case that phenomenal relations do not supervene on noumenal non-relational properties alone, it seems reasonable to claim that they do supervene on a base that includes noumenal relational properties. Thus, if the ‘non-supervenient’ phenomenal relations are to be grounded, it is not sufficient to ground the intrinsic properties of their relata. Instead, we need to provide a direct ground of these relations. Accordingly, we should claim that phenomenal relations that do not super-

²³How we ought to understand the reducibility of chiral relations and what impact this will have on the argument from incongruent counterparts will not be discussed here. An investigation of this intriguing topic will have to wait for another occasion.

vene on the intrinsic properties of their relata supervene on noumenal relations, which means that our supervenience claim must include relations or relational properties in the supervenience base. Unless we want to be extreme Leibnizians and argue that all relational properties are reducible to noumenal non-relational properties, we will have to make room for noumenal relations upon which these 'non-supervenient' relations can supervene.

Thus, we can claim that relational and non-relational phenomenal properties supervene on relational and non-relational noumenal properties. We must take the relational properties of the noumenal grounds into consideration if we are to have a supervenience principle that covers all phenomenal features. Accordingly, we can claim that the phenomenal sphere is wholly sustained by noumena, that it is a logical complex and that every aspect of it, including every relational aspect, is reducible to that out of which it is constructed.

Transcendental idealism commits us to the reducibility of phenomenal relations, including the reducibility of spatio-temporal relations. To this it can be objected that such a reduction of phenomenal relations amounts to ontologising space and time in the way done by Leibnizians and that Kantians should be suspicious of such a commitment. To ontologise space and time amounts to treating them as transcendently real, making them properties of things in themselves. Understood in this way, we can see why Leibnizians ontologise space and time insofar as they accept the reducibility of spatio-temporal relations, even though they argue that monads are atemporal and aspatial. If spatio-temporal relations are reducible to monads, then they are features of monads, even if monads themselves are neither in space nor in time. They are not fundamental features of monads but are rather derivative features. This means that the reducibility of spatio-temporal relations implies that space and time turn out to be features of monads, that is, of things in themselves.

The Kantian can avoid treating space and time as transcendently real, while accepting the reducibility of relational properties. This combination of views is possible because of the imposition and translation functions involved in the process of intuition. These functions mediate the supervenience relation and consequently also mediate the reducibility relation. In both the Leibnizian and the Kantian system there is supervenience and reducibility. What differentiates them is that the supervenience relation in the latter system is a co-ordinated multiple domain supervenience relation, whereby the co-ordination relation is provided by the process of intuition. Rather than understanding phenomena as just being confused perceptions of noumena, they are logical complexes that result from a transformation process that translates the information contained in the manifold of intuition into imposed frameworks, namely the forms of intuition. Consequently, the relation between monads and phenomena in the Leibnizian system is characterised by a non-mediated reducibility relation. Spatio-temporal relations

are therefore immediately reducible to determinations of monads. The Kantian system also includes a commitment to a supervenience relation. Yet, the supervenience relation in this system is mediated by the translation process. Accordingly, we need both (i) the supervenience base and (ii) the transformation functions in order to reduce spatio-temporal relations. This means that we are dealing with a mediated reducibility relation.

The difference between the two systems derives from the forms of intuition. The forms of intuition ensure that we have real heterogeneity, rather than merely confused perceptions. These forms genuinely add something and thereby ensure that we do not have a direct reducibility to the properties of noumena. We need something in addition to the non-relational properties of noumena to get phenomena. We even need something in addition to the non-relational and relational properties of noumena to get phenomena. What we need is the translation scheme. It is the translation scheme that provides the connection between noumena and phenomena, thereby mediating the supervenience and reducibility relations. In this way the forms of intuition ensure that the mediated reducibility of spatio-temporal relations does not involve the ontologisation of space and time.

From a Kantian point of view, the kind of reducibility of relational properties to which Leibnizians are committed is particularly problematic given that Leibnizians hold a relationalist view of space and time. In the context of such a relationalist view, the reduction of spatio-temporal relations amounts to a reduction of space and time themselves. This is something the Kantian cannot accept. Space and time would thereby become relational properties of things in themselves. For the Kantian, however, space and time are forms of intuition. They are not reducible to noumenal relations, but are our contributions to the phenomenal realm. While the Kantian needs to reject the reducibility of space and time, there is no need to reject the reducibility of spatio-temporal relations. We can reduce spatial relations without reducing space itself. All that needs to be rejected is the relationalist view of space and time. Instead, the Kantian can claim that space and time are mental frameworks. As such, they are independent of any spatio-temporal relations. Things are related within space and time, rather than space and time merely being the systems of spatio-temporal relations.

According to transcendental idealism, spatio-temporal relations are grounded in and supervene on noumenal relations. As a result, we can reduce spatio-temporal relations to noumenal relations. This reduction, however, has to go via the forms of intuition, thereby avoiding worries of ontologising space and time. To understand how this works, we need to appeal to the co-ordinated supervenience relation and to the role of the translation function. This allows us to retain our commitment to the view that space and time are nothing but forms of intuition, while accepting the reducibility of all phenomenal relations.

2.4.3 Antinomial worries

The noumenal grounding theory of transcendental idealism is committed to there being noumenal grounds for phenomenal facts. This may seem to be problematic in that it makes the connection between noumena and phenomena too tight. In particular, two problems arise from this tight connection.

On the one hand, there is a worry that phenomena are not independent enough from noumena and that this leads to phenomena being merely epiphenomenal. In other words, the noumenal grounds are seen to deprive phenomena of significance. Since the empirical realm is intuitively taken to possess some form of independence, it may seem worrisome that noumena that are doing all the work and that phenomena are just manifestations or reflections of an underlying noumenal reality. (This worry will be discussed in the next section.)

On the other hand, a difficulty arises insofar as this theory allows noumena to do too much work, thereby inviting the problems that transcendental realists face. If the connection between phenomena and noumena is too close, then one may worry that the former inherit the realism attaching to the latter. In particular, it may be objected that this version of transcendental idealism does not enable us to deal with the antinomies anymore and that it does not allow us to give regulative principles their due regard. Accepting noumenal grounds does not sufficiently recognise the object-constituting role that supposedly is an essential aspect of transcendental idealism. The objection states that if this object-constituting role were denied, and if phenomena were to inherit their reality from noumena, then this would have the effect of hypostatizing phenomena, which would undercut the transcendental idealist's response to the antinomies. The phenomenal realm would then end up being subject to antinomial paradoxes after all. In particular, even though noumena would not be subject to antinomies, given that they are outside of space and time, noumenally-grounded phenomena would be spatio-temporal entities that would derive their reality from noumena and would thus be subject to antinomies.

While considerations of space preclude us from giving a comprehensive treatment of the antinomial conflicts, we will give some indication as to how the antinomies can be resolved when accepting the grounding theory. In particular, we will focus on the second antinomy, which is concerned with the infinite divisibility of matter. The thesis of the antinomy states that everything must be infinitely divisible, given that objects occupy infinitely divisible space. The antithesis, on the contrary, states that we have to accept indivisible simples because we would otherwise end up with an infinite regress, given that the existence of wholes is grounded in the existence of their parts. Reason is here in conflict with itself since it can neither accept that matter is infinitely divisible, nor that there are indivisible simples.

A standard Kantian response to this antinomy consists in treating phenomena as entities that are constructed or constituted by us, such that they only possess

parts to the extent to which they are divided. As a result, phenomena turn out to be indefinitely divisible, without being infinitely divided. Rather than following this constructivist route, we can accept a realist stance. We can do this by arguing that spatio-temporal divisibility need not correspond to ontological divisibility. This means that we will not have a correspondence between spatio-temporal parts of phenomena and mereological parts of noumena. This then shows that the antinomy is due to a transcendently realist construal of space and time, in that spatio-temporal parts are considered to be the actual parts that make up an object. A transcendental idealist, on the contrary, can treat spatio-temporal regions and their parts as merely manifesting features of their grounds.

Thus, we might have a simple and indivisible noumenon that grounds the facts holding in an extended region *R* as well as all the facts in all the sub-regions of *R*.²⁴ Now, this does not mean that the object identified with region *R* has infinitely many parts corresponding to the infinitely many sub-regions of *R* and that there are infinitely many distinct grounds for these different parts. Instead, we have a grounding relation connecting one noumenon to an infinite number of regions contained in *R*. That is, if we individuate phenomena by means of spatio-temporal criteria, then we have a one-many grounding relation holding between noumena and phenomena. One noumenon directly grounds an infinite number of phenomena (which form a hierarchy connected by an inclusion relation and harmonise due to the identity of grounds). This means that we do not have the infinitely many phenomena occupying the sub-regions somehow composing or making up the phenomenon that occupies region *R*. The phenomena in these sub-regions are not mereological parts but only spatio-temporal parts.

While it is true that parts are prior to wholes, as the antithesis states, this does not apply to spatio-temporal parts but only to mereological parts. Accordingly, we can restrict this priority claim to the noumenal realm, while allowing infinite spatio-temporal divisibility at the phenomenal realm. In this way, we end up with the infinite divisibility of space as well as the infinite divisibility of filled regions, without a commitment to there being infinitely divisible mereological parts.²⁵

The grounding theory implies that, in some sense, there are no parthood relations at all in the phenomenal realm since this realm is not intrinsically structured but derives its structure from its grounds. Phenomena considered on their own are ontologically amorphous and the phenomenal realm can be characterised by an adverbial understanding. Now, it is clear that an adverbial account does not give rise to mereological antinomies since it does not involve quantification over

²⁴In this way we avoid a clash of what is made true of the region and its sub-regions, as well as of the sub-regions and their sub-regions and so on.

²⁵It might be objected that we end up with infinitely divisible parts of space. Yet, since the priority of parts applies only to objects and since space is not an object and does not have parts of which it is composed, it follows that space falls outside the scope of the antithesis. Accordingly, it is possible to reconcile an acceptance of the antithesis with a commitment to the infinite divisibility of space.

any objects that could stand in parthood relations. All that the phenomenal level contains by itself is inclusion relations holding between filled regions. However, it does not contain unified objects made up of parts. Given that all mereological structure derives from the noumenal realm, it follows that mereological structure is not due to spatial structure.²⁶ In particular, parthood relations and constraints do not derive from geometrical relations and constraints. The geometrical divisibility of filled spatial regions thus has to be distinguished from the mereological divisibility of ontological entities.

Considerations concerning space do not on their own give rise to an antinomy. There is nothing about the infinite divisibility of space and time that engenders an antinomy. We only end up with an antinomy if we combine the view that objects inherit their mereological structure from the structure of space with the view that parts have ontological priority over wholes. To give rise to an antinomy, considerations about space must be combined with metaphysical considerations. In particular, we need objects and substances in order to have mereological relations. If there were no substances, then there would not be any mereological relations and hence no antinomies.

Since it is noumena that provide ontological structure, it is they that determine mereological divisibility. Space and time, on the contrary, are not concerned with mereological relations and do not determine parthood structure. Instead, they are individuating frameworks that determine the structure of individuation of spatio-temporal regions and their contents. In particular, the infinite divisibility of space and time allows for more and more fine-grained adverbial ascriptions. Regions can be treated as units of individuation and given that regions are infinitely divisible, it follows that the individuation of the phenomenal realm can be infinitely fine-grained. Yet, this does not mean that there is a correspondence between mereological units and spatio-temporal individuating units. The structure of individuation of space and time does not constrain or determine the mereological structure but only determines how we can individuate phenomenal features.

