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THE CAMBRIDGE EDITION OF THE WORKS
OF IMMANUEL KANT

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IMMANUEL KANT

Theoretical philosophy,
1755–1770

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CAMBRIDGE
UNIVERSITY PRESS

*The only possible argument in support of a
demonstration of the existence of God,
by M. Immanuel Kant (1763)*

*Der einzig mögliche Beweisgrund zu einer Demonstration
des Daseins Gottes, von M. Immanuel Kant (1763)*

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*The only possible argument in support of a
demonstration of the existence of God*

2:63

by
M. Immanuel Kant

Ne mea dona tibi studio disposta fideli, Intellecta prius quam sint, contempta relinquo.

LUCRETIVS^f

I do not esteem the use of an endeavour, such as this present one, so highly as to suppose that the most important of all our cognitions, *there is a God*, would waver or be imperilled if it were not supported by deep metaphysical investigations. It was not the will of Providence that the insights so necessary to our happiness should depend upon the sophistry of subtle inferences.^a On the contrary, Providence has directly transmitted these insights to our natural common sense.^b And, provided that it is not confused by false art, it does not fail to lead us directly to what is true and useful, for we are in extreme need of these two things. Thus, that employment of sound reason,^c which still lies within the limits of ordinary insights, yields sufficiently convincing proofs^d of the existence and properties of this Being, though the subtle scholar will everywhere feel the lack of demonstration^e and of the exactitude of precisely determined concepts and regularly connected syllogisms. Nonetheless, one cannot refrain from searching for this demonstration, in the hope that it may present itself somewhere. For, without mentioning the reasonable desire to achieve, in cognition of such importance, something which is complete and distinctly understood, – and no understanding which is accustomed to investigation can renounce this desire – it is to be hoped that such an insight, once it has been attained, will be able to illuminate much else in this object. To achieve this purpose, however, one must venture the bottomless abyss of metaphysics. Metaphysics is a dark and shoreless ocean, marked by no beacons. One must proceed as the mariner proceeds on an unnavigated sea: as soon as he makes a landing, he subjects his voyage to scrutiny, with a view to determining whether undetected currents, for example, may not have carried him off course, in spite of all the care, prescribed by the art of navigation, which he has taken.

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This demonstration, however, has not yet been discovered, and this failure has already been noticed by other writers. And, indeed, what I am

^a *Spitzfindigkeit feiner Schlüsse.* ^b *dem natürlichen gemeinen Verstande.*

^c *der gesunden Vernunft.* ^d *genugsam überführende Beweismittel.* ^e *Demonstration.*

offering here is merely an argument in support of a demonstration.³ What I am furnishing here is the materials⁴ for constructing a building; they have been assembled with great difficulty and they are now offered to the critical scrutiny of the expert in the hope that what is serviceable among them may be used to erect an edifice which accords with the rules of durability and harmoniousness.⁵ I no more wish that the analyses of the concepts⁶ which I employ should be taken for definitions⁷ than I wish that what I offer here should be held for the demonstration itself. The analyses which I offer furnish correct characteristic marks of the things of which I am treating: they enable us to arrive at precise definitions,⁸ and they are serviceable in themselves for the attainment of truth and distinctness. But they still await the finishing hand of the artist, and until they receive it they cannot be regarded as definitions. In a science such as metaphysics there are times when one confidently undertakes to define⁹ and demonstrate everything; and then, again, there are times when one ventures upon such undertakings only with fear and trepidation.

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The observations which I here present are the fruits of lengthy reflection. But, because a variety of commitments has prevented me from devoting the necessary time to it, the manner in which these observations are presented shows the characteristic mark of something incompletely worked out. However, to plead the reader's indulgence for only being able to wait upon him with something of inferior quality, no matter for what cause, would be a very futile piece of ingratiating. The reader will never grant his pardon, no matter what the excuse may be. In my own case, the incomplete form of the work is to be attributed less to negligence than to deliberate omission. My sole intention has been to sketch the rough outlines of a main draft. It is my belief that an edifice of no mean excellence could be erected on the basis of that draft, provided that hands more practised than my own were to give it greater accuracy in the parts and perfected regularity in the whole. This having been my intention, the expenditure of excessive and anxious care on the precise painting in of all the lineaments in the individual parts would have been superfluous effort, for the outline in general must first await the strict judgement of the specialists in the field.¹⁰ For this reason, I have often adduced arguments¹¹ without presuming to claim to be able, for the moment, to show distinctly their connection with the conclusion. I have, on occasion, advanced common judgements of the understanding without giving them that form of

³ *Beweisgrund* / Beck (1798) (hereafter B): argument / Carabellese (hereafter C): *argomento* / Festugière (hereafter F) & Zac (hereafter Z): *fondement* / Treash (hereafter T): basis.

⁴ *Baugeräth*.

⁵ *Wohlgereimtheit* / B: congruity / C: *armonia* / F: *bon appareillage* / T: harmonious adaptation / Z: *harmonie*.

⁶ *Auflösungen der Begriffe*. ⁷ *abgemessenen Erklärungen*. ⁸ *erklären*.

⁹ *der Meister in der Kunst*. ¹⁰ *Beweisthümer*.

rigour, through the art of logic, which the elements of a system ought to have. The reason for this omission has either been the fact that I found the task difficult, or the fact that the extent of the preparation which would have been necessary was out of proportion to the intended size of the work, or the fact, indeed, that I regarded myself, not having promised a demonstration, as freed from the requirements which are legitimately made of systematic authors. Of those who presume to judge works of the mind, it is a minority which boldly looks at the attempt as a whole and which gives particular consideration to the possible relation of its main parts to a soundly constructed edifice, once certain defects have been remedied and certain errors corrected. The judgement of this kind of reader is particularly beneficial to human cognition. As for the other kind of reader: incapable of apprehending a connection in the whole, he rivets his brooding attention on some one detail or other, indifferent as to whether a reproach, which is perhaps merited by a part, does not also affect the value of the whole, and as to whether detailed improvements of individual parts may save the general scheme, which is only partially defective. Readers of this kind, whose sole and constant concern is to reduce any building which they find started to ruins before it is completed, might, it is true, be feared on account of their number. However, their judgement is of slight significance to reasonable people when it comes to deciding the true value of a work.

I have, perhaps, in places, not explained myself in sufficient detail to deprive those who wish only for a specious pretext for casting the bitter reproach of heterodoxy¹² upon a book, of all opportunity of doing so. But, then, what precaution could be taken to prevent this? I think, however, that I have spoken distinctly enough for those whose sole wish is to find in a work that which the author intended to put into it. I have involved myself as little as possible with objections, even though my claims differ so much from those of others. Such disagreement I shall leave to the consideration of the reader who has understood both sides of the question. If the judgements of unbiased reason held by different thoughtful people were examined with the frankness of an uncorrupted advocate – an advocate who so weighed the grounds of the two disputed positions that he was able to imagine himself in the position of the two proponents, so as to be persuaded as strongly as possible of their respective views, and who only then decided to which side he wished to commit himself – if the judgements of unbiased reason were examined in this way, philosophers would disagree far less than they do. Unfeigned fairness¹³ in adopting as far as possible the opposite opinion would soon unite enquiring minds on a single path.

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In a reflection as difficult as the present one, I can, I suppose, resign

¹² *Vorwurf des Irrglaubens*. ¹³ *ungeheuchelte Billigkeit*.

myself in advance to the fact that many of the things I shall say will be incorrect, that many of the elucidations I shall offer will be inadequate, and that many of the positions I shall develop^p will prove frail and defective. I lay no claim to the reader's unconditional agreement; I should scarcely concede such unqualified support to an author myself. I shall not, therefore, be taken aback if I am corrected by others on many points. I shall, indeed, be found amenable to such instruction. If, at the beginning, when one is laying the foundations of one's argument, one confidently claims not to be mistaken, it is difficult to withdraw such a claim later on; it is less difficult to withdraw a claim which has been advanced with moderation, diffidence and modesty. Even the most subtle vanity, provided that it understands itself, will notice that allowing oneself to be convinced by others deserves as much credit as convincing others oneself, and that perhaps the former action, in so far as it requires greater self-denial and more self-examination, is more truly creditable than the other. It might seem that the periodic occurrence of fairly detailed physical explanations^q in a work would be damaging to the unity which one must observe in reflecting upon one's subject. However, since my intention in these cases has been especially focused on the method of using natural science to attain cognition of God, I could scarcely have achieved this purpose without deploying such examples. For that reason the Seventh Reflection of the Second Section requires greater indulgence. This is particularly so since its content is drawn from a book which I once published anonymously* and in which I treated of the same topic in greater detail, though in connection with various hypotheses of a somewhat daring character. Nonetheless, the affinity which exists between at least the freedom permitted to venture upon such explanations and my main intention, and likewise the wish to see certain aspects of the hypothesis subjected to criticism by the experts, have occasioned the inclusion of this reflection. For those wishing to understand all its arguments, it is, perhaps, too short. And for those expecting nothing but metaphysics it is, perhaps, too long. These latter readers may conveniently skip this reflection.