In other words, what does derive from geometrical considerations is the individuation of features of the phenomenal realm. Due to the infinite divisibility of space and time we can give infinitely fine-grained individuations of phenomenal features. This, however, does not imply that there correspond bounded mereological unities to these individuated features. The infinitely fine-grained individuation does not track or highlight objective boundaries. This is because we can individuate and distinguish beyond the metaphysical structure. In other words, we can draw arbitrary boundaries and identify ever smaller filled regions, even

²⁶Since all mereological relations derive from noumena, it follows that if we were to have an antinomy obtaining at the phenomenal level, then this would also affect the noumenal level since the structure of the former derives from that of the latter (the only exception would be if the mediation by the forms of intuition would have an impact on the antinomy, which does not seem to be the case in the scenario at issue).

though no unified objects correspond to these regions.

Thus, the resolution of the second antinomy that a grounding theorist can give involves a scope-restriction that involves disconnecting the geometrical structure of phenomena and the mereological structure of noumena. We restrict the metaphysical principle about the priority of parts to the metaphysical realm, that is, to the noumenal realm. At the same time, we restrict the geometrical principle about the infinite divisibility of space to the spatial realm, that is, to the phenomenal realm. This resolution cannot be accepted by transcendental realists since, by giving reality to space, they make it the case that the mereological structure of objects is inherited from the infinitely divisible geometrical structure of space and time.

By utilising this scope-restriction we can avoid the antinomial conflict. This means that we can use the same strategy for dealing with the mathematical antinomies that we use for the dynamical antinomies, namely restricting the scopes of the thesis and antithesis to different realms.²⁷ This is appropriate in that an antinomy about mereological divisibility arises only in a context in which dynamical categories are applied, in particular the category of substance. It would only be a purely mathematical antinomy if solely considerations regarding space were at issue. Such geometrical considerations, however, are insufficient to generate an antinomy since they must be combined with metaphysical principles for the conflict to arise. These metaphysical principles require the involvement of the dynamical categories since only then do we get ontological structure to begin with.

2.4.4 Epiphenomenal phenomena

“... that all life is really only intelligible, not subject to temporal alterations at all, and has neither begun at birth nor will be ended through death, that this life is nothing but mere appearance, i.e. a sensible representation of the purely spiritual life, and the entire world of the senses is a mere image, which hovers before our present cognition and, like a dream, has no objective reality in itself” (A780/B808).

We have argued that the phenomenal realm is a non-autonomous realm that can be reduced noumenalistically. Every phenomenal fact has a noumenal ground and there is a complete determination of the phenomenal realm by the noumenal realm. The phenomenal realm is the way it is because the noumenal realm, or more precisely the part of this world consisting of its transcendental features, is the way it is. Given that the phenomenal realm lacks autonomy, it may well be wondered whether the ‘dream analogy’ that Kant gives as a transcendental hypothesis in his discussion of the possibility of immortality is an adequate descrip-

²⁷We saw previously that spatio-temporal structure is fixed by ontological structure. This implies that a similar scope-restriction strategy can be employed for dealing with the first antinomy.

tion of what the grounding theory implies. Put differently, once the phenomenal realm is deprived of any independence, it may seem that phenomenal life really is nothing but an image or a dream.

It is indeed true that the phenomenal realm is non-autonomous and that it is fully determined by and dependent upon the noumenal realm. Yet, it does not thereby follow that it is a mere illusion or that it lacks any significance. Phenomenal life is not like a dream since it is not the arbitrary product of the imagination. Even though phenomena can be considered to be epiphenomenal, and even though they are not absolutely real, this does not change the fact that the phenomenal realm does have objective reality, that it is real for us. Indeed, it is precisely because it is determined in this way by the noumenal realm, in conjunction with the forms of intuition, because it derives from this realm in an orderly fashion, that it is objective for us. In other words, phenomena derive their objectivity from the absolutely real and objective noumena. This means that even though phenomenal life is an appearance or a manifestation, it is one that possesses objectivity and is empirically real.²⁸

²⁸In Kit Fine's terminology, the phenomenal realm has factuality but not reality (cf. Fine: 2001).

Chapter 3

Transcendental structure

3.1 Grounding ontological structure

The phenomenal realm is ontologically amorphous. When the phenomenal world is considered in isolation from its noumenal grounds, it is completely devoid of ontological structure. Like the realm of appearances, it only has empirical structure and no metaphysical structure. An adverbial account that specifies the spatio-temporal distribution of physical intensive magnitudes exhausts all features of the phenomenal realm. The phenomenal world can be fully described adverbially and everything is reducible to the matter of the manifold of intuition as well as the forms of intuition. This implies that phenomena can be fully characterised without bringing in metaphysical concepts. In particular, no appeal to the notion of an individual object or substance needs to be made. Similarly, causation and modality are equally left out of the picture and can be set aside in describing the phenomenal world. There is no commitment to substances, causality or modality. Instead, everything can be characterised adverbially in terms of intensive and extensive magnitudes. All we have are facts about intensive and extensive magnitudes. There are only magnitudes and space-time regions across which they are distributed.

Given that no unity, causation and modality are to be found, it follows that we need not appeal to these metaphysical notions when giving a scientific description of the world. Instead of making metaphysical claims based on the dynamical categories, science only makes use of the mathematical categories in describing the world. These categories permit us to cognise empirical structure, make scientific claims and describe the empirical features of the phenomenal world. The mathematical categories concern the spatio-temporal features as well as the degree of reality of various properties, allowing us to specify extensive and intensive magnitudes. More precisely, they underwrite adverbial judgements that describe what the world is like. Spatio-temporal regions function as the individuating backdrop, while the intensive magnitudes that are ascribed to these regions give the adver-

bial modification. While the categories of quantity are required for specifying the spatio-temporal regions (the extensive magnitudes), the categories of quality allow us to specify the adverbial filling (the intensive magnitudes).

Accordingly, the intensive magnitudes are not attributed to objects, but to spatio-temporal regions. That is, instead of making claims about objects, science describes the spatio-temporal patterns amongst property instances. We simply describe how things are at the region, what properties are instantiated thereat. There is no subject of instantiation. There are no objects, no unities, no bearers of magnitudes. Not even the region counts as the subject of instantiation, given that we accept the ideality of the forms of intuition and thereby reject the hypostatisation of spatio-temporal points.¹ The spatio-temporal regions only play an individuating function. Thus, properties are instantiated at regions rather than being instantiated by regions – they merely occur there.

This lack of ontological structure is problematic since the world must be structured if there is to be a unified intersubjective spatio-temporal framework, if metaphysics is to be possible and if morality is to be grounded. The problem we face is thus that metaphysics, morality and science require ontological structure, yet the phenomenal realm is ontologically amorphous. If the phenomenal realm were to exhaust reality, then we would only have perspective-dependent spatio-temporal frameworks across which intensive magnitudes would be distributed. Science, metaphysics and morality would accordingly be impossible. As transcendental idealists, however, we deny that the phenomenal realm exhausts reality and instead accept that there is also a noumenal realm. This allows us to invoke noumena to ground ontological structure and attribute non-empirical features to phenomena that can be cognised by means of the dynamical categories.

Whilst the phenomenal realm is ontologically amorphous when it is considered on its own, ontological structure can be brought in when phenomena are considered in relation to their noumenal grounds. Once the noumenal grounds are included into the picture, we are able to provide ontological structure to the phenomenal realm. Metaphysical features can be introduced into the phenomenal realm in virtue of properties of the noumenal grounds that underlie the facts that make up the empirical world. Since noumena are ontologically structured, this structure can be transferred to the phenomenal realm. The grounding relation allows us to import metaphysical structure from the noumenal world. We can structure the content of the phenomenal world in accordance with the structure of the grounds which determine this content. In other words, since phenomena are manifestations of ontologically structured noumena, ontological structure can be attributed to them in virtue of the structure possessed by the grounds of which they are manifestations. In this way we can get substantial individual entities that are both synchronically and diachronically unified. Similarly, we can make room for causation and modality. If we were, *per impossibile*, to take away

¹As a result, we only give an adverbial account of properties and not of regions.

the noumena without thereby eliminating the phenomena, we would only be left with empirical structure. But given that there are noumena and given the way in which they ground phenomena, we can make room for non-empirical features in the empirical world and provide phenomena with ontological structure.

Even though phenomena do not literally possess or instantiate non-empirical properties, they can nonetheless be said to have non-empirical features in virtue of having certain grounds. These features are not elements of the constructs and do not directly belong to them. Nonetheless, we can characterise the constructs in terms of these features. To borrow van Cleve's phrase, we can say that they possess these features 'by courtesy' (cf. van Cleve: 1999, p. 166). They are not features that are directly possessed by phenomena, but rather are attributable to them in virtue of being grounded in a certain way. Phenomena do not possess these features by themselves but only in virtue of standing in a grounding relation to noumena that do possess such features. It is not the case that the thing to which we attribute these features directly possesses these properties but rather that there is an objective distinction corresponding to this attribution. For instance, it is not the case that there is a bounded and unified phenomenal entity, but rather that there is a privileged place where to draw a boundary in the phenomenal realm. Drawing a boundary at this place captures an important fact about the world. To this place there does correspond a real boundary. Obviously this is not a spatial boundary, given that noumena do not exist in space. Instead, it is an ontological boundary that concerns the unity of an object and its distinctness from other objects. This boundary thus captures a fact about the distinctness of objects and about the respective unities of different collections of aspects or features.

In this way we can include non-empirical ontological features that are not empirically accessible. Such features are not amenable to being represented by intuition, but require the understanding and in particular the dynamical categories in order for them to be thought. They are features that we do not experience and that are not open to scientific investigation. Instead, they exclusively belong to the domain of metaphysics. Despite the fact that these features are not empirically accessible, the phenomenal world can contain such non-empirical features in virtue of the features possessed by the grounds of this world. Since these non-empirical features do not play any role in experience, they cannot be covered by an empirical reduction, which implies that ontologically structured phenomena cannot be fully reduced to facts about the manifold of intuition and the forms of intuition. To achieve a full reduction of both empirical and non-empirical features, the reductive base needs to be expanded to include noumenal properties.

What is given in experience is only a spatio-temporal distribution of qualitative features and hence lacks ontological structure. Any demarcation of objects, both in space and through time, any bundling of properties into unified collections, any attribution of causal dependencies and interactions, as well as any

assignments of modal statuses are due to our thought, due to our conceptual structuring that is guided by the categories. While the mathematical categories capture empirical structure, the dynamical categories capture ontological structure. These pure concepts are required to cognise ontological structure since they embody the fundamental unifying functions that bundle representations and provide them with unity. They allow us to synthesise and unify our representations, thereby allowing us to make metaphysical claims and describe the non-empirical features of the phenomenal world.

The category of substance, for instance, allows us to carve out and demarcate objects out of the undifferentiated and amorphous qualitative manifold that is provided by intuition and thereby allows us to represent real objects that possess unity.² Carving up the manifold of appearances into objects involves drawing boundaries and bundling together properties. Filled spatio-temporal regions, i.e. regions across which qualitative properties are distributed, are treated as containing unified and bounded entities. These boundaries are taken to reflect the unities of different objects insofar as properties located on the different sides of a boundary are taken to belong to different unified wholes.

Our ability to cognise unified objects rests on the fact that the pure concept of substance fulfils the same function as objects do insofar as they both synthesise and provide unity. This category, on the one hand, unifies representations. It synthesises and combines a plurality of representations. Objects, on the other, unify properties. They combine properties and provide unity to them. Accordingly, the concept of substance can be considered as the conceptual correlate of an object. It allows us to bring unity to our representations that corresponds to the unity in the object.

Thus, the unification resulting from conceptualisation is supposed to mirror the unity to be found in the object. This implies that objects determine the criteria of correctness. They determine which representations go together, namely those representations that have corresponding properties that are unified in the object. While we never know which properties really do go together, since we have no access to the objects in themselves, this is not problematic. Though we lack knowledge, we can nonetheless have warranted belief. There are various indicators that we can identify and there are theoretical and practical principles to which we can appeal in our search for unity. The key thing to note is that this search for unity is underwritten by our explanatory story. This story explains how objective unities are intelligible and how the category of substance allows us to represent unified objects.