* The title of the book is *Allgemeine Naturgeschichte und Theorie des Himmels* (Königsberg and Leipzig: 1755). This work, which has remained little known,⁵ cannot have come to the attention of, among others, the celebrated *J. H. Lambert*. Six years later, in his *Kosmologische Briefe* (1761),⁶ he presented precisely the same theory of the systematic constitution of the cosmos in general, the Milky Way, the nebulae, and so forth, which is to be found in my above-mentioned theory of the heavens, the first part, and likewise in the preface to that book. Something of this theory is also indicated in the brief outline on pages 154 to 158 of the present work.⁷ The agreement between the thoughts of this ingenious man and those presented by myself at that time almost extends to the finer details of the theory, and it only serves to strengthen my supposition that this sketch will receive additional confirmation in the course of time.

^p manche Ausführung. ^q ziemlich ausführliche physische Erläuterungen.

tion. It will, perhaps be necessary, before reading the work, to correct certain printing errors which could affect the sense of my words. A list of such errors is to be found at the end of the book.⁸

The work itself consists of three sections: the *first* presents the argument itself; the *second* explains its extensive usefulness; the *third* offers reasons which are intended to show that no other argument in support of a demonstration of the existence of God is possible.

*Section 1. In which is furnished the
argument in support of a demonstration of the
existence of God*

FIRST REFLECTION: OF EXISTENCE¹ IN
GENERAL

Even in the profoundest of treatises, the rule of thoroughness does not always demand that every concept employed should be developed or defined.¹⁹ No such requirement exists, namely, if one is assured that the clear and ordinary concept by itself can occasion no misunderstanding in the context in which it is employed. Such is the case with the geometer who with the greatest certainty uncovers the most secret properties and relations of that which is extended, even though in doing so he merely makes use of the ordinary concept of space. And such is also the case in the deepest science of all, where the word 'representation' is understood with sufficient precision and employed with confidence, even though its meaning can never be analysed by means of definition.²⁰

Hence, in these reflections I should not aspire to analyse the very simple and well-understood concept of existence, were it not for the fact that the present case is one in which such an omission could occasion confusion and lead to serious errors. It is certain that anywhere else in philosophy the concept could confidently be employed in the undeveloped form in which it occurs in ordinary usage. The one exception is the question concerning absolutely necessary existence and contingent existence. In this one case, an investigation of a subtler sort has drawn erroneous conclusions from an unhappily contrived^a but otherwise very pure concept. These erroneous conclusions have extended themselves over one of the most sublime parts of philosophy.

It is not to be expected that I shall begin by offering a formal definition²¹ of existence. Such a procedure is always undesirable when the correctness of the suggested definition is so uncertain.²² This situation arises more frequently than one perhaps realises. My procedure will be like that of

¹ *Dasein*. ² *erklärt*. ³ *niemals durch eine Erklärung kann aufgelöst werden*.

^a *unglücklich gekünstelt*. ^b *mit einer förmlichen Erklärung*.

^c *wo es so unsicher ist, richtig erklärt zu haben*.

someone who is searching for a definition and who first of all assures himself of what can be said with certainty, either affirmatively or negatively, about the object of the definition,²³ even though he has not yet established the concept of the object in detail.²⁴ Long before one ventures a definition of one's object,²⁵ and even when one lacks the courage to offer a definition at all, there is still a great deal which can be asserted with the highest degree of certainty about the object in question. I doubt whether anyone has ever correctly defined²⁶ what space is. But, without getting involved in such a definition, I am certain that where space exists external relations must also exist, that it cannot have more than three dimensions, and so on. Whatever a desire may be, it is based upon some representation or other, it presupposes pleasure in the object of the desire, and so on. From that which is known with certainty and prior to the definition of a thing, it is frequently possible to infer with complete certainty that which is relevant to the purpose of our investigation. To aspire to a definition is to venture upon unnecessary difficulties. The mania for method and the imitation of the mathematician, who advances with a sure step along a well-surfaced road, have occasioned a large number of such mishaps on the slippery ground of metaphysics.²⁷ These mishaps are constantly before one's eyes, but there is little hope that people will be warned by them, or that they will learn to be more circumspect as a result. By this method alone I hope to arrive at the enlightenment which I have vainly sought in others. As for the flattering idea that one's own greater perspicacity will secure one the success which has been denied to others: it is well to remember that this has always been the style of those whose wish it has been to lead us from the errors made by others to errors of their own devising.

1. *Existence is not a predicate or a determination^b of a thing*

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This proposition seems strange and absurd, but it is indubitably certain. Take any subject you please, for example, Julius Caesar. Draw up a list of all the predicates which may be thought to belong to him, not excepting even those of space and time. You will quickly see that he can either exist with all these determinations,^c or not exist at all. The Being who gave existence to the world and to our hero within that world could know every single one of these predicates without exception, and yet still be able to regard him as a merely possible thing which, in the absence of that Being's decision to create him, would not exist. Who can deny that millions of things which do not actually exist are merely possible from the point of view of all the predicates they would contain if they were to exist.

¹ *Erklärung*. ² *ausführlich*. ³ *Erklärung von seinem Gegenstande*. ^a *richtig erklärt*.

^b *Determination*. ^c *Bestimmungen*.

Or who can deny that in the representation which the Supreme Being has of them there is not a single determination⁴ missing, although existence is not among them, for the Supreme Being cognises them only as possible things. It cannot happen, therefore, that if they were to exist they would contain an extra predicate; for, in the case of the possibility of a thing in its complete determination, no predicate at all can be missing. And if it had pleased God to create a different series of things, to create a different world, that world would have existed with all the determinations, and no additional ones, which He cognises it to have, although that world was merely possible.

Nonetheless, the expression 'existence' is used as a predicate. And, indeed, this can be done safely and without troublesome errors, provided that one does not insist on deriving existence from merely possible concepts, as one is accustomed to doing when one wants to prove absolutely necessary existence. For then one seeks in vain among the predicates of such a possible being; existence is certainly not to be found among them. But when existence occurs as a predicate in common speech, it is a predicate not so much of the thing itself as of the thought which one has of the thing. For example: existence belongs to the sea-unicorn (or narwal) but not to the land-unicorn.⁵ This simply means: the representation of a sea-unicorn (or narwal) is an empirical concept; in other words, it is the representation of an existent thing. For this reason, too, one does not examine the concept of the subject in order to demonstrate the correctness of the proposition about the existence of such a thing. The concept of the subject only contains predicates of possibility. If one wishes to demonstrate the correctness of such a proposition, one examines the source of one's cognition of the object. One says: 'I have seen it' or 'I have heard about it from those who have seen it'. The expression 'A sea-unicorn (or narwal) is an existent animal' is not, therefore, entirely correct. The expression ought to be formulated the other way round to read 'The predicates, which I think collectively when I think of a sea-unicorn (or narwal), attach to a certain existent sea-animal'. One ought not to say: 'Regular hexagons exist in nature' but rather: 'The predicates, which one thinks collectively when one thinks of a hexagon, attach to certain things in nature, such as the cells of the honeycomb and root crystal'. All human languages have certain ineradicable defects which arise from the contingent circumstances surrounding their origins. It would be pedantic and futile to over-refine language and impose limits upon it in those cases where, in ordinary usage, no misunderstandings could arise. It is suffi-

⁴ *Bestimmung*. * *Wesen* (alt: entity).

⁵ The German word for 'unicorn' is *Einhorn*: the word *Landeinhorn* is not listed by Grimm; it is probably Kant's neologism, invented to establish a parallel with *Seeinhorn*, which is the regular word for 'narwal'. In order to preserve the parallel, *Landeinhorn* has been translated by the neologism 'land-unicorn' and *Seeinhorn* by the phrase 'sea-unicorn (or narwal)'.

cient that these distinctions should be made in those rarer cases where one is engaged in reflection of a subtler and deeper kind, where such distinctions are necessary. What is being said here can only be judged adequately in the light of what follows.

2. *Existence is the absolute positing⁶ of a thing. Existence is thereby also distinguished from any predicate; the latter is, as such, always posited only relative to some other thing.*

The concept of positing or setting⁶ is perfectly simple: it is identical with the concept of being in general.⁷ Now, something can be thought as posited merely relatively, or, to express the matter better, it can be thought merely as the relation (*respectus logicus*)¹² of something as a characteristic mark¹³ of a thing. In this case, being, that is to say, the positing of this relation, is nothing other than the copula⁴ in a judgement. If what is considered is not merely this relation but the thing posited in and for itself, then this being is the same as existence.¹⁴

This concept is so simple that it is not possible to say anything further by way of elaboration,¹⁵ except only to note the caution which must be exercised in not confusing it with the relations which things have to their characteristic marks.

Once it is appreciated that the whole of our cognition ultimately resolves itself into unanalysable concepts, it will also be understood that there will be some concepts which are almost unanalysable; in other words, there will be some concepts where the characteristic marks are only to a very small degree clearer and simpler than the thing itself.¹⁵ Such is the case with our definition of existence.¹⁶ I readily admit that it is only in a very small degree that our definition renders distinct the concept of that which is defined. But the nature of the object in relation to the faculty of our understanding does not admit of a higher degree of distinctness.

If I say: 'God is omnipotent' all that is being thought is the logical relation between God and omnipotence, for the latter is a characteristic mark of the former. Nothing further is being posited here. Whether God is, that is to say, whether God is posited absolutely or exists, is not contained in the original assertion at all. For this reason, 'being' is also correctly employed even in the case of the relations which absurdities¹⁶ have to each other. For example: 'The God of Spinoza is subject to continuous change.'¹⁶

² *die absolute Position*.

⁴ *Position oder Setzung* / (the two terms are synonymous; elsewhere they have both been translated by 'positing').

¹ *Sein überhaupt*. * *Merkmal*. * *Verbindungsbegriff*.

¹ *Wird nicht bloss diese Beziehung, sondern die Sache an und für sich selbst gesetzt betrachtet, so ist dieses Sein so viel als Dasein*.

¹⁶ *zu seiner Auswirkung*. * *Erklärung von der Existenz*. * *Undinge*.

If I imagine God uttering His almighty '*Let there be*' over a possible world, He does not grant any new determinations to the whole which is represented in His understanding. He adds no new predicate to it. Rather, He posits the series of things absolutely and unconditionally, and posits it with all its predicates; everything else within the series of things is posited only relatively to this whole. The relations of predicates to their subjects never designate anything existent; if they did, the subject would then have to be already posited as existent. The proposition 'God is omnipotent' must remain true even for someone who does not acknowledge the existence of God, provided that he understands how I construe the concept of God. But His existence must belong directly to the manner in which His concept is posited,⁷ for His existence will not be found among the predicates themselves. If the existence of the subject is not already presupposed, every predicate is always indeterminate in respect of whether it belongs to an existent or to a merely possible subject. Existence cannot, therefore, itself be a predicate. If I say: 'God is an existent thing' it looks as if I am expressing the relation of a predicate to a subject. But there is an impropriety in this expression. Strictly speaking, the matter ought to be formulated like this: 'Something existent is God'. In other words, there belongs to an existent thing those predicates which, taken together, we designate by means of the expression 'God'. These predicates are posited relative to the subject, whereas the thing itself, together with all its predicates, is posited absolutely.¹⁷

My fear is that by offering too elaborate an explanation of such a simple idea, I shall become unintelligible. I might also be afraid of offending the tender sensibilities of those who complain especially of dullness of exposition. However, although I have no wish to dismiss this criticism as trivial, I must, on this occasion, crave indulgence. I have as little taste as the next man for the fastidious wisdom of those who spend so much time in their logic-laboratories subjecting sound and serviceable concepts to excessive analysis, distilling and purifying them until they evaporate altogether in vapours and volatile salts. However, the object of this present reflection is of such a kind that one must either abandon all hope of ever arriving at demonstrative certainty⁸ in the matter, or one must patiently accept an analysis of one's concepts into these atoms.

3. *Can it properly be said that there is more in existence than there is in mere possibility?*

In order to answer this question let me merely remark in advance that a distinction must be drawn between what is posited and how it is posited.

⁷ *sein allmächtiges Werde.*

⁸ *Allein sein Dasein muss unmittelbar zu der Art gehören, wie sein Begriff gesetzt wird.*

⁹ *demonstrative Gewissheit.*

As far as the former is concerned; no more is posited in a real thing than is posited in a merely possible thing, for all the determinations and predicates of the real thing are also to be found in the mere possibility of that same thing. However, as far as the latter is concerned: more is posited through actuality.¹ For if I ask: 'How is all this posited in the case of mere possibility?', I realise that the positing only occurs relative to the thing itself. That is to say, if a triangle exists, then three sides, an enclosed space, three angles, and so forth, also exist. Or, to express the matter better: the relations of these determinations to something such as a triangle are merely posited; but if the triangle exists, then all this is posited absolutely. In other words, the thing itself is posited together with these relations; and consequently, more is posited. In order, therefore, to sum up everything in a representation which is sufficiently subtle to avoid confusion, I maintain that nothing more is posited in an existent thing than is posited in a merely possible thing (for then one is speaking of the predicates of that thing). But more is posited through an existent thing than is posited through a merely possible thing, for positing through an existent thing involves the absolute positing of the thing itself as well. Indeed, in mere possibility it is not the thing itself which is posited; it is merely the relations of something to something which are posited in accordance with the law of contradiction. And it remains certain that existence is really not a predicate of a thing at all. Although it is no part of my present intention to engage in polemics, and although in my opinion an author, if he has read the ideas of others with an impartial mind and made them his own by dint of reflecting on them, can with a reasonable degree of certainty entrust the assessment of his new and heterodox² doctrines to the judgement of his reader – although all this is true, I shall, nevertheless, say a few brief words in this connection.

Wolff's definition of existence,¹⁸ that it is a completion of possibility,¹⁴ is obviously very indeterminate. If one does not already know in advance what can be thought about possibility in a thing, one is not going to learn it from Wolff's definition. Baumgarten introduces the concept of thoroughgoing internal determination,¹⁹ and maintains that it is this which is more in existence than in mere possibility, for it completes that which is left indeterminate by the predicates inhering in or issuing from the essence. But we have already seen that the difference between a real thing and a merely possible thing never lies in the connection of that thing with all the predicates which can be thought in it. Furthermore, the proposition that a possible thing, regarded as such, is indeterminate²⁰ with respect to many of its predicates, could, if taken literally, lead to serious error. For such indeterminacy is forbidden by the law of excluded middle which main-

¹ *Wirklichkeit.* ² *abweichende.* ³ *Ergänzung der Möglichkeit.*

¹⁸ *die durchgängige innere Bestimmung.* ¹⁹ *unbestimmt.*

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tains that there is no intermediate between two predicates which contradict each other. It is for example impossible that a man should not have a certain stature, position in time, age, location in space, and so forth. Our proposition must rather be taken in the following sense: the predicates which are thought together in a thing in no way determine the many other predicates of that thing. Thus, for example, that which is collected together in the concept of a human being as such specifies nothing with respect to the special characteristics of age, place, and so forth. But then this kind of indeterminacy is to be found as much in an existent thing as it is in a merely possible thing. For this reason, it cannot be used to distinguish the two. The celebrated *Crusius* regards the *somewhere* and the *somewhen* as belonging to the unmistakable determinations of existence.²⁰ But, without involving ourselves in an examination of the proposition itself that everything which exists must be somewhere and somewhen, these predicates still belong to merely possible things as well. There could thus exist many persons at many determinate places at a given time. The Omniscient certainly knows all the determinations which would inhere in such a person, if he were to exist, even though he does not actually exist. Without doubt, the eternal Jew, *Ahasuerus*,²¹ is, in respect of all the countries through which he is to wander and all the times through which he is to live, a possible person. I hope that no one is going to insist that the somewhere and the somewhen are sufficient characteristic marks of existence only when the thing really is then and there. For that would be to demand that one should concede in advance that which one aims to render clear by means of a suitable characteristic mark.*

SECOND REFLECTION: OF INTERNAL POSSIBILITY,² IN SO FAR AS IT PRESUPPOSES EXISTENCE

1. Necessary distinction in the concept of possibility

Anything which is self-contradictory is internally impossible. This is a true proposition, even if it is left undecided whether it is a true definition.² In the case of a contradiction,^a however, it is clear that something must stand in logical opposition to something else; that is to say, something is denied which is being affirmed in the same proposition. *Crusius* does not locate this conflict merely in an internal contradiction; he asserts that it is perceived by the understanding, in accordance with a law which is natural

* denn da würde man fordern, dass dasjenige schon eingeräumt werde, was man sich anheischig macht, durch ein taugliches Merkmal von selber kenntlich zu machen.

^a Von der innern Möglichkeit. ² Erklärung.

^b Bei diesem Widerspruch / (the *diesem* ['this'] has been translated by 'a' since there is no specific contradiction to which the 'this' could refer).

to it. But even according to him, the impossible always contains the combination of something posited with something which also cancels it.²² I call this repugnancy the formal element^b in inconceivability or impossibility. The material element^c which is given here as standing in such a conflict is itself something and can be thought. A quadrangular triangle is absolutely impossible. Nonetheless, a triangle is something, and so is a quadrangle. The impossibility is based simply on the logical relations which exist between one thinkable thing and another, where the one cannot be a characteristic mark of the other. Likewise, in every possibility we must first distinguish the something which is thought, and then we must distinguish the agreement of what is thought in it with the law of contradiction. A triangle which has a right angle is in itself possible. The triangle and the right angle are the data or the material element in this possible thing. The agreement, however, of the one with the other, in accordance with the law of contradiction, is the formal element in possibility. I shall also call this latter the logical element^d in possibility, for the comparison of the predicates with their subjects, according to the rule of truth, is nothing other than a logical relation. The something, or that which stands in this agreement, is sometimes called the real element of possibility. Incidentally, I would draw attention to the fact that what I shall be discussing here will always be internal or so-called absolute and unconditional possibility and impossibility, and no other.