It is important to note that it is not the case that we construct phenomena, that we provide unity and confer properties upon them. We do not create unity

²There are interesting parallels to Quine's claim that "the very notion of an object at all, concrete or abstract, is a human contribution, a feature of our inherited apparatus for organizing the amorphous welter of neural input" (Quine: 1992, p. 6).

and do not construct the world by means of the forms of thought. We do not impose laws or categories on the world. Instead, we accept a modest position that classifies, broadly speaking, as a realist approach, according to which the world must co-operate to make unified experience possible. The metaphysical features that structure the world are not given in intuition³ and if there are phenomena that do possess these non-empirical features, then they do so independently of any activity of the human mind. The structural features possessed by phenomena are grounded in noumena and do not derive from us. It is simply the case that we utilise the categories to conceptualise that which is given in experience in such a way that it matches up to the structure that objects possess independently of any conceptualising. We only provide ontological structure to our thoughts and our representations, not to the objects themselves, which means that the categories only allow us to capture what is already there.

3.1.1 Unity

The phenomenal level considered on its own contains only intensive and extensive magnitudes. There are no ontological boundaries, no unified bundles of qualities or magnitudes. There are no unified wholes. Without appealing to noumena, any construction of individuals would be relatively arbitrary and convention-dependent. Structural nexuses that are invariant under various transformations can only be considered as ‘objects’ in an ontologically insignificant sense. Such objects are merely heuristic devices.

It is not just the case that for there to be an object is for there to be a spatio-temporal region filled with physical intensive magnitudes. Rather, for there to be an object is for there to be a spatio-temporal region that is filled in such a way that these physical properties possess a certain unity. These properties are not arbitrarily assembled but constitute a unity. Whilst objects have the particular feature of being bounded entities, there is nothing in the phenomenal realm to unify properties and to hold them together. Nothing is available to provide boundaries and to determine which properties belong to which object and where one object begins and another ends.

If we want to identify certain bundles as objects, then we need to give an account of how boundaries are to be drawn and of what is responsible for the demarcation and individuation of objects. We need to explain how there can be boundaries. Within the phenomenal realm, there are no resources for explaining the existence of boundaries. All we have is the distribution of intensive magnitudes. There simply is not anything available that could function as a boundary or give rise to boundaries. There is nothing that could produce unities. Any phe-

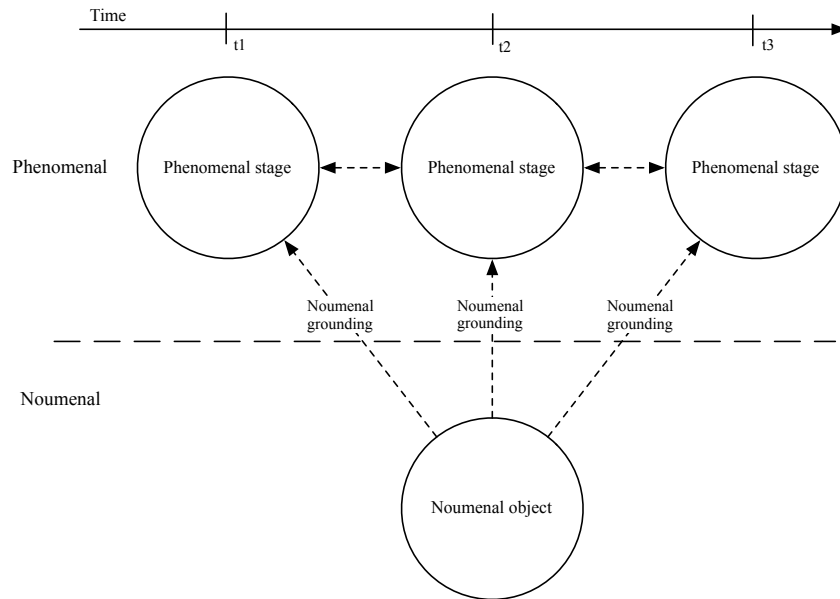
³What appearances are given to us is entirely unrelated to the dynamical categories since these categories do not enter at the stage of perception, but only afterward when it comes to carving up the manifold of appearances and representing metaphysical structure.

nomenal bundle considered on its own is simply an arbitrary bundle and is not in any way distinguished from other arbitrary bundles as regards its ontological status.

Real objects can only be gained by invoking the noumenal grounds since it is the underlying noumenal level that provides principles of unity and to which we must appeal to make sense of individual entities. Accordingly, if we are to account for the unity of objects, we need to appeal to noumenal grounds. Thus, in addition to grounding the intensive and extensive magnitudes of the phenomenal world, noumena also permit us to make room for substantive individuals in the phenomenal realm. We can introduce individuals at the phenomenal level since phenomena are grounded in noumena that do possess individuality. This individuality can be conferred upon the phenomena. We thereby get transcendental individuality, which means that the individuality of an object is explained in terms of the individuality of its transcendental ground.

Bundles of qualitative features constitute a unified object insofar as they are grounded in the same noumenal object. Boundaries in the phenomenal sphere thereby reflect facts about the distinctness and identity of noumenal grounds. The spatial boundaries between phenomenal objects supervene on distinctness-facts amongst noumenal grounds. In this way we can make room for unity and individuality. The grounds provide unity and identity-criteria. The unity of the collection derives from the unity of the ground of the collection. The unity of the noumenal ground allows us to account for the way in which different properties belong together and form unities. Different properties are connected and belong to the same phenomenal object in virtue of the identity of the ground of these different properties.

This account of unity applies both to synchronic and to diachronic cases. Noumenal grounds provide both synchronic and diachronic unity, connecting phenomenal features existing at the same time, as well as at different times. Accordingly, transcendental idealism provides us with an account of persistence that allows us to explain how there can be genuine diachronic unities. Transcendental idealism allows us to make room for persisting objects and allows us to explain genuine identity through time. It allows us to identify persisting objects as unified temporally extended filled spatio-temporal regions and make sense of the idea that the very same object can be present at different times. This is achieved by appealing to the identity of the noumenal ground of a plurality of phenomenal features existing at different times. In other words, persistence can be explained by means of reference to the atemporal noumenal ground. Things existing at different times can be unified if they have the same noumenal ground. The ground provides unity to them and ensures that we do not just have a random collection of phenomenal features, but have diachronic unities that are unified by their grounds.



Thus, if we consider the phenomenal realm on its own, then all we have is different properties at different times. There is nothing that connects or binds them together, nothing that tells us which go together and form a diachronic unity. Yet, by bringing noumena into the picture we can make room for diachronic unity. Properties at different times belong together if they have the same noumenal ground. A noumenal ground can manifest itself at different times by giving rise to properties at different times. We thus have genuine identity through time since it is numerically the same thing that is present at these different times, the very same object that is manifested at different times. It is not a temporal entity that is thus located at multiple times, but rather an atemporal entity that manifests itself at multiple times, an entity the manifestations of which are located at multiple times. Unity at the phenomenal level is accordingly again grounded in unity at the noumenal level.

The synchronic as well as diachronic unity and boundedness provided by the noumenal grounds does not imply that we cannot view phenomena as logical constructs. Rather, it means that phenomena are logical constructs that possess unity and stand in certain relations and that these non-empirical features have to be reduced to noumenal features. Fully fledged phenomena are privileged logical constructs, namely constructs that have unified grounds. This means that while every filled region can be treated as a logically constructed object, only some of these constructs classify as real objects whilst the others are only arbitrary collections of properties. In order for there to be more than a mere collection, for there to be a substantive object, we need unity and this unity can be provided by

a noumenal ground. What makes it the case that a logical construct corresponds to or can be identified with a substantive object is that certain non-empirical features can be attributed to it. A substantive object is a collection of such properties that is unified in virtue of being grounded in a noumenon that possesses unity. Real phenomena are only those constructs that possess unity in virtue of an adequate ground. That is, there is a set of privileged complexes which can be considered to possess unity in virtue of being made of elements that have a unified ground. All other constructs are just arbitrary collections of properties that are of no ontological significance.

It is not the case that we then no longer have a logical construct or complex and instead have a mereological sum that has the elements as its parts. Real objects simply are privileged collections or bundles of facts. They are bundles that reflect an underlying unity. That is, it is not the case that the facts compose an emergent existent if they possess unity or that a unified individual somehow arises. Instead, we still only have logical constructs whereby adequately grounded constructs are collections that possess the non-empirical feature of being unified collections. They are privileged collections or constructs.⁴

The grounding relation thus allows us to make the existence of persisting individuals at the phenomenal level intelligible. Since these individuals are empirically inaccessible, we still need to appeal to invariances to identify individuals in practice. Yet, while we appeal to invariances to identify individuals in practice, when it comes to making the possibility of individuals intelligible, we have to appeal to the noumenal grounds. Given that the phenomenal world has ontological structure and is carved up in certain ways in virtue of the way it is grounded, we can take these invariances as indications of there being substantial metaphysical individuals. We can then carve up the representational manifold by making use of the categories in such a way that it hopefully coincides with the objective carving. Thus, though we cannot empirically discover the way the world is carved up, we can identify invariances and treat them as indications of underlying unities.

⁴This can be compared to the contemporary debate regarding the ‘naturalness’ or ‘ontological privilege’ that certain mereological fusions supposedly possess. In the same way that naturalness is supposed to privilege certain fusions, noumenal grounding provides unity to logical constructs and identifies the boundaries of objects. However, rather than positing unexplained ‘joints in nature’ we can give a principled account of the possibility of genuinely unified objects in terms of the underlying noumenal grounds. Moreover, by appealing to noumenal grounds we can ensure that unity and boundedness are binary rather than being a matter of degree.

Since extensive and intensive magnitudes allow for continuous variation, the drawing of sharp boundaries at the phenomenal level would seem arbitrary. The underlying noumenal features, however, need not be susceptible to these kinds of continuous variations, thereby making room for non-arbitrary sharp cut-offs. Accordingly, a sharp cut-off on the phenomenal continuum, that would be arbitrary if it were chosen on the basis of it occupying that position on the continuum, can still turn out to be non-arbitrary in virtue of reflecting a principled cut-off along a (possibly non-continuous) noumenal dimension.

3.1.2 Causation

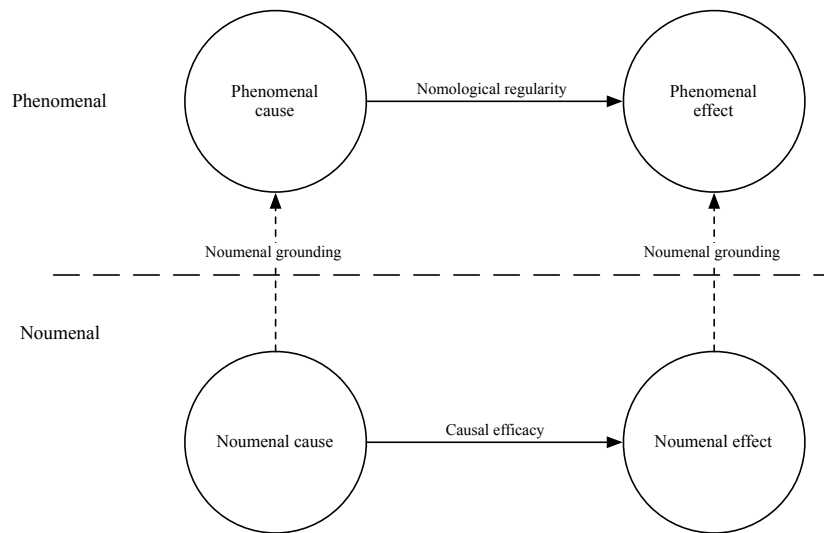
At the phenomenal level we have a distribution of intensive magnitudes that exhibits certain regularities and patterns. There are, however, no necessary connections and hence no causal relations at this level. Yet, once we bring in noumena, we can make room for genuine causation. We do not have to appeal to some inadequate Humean substitute, but can allow for necessary connections whereby a cause brings about its effect in such a way that the effect follows from the cause with necessity. In particular, the phenomenal effect necessarily follows the phenomenal cause since their grounds stand in a necessary connection. Noumenal grounds stand in necessary connections and thereby give rise to causal relations amongst the phenomena that they ground.

Supervenient causation in transcendental idealism allows us to explain how we can have necessary connections at the phenomenal level. It allows us to explain how phenomenal objects can be connected by the schema of causality. We can explain necessary connections holding between phenomenal objects insofar as they result from causal efficacy that belongs to the noumenal realm. We can say that causes and effects are joined with necessity because we have causal efficacy at the level of the noumenal grounds. Causal efficacy at the noumenal level ensures that we do not have mere regularity but necessity amongst phenomena. This necessity is not brute, but grounded in noumena. This enables us to explain why it is the case that x necessarily follows y , why they stand in this necessary relation. Accordingly, causality at the phenomenal level can be seen as nomologically governed regularity that reflects underlying noumenal causation. Noumenal causation underlies and gives rise to the necessary connection at the phenomenal level, which means that phenomenal causation supervenes on noumenal causation.

The relation between phenomenal objects x and y falls under the schematised category of causality iff the relation between the noumenal grounds of x and y falls under the unschematised category of causality.

That is, y follows on x with necessity iff the noumenal grounds of x and y stand in the asymmetrical ground-consequent relation, whereby the effect obtains in virtue of the cause. In other words, we have nomologically-governed regularity between x and y iff we have causal efficacy between the noumenal grounds of x and y .

The necessity at the phenomenal level is sustained by necessary connections that obtain at the noumenal level. Such an indirect explanation of causation accounts for nomological regularity in terms of underlying causal efficacy. Accordingly, we can explain necessary connections at the phenomenal level and thereby underwrite causal explanations. While supervenient causation in contemporary philosophy is concerned with explaining causal processes at one level in the mere-



ological hierarchy in terms of the causal connections that hold at more fundamental levels, transcendental idealism appeals to the grounding relation to connect two heterogeneous levels in order to combine causal efficacy at the noumenal level with nomologically-governed regularity at the phenomenal level. Different kinds of causation are involved at the different levels and the grounding relation enables us to explain one kind of causal relation obtaining at the supervening level, namely nomological regularity, in terms of another kind obtaining at the subvening level, namely causal efficacy.

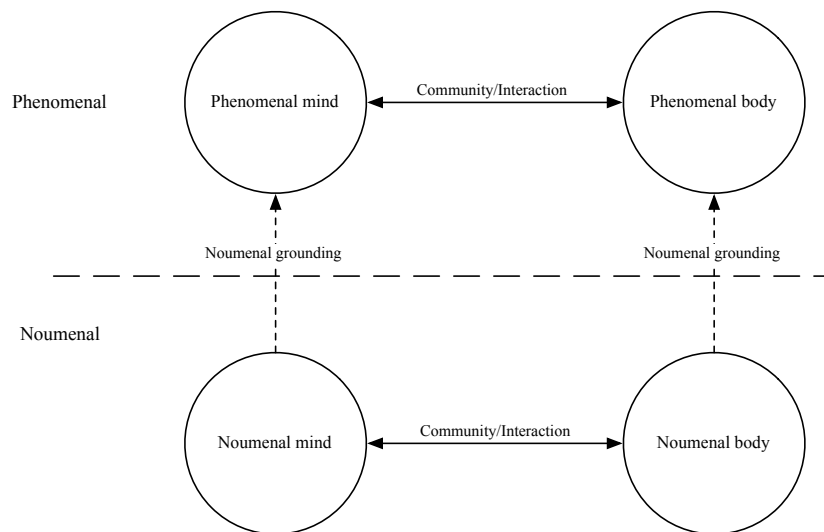
While phenomena do not strictly speaking possess any non-empirical properties, they can be said to be causally efficacious in virtue of the efficacy of their noumenal grounds, they can be said to manifest the efficacy of their grounds. This implies that the causation attributed to phenomena is not threatened by the causal efficacy to be found in the noumenal realm. We have two different levels at which two different kinds of causation are to be found and that do not compete with each other, thereby undermining worries regarding overdetermination. Rather than giving rise to doubts about overdetermination, the causal relations at the noumenal level ground the phenomenal relations. Those who accept only one kind of causal relation will not be able to avoid this problem. For them, supervenient and subvenient causation seem to be in competition, which implies that, unless we are dealing with a case of overdetermination, only one of them can have a claim to being an instance of genuine causation.

3.1.3 Mind-body interaction

“[I]f one considers that the two kinds of objects are different not inwardly but only insofar as one of them *appears* outwardly to the

other, hence that what grounds the appearance of matter as thing in itself might perhaps not be so different in kind, then this difficulty vanishes, and the only difficulty remaining is that concerning how a community of substances is possible at all” (B427-428).

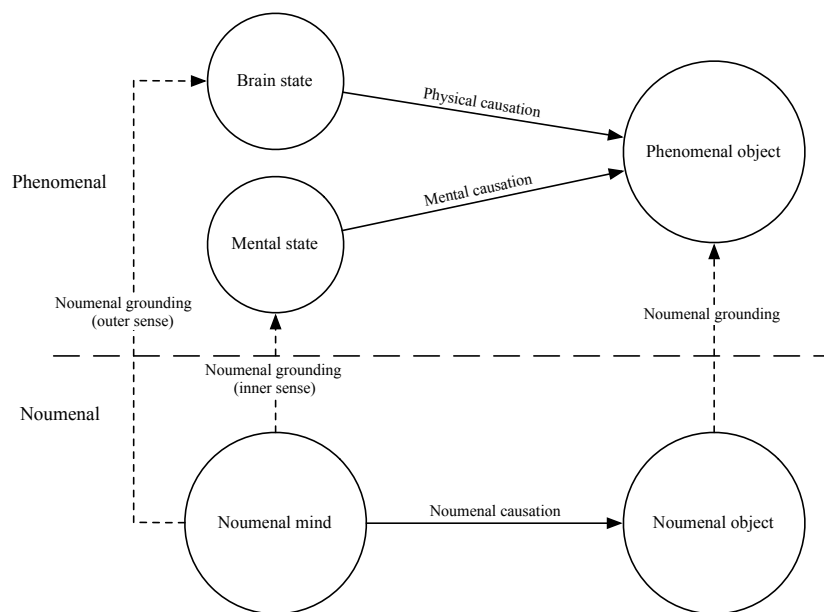
Mind and body seem to be radically heterogeneous, thereby making it difficult to comprehend how they could interact. This problem can be overcome by providing a dual-level explanation of mind-body interaction. Though the phenomena are heterogeneous and differ significantly, it may be that their grounds are homogenous. The phenomenal heterogeneity would then not be due to an underlying noumenal heterogeneity but would rather result from the differences in the ways in which we are related to the noumenal grounds. While the grounds of the mind are inwardly intuited, those of the body are outwardly intuited. This difference in access relations can explain the radical differences between mind and body at the phenomenal level, without requiring us to posit an underlying heterogeneity at the noumenal level thus allowing us to preserve the homogeneity that is required to account for interaction. Interaction between a heterogeneous mind and body can then be made intelligible by appealing to interaction between homogeneous grounds.



This allows us to say that mental state m causes physical state p iff the noumenal grounds of m and p stand in a causal relation. Since mental states have physical correlates, it follows that mental state m causes physical state p iff the physical correlate of m causes p , which in turn, happens iff the noumenal grounds of the physical correlate of m and of p stand in a causal relation.

Since the noumenal ground of m is identical to the noumenal ground of the physical correlate of m , it follows that the mental state and its correlate are

manifestations of the same thing but differ insofar as they manifest the same thing in different ways.⁵ There is one thing, namely a noumenal mental state, that is manifested in two different ways. The former constitutes a manifestation as it appears to inner sense⁶, while the latter is a manifestation as it appears to outer sense. This means that the former is a subjective manifestation, while the latter is an intersubjective manifestation. In this way we can explain the heterogeneity that is to be found at the phenomenal level in terms of the different ways in which the noumenal entity is manifested. Mental states and their physical correlates are thus both manifestations of the same underlying noumenal thing.



Accordingly, we can see that the mental and the physical are on a par. It is not the case that the physical correlates are fundamental and that the mental states are supervenient and derivative. Rather both of them are derivative. We do not have real physical causation and then supervenient mental causation. Instead, we have real noumenal causation and supervenient physical as well as mental causation. Since these different kinds of supervenient causation are perfectly compatible and do not exclude each other, it follows that we can confer efficacy on the mental (even if this is only efficacy by courtesy) whilst avoiding exclusion arguments. In particular, since the mental state and its correlate are manifestations of the same thing, it follows that there is no overdetermination. Both the mental state and

⁵In this way we can understand how it is possible for mental states to have physical correlates, how we can identify mental states with physical states given that they seem to be radically different in kind.

⁶Inner sense is here to be understood as reflexive awareness, rather than as reappropriation of mental content.

its correlate are related to the physical state p by means of the schema of causality since both of them are grounded in a noumenal object that is connected to the ground of p by the unschematised relation of causation.

3.2 Dual-level explanations

Transcendental idealism is a dual-level ontology consisting of noumena and phenomena, whereby the levels are connected by a grounding relation. Since the phenomenal sphere is grounded in the noumenal sphere, we can appeal to the latter to explain the former. We can explain that which is derivative in terms of that which is more fundamental and from which it derives. Such dual-level explanations explain features at one level in terms of features at another level. The limiting case arises when we explain the whole level in terms of the level that grounds it. Explanations of this kind track ontological dependence, whereby the direction of explanation is the inverse of the direction of grounding. If y grounds x , then x can be explained in terms of y .

These explanations can be combined in an effective manner with transcendental arguments. We identify necessary preconditions by means of transcendental arguments and appeal to dual-level explanations to make these preconditions intelligible. In particular, transcendental idealism allows us to identify the necessary presuppositions for experience as well as for moral agency. In both cases, we can then provide grounding for these presuppositions by appealing to the noumenal level. In this way problematic metaphysical features that are presupposed by experience and morality can be relegated to the noumenal sphere. We thereby explain their relative unintelligibility, while at the same time allowing them to be connected to the phenomenal level by means of the grounding relation, given that the phenomenal realm arises out of the noumenal realm via the process of intuition. This is important since dual-level explanations require that there is some correspondence relation between the realms. The phenomenal features must have their noumenal counterparts and the different realms must somehow be connected and co-ordinated if the phenomenal realm is to be explained in terms of the noumenal realm.

As we have seen, dual-level explanations can be used to provide a vindication of metaphysical features, such as causation and substance. They provide answers to questions as to how certain things are possible, by making these features intelligible to us. They show us how it could be the case that there is causation and that there are substances. These are metaphysical explanations that are concerned with how certain metaphysical features are possible. They do not tell us what is actually the case but only tell us how something that is inexplicable and unintelligible in its own terms can be made intelligible by explaining it in terms of some other set of facts to which it is related.

The reason why we need to appeal to dual-level explanations is that, *prima*

facie, it looks as if these metaphysical features cannot be accounted for. The phenomenal realm does not give us adequate explanatory resources to account for their possibility. Accordingly, we have to appeal to another level, namely the noumenal level. In this way we can give an indirect explanation, whereby features at the phenomenal level are explained in terms of features at the noumenal level. By invoking the noumenal realm, we can bring in additional explanatory resources. As a result, we can explain things that would otherwise seem inexplicable.