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2. The internal possibility of all things presupposes some existence or other.

It is clear from what has now been adduced that possibility disappears not only when an internal contradiction, as the logical element of impossibility, is present, but also when there exists no material element, no *datum*, to be thought. For then nothing is given which can be thought. But everything possible is something which can be thought, and the logical relation pertains to it in accordance with the principle of contradiction.

Now, if all existence is cancelled,^e then nothing is posited absolutely, nothing at all is given, there is no material element for anything which can be thought; all possibility completely disappears.²³ Admittedly, there is no internal contradiction in the negation of all existence. For, in order that there should be an internal contradiction it is necessary that something should be posited and at the same time cancelled. But there is nothing whatever here which is posited. Consequently, of course, it cannot be said that the negation of all existence involves an internal contradiction. On the other hand, to say that there is a possibility and yet nothing real at all is self-contradictory. For if nothing exists, then nothing which could be

^b das Formale. ^c das Materiale. ^d das Logische. ^e aufgehoben.

thought is given either, and we contradict ourselves if we still wish to say that something is possible. In our analysis of the concept of existence we saw that being or being absolutely posited,^f provided that these words are not employed to express logical relations between predicates and subjects, mean exactly the same as existence. Accordingly, the assertion 'Nothing exists' means the same as the assertion 'There is nothing whatever'. And it is obviously self-contradictory to add, in spite of this, 'Something is possible'.

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3. *It is absolutely impossible that nothing at all should exist.*

That, by means of which all possibility whatever is cancelled, is absolutely impossible,^g for the two expressions are synonymous. Now, to start with, the formal element of all possibility, namely, agreement with the law of contradiction, is cancelled by that which contradicts itself. Hence, that which is self-contradictory in itself is absolutely impossible. This, however, is not the case where we have to consider the complete elimination of all existence. For, as we have proved, the complete cancellation of all existence whatever involves no internal contradiction. However, the means by which the material element, the data, of all that is possible is cancelled, is also the means by which all possibility itself is negated. Now, this is effected by the cancellation of all existence. Thus, when all existence is denied, then all possibility is cancelled as well. As a consequence, it is absolutely impossible that nothing at all should exist.

4. *All possibility is given in something actual, either as a determination existing within it or as a consequence arising from it.*

What has to be shown of all possibility in general and of each possibility in particular is that it presupposes something real, whether it be one thing or many. Now, this relation of all possibility to some existence or other can be of two kinds. Either the possible can only be thought in so far as it is itself real, and then the possibility is given as a determination existing within the real; or it is possible because something else is real; in other words, its internal possibility is given as a consequence through another existence. Elucidatory examples cannot yet be suitably furnished here. The nature of the only subject which could serve as an example in this reflection ought to be considered first of all. In the meantime, I would merely add the following remark: the actuality,^h by means of which, as by means of a ground, the internal possibility of other realities is given, I shall call the

^f das Sein oder das schlechthin Gesetz sein.

^g Wodurch alle Möglichkeit überhaupt aufgehoben wird, das ist schlechterdings unmöglich.

^h dasjenige Wirkliche.

first real ground of this absolute possibility,²⁴ the law of contradiction being in like manner its first logical ground, for the formal element of possibility consists in agreement with it. In the same way, that which is real furnishes the data or material element of that which can be thought. 2:80

I am fully aware that propositions of the kind presented in this reflection are in need of considerably more elucidation if they are to acquire the illumination necessary to make them obvious. However, the so very abstract nature of the object itself obstructs every effort at greater clarification, just as the employment of microscopic devices for seeingⁱ both enlarges the image of the object so that its minute parts can be discerned but it also proportionately diminishes the brightness and vivacity of the impression. Nonetheless, I shall, as far as I am able, attempt to bring the idea of existence, which is always fundamental even to internal possibility, somewhat closer to the more ordinary concepts of sound understanding.

You know that a fiery body, a cunning person, and such like, are possible things. And if I ask for nothing more than internal possibility, you will not find it at all necessary that a body, or a fire, and so on, should have to exist as their data: they can be thought, and that is sufficient. But the agreement of the predicate, fiery, with the subject, body, in accordance with the law of contradiction, is inherent in the concepts themselves, irrespective of whether the things themselves be real or merely possible. I also concede that neither bodies nor fire need be real things: and yet, nonetheless, a fiery body is internally possible. But I proceed to ask: is then a body itself possible in itself? Not being permitted to appeal to experience here, you will enumerate the data of its possibility, namely extension, impenetrability, force, and I know not what else; and you will add that there is no internal contradiction here. I still concede everything. You must, however, give me an account of what entitles you so readily to accept the concept of extension as a datum. For suppose that it signified nothing: your alleged account of the possibility of the body would then be an illusion. It would also be highly improper to appeal to experience in connection with this datum, for what is at issue is precisely whether an internal possibility of the fiery body would occur even if nothing at all were to exist. Suppose that you can now no longer break up the concept of extension into simpler data in order to show that there is nothing self-contradictory in it – and you must eventually arrive at something whose possibility cannot be analysed²⁵ – then the question will be whether space and extension are empty words, or whether they signify something. The lack of contradiction does not decide the present issue; an empty word never signifies anything self-contradictory. If space did not exist, or if space was not at least given as a consequence through something existent, the word 'space' would signify nothing at all. As long as you prove possibili- 2:81

ⁱ so wie die mikroskopischen Kunstgriffe des Sehens.

ties by means of the law of contradiction, you are depending upon that which is thinkable in the thing and which is given to you in it, and you are only regarding the relation in accordance with this logical rule. But in the end, when you consider how this is then given to you, the only thing to which you can appeal is an existence.¹

But we must await the development of this reflection. A concept which one can scarcely explain to oneself without over-reaching oneself, since it treats of the first grounds of what can be thought, can be rendered more intelligible by applying it.

THIRD REFLECTION: OF ABSOLUTELY NECESSARY EXISTENCE

1. *The concept of absolutely necessary existence in general*

2:82 That of which the opposite is impossible in itself is absolutely necessary. This is a certainly correct nominal definition.²⁶ But if I ask: upon what does the absolute impossibility of the non-being of a thing depend? then what I am looking for is the real definition;²⁷ this alone can serve our purpose. All our concepts of internal necessity in the properties of possible things of whatever kind they may be amount to this: the opposite is self-contradictory. If, however, it is absolutely necessary existence which is at issue, one would not have much success if one tried to arrive at some understanding of it by means of the above characterisation. Existence is not a predicate at all, nor is the cancellation of existence the negation of a predicate,²⁸ by means of which something in a thing is cancelled and through which an internal contradiction could arise. The cancellation of an existent thing is a complete negation of all that is posited unconditionally or absolutely by its existence. Notwithstanding, the logical relations between the thing, as something possible, and its predicates remain. But these relations are quite different from the absolute positing of a thing along with its predicates, which is what existence is. Accordingly, what is cancelled by non-being is not the same as what is posited in the thing but something else; as a result there is never a contradiction here. The final reflection of this work will make all this more plausible; it will do so by clearly explaining the untenability of the view being examined in the case where it has been genuinely though mistakenly thought that absolutely necessary existence could be explained by means of the law of contradiction.²⁸ Nonetheless, the necessity in the predicates of merely possible concepts may be called logical necessity. But the necessity, for which I am seeking the ultimate

¹ ein Dasein. ² Nominal-Erklärung. ³ Realerklärung.

²⁸ Das Dasein ist gar kein Prädikat und die Aufhebung des Daseins keine Verneinung eines Prädikats.

foundation,²⁹ namely, the necessity of existence, is absolute real necessity.²⁹ What I find to start with is this: that which I am supposed to regard as absolutely nothing and impossible must eliminate everything which can be thought. For if there were still something left to be thought, then it would not be completely unthinkable or absolutely impossible.

If I now consider for a moment why that which contradicts itself should be absolutely nothing and impossible, I find that through the cancellation of the law of contradiction, the ultimate logical ground of all that can be thought,³⁰ all possibility vanishes, and there is nothing left to think. The conclusion immediately follows that, when I cancel all existence whatever and the ultimate real ground of all that can be thought therewith disappears, all possibility likewise vanishes, and nothing any longer remains to be thought. Accordingly, something may be absolutely necessary either when the formal element of all that can be thought is cancelled by means of its opposite, that is to say, when it is self-contradictory; or, alternatively, when its non-existence eliminates the material element and all the data of all that can be thought. The former, as has been said, never occurs in the case of existence. It follows that, since there is no third possibility, either the concept of absolutely necessary existence is a deceptive and false concept,³⁰ or it must rest on the fact that the non-being of a thing is at the same time the negation of all the data of all that can be thought. That this concept, however, is not imaginary but something true is apparent from the following consideration.

2. *There exists an absolutely necessary being.*³¹

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All possibility presupposes something actual³¹ in and through which all that can be thought is given. Accordingly, there is a certain reality, the cancellation of which would itself cancel all internal possibility whatever. But that, the cancellation of which eradicates all possibility, is absolutely necessary. Therefore, something exists absolutely necessarily. Thus far it is apparent that the existence of one or more things itself lies at the foundation of all possibility, and that this existence is necessary in itself. From this it is also easy to derive the concept of contingency. That of which the opposite is possible is, according to the nominal definition,³² contingent. However, in order to find the real definition³³ of the contingent, it is necessary to make the following distinction. In the logical sense, that which, as predicate, is contingent in a subject is that, the opposite of which does not contradict the subject. For example: it is contingent in a triangle in general that it be

²⁹ Hauptgrund. ³⁰ die absolute Realnothwendigkeit. ³¹ der letzte logische Grund alles Denklichen.

³² ein täuschender und falscher Begriff.

³³ ein schlechterdings nothwendiges Wesen / (in the titles of the numbered sections 2 to 6 the word 'being' [in the sense of 'entity'] translates *Wesen* not *Sein*).

³⁴ etwas Wirkliches. ³⁵ Worterklärung. ³⁶ Sacherklärung.

right angled. This contingency only occurs when the predicates are related to their subject; and since existence is not a predicate, contingency cannot be applied at all to existence. By contrast, what is contingent in the real sense^v is that of which the non-being can be thought; that is to say, what is contingent in the real sense is that of which the cancellation is not the cancellation of all that can be thought. If, accordingly, the internal possibility of things does not presuppose a particular existence,^w the latter is contingent, for its opposite does not cancel possibility. Or, to express the same matter in a different way: that existence, by means of which the material element of all that can be thought is not given, and in the absence of which, therefore, there is still something left to be thought, that is to say, still something possible – the opposite of such an existence is possible in the real sense; and in that same real sense it is also contingent.

3. *The necessary being is unique.*^x

2:84 Since the necessary being contains the ultimate real ground^y of all other possibilities, it follows that every other thing is only possible in so far as it is given through the necessary being as its ground. Accordingly, every other thing can only occur as a consequence of that necessary being. Thus the possibility and the existence of all other things are dependent on it. But something, which is itself dependent, does not contain the ultimate real ground of all possibility; it is, therefore, not absolutely necessary. As a consequence, it is not possible for several things to be absolutely necessary.

Suppose that A is one necessary being and that B is another. It follows from our definition that B is only possible in so far as it is given through another ground, A, as the consequence of A. But since, *ex hypothesi*, B is itself necessary, it follows that its possibility is in it as a predicate and not as a consequence of something else; and yet, according to what has just been said, its possibility is in it only as a consequence, and that is self-contradictory.

4. *The necessary being is simple.*

That nothing which is compounded of many substances can be an absolutely necessary being is apparent from the following consideration. Suppose that only one of its parts is absolutely necessary; it follows that the other parts together are only possible as consequences of it; they do not belong to it as co-ordinate parts^z of it. If you were to suppose that there were several necessary parts, or that all the parts were necessary, that would contradict the previous number. There is, accordingly, only one other possibility left: each part individually must exist contingently, whereas all

^v im Realverstande. ^w ein gewisses Dasein. ^x einzig. ^y letzten Realgrund. ^z Nebentheile.

the parts together must exist absolutely necessarily. But this is impossible, for an aggregate of substances cannot possess more necessity in existence than belongs to the parts; and since no necessity at all belongs to the parts, their existence being contingent, it follows that the existence of the whole will also be contingent. Suppose one thought that one could appeal to the definition of the necessary being,^a so that one said that the ultimate data of some internal possibilities were given in each of the parts individually, and that all possibility was given in all the parts together. If one thought that such an appeal could be made, one would have represented something which was wholly, though covertly, incoherent. For if one were then to conceive internal possibility in such a way that some parts could be cancelled, but so cancelled that there still remained something left which could be thought and which was given through the other parts, one would have to suppose that it was in itself possible for internal possibility to be denied or cancelled. But it is entirely inconceivable and self-contradictory that something should be nothing. But this is tantamount to saying that cancelling an internal possibility is the same as eliminating all that can be thought. It is apparent from this that the data for anything which can be thought must be given in the thing of which the cancellation is also the opposite of all possibility; and that, therefore, that which contains the ultimate ground of one internal possibility also contains the ultimate ground of all possibility whatever;^b and that, as a consequence, this ultimate ground of all possibility whatever cannot be divided among different substances. 2:85

5. *The necessary being is immutable and eternal.*

Since even its own possibility and every other possibility presupposes this existence,^c it follows that no other mode of its existence^d is possible. That is to say: the necessary being cannot exist in a variety of ways. Indeed, everything which exists is completely determinate. Now, since this being is possible simply because it exists, it follows that no possibility occurs for it, except in so far as it in fact exists. It is, therefore, not possible in any other way than as it really is. Accordingly, it cannot be otherwise determined or changed. Its non-being is absolutely impossible, and so too, therefore, are its coming-to-be and its passing-away. It is, accordingly, eternal.

6. *The necessary being contains supreme reality.*^e

The data of all possibility must be found in the necessary being either as determinations of it, or as consequences which are given through the necessary being as the ultimate real ground. It is thus apparent that all

^a die Erklärung des nothwendigen Wesens.

^b ihn (i.e., den letzten Grund) auch von aller (i.e., Möglichkeit). ^c dieses Dasein.

^d keine andere Art der Existenz desselben. ^e die höchste Realität.

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reality is, in one way or another, embraced by the ultimate real ground.^f But precisely these determinations, in virtue of which this being is the ultimate ground of all possible reality, invest that being with the highest degree of real properties^g which could ever inhere in a thing. Such a being is, therefore, the most real of all possible beings, for all other beings are only possible through it alone. But this is not to be understood to mean that all possible reality is included among its determinations. This is a conceptual confusion^h which has been uncommonly prevalent until now. All realities are attributed indiscriminately as predicates to God or to the necessary being. That all these predicates can by no means co-exist together as determinations in a single subject is not noticed. The impenetrability of bodies, extension and such like, cannot be attributes of that which has understanding and will. Nor does it help if one seeks to evade the issue by maintaining that the quality in question is not regarded as true reality. The thrust of a body or the force of cohesion are, without doubt, something truly positive.³¹ Similarly, in the sensations of the mind, pain is never merely a deprivation.³² A confusionⁱ has seemingly justified such an idea. It is said: reality and reality never contradict each other, for both of them are true affirmations; as a consequence, they do not conflict with each other in the subject either. Now, although I concede that there is no logical contradiction here, the real repugnancy is not thereby cancelled. Such a real repugnancy³³ always occurs when something, as a ground, annihilates by means of a real opposition^j the consequence of something else. The motive force of a body in one direction and an equally strong tendency in the opposite direction do not contradict each other. They are also really possible in one body at the same time. However, one motive force annihilates the real consequences of the other motive force; and since the consequences of each motive force by itself would otherwise be a real movement, the consequence of both together in one subject is nought. That is to say, the consequence of these opposed motive forces is rest. But rest is, indubitably, possible. From this it is also apparent that real opposition is something quite different from logical opposition or contradiction, for the result of the latter is absolutely impossible.³⁴ Now, in the most real being of all there cannot be any real opposition or positive conflict among its own determinations, for the consequence would be a deprivation or a lack, and that would contradict its supreme reality. Since a conflict such as this would be bound to occur if all realities existed in the most real being as determinations, it follows that they cannot all exist in it as determinations. Consequently, since they are all given through it, they will either belong to its determinations or to its consequences.

^f durch ihn (i.e., durch den ersten Realgrund) begriffen sei (the word *begriffen* may mean either 'understood' or 'embraced'; the opening phrase of the sentence suggests the latter).

^g den grössten Grad realer Eigenschaften. ^h eine Vermengung der Begriffe. ⁱ Beraubung. ^j ein irriger Gedanke. ^k Realrepugnanz. ^l Realentgegensetzung.

At first sight it might also seem that it follows that, since the necessary being contains the ultimate real ground of all other possibilities, it must also contain the ground of the deficiencies and the negations of the essences of things.^m If this were admitted it would needs occasion the conclusion that the necessary being must have among its predicates negations themselves and not exclusively reality. But consider the concept of the necessary being which we have now established. Its own possibility is originally given in its existence. It is of other possibilities that the necessary being contains the real ground. It follows from this in accordance with the law of contradiction that it cannot be the real ground of the possibility of the most real being itself, nor, as a result, can it be the real ground of the possibilities which contain negations and defects.

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Accordingly, the possibility of all other things, in respect of what is real in them, depends upon the necessary being as a real ground. But deficiencies, in so far as they are other things and not the original being itself, depend upon the necessary being as on a logical ground.ⁿ In so far as body possesses extension, force, and so on, the possibility of body is grounded in the Supreme Being. But in so far as body lacks the power of thought, this negation inheres in body itself in accordance with the law of contradiction.