For instance, we are not able to explain how something can persist through time if we only appeal to resources to be found at the phenomenal level. Numerical identity through time is unintelligible if the phenomenal realm is considered on its own. Nonetheless, we know that objects must persist through time if there is to be experience. We have to posit persisting objects, but are unable to explain their possibility. In order to overcome this conflict we have to bring in additional explanatory resources. In particular, we have to invoke two different levels and explain persistence at the phenomenal level by reference to the noumenal world. This allows us to accept the need for persistence, while accepting that it is incoherent to claim that phenomena persist if these are understood independently of their grounds.

It should be noted that these dual-level accounts are highly significant for Kantian ethics. This is because it might well be possible to appeal to dual-level explanations to establish correspondences and connections between intelligible and empirical characters, between intelligible and empirical laws and between noumenal and phenomenal choices. For example, we might be able to take the empirical character to be an expression of an agent's intelligible character, thereby providing us with an indication of an agent's fundamental disposition (*Gesinnung*). This would allow us to partly countenance our ignorance of our maxims and thereby our ignorance of our moral worth.

Moreover, these connections are crucial if we are to attempt an integration of the empirical and the intelligible causal orders. Such an integration must enable us to overcome the modal conflict resulting from reconciling the necessity of determinism with the contingency of spontaneity. This integration should also make room for our ordinary understanding of moral agency and responsibility, as well as the possibility of moral progress. Both of these aspects of the integration require that the different realms and the different causal orders be connected and co-ordinated in a systematic way. It is the task of dual-level explanations to show how such connections are possible.

3.2.1 Fundamental explanations

We have seen that noumena are ontologically prior to phenomena. This ontological priority implies an explanatory priority. We can explain phenomena in terms

of noumena, but not vice versa. Indeed, in order to give a complete account of phenomena we must appeal to noumena. Only in that way will we be able to give more than just a description of phenomenal features, but explain how they come about and what their grounds are. As Fine notes, an explanation in terms of grounds “is the ultimate form of explanation” (Fine: 2001, p. 16). To achieve this kind of explanation we need to appeal to noumena. We need to explain the phenomenal realm in terms of the noumenal realm. An explanation whereby one realm is explained in terms of another realm is called a ‘fundamental explanation’ by Nozick (cf. Nozick: 1974, p. 6). Dual-level explanations are such fundamental explanations. We can then say that noumena have explanatory priority since they must be appealed to if a complete or fundamental explanation of phenomena is to be given.

Fundamental explanations are particularly informative since they explain one realm in terms of another realm and thereby enable us to bring in explanatory resources that are not available for intra-realm explanations. If the realms are heterogeneous, then the explanantia and the explananda share very few variables in common. This heterogeneity makes the explanation informative, non-question begging and non-circular. If we need to explain *x*, then we need to appeal to something other than *x* to do the explaining. We need a qualitative difference or a difference in kind between the explanantia and the explanandum for the explanation to be informative.

The need for heterogeneity is particularly relevant when it comes to answering how-possible questions since the question how *x* is possible arises when the intelligibility and coherence of *x* is put into doubt. In order to explain the intelligibility of *x*, we need to appeal to something that is not doubtful, something that is sufficiently dissimilar from *x*. Otherwise, if the explanantia should be too similar to *x*, then those things that put the coherence of *x* into doubt would also raise questions about the intelligibility of the explanantia. Unless we have sufficient heterogeneity, the doubts about explananda will transfer to the explanantia. At the same time, the explanantia must still be connected to *x* in a substantial way, such that *x* can be explained in terms of them. Without an adequate ontological connection, there will not be an adequate explanatory connection. Explaining phenomena in terms of their noumenal grounds satisfies both conditions since phenomena and noumena are heterogeneous, but are nevertheless connected by a grounding relation, thereby allowing for informative explanatory connections.

3.2.2 Fact-defective potential explanations

The suggestion that we can provide dual-level explanations of the phenomenal realm in terms of the noumenal realm, naturally gives rise to the objection that this endeavour is futile since we lack knowledge of noumena. How can we appeal to noumena to explain something, if we do not have knowledge of any of their positive determinations? The point of a supervenience explanation is to explain

something that is not very well understood, by showing that it supervenes on something of which we do have a more sophisticated understanding. This means that in order for such explanations to be explanatory, the explanantia to which they appeal must have a better epistemic standing than the explananda. Yet, *prima facie*, this condition does not seem to be met by our noumenal explanations.

Despite our ignorance of noumena, we can explain problematic features, in this case the problematic metaphysical features of phenomena, in terms of something that is taken to be less problematic, namely noumenal features. Metaphysical features at the phenomenal level are problematic because they appear to be incoherent and unintelligible if we consider the phenomenal realm on its own. Noumenal features, on the contrary, are simply unknown rather than incoherent and unintelligible. There is at least room for their possibility since nothing counts against them. Accordingly, even though we lack knowledge of the antecedent of the explanation, we still have a scenario in which something that is problematic is explained in terms of something that is less problematic. The explanantia are more intelligible, or rather less unintelligible, than the explananda. This implies that explaining phenomena in terms of noumena does satisfy the condition for being explanatory.

Nonetheless, it may still be objected that an explanation of *x* in terms of *y* is only of significance if *y* is really the case. Telling some hypothetical story is not of interest to us, the objection goes, since we want to know what is actually the case. If appealing to *y* constitutes only one of a large number of possible explanations of *x*, then our ignorance of *y* will undermine any claim to having given an adequate explanation of *x*. In order to explain why we have *x*, we need to identify the way in which *x* actually arises and not a way in which it could possibly have arisen. In short, the objection states that to be a genuine explanation that is informative the explanantia that are given must actually be the case. The facts to which one appeals must really obtain and this we cannot know when appealing to noumenal facts, thereby undermining the utility of dual-level explanations.

The objection correctly depicts the relation between the explanantia and the explananda. Moreover, it gives a correct account of our epistemic status with respect to the former. However, it misses the point of dual-level explanations. When giving such explanations, we are involved in a different kind of explanatory project. We do not want to provide a description of the way reality actually is. Instead, we want to show how certain things are intelligible. We want to answer certain 'how-possible questions'. It is because we have this different aim that even potential explanations, i.e. explanations that are valid but have some false premises, can be useful.

Potential explanations come in different kinds, depending on what kind of premises are false. In particular, we can distinguish fact-defective, law-defective, and process-defective potential explanation (cf. Hempel: 1965 & Nozick: 1974, pp. 6-9). Our dual-level explanations would be problematic if they were law-

defective or process-defective. Fact-deficiency, however, does not cause any complications.

The process to which dual-level explanations appeal is the process of intuition that gives rise to phenomena, as well as the supervenience relations following therefrom. Accordingly, we can see that process-deficiency would be a serious problem. If the process were deficient, we would be unable to give an account of the relation between noumena and phenomena. Phenomena are those things that arise as a result of the process of intuition. If we should be appealing to a different process, then we would no longer be speaking about phenomena. We do not, however, have to worry about process-deficiency. This possibility is not connected to our ignorance of noumena. We are ignorant of the positive determinations of the noumenal realm, but this does not undermine our knowledge of the way in which phenomena arise. That is, ignorance of noumena is compatible with knowing the process of intuition, thereby warding off the danger of process-deficiency.

A law-defective explanation would be at least equally worrisome. The laws governing the genesis of phenomena are the laws of logic. This can be seen from the fact that the multiple-domain supervenience principles hold with logical rather than nomological necessity. The existence of transcendental objects and transcendental properties logically implies the existence of phenomena. Phenomena are logical constructs, rather than being emergent entities that arise by means of certain bridge laws. This means that our dual-level explanations do not appeal to any bridge laws, but only to the laws of logic. Accordingly, law-deficiency would amount to an explanation making use of the wrong logical laws. The possibility that we are mistaken about the laws of logic is sufficiently remote to be safely set aside.

It is only fact-deficiency that is relevant to our case. In giving dual-level explanations we appeal to certain noumenal facts, even though we do not know whether they actually obtain. This, however, is unproblematic since we do not attempt to explain why things are the way they are. Our aim is rather to make things intelligible. We try to show how they are possible. We attempt to establish their coherence relative to certain background assumptions. Even if the explanation is not true, insofar as some of the explanantia do not obtain, it can still be a useful explanation. Our dual-level explanations can be insightful, even if we do not know whether the antecedent of the explanation is met and even if it should turn out to be false. A potential explanation can be useful and informative, even if it is fact-deficient. It can explain how something could be the case by providing a mechanism or a scenario that depicts how the explananda could occur, how they could be instantiated. It thereby gives us an understanding of what the possibilities are and helps us to get a better grasp of what kind of things phenomena are. Most importantly, it shows that the explananda are not incoherent and unintelligible.

When we are concerned with ‘how-possible’ questions, we do not want a description of what is the case. We do not want to know whether we have *x*. Rather, we want to know whether *x* is possible and under what conditions it could be actual. We want to understand and make sense of *x*. We want to grasp and comprehend its nature. If these are our goals, then fact-deficiency is not a real issue. Accordingly, if we are explaining *x* in terms of *y* by means of an explanation that allows us to gain some understanding of what kind of thing *x* is, then it does not matter whether *y* is actual. A fact-deficient explanation allows us to learn about the status of *x*. We learn that *x* is the kind of thing the actuality of which could be explained by *y*. The explanation shows that *x* is possible, that it could arise in a certain way, that it is compatible with certain things. These are all important things to know and none of them is dependent on the actuality of the explanantia. All that we require is that the explanantia be possible, not that they be actual.

3.2.3 Answering ‘how-possible questions’

Dual-level explanations aimed at answering how-possible questions are not supposed to describe how things are or explain why things are the way they are. Instead, they are supposed to make things intelligible and explain how certain things are possible. It is for this reason that fact-defective potential explanations are still useful since factual accuracy is not our concern. We need to provide a description of a possible way in which something could be the case, rather than providing an account of what is actually the case. Such a description of a possible scenario involving the thing in question establishes that that thing is possible and shows us how it could be actual. It tells us what kind of scenario would make it actual. The depicted scenario may be one of many scenarios in which that thing would be actual or it may be the only one. We do not need to provide an exhaustive list of such scenarios but only show that there is at least one. Providing a single scenario is sufficient to establish the coherence and possibility of the thing in question. It is sufficient for making that thing intelligible.

How-possible questions are naturally followed by ‘whether-actual questions’. Once the possibility of *x* has been established the question then becomes salient whether *x* is actual. Transcendental idealism allows us to deal with the first kind of question by providing us with dual-level explanations. Answering the latter question requires us to appeal to transcendental arguments. The role and nature of transcendental arguments will be considered later on in this chapter. For now, however, we will be concerned with the general nature of how-possible questions, the conditions under which they arise and the ways in which we can deal with them.

How-possible questions are concerned with the coherence, intelligibility and possibility of certain things. They ask for an explanation of how something could be the case. As such, they require us to provide a coherent scenario in which

that thing is the case, thereby showing that its obtaining is possible. These kinds of questions arise if there are apparent obstacles to the possibility of the thing in question. As Cassam notes, how-possible questions are obstacle-dependent. If we want to assert that *x* is possible and there are arguments to the contrary, then the question concerning how *x* is possible gains salience. There must be arguments that put the coherence and intelligibility of *x* in doubt for this question to become relevant.

The question how *x* is possible arises if we want to assert *x*, but realise that *x* is incompatible with *y*. In this case, *y* casts doubts on the possibility of *x*. If *y* is contingent, the question is how *x* can be possible given the actuality of *y*, i.e. how we can have *y*-worlds that are also *x*-worlds, whilst if *y* is necessary, the question is how *x* is possible at all. To answer such questions, we need to provide an account that explains how *x* and *y* can be rendered compatible. We must depict the way in which we can have the thing in question despite the fact that its coherence is put in doubt and despite the fact that it appears to be incompatible with something to which we are committed.

There are different ways of dealing with how-possible questions (cf. Cassam: 2007 & Nozick: 1981). In particular, we can identify two main strategies. The problem is that we want to assert *x*, but then realise that *x* and *y* are incompatible, whereby *y* seems *prima facie* to be plausible. This casts doubt on *x* and raises the question how *x* could be possible. The first strategy involves the denial that the obstacle does exist. That is, we reject *y*, showing that even though *y* is *prima facie* plausible it should upon analysis be denied, thereby removing the obstacle to the coherence of *x*.

Alternatively, we can make use of the second strategy and show that what was considered to be an obstacle is actually compatible with what we want to assert. In other words, we do not deny *y* but show that there is only a *prima facie* incompatibility. We show that *x* and *y* turn out on analysis to be compatible after all or that there are certain background assumptions we can make that render *x* and *y* compatible. We provide some story or mechanism of how *x* and *y* could both be true, thereby showing that *y* is not necessarily an obstacle to *x* and that the acceptance of *y* accordingly does not cast doubt on the coherence of *x*. Cassam calls these strategies ‘obstacle-dissipating’ and ‘obstacle-overcoming’, respectively.

Thus, a how-possible question arises if we want to assert *x*, but are unable to do so because there is an obstacle to *x*, namely *y*. We have a situation where we want to accept *x* and *y*, but are not able to assert both of them since they are incompatible. In such a situation, we need to find a way to deal with the incompatibility. If we cannot use an obstacle-dissipating strategy, that is, if we cannot reject *y*, then we have to find some way to overcome the incompatibility.

Fundamental explanations that invoke transcendental idealism allow us to provide answers to particularly difficult how-possible questions. These questions

involve an obstacle that can neither be overcome nor dissipated, as long as one appeals only to explanatory resources internal to the phenomenal realm. Transcendental idealism provides us with further explanatory resources, allowing us to provide obstacle-overcoming dual-level explanations. By appealing to another realm we can show that there is inter-realm compatibility, even though there is an intra-realm incompatibility, and thus explain how we can accept both *x* and *y*, thereby overcoming the incompatibility.

Transcendental realists are not able to provide such obstacle-overcoming dual-level explanations. The reason for this is that in order to be able to give such an explanation, the level which is to be explained must differ sufficiently from the level which features in the antecedent of the explanation. Unless we have sufficient heterogeneity, we will not be able to get adequate explanatory resources to overcome the incompatibility. Though it is possible for transcendental realists to use multi-level explanations that explain what happens at one level in terms of what happens at another level, their levels lack the requisite heterogeneity. This is because these levels are understood as layers in a mereological hierarchy, which means that they all belong to the same realm, have the same nature and are levels of the same kind. Given this similarity amongst the levels, it will not be possible to overcome the incompatibilities. Explaining one level in a mereological hierarchy in terms of another level in that very same hierarchy does not suffice for dissipating incompatibilities.

Transcendental idealists, on the contrary, have at their disposal two radically heterogeneous levels, namely the noumenal and phenomenal realms, that are connected by a grounding relation. These levels are heterogeneous in important respects. We have realms of different kinds that differ quite radically, rather than merely having different levels in a mereological hierarchy. This enables us to give a fundamental explanation of a whole realm in terms of a different realm and allows us to restrict the scope of certain constraints in such a way that they only apply to the phenomenal realm, while leaving open the possibility that these constraints do not apply to the noumenal realm. In that way we can appeal to explanatory resources that are to be found in the noumenal realm and give fundamental explanations that allow us to overcome incompatibilities.

The requirement of having heterogeneous realms applies, for instance, if we want to explain the possibility of causal efficacy. We can accept that causal efficacy is unintelligible at the phenomenal level. At the same time, we can argue that we can make sense of noumenal causal efficacy. These views are compatible since the obstacle which prevents us from ascribing causal efficacy to phenomena does not apply to noumena. The obstacle has restricted applicability and can hence be overcome by appealing to noumena. We can then claim that phenomenal causation differs fundamentally from noumenal causation. The former is nomologically-governed regularity, while the latter consists in causal efficacy. Similarly, by accepting the atemporality of the noumenal realm, we can explain

identity through time by means of the identity of an atemporal ground. In this way we can show how an object can be present at different times. We can give this explanation, whilst allowing that it is unintelligible how phenomena could persist through time by being wholly present at different times.

We need to appeal to the noumenal level because all these metaphysical features that we want to account for, such as unity and causal efficacy, cannot be found at the phenomenal level. The level of phenomena is a logical construct and logical complexes lack causal efficacy and unity. To show the possibility of these features, we need to appeal to the grounds of these logical complexes. This means that even though we do not need transcendental idealism for dual-level explanations in general, we do require it for vindicating metaphysics and for making sense of unity, persistence, causation and mind-body interaction. These dual-level explanations cannot be provided by simply appealing to different layers in a mereological hierarchy, but require us to appeal to different levels that are heterogeneous in important respects.

3.3 Transcendental arguments

We have seen so far that the ontological framework of transcendental idealism gives rise to the possibility of dual-level or transcendental explanations. By means of these explanations we can make various metaphysical features intelligible. They do not tell us what is the case, but show us how something could be the case, how it is intelligible and coherent despite serious arguments to the contrary.

Such dual-level explanations can be combined with theoretical and practical transcendental arguments that show that these metaphysical features are necessary presuppositions for the possibility of experience and morality. Transcendental arguments are concerned with identifying the necessary conditions that must be satisfied for experience and morality to be possible. They establish that if experience and morality are to be possible, then these presuppositions must be met. Thus, having established the intelligibility and coherence of various problematic metaphysical features by means of dual-level explanations, we can appeal to transcendental arguments to connect these metaphysical features to morality and experience.

The transcendental arguments only show that x is a necessary presupposition for the possibility of y . They only establish a hypothetical statement of the form: 'if we do have experience, then the world is ...'. However, they do not establish the actuality of y and therefore do not show us that x obtains. In order to establish the actuality of the antecedents of the transcendental arguments, we can appeal to considerations stemming from practical and theoretical reason. In this way we can arrive at a warranted belief in the actuality of these metaphysical features.

Thus, our strategy consists of three steps, namely (i) make x intelligible by means of a dual-level explanation, (ii) show that x is a necessary presupposition

of y by means of a transcendental argument, and (iii) provide some warrant for believing in the actuality of y and thereby its necessary presupposition x .

Transcendental idealism makes room for things that are connected to experience, and can thus constitute necessary presuppositions for the possibility of experience, without it being possible to experience those things themselves. Transcendental arguments thus allow us to make claims that go beyond that which is experienced, by allowing us to make claims about that which is required if experience is to be possible. Such preconditions of experience cannot be experienced but are presupposed by the possibility of experience. By means of such arguments we can identify the transcendental grounds of experience and show what must be the case for experience to be possible. This implies that we can make claims about what the noumenal realm must be like if experience is to be possible. In particular, we can identify a role that the noumenal realm must fill, namely the role of grounding the metaphysical structure that is required for experience and morality to be possible. While we do not know what fills this role, what exactly it is that grounds this metaphysical structure, we do know that this role must be filled.

Transcendental arguments are not particularly effective against sceptics and nihilists since it is always possible for them to deny the antecedent. Transcendental realists who accept the antecedent, however, will have difficulty in reconciling the consequent with their transcendental realism. If the antecedent is accepted, then the consequent should also be accepted. Yet, accepting the consequent is problematic for transcendental realists since they do not have the explanatory resources of transcendental idealism to explain how the consequent is even possible.

Thus, any transcendental realist who wants to accept that we have objective experience or who wants to accept that we are bound by morality faces the difficult task of establishing the coherence of the presuppositions of morality and experience. This task does not seem possible given the limited explanatory resources available to the transcendental realist. Accordingly, we can argue that morality and experience have various presuppositions that can only be explained by transcendental idealism. Nihilism about experience and morality, on the one hand, and transcendental idealism, on the other, seem to be the only two coherent options. This means that to be a realist one has to be a transcendental idealist.

This argumentative strategy fits into a larger dialectic that leads from a common sense metaphysics via a Humean reductionist metaphysics to transcendental idealism. The debate begins with a criticism of single-level theories of unity, substance, persistence, causation and reciprocity. This is done by appealing to the Humean critiques of real connections. We then argue against the adequacy of Humean substitutes. To do this we make use of transcendental arguments that establish the need for ontological structure, thereby showing the inadequacy of reductionist metaphysical theories. After rejecting reductionist theories, we establish the intelligibility of dual-level theories of unity, substance, persistence,

causation and reciprocity by means of dual-level explanations. The upshot of this discussion then is that nihilism and transcendental idealism are the only two tenable positions.

More precisely, the dialectic unfolds as follows:

- (i) We begin with the common sense starting-point of transcendental realism. In particular, we believe that there are substances that persist through time and stand in causal relations to each other. Substance, persistence and causation are all understood in a metaphysically weighty sense. That is, we appeal to a broadly Aristotelian notion of substance as an underlying substratum in which properties inhere, the endurantist's account of persistence as being wholly present at different times, as well as an understanding of causality whereby the cause produces the effect, making it the case that the latter follows with necessity from the former.
- (ii) As a result of various Humean critiques we realise that the common sense picture has to be abandoned. Aristotelian substances, enduring objects and causal efficacy are all ruled out given the Humean denial of real connections. These weighty metaphysical notions are shown to be incoherent and accordingly have to be rejected.
- (iii) Even though these metaphysical notions fall prey to the Humean criticisms, we are not left with nihilism since the Humean provides various reductionist substitutes that supposedly permit us to claim that there are persisting objects that stand in causal relations. To do this, we simply have to construe the metaphysical notions in a way that is significantly less ontologically loaded. For example, persistence becomes perdurance instead of endurance and causation is identified with counterfactual dependence rather than with causal efficacy.
- (iv) The Humean substitutes are shown to be insufficient by means of transcendental arguments. In particular, it is shown that objective unified experience and unconditioned morality require substantial ontological structure which the Humean cannot provide. Real unity, real persistence and real causation are required, which implies that the Humean account is deficient.
- (v) The threat of nihilism then re-emerges. We want to be realists and accept that there is objective unified experience and that we are unconditionally bound by morality but do not seem to be able to do so since such a commitment presupposes the metaphysical notions that have been ruled out by the Humean critiques.
- (vi) Transcendental idealism allows us to ward off nihilism by making it intelligible how there can be ontological structure. Its dual-level ontology

permits us to accept that there are no real connections at the phenomenal level, while still making room for real unity, real persistence and real causation. By means of scope-restrictions it enables us to reconcile what is irreconcilable within the framework of the single-level ontologies of transcendental realists. In this way we can be realists who can make room for ontological structure and thus for experience and morality, without being shown to be inconsistent by the denial of real connections in the way that this happened to the common sense picture with which we began.

- (vii) Hence, we can see that the only way to be a realist is to be a transcendental idealist. We need to accept a dual-level ontology to acquire the relevant explanatory resources to make intelligible the necessary presuppositions of experience and morality.
- (viii) Transcendental idealism is thereby shown to be the only viable alternative to nihilism. Moreover, we can argue against nihilism by appealing to the fact of experience and the fact of reason, which support the reality of experience and morality, respectively, and thereby support transcendental idealism. As a result, we conclude that we should reject nihilism and instead accept realism and consequently transcendental idealism.