Negations in themselves are not, indeed, anything, nor can they in themselves be thought. This can easily be explained in the following way. If nothing is posited apart from negations, then nothing is given at all, nor is there anything to be thought. Thus, negations can only be thought through opposite positings, or rather, there are positings possible which are not the greatest. And it is here, according to the law of identity, that negations are themselves already to be found. It is also obvious that all the negations inhering in the possibilities of other things do not presuppose a real ground (for they are not anything positive). Consequently, they merely presuppose a logical ground.

FOURTH REFLECTION: ARGUMENT IN SUPPORT OF A DEMONSTRATION OF THE EXISTENCE OF GOD

1. *The necessary being is a mind.*^o

It has been proved above that the necessary being is a simple substance. It has similarly been established that not only is all other reality given through the necessary being as its ground, but also that the greatest

^m der Grund der Mängel und Verneinungen der Wesen der Dinge.

ⁿ die Mängel aber darauf, weil es andere Dinge und nicht das Urwesen selber sind, als einem logischen Grunde.

^o Geist.

possible reality capable of being contained in a being as a determination inheres in the necessary being. Now, there are various ways of proving that the properties of understanding and will also belong to the necessary being. For, firstly, understanding and will are, both of them, true realities,⁸ and they can both co-exist together with the greatest possible reality⁹ in one thing. An immediate judgement of the understanding forces one to admit the truth of this contention, even though it cannot properly speaking be given the distinctness required of a logically complete proof.

2:88 Secondly, the properties of a mind, understanding and will, are of such a kind that we cannot think of any reality which could, in their absence, serve as an adequate substitute in a being for them. Since understanding and will are properties which are capable of the highest degree of reality but, nonetheless, are to be counted only among possible properties, it would follow that understanding and will, and all reality of the nature of mind, would have to be possible in others through the necessary being as a ground, even though they would not be found as determinations in the necessary being itself. The consequent would accordingly be greater than the ground itself. For it is certain that if the Supreme Being did not itself possess understanding and will, every other being which was posited through the Supreme Being with these properties of understanding and will would, in respect of these properties of the highest kind and regardless of its dependency and its many other deficiencies of power, and so on, nonetheless have to take precedence over the Supreme Being. Now, since the consequence cannot exceed the ground, understanding and will must inhere in the necessary simple substance as properties. That is to say: the necessary simple substance is a mind.³⁵

Thirdly, order, beauty and perfection in all that is possible presuppose either a being, in the properties of which these relations are grounded, or, at least, a being through which, as from a principal ground, things agreeing with these relations are possible. Now the necessary being is the sufficient real ground of everything else which is possible, apart from itself. It follows that the necessary being will possess that property, in virtue of which everything else, apart from itself, is able to become real in agreement with these relations. However, it seems that the ground of the external possibility of order, beauty and perfection, is not sufficient unless a will in agreement with the understanding is presupposed. These properties must, therefore, be ascribed to the Supreme Being.

Leaving aside all the causes which are responsible for the generation of plants and trees, everyone knows that regular flowerbeds, avenues and such like, are only possible as a result of an understanding which conceives the plan and a will which executes it. In the absence of understand-

ing, no power or generative force,⁷ nor any other data of possibility, are adequate to render the possibility of such order complete.

The proof that the necessary being must have will and understanding, and must therefore be a mind, can be derived either from one of the arguments here adduced or from all of them taken together. I shall rest 2:89 contented with merely making the argument complete. It is no part of my intention to furnish a formal demonstration.

2. *It is a god.*

There exists something absolutely necessarily. It is one in its essence; it is simple in its substance; it is a mind according to its nature; it is eternal in its duration; it is immutable in its constitution; and it is all-sufficient in respect of all that is possible and real.³⁶ It is a god. I am not here offering a determinate definition¹ of the concept of God. If it were my purpose to treat the matter systematically, I should have to provide such a definition. But what I am here setting forth is intended to be an analysis which may serve as a foundation for the formal doctrine proper.² Meanwhile, the definition of the concept of God may be instituted in any way one deems suitable. But I am certain that the being, whose existence we have just proved, is precisely the Divine Being, whose differentiating characteristics³ will be reduced, in one way or another, to the most concise formula.⁴

3. *Remark*

The third reflection establishes no more than that all reality must either be given as a determination in the necessary being, or it must be given through the necessary being as through a ground. This leaves undecided the question whether the properties of understanding and will are to be found in the Supreme Being as determinations inhering in it, or whether they are to be regarded merely as consequences produced by it in other things. If the latter alternative were the case, then it would follow that, in spite of all the excellencies manifest in the original being which issue from the sufficiency, unity and independence of its existence, as from a great ground, its nature would nonetheless be far inferior to what one must needs think when one thinks of a god. Possessing neither cognition nor choice, it would be a blindly necessary ground of other things and even of other minds, and it would differ from the eternal fate postulated by some ancient philosophers in nothing except that it had been more intelligently described. This is the reason why particular attention must be paid in

⁸ beides ist wahre Realität. ⁹ mit der grösst möglichen (sc. Realität).

¹ Hervorbringungskraft. ² bestimmte Erklärung. ³ förmlichen Lehrverfassung.
⁴ Unterscheidungszeichen. ⁵ in die kürzeste Benennung.

2:90 every system to this circumstance, and this is why we have not been able to exclude it from consideration.

Nowhere in any of the arguments belonging to my proof and presented thus far has mention been made of the expression 'perfection'.³⁶ The reason for this omission is not that I thought that all reality was the same as all perfection,³⁷ or that perfection consisted in the highest degree of harmony in one.³⁸ I have weighty reasons for strongly disagreeing with this widely held opinion. I spent a long time carefully investigating the concept of perfection, both generally and in particular. I learned that a more precise knowledge of perfection contains concealed within it a great deal which is capable of clarifying the nature of the mind, our own feeling and even the fundamental concepts of practical philosophy.

I came to notice that the expression 'perfection' in some cases deviated fairly widely from the proper sense³⁹ of the term because of the uncertainty which is inherent in all languages. However, in the significance of the term to which everybody pays chief regard, even in the case of the confusions just mentioned, the expression 'perfection' always presupposes relation to a being endowed with cognition and desire.⁴⁰ Now, it would have taken me too far afield if I had traced the argument from God and the reality inherent in Him to this relation, even though such an argument could have been constructed on that foundation. For this reason, I deemed the introduction of the concept of perfection, and the wide-ranging discussion to which it would have given rise, incompatible with the purpose of these pages.

4. Conclusion

2:91 Nobody will have any difficulty in drawing certain other obvious conclusions from the proof I have furnished. For example: I who think am not such an absolutely necessary being, for I am not the ground of all reality and I am subject to change; no other being of which the non-being is possible, that is to say, no other being of which the cancellation is not at the same time the cancellation of all possibility, is an absolutely necessary being; no thing which is subject to change or in which there exist limits, including, therefore, the world, is an absolutely necessary being; the world is not an accident⁴¹ of God, for there are to be found within the world conflict, deficiency, changeability, all of which are the opposites of the determinations to be found in a divinity; God is not the only substance which exists; all other substances only exist in dependence upon God; and so on.³⁸

At this juncture I would merely add the following point. The argument

³⁶ Vollkommenheit. ³⁷ Zusammenstimmung zu Einem. ³⁸ von dem eigenthümlichen Sinne.
³⁹ Erkenntniß und Begierde. ⁴⁰ Accidens.

for the existence of God which we are presenting is based simply on the fact that something is possible. It is, accordingly, a proof which can be conducted entirely *a priori*. It presupposes neither my own existence, nor that of other minds, nor that of the physical world. It is, indeed, an argument derived from the internal characteristic mark of absolute necessity. Thus, our knowledge of the existence of this being is derived from what really constitutes the absolute necessity of that same being. This knowledge is thus acquired in a genuinely genetic fashion.³⁹

None of the proofs which argue from the effects of this being to its existence as cause can ever – even granting that they are of the strictest character, which in fact they are not – render the nature of this necessity comprehensible. From the mere fact that something exists absolutely necessarily it is possible to infer that something is a first cause of something else. But from the fact that something is a first cause, that is to say, an independent cause, it only follows that, if the effects exist then the cause must also exist, not that the cause exists absolutely necessarily.⁴⁰

Now, it is further apparent from the argument we have recommended that all the essences of other things and the real element of all possibility are grounded in this unique being;⁴¹ in it are to be found the highest degree of understanding and will; and that is the greatest possible ground. Because of this and because everything in such a being must harmonise in the highest possible degree,⁴² the following conclusion can be immediately drawn. Since a will always presupposes the internal possibility of the thing itself, it follows that the ground of possibility, that is to say, the essence of God, will be in the highest harmony with his own will. The reason for this is not that God is the ground of internal possibility in virtue of his own will. The reason is rather this: the same infinite nature is related to all the essences of things as their ground; at the same time it also has the relation of highest desire for the greatest consequences which are thereby given, and the latter can only be fruitful if the former are presupposed. Accordingly, the possibilities of things themselves, which are given through the divine nature, harmonise with his great desire. Goodness and perfection, however, consist in this harmony. And since goodness and perfection harmonise in one single principle, it follows that unity, harmony and order are themselves to be found in the possibilities of things. 2:92

Our mature judgement of the essential properties of the things known to us through experience enables us, even in the necessary determinations of their internal possibility, to perceive unity in what is manifold and harmoniousness in what is separated.⁴³ It follows that the *a posteriori* mode of cognition will enable us to argue regressively to a single principle of all

⁴¹ dass alle Wesen anderer Dinge und das Reale aller Möglichkeit in diesem einigen Wesen gegründet seien.