3.3.1 The possibility of experience and morality

Experience is objective cognition of a unified world. This means that the world must be unified and possess structure for experience to be possible. Phenomena must stand in metaphysical relations that provide unity to the phenomenal realm. The elements must be arranged so as to form a unified whole (nature). The non-empirical properties corresponding to the dynamical categories, in particular the categories of relation, must connect, order and unify the phenomenal elements in order for experience to be possible.

While the world must be unified in this way, the elements of our experience, that is, our representations, must be combined and synthesised in a way that reflects the structure of the world. Our representations must be connected and ordered to amount to a unified whole. This connectedness results from synthesis that is guided by the categories since it is the categories that allow us to order our representations and provide structure and form to them. The categories provide unity to our representations and thereby allow us capture the ontological structure of the phenomenal realm.

The phenomenal world consists of a spatio-temporal distribution of intensive magnitudes. These magnitudes must be unified and structured if experience is to be possible. Ontological structuring consists in connecting, ordering and unifying the real in space. Unity is provided by metaphysical relations that connect, combine and order different elements both synchronically and diachronically. In

particular, the unity of experience requires there to be spatially and temporally bounded entities that combine properties into objects, as well as necessary connections that relate different things existing at the same time as well as at different times. The elements of the phenomenal world must be unified by inherence, causal and reciprocal relations. These metaphysical relations at the phenomenal level must, in turn, be grounded in the ontological structure of the noumenal realm.

The inherence relation allows us to treat a plurality of features as a unity and is thus a synchronic as well as diachronic unification function. In this way we can identify a (temporally as well as spatially) extended filled spatio-temporal region as an object. Substances are thus responsible for synchronically and diachronically unifying features into objects. Causal and reciprocal relations, on the contrary, allow us to treat different features as connected by dependency relations or as being mutually interdependent. They are diachronic sub-ordination and synchronic co-ordination functions that are responsible for the asymmetrical and symmetrical ontological dependencies amongst property instances, ensuring that they are combined into a unified whole.

More precisely, causation connects properties diachronically, by providing a dependency-ordering. It provides unity to the property distributions at different times, connecting the qualitative distribution of properties at one time with the distributions at other times. One property distribution becomes the cause or ground of the subsequent distribution. In this way the different property distributions are connected, which means that causation provides diachronic unity. Reciprocity connects properties of different objects synchronically, thereby providing synchronic unity. The different aspects of a synchronic property distribution are interconnected and explicable in terms of each other. This ensure that the distribution at any time constitutes a unified whole that does not possess disconnected and separate elements.

Hence, experience is only possible if the world is a unified whole. The world must possess ontological structure that provides unity. This ontological structure results from synchronic as well as diachronic unification, dependency and interdependency relations. These metaphysical features are responsible for bundling properties into objects, thereby providing synchronic and diachronic unity to the bundles, as well as for connecting these unified bundles to each other synchronically by reciprocity and diachronically by causation, thereby ensuring that they all belong to the same unified whole. Accordingly, we can see that substance, causation and reciprocity are necessary presuppositions of the possibility of experience since they are responsible for structuring the world and providing unity to it.

We have seen that we require ontological structure if experience is to be possible. The ontological structure is needed for connecting the different things that happen at a time as well as at different times, thereby providing synchronic and

diachronic unity. We can strengthen this argument by showing that without ontological structure we would not have an objective spatio-temporal order at all. There would not be a unified spatio-temporal framework within which different events would be ordered. There would thus not be any matters of fact about the spatio-temporal relations amongst different events. This means that for there to be an objective temporal ordering, there must be ontological structure. This is not just an epistemological claim about what the conditions that must be satisfied for us to be able to identify or represent such an ordering, but is rather a claim about the conditions of the very existence of such an ordering.

It was argued earlier that different perspective-dependent spatio-temporal frameworks are fragmented and do not stand in spatio-temporal relations to each other. To get a unified perspective-independent spatio-temporal ordering there must be ontological structure that connects the different perspectives and imposes an ordering on them. We need objective ontological structure to get objective spatio-temporal structure. The ontological structure is fixed by gen-identity relations as well as by synchronic and diachronic causal relations, and is accordingly captured by the categories of substance, causality and reciprocity. These ontological relations are thus required for unifying different spatio-temporal frameworks into a single, unified, objective perspective-independent space-time. Without them, we would have different spatio-temporal frameworks that would not be part of the same order and that could not be integrated into a unified and objective ordering.

This transcendental argument shows not only that we need substantive ontological structure. It also gives us details about what this structure must be like if experience is to be possible. For instance, there must be universal causal dependencies, such that any two events are connected by a chain of causal dependencies. Otherwise, we end up with isolated systems that cannot be integrated into a unified framework. More precisely, in order to have a unified ordering that makes possible the unity of experience, it must be the case that every pair of events $\langle x, y \rangle$ is such that either (i) x and y are reciprocally causally dependent, or (ii) x and y are identical to or contemporaneous with events that stand in an asymmetrical causal dependency relation.

The ontological structure required for grounding an objective spatio-temporal order cannot be provided by Humeans since the Humean substitutes for substance, causation and reciprocity presuppose the very spatio-temporal ordering that these metaphysical features have to ground. For example, causal relations and laws of nature cannot simply be reduced to local matters of fact since the supervenience base would have to include a spatio-temporal ordering and this presupposes that we have independently given spatio-temporally ordered matters of fact. However, no such independently ordered facts are given, which implies that we have to be non-reductionists about laws and causation. Instead, what is given are independently ontologically structured facts that ground the objec-

tive spatio-temporal ordering. The ontological structure is prior to the spatio-temporal structure, which means that we need independently causally ordered facts.

Thus, we can see that the Humean project cannot even get off the ground and that the Humean substitutes are insufficient for making experience possible. These substitutes are not able to provide the requisite ontological structure and presuppose precisely that which they are meant to ground. Ontological structure cannot be reduced to local categorical matters of fact since such matters of fact do not give rise to a unified and objective spatio-temporal ordering, leaving the world fragmented and ontologically amorphous. This fragmentation and amorphousness, however, cannot be accepted, which implies that there is a need for ontological structure. What is required to make experience possible is something that provides structure to the matters of fact, something that unifies and connects them. Since the categorical matters of fact must be unified and structured, it follows that ontological structure cannot be reduced to these matters of fact. Humeanism thus does not suffice for objectivity and unity. For that ontological structure is required, which can only be provided by the structure of the noumenal world.

Morality, understood along Kantian lines, amounts to a system of moral laws that are derived from the categorical imperative and that are objectively binding. Practical transcendental arguments are based on the fact that morality imposes requirements upon us. The applicability of moral requirements has transcendental conditions since such requirements only apply to an agent if that agent satisfies certain conditions that can only be grounded in noumena. Practical transcendental arguments try to identify these necessary preconditions of the applicability of moral requirements.

In particular, bindingness requires the possibility of compliance since 'ought implies can'. For it to be possible for an agent to comply with a moral requirement that agent must be able to act out of duty. This, in turn, requires that the agent is transcendently free and able to act on maxims. The agent must be an uncaused cause, freely bringing about effects in the world. Accordingly, we need to make room for transcendental freedom and need to explain how an agent can be efficacious by acting on maxims. Moreover, it can be argued that the imposition of requirements brings with it the possibility of attributing responsibility to agents. For this to be possible, the agent must be a unified subject who persists through time. Only in this way can a subject be a locus of responsibility.

3.3.2 Supporting the antecedent

A transcendental argument only establishes that x is a necessary presupposition for the possibility of y . It does not, however, show us that y is actual and consequently does not show us that x obtains. In order to go from the conditional statement

that is established by the transcendental arguments to an affirmative claim about the actual world, we need to close this gap and provide warrant for believing in the actuality of the antecedent. In this way we can be warranted in inferring the actuality of the consequent.

Transcendental arguments cause problems for transcendental realists since they are willing to accept the antecedent but are unable to explain the consequent. These arguments identify necessary connections between experience and morality, on the one hand, and certain metaphysical features that are only intelligible on the assumption of transcendental idealism, on the other hand. This then establishes that one has to be a transcendental idealist, if one wants to accept the actuality of experience and morality.

Nihilists and sceptics are not affected by such arguments since they are willing to reject the antecedent. In response to this manoeuvre, we have to provide some support for accepting that experience and morality are actual. No proof can be given that establishes the truth of the antecedent and no refutation of scepticism or nihilism seems possible. Nonetheless, there are various supporting considerations to which we can appeal. These considerations allow us to ward off nihilism as well as scepticism and thereby render the acceptance of experience and morality and hence a commitment to transcendental idealism more plausible.⁷

To support the belief that we do have experience and not mere imagination we can appeal to a broadly realist starting-point and simply treat experience as a fact. We start with the fact of experience and explain its possibility, rather than attempt to establish its actuality (cf. Ameriks: 2003, Introduction). We appeal to common sense and take it for granted that there is a reality independent of us and that this reality is not an amorphous, inchoate, disconnected assemblage of stuff that lacks unity but is rather ontologically structured. We show how this common sense realism is intelligible on the assumption of transcendental idealism, thereby countering any doubts about its coherence. While transcendental realism is open to various criticisms, transcendental idealism allows us to capture this common sense view and provide a broadly realist position the intelligibility of which can be defended. In particular, we can make intelligible how experience is possible by providing dual-level explanations of the presuppositions of experience. That is, we do not provide a refutation of the sceptical position. Instead, we make the realist assumption that our sensory input is somehow determined by objects that are independent of us and that sensation is not merely an arbitrary play of the imagination.

Similarly, we cannot provide a refutation of the moral sceptic but can only provide supporting considerations for believing that morality is objectively valid

⁷I am not going to give any detailed account of how these considerations work and what their precise epistemic status is. Rather, I will provide some indications of what kind of considerations could support our belief in the actuality of morality and experience.

and not a mere figment of the imagination. In particular, we can appeal to the fact of reason, to our consciousness of the bindingness of moral requirements. Moreover, we can show that we have to make certain presuppositions if action is to be possible at all, that certain presuppositions are inescapable from a practical standpoint.

More precisely, there are two facts of reason or two aspects of the fact of reason. The first aspect consists in our consciousness of the bindingness of the moral law. This is a fact given to reason insofar as the commands of the moral law confront us. From this bindingness we can infer our freedom. Given that we ought to act in certain ways and given that it is only possible for us to act in these ways if we are free, it follows that we are free. The second aspect concerns our consciousness of the moral motive. This is a fact that is produced by reason. We are aware of a feeling of respect and this is a feeling that could only come from reason. It is an a priori feeling resulting from the activity of a free rational will.

Additionally, practical reason can only act under the assumption of freedom. Freedom must be presupposed for deliberation and agency to be possible. This obviously does not establish that we are free but only that we have to regard ourselves as being free. Accordingly, we have to reject nihilism and scepticism from a practical point of view and instead accept transcendental idealism, which allows us to consider ourselves as free agents who are bound by the moral law.

3.3.3 Refuting idealism and scepticism

In addition to appealing to the ‘fact of experience’ and the ‘fact of reason’, we can also show that the most attractive forms of idealism and scepticism are untenable, thereby making the acceptance of anti-realist positions more burdensome and shifting the dialectical situation in favour of realism and hence transcendental idealism.

The perspectival and fragmentary nature of appearances implies that the appearances of which a particular subject is aware fail to be temporally ordered and do not stand in temporal relations to each other. Not only is it the case that they are not temporally ordered, it is also the case that we lack the requisite transcendental structure to impose an ordering on them if we confine ourselves solely to these appearances and their grounds. To connect them and impose an ordering on them, we need to integrate them into a larger nexus and look not only at their grounds but also at the relations that connect these grounds to other things.