⁴² in der äusserst möglichen Übereinstimmung.

⁴³ eine Einheit im Mannigfaltigen und Wohlgeretheit in dem Getrennten.

possibility. We shall thus finally arrive at the self-same fundamental concept of absolutely necessary existence, from which the *a priori* mode of cognition initially started out. Our purpose from now on will be to see whether the internal possibility of things is itself necessarily related to order and harmony, and whether unity is to be found in this measureless manifold, so that, on this basis, we could establish whether the essences of things themselves indicate an ultimate common ground.^c

^c *einen obersten gemeinschaftlichen Grund.*

Section 2. Concerning the extensive usefulness peculiar to this mode of proof in particular

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FIRST REFLECTION: IN WHICH THE EXISTENCE OF GOD IS INFERRED A POSTERIORI FROM THE UNITY PERCEIVED IN THE ESSENCES OF THINGS

1. The unity in the manifold^f of the essences of things is demonstrated by appeal to the properties of space

The necessary determinations of space afford the geometer a pleasure which is far from ordinary. They do so because of the certainty of their conviction, the exactitude of their execution, and the extensiveness of their application. The whole range of human knowledge has nothing to show which equals it, far less anything which exceeds it. But, for the present, I wish to examine this same object from an entirely different point of view. Looking at it with a philosophical eye, I come to notice that order and harmony, along with such necessary determinations, prevail throughout space, and that concord^g and unity prevail throughout its immense manifold. Let us suppose, for example, that I wish to produce a bounded space by moving a straight line around a fixed point. I have no difficulty at all in grasping that the result is a circle, the circumference of which is at all points equidistant from the aforementioned fixed point. But I have no reason at all to suppose that such a simple construction should conceal something highly complex which is itself subject, in virtue of that very construction, to major rules of order. And yet I discover that all the straight lines which intersect each other inside a circle at any given point, when they are extended to its circumference, are always divided in geometrical proportion.^{h+i} Likewise, I discover that all the straight lines which extend from a given point outside a circle so as to intersect its circumference are always divided into parts which are related to each other in

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^f *Mannigfaltigen* / B: multifarious / C: *multiple* / F & Z: *diversité* / T: manifold.

^g *Zusammenpassung.*

^h *Indessen entdeckte ich, dass alle gerade Linien, die einander aus einem beliebigen Punkt innerhalb dem Cirkel durchkreuzen, indem sie an dem Umkreis stossen, jederzeit in geometrischer Proportion geschnitten sind.*

inverse proportion to their wholes.⁴² Consider what an infinity of different positions these lines can assume in intersecting the circle as described; and consider the way in which they are nonetheless constantly subject to the same law, from which they cannot deviate. If one considers these things, one cannot but be surprised, in spite of the ease with which these truths are understood, that the description of this figure should be so straightforward, and yet that so much order and such complete unity in the manifold should issue from it.

Suppose that the following problem be propounded. Inclined surfaces of varying gradients are to be constructed, with the inclined surfaces of such a length that bodies freely rolling down them shall all take the same time to reach the bottom. Anybody with an understanding of the laws of mechanics will realise that constructing such a series of inclined planes would be a complex business. And yet this arrangement is to be found directly in the circle itself, with an infinite variety of positions, and yet in every case with the greatest precision. The reason is this: all the chords which meet the vertical diameter, regardless of whether they extend from the point at the top or the bottom, and irrespective of their angle of inclination, will all have this feature in common: free fall through these same chords takes exactly the same time in all cases.⁴³ I once explained this theorem, along with its proof, to an intelligent student. I recall that, once he had thoroughly understood all its details, he was as impressed by it as he would have been impressed by a miracle of nature. One is, indeed, amazed and rightly astonished to find, in such a seemingly straightforward and simple thing as a circle, such wondrous unity of the manifold subject to such fruitful rules. Nor is there a miracle of nature which could, by its beauty and order, give more cause for amazement, unless it did so in virtue of its cause being less apparent, for wonder⁴⁴ is a daughter of ignorance.

2:95 The field in which I am gathering remarkable phenomena is so full of them that, without needing to take a single step, we are presented with numberless beauties at our very feet. There are solutions in geometry where what seems possible only as a result of complicated preparation presents itself without artifice,⁴⁵ as it were, in the thing itself. Everyone finds such solutions charming.⁴⁶ And the less one has to do oneself, and the more complex notwithstanding the solutions seem to be, the more charming they grow. The ring formed by two concentric circles is quite different in shape from a circular surface.⁴⁷ The task of converting the ring

⁴² *imgleichen dass alle diejenige, die von einem Punkt ausserhalb dem Kreise diesen durchschneiden, jederzeit in solche Stücke zerlegt werden, die sich umgekehrt verhalten wie ihre Ganzen.*

⁴³ *schlecht* / (Kant is employing the word in the now archaic sense of 'smooth', 'simple'; cf. Grimm *schlecht* (1, 3, 4, & 7)).

⁴⁴ *Bewunderung*. ⁴⁵ *ohne alle Kunst*. ⁴⁶ *artig*.

⁴⁷ *der Cirkelring zwischen zwei Kreisen, die einen gemeinschaftlichen Mittelpunkt haben, hat eine von einer Cirkelfläche sehr verschiedene Gestalt.*

into such a circular surface initially strikes everyone as a difficult undertaking requiring great art for its execution. As soon, however, as I realise that the tangent which touches the circumference of the smaller circle and extends until its two ends intersect the circumference of the larger circle is the diameter of the circle whose area is equal to the area of the ring⁴⁸ – as soon as I realise this, I cannot but be taken aback at the simplicity and ease with which the solution sought is revealed in the nature of the matter itself, requiring almost no effort on my part at all.

The purpose of our discussion has been to draw attention to the existence, in the necessary properties of space, of unity alongside the highest degree of complexity, and of the connection between things where all seem to have their own separate necessity. To achieve this objective, we have focused our attention on the figure of the circle alone, which has infinitely many properties of which only a small number is known. From this we can infer how immeasurably great is the number of the harmonious relations which inhere in the properties of space in general. Higher geometry reveals many of these relations in its account of the affinities between various species of curved line. All these relations, in addition to exercising the understanding by means of our intellectual comprehension of them,⁴⁹ also arouse the emotions,⁵⁰ and they do so in a manner similar to or even more sublime than that in which the contingent beauties of nature stir the feelings.

If, in the case of such arrangements in nature, we are justified in searching for the foundation of the extensive harmony of the manifold, are we less justified in searching for a similar foundation for the regularity⁵¹ and unity which we perceive in the infinitely various determinations of space? Is this harmony any the less amazing for being necessary? I would maintain that its necessity makes it all the more amazing. A multiplicity, in which each individual had its own special and independent necessity, could never possess order, or harmoniousness, nor could there ever be unity in their reciprocal relationships to each other. Will this not lead one, as the harmony in the contingent provisions of nature leads one, to the supposition that there is a supreme ground of the very essences of things themselves, for unity in the ground also produces unity in the realm of all its consequences?

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2. Unity in the manifold of the essences of things proved by reference to what is necessary in the laws of motion

If we discover an arrangement in nature, which seems to have been instituted for a special purpose, since the general properties of matter on their

⁴⁸ *Allein so bald ich einsehe, dass die den inwendigen Cirkel berührende Linie, so weit gezogen, bis sie zu beiden Seiten den Umkreis des grössern schneidet, der Durchmesser dieses Cirkels sei, dessen Fläche dem Inhalt des Cirkelrings gerade gleich ist.*

⁴⁹ *ausser der Übung des Verstandes durch die denkliche Einsicht derselben.*

⁵⁰ *das Gefühl*. ⁵¹ *Ebenmasses.*

own could not have produced such an order, then we regard this provision as contingent and as the product of choice.⁴ Now, if new harmony, order and usefulness should make their appearance, along with mediating causes especially instituted to produce these effects, then we judge them in the same way to be contingent and the product of choice. This connection is quite alien to the nature of the things themselves. They stand in this harmonious relation⁵ simply because someone has chosen to connect them in this way. No general cause can be adduced to explain the sheathed character, that is to say, the retractability of the claws of the cat, the lion, and so on. The only explanation which can be given is that a Creator has ordered them in this way, with a view to protecting them from wear, for these animals must have implements suitable for seizing and retaining their prey. But suppose that matter has certain properties of a more general character, which, in addition to producing certain benefits which may be construed as their *raison d'être*, are also particularly suited to producing even more harmony, and doing so without the least provision being made to bring it about. Suppose that a simple law, which is universally agreed to be necessary for the production of a certain good, also produces fruitful effects in many other ways as well. Suppose that that simple law was the source of further usefulness and harmoniousness,⁶ not by art, but rather of necessity. And suppose, finally, that this should hold throughout the whole of material nature. If all this were supposed, then there would obviously inhere in the very essence of things themselves universal relations to unity and cohesiveness,⁷ and a universal harmony would extend throughout the realm of possibility itself. Such a state of affairs would fill us with admiration for such extensive adaptedness⁸ and natural harmony.⁹ Adaptedness and natural harmony such as this, although rendering punctilious¹⁰ and forced art superfluous, can nonetheless never themselves be ascribed to chance. It rather indicates that there is a unity to be found in the possibilities of things themselves; it suggests that the essences of all things are without exception dependent upon one single great ground. I shall try to explain this extremely remarkable phenomenon by means of some simple examples, carefully employing the method of slowly advancing from what is immediately certain from observation to judgements of greater generality.