We can do this by considering the noumenal representations that ground a subject’s appearances not as they appear to inner sense, but as they appear to outer sense, namely as brain states. Once we focus on the physical correlates, we can arrive at a temporal ordering of appearances since these correlates are integrated into the law-governed external world.⁸ They are embedded in a larger system that

⁸It should be noted that we are concerned with the correlates of the mental states, not with the

possesses the right kind of structure since the elements of this system stand in the relevant ontological relations that give rise to a spatio-temporal ordering. Since the physical correlates of appearances are embedded in physical space-time, we can use the temporal order of the physical counterparts of these appearances to impose an ordering on the appearances of a subject. This means that an inner event *x* can only be said to be earlier than an inner event *y* if the intersubjective correlates of *x* and *y* can be said to stand in this temporal relation, which in turn is the case only if the correlates of *x* and *y* stand in a chain of asymmetrical causal dependency relations or are contemporaneous with events that stand in such relations.⁹

Thus, the requisite dependency ordering obtains amongst the intersubjective phenomena and not amongst the merely subjective appearances. This means that the ordering of appearances is parasitical on the ordering of phenomena and that appearances can only be ordered indirectly by ordering their phenomenal correlates. Accordingly, in order for appearances to be temporally ordered, they must be integrated into a larger nexus of events that stand in the right kinds of ontological relations. In particular, they must be integrated into the law-governed physical world. This can be done by focusing on the physical correlates of the appearances, namely the brain states that result when the noumenal mental states are not inwardly intuited by means of reflexive awareness, but are outwardly intuited. Hence, for my mental states to be temporally ordered, there must exist an external world that has the right kind of ontological structure and into which the physical correlates of my mental states are integrated. Otherwise, they will be fragmented and will not stand in any temporal relations to each other.

A corollary of this argument is that any objective time-determination that tracks the relations giving rise to the temporal order has to proceed via identifying the physical counterparts of the mental states as well as identifying the causal laws that govern the physical world. Once the laws have been specified, they can be used to identify the objective ordering amongst the brain states, which then allows us to order the mental states accordingly. Hence, it is the functional relationships established by science, as well as the causal laws that these relationships track, that are to be appealed to in objectively determining any temporal ordering. Thus, whilst subjective time-determination proceeds via the contents of representations, objective time-determination has to proceed via laws. It is the physical laws that provide criteria of objectivity, that ground temporal relations and determine which ordering is correct. This means that any objective time-determination has to go via the law-governed external world.

Those who deny or doubt the existence of a law-governed external world will

correlates of the contents of these states. The physical correlates are thus determined by sameness of ground, rather than by sameness of source of manifold of intuition.

⁹'Inner' is here taken in the transcendental rather than the empirical sense and accordingly includes all subjective events, i.e. all appearances rather than only all inner appearances.

have to deny or doubt that the different episodes of a subject's mental life are temporally ordered.¹⁰ Since the claim that the different episodes of a subject's mental life do stand in temporal relations is not indubitable, it follows that this argument does not constitute a refutation of all forms of scepticism and idealism, but only a refutation of those sceptics and idealists who, whilst doubting or denying the existence of a law-governed external world, nonetheless believe that their representations are temporally ordered.¹¹ This implies that, even though this argument does not establish the truth of realism beyond doubt, it nevertheless significantly increases the costs of accepting scepticism and idealism and thereby strengthens the dialectical position of realism.

¹⁰It should be noted that we might be able to get some temporal relations by restricting our attention to inner states since their grounds may well stand in dependency relations to each other. Yet, since brain states do not form a closed causal system, it follows that there are not enough dependency relations amongst inner states for there to be a complete ordering and that we must consequently embed them into a larger set of law-governed events. Moreover, to the extent to which we are concerned not only with the existence of temporal relations but also with objective time-determination, we need to appeal to laws. Since laws are holistic and can only be identified or rather approximated by considering the physical system as a whole, the objective determination of temporal relations requires us to extend our attention to the whole physical system.

¹¹Additionally, idealists who do not want to be solipsists, but want to accept that there are several subjects that stand in temporal relations to each other, will be refuted since temporal relations amongst different subjects can only be established via the shared intersubjective physical realm.

Conclusion

According to the theory developed in this dissertation, there exist aspatial and atemporal noumena. These noumena give rise to appearances insofar as noumenal selves are affected and thereby receive a manifold of intuition that is then processed in accordance with the forms of intuition to yield noumenal mental states with translated content. By means of apperception the subject can become reflexively aware of the contents of its own representations whereby these contents are subjected to the form of inner sense, namely time. As a result, the subject is immediately aware in a temporalised manner of the intentional objects of its noumenal representations, whereby these intentional objects can be both inner and outer appearances depending on whether the original manifold was provided by inner intuition or outer intuition.

The intentionalities of which we are aware are subjective emergent inexistents that are immanent to the act of awareness. They are subjective objects that only exist for the subject that is aware of them and that are dependent for their existence on the act of awareness that gives rise to them. These intentional objects do not possess any ontological structure, which means that the world of appearances is ontologically amorphous and consists only of a spatio-temporal distribution of qualitative features, namely of phenomenological intensive magnitudes. We can carve up this manifold of appearances in thought by drawing boundaries and treating bundles of properties as possessing unity. To do this we have to appeal to the dynamical categories since these a priori concepts allow us to represent non-empirical properties and cognise ontological structure.

While appearances are subjective objects, phenomena are intersubjective objects. They are logical complexes that have as their elements translated noumenal information. This noumenal information encapsulates noumenal properties and constitutes the matter of the manifold of intuition. This matter is translated into the frameworks provided by the forms of intuition to yield phenomena since these are nothing other than matter-in-form. Phenomena thus arise through a constructive process whereby the information provided by noumena is transformed to yield logical constructs. That is, we have a noumenal informational manifold that is processed in accordance with the forms of intuition, whereby the processing consists of imposition, selection and translation functions. The manifold is filtered insofar as only that information which is amenable to translation into the

imposed frameworks is selected. This selected manifold is then translated into spatio-temporal frameworks provided by the forms of intuition.

This constructive process yields a spatio-temporal distribution of qualitative features, which means that the phenomenal world consists of a distribution of physical intensive magnitudes, whereby these physical magnitudes are the inter-subjective correlates of the phenomenological magnitudes of appearances. While we can gain knowledge of the structure of the phenomenal world, since the spatio-temporal structure of perspective-dependent phenomena corresponds to that of appearances thereby allowing for non-trivial knowledge of concrete physical structure, we cannot know the intrinsic natures of these intensive magnitudes. Though this way of constructing phenomena initially only provides perspective-dependent spatio-temporal structures, these fragmented perspectives can be connected and unified to form a perspective-independent manifold since the transcendental structure of the world imposes an ordering on the perspectives.

The phenomenal and noumenal realms are thus connected insofar as they encapsulate the same information, though they differ with respect to the form in which this information is to be found. While noumena embody the matter in its pure form, phenomena are made of translated matter since they are matter-in-form. Given that phenomena have translated noumenal information as their matter it follows that they are grounded in noumena, that they depend on and are determined by noumena. This grounding relation can be captured by a supervenience relation. In particular, we can appeal to a co-ordinated multiple-domain supervenience relation to model the relation between noumena and phenomena, whereby the process of intuition provides the co-ordination relation.

Phenomenal properties supervene on transcendental properties relative to co-ordination relation R just in case for any collections of phenomenal objects $x_1 \dots x_n$ and $y_1 \dots y_n$ that have images under R and any worlds w and w^* , if $R|x_1 \dots x_n$ in w is indiscernible with respect to transcendental properties from $R|y_1 \dots y_n$ in w^* , then $x_1 \dots x_n$ in w is indiscernible with respect to phenomenal properties from $y_1 \dots y_n$ in w^* .

Even though the phenomenal world is ontologically amorphous when it is considered on its own, we can attribute non-empirical features to phenomena when these are considered in relation to their noumenal grounds. Certain logical complexes are privileged in virtue of being made up of elements that have a unified noumenal ground. In this way we can get unified and bounded phenomenal objects and can identify boundaries in the phenomenal world to which our carvings of the manifold of appearances should correspond.

Such attributions of non-empirical features are cases of dual-level explanations. This kind of explanation is possible since the grounding relation connects the two levels in such a way that we can explain features at the phenomenal level in

terms of features at the noumenal level that ground them. These explanations allow us to make certain metaphysical features, such as unity, persistence, causation and mind-body interaction, intelligible. Though we are not able to identify how the world is actually structured since we are ignorant of the noumenal grounds, we can give accounts of how certain features at the phenomenal level could result from certain noumenal features. The dual-level explanations therefore provide a vindication of metaphysics insofar as they show how it is possible for the world to be ontologically structured.

Once the intelligibility of these metaphysical features has been established, it is possible to appeal to theoretical and practical transcendental arguments in order to connect them to morality and experience. This is done by showing that metaphysical structure, provided by substance, causation and reciprocity, is necessary for the possibility of experience since this structure makes possible the unity of experience, and that these metaphysical features are required for the possibility of morality since there must be unified agents that can persist through time and be causally efficacious by acting on their maxims.

More generally, we have seen that transcendental idealism is indispensable for science and metaphysics. On the one hand, it provides the subject matters of science and metaphysics since the forms of intuition provide empirical structure, while the noumenal grounds provide ontological structure. Empirical structure is the spatio-temporal structure with which science is concerned, while ontological structure is the non-empirical structure with which metaphysics is concerned. On the other hand, it allows us to cognise empirical and ontological structure by giving us the fundamental mathematical and dynamical pure concepts enumerated in the table of categories, making scientific and metaphysical cognition possible. Without the mathematical categories, science would not be possible since the categories of quantity and quality are required for cognising extensive and intensive magnitudes and for mathematising nature. Without the dynamical categories, metaphysics would not be possible since the categories of relation and modality are required for cognising non-empirical features and for ontologically structuring nature.

This situation then implies that we have two options since we can either be transcendental idealists who can accept the actuality of experience as well as morality and can be realists about science, metaphysics and ethics, or we can be nihilists or sceptics. Transcendental realism is ruled out as an option since it attempts to accept experience and morality but is unable to make the necessary presuppositions thereof intelligible since it lacks the explanatory resources to give dual-level explanations of these presuppositions. As a result, we can see that if one wants to be a realist one has to be a transcendental idealist.

To ward off nihilism and scepticism, we have to provide considerations in favour of the actuality of experience and morality. By appealing to a broadly realist starting-point as well as to considerations stemming from practical reason,

we can provide support for believing that the antecedents of our transcendental arguments are met. This then provides warrant for believing in transcendental idealism and in the actuality of experience and morality, as well as for understanding ourselves as causally efficacious agents who persist through time. Moreover, by appealing to considerations regarding the conditions that must be satisfied for there to be a temporal ordering of mental states as well as the conditions required for objective time-determination, we can refute the more attractive versions of scepticism and idealism, thereby making the acceptance of anti-realist positions more burdensome, shifting the dialectical position in favour of transcendental idealism.

If the view that space and time are forms of intuition is flatly rejected, then the proposed theory should also be dismissed. Those willing to repudiate this system should, however, be aware of the implications that follow from this rejection. In particular, they will not be able to account for ontological structure and will not be able to defend realism about science, metaphysics and ethics. Realism is only possible on the assumption of transcendental idealism, which implies that the denial of transcendental idealism leaves us only with scepticism and nihilism. The world will be desolate, dismal and bleak and there will be no hope for morality. However, once this system is accepted we are able to make room for ontological structure, explain the possibility of non-trivial scientific knowledge, provide a vindication of metaphysics and secure the presuppositions of ethics. Transcendental idealism allows us to consider ourselves as unified subjects, as agents that persist through time, are causally efficacious and can freely act on maxims. It is for this reason that transcendental idealism should be accepted and that we should hold that the world has a transcendental structure.

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