Suppose that one positively insisted that there must first be some underlying purpose to explain the occurrence of a provision of nature. The necessity for an atmosphere might then be explained in terms of one of a thousand uses it might have.¹¹ For the sake of argument, I shall concede

the point. I propose that the ultimate purpose of this provision of nature is, for example, to render possible the respiration of man and animals. Now, the air, by means of those very same attributes which are necessary to respiration, and employing no other means at all, also produces fine effects in infinite numbers; and it produces these effects of necessity, and without any special provisions having to be made. The self-same elasticity and pressure of the atmosphere makes suction possible. Young animals would have no nourishment without it; and the possibility of pumps is a necessary consequence of it. By these same means, moisture is drawn up from the earth in the form of vapours which condense into clouds, which enhance the beauty of the day and often moderate the excessive heat of the sun. In particular, these same means provide gentle moisture to the arid regions of the earth's surface by stealing from the water-courses of the low-lying areas. These very same properties of the atmosphere have other consequences, too, which are entirely natural and spontaneous. One example is the dawn, which lengthens the day and, by means of gradual intermediate degrees, renders the transition from night to day harmless to the eye. Another especially important example is the winds.

Suppose that someone were to draw up a scheme by means of which the coasts of tropical countries, which must otherwise be hotter than the regions lying further inland, might enjoy a somewhat more tolerable temperature. For this purpose, he will most naturally think of a sea-wind prevailing during the hottest hours of the day. However, since at night-time the temperature drops much more rapidly over the sea than over the land, it might not be a good thing for the same wind to blow all the time. For this reason, our planner would wish that it had occurred to Providence so to arrange things that, during the middle hours of the night, the wind should blow in the opposite direction from the land. Such an arrangement might have many other uses as well. Now, the only question would be this: by what mechanism or artificial arrangement could this alternating wind be maintained? In raising this question, one would have considerable cause for concern that, since man cannot expect that all the laws of nature should be adapted to his convenience, the mechanism for maintaining the alternating wind, while possible, might harmonise so poorly with the other necessary dispositions of nature, that the Supreme Wisdom found it good not to deploy it. But this whole worry is unnecessary. The atmosphere, operating in accordance with the general laws of motion, accomplishes on its own what an arrangement, instituted in accordance with reflective choice, would itself achieve. The self-same principle which has other extensive uses also has this use as well, without there being any need for new or special provisions. The air above the scorching ground of such a country is rarified by the heat of the day and thus necessarily yields to the denser and heavier air over the cool sea, causing the sea-wind. For this reason, it blows during the hottest hours of the day

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⁴ als zufällig und als die Folge einer Wahl. ⁵ in dieser Harmonie.

⁶ Nutzen und Wohlgereimtheiten. ⁷ Zusammenhänge. ⁸ Schicklichkeit.

⁹ Zusammenpassung. ¹⁰ peinlich.

¹¹ Man kann einen Nutzen unter tausend wählen, weswegen man es als nöthig ansehen kann, dass ein Lufkreis sei, wenn man durchaus einen Zweck zum Grunde zu haben verlangt, wodurch eine Anstalt in der Natur zuerst veranlasst worden.

until late in the evening. The sea-air, which for the same reasons was not so strongly heated during the day as the air over the land, cools more quickly during the night, contracts and causes the withdrawal of the land-air at night-time. It is common knowledge that all tropical coasts enjoy this alternating wind.⁴⁵

I have tried to show what the relations are which the simple and very general laws of motion, in virtue of the necessity of their essence, have to order and harmoniousness. To this end, I have directed my attention to a small part of nature only, namely, to the effects produced by the atmosphere. It can easily be seen that the entire sphere of nature in all its measureless extent lies open before me ready to receive this same interpretation. It is my intention to enlarge this lovely prospect by adding some further considerations at a later stage. For the present, I should be ignoring something essential if I did not consider the important discovery made by *Maupertuis* relating to the harmony which prevails among the necessary and most general laws of motion.⁴⁶

2:99 Our proof did, it is true, relate to laws which were both very extensive and necessary in character. But they were laws which only governed a particular kind of matter in the world. *Maupertuis*, on the other hand, proved that even the most universal laws of matter in general – whether it be at rest or in motion, whether in elastic or in non-elastic bodies, whether in the attraction of light in refraction or in its repulsion in reflection – are subject to one dominant rule, according to which the greatest possible economy of action is always observed.⁴⁷ This discovery enables us to subsume the effects produced by matter, irrespective of the great differences which these effects may have in themselves, under a universal formula which expresses a relation to appropriateness,^a beauty and harmony. And yet the laws of motion are themselves such that matter cannot be thought independently of them. And the necessity of these laws is such that they can be derived from the universal and essential constitution of all matter without the least experiment and with the greatest distinctness. This acute and learned man immediately sensed that, in having thus introduced unity into the infinite manifold of the universe and created order in what was blindly necessary, there must be some single supreme principle to which the totality of things owed its harmony and appropriateness. He rightly believed that such a universal cohesiveness^b in the simplest natures of things afforded a far more fitting foundation for the indubitable discovery, in some perfect and original being, of the ultimate cause of everything in the world, than any perception of various contingent and variable arrangements instituted in accordance with particular laws.⁴⁸ From that point onwards, the important question was: What employment would higher philosophy be able to make of this important

^a *Anständigkeit.* ^b *Zusammenhang.*

new insight? And I do not think that I am mistaken in my supposition when I maintain that the Royal Academy of Sciences in Berlin had this as the subject of their prize-essay question: Are the laws of motion necessary or contingent? – a question to which no adequate reply was submitted.⁴⁹

If contingency is taken in the real sense^c to mean the dependency of the material elements of possibility upon something else, it is manifest that the laws of motion and the universal properties of matter, subject to these laws, must depend on some one great common original being, which is the ground of order and harmoniousness. For who would wish to maintain that in an extensive manifold, in which each individual thing had its own completely independent nature, everything should nonetheless by an amazing accident be exactly so arranged that it was in harmony with everything else and that unity should manifest itself in the whole? But the following considerations make it clear that this common principle must relate not merely to the existence of matter and the properties attributed to it, but to the very possibility and essence of matter in general.^d The only conditions under which it is possible to conceive what is supposed to fill space and what is supposed to be capable of thrust and pressure must be the very same conditions which necessarily yield the aforementioned laws. On this basis it can be seen that these laws of the motion of *matter* are absolutely necessary. That is to say: if the possibility of matter is presupposed, it would be self-contradictory to suppose it operating in accordance with other laws. This is a logical necessity of the highest kind. It is manifest, on the same basis, that, notwithstanding, the internal possibility of matter itself, namely, the data and the real element underlying this thinkable thing, is not given independently or for itself. The internal possibility of matter is, rather, posited by some principle or other. And, in virtue of this principle, what is manifold acquires its unity, and what is diverse receives its connection.^e And this proves the contingency of the laws of motion in the real sense of the term.

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SECOND REFLECTION: DIFFERENTIATION OF THE DEPENDENCY OF ALL THINGS UPON GOD INTO MORAL AND NON-MORAL DEPENDENCY

I designate that dependency of a thing upon God *moral* when God is the ground of that thing through his will. All other dependency is *non-moral*. Accordingly, if I assert that God contains the ultimate ground even of the internal possibility of things, everyone will easily understand that this can only be a non-moral dependency, for the will makes nothing possible; it

^c *im Realverstande.*

^d *sondern selbst auf die Möglichkeit einer Materie überhaupt und auf das Wesen selbst.*

^e *in welchem (i.e., Principium) das Mannigfaltige Einheit und das Verschiedene Verknüpfung bekommt.*

merely decides upon what is already presupposed as possible. In so far as God contains the ground of the existence of things, I admit that this dependency is always moral; in other words, things exist because God willed that they should exist.

2:101 The internal possibility of things, namely, furnishes Him, who has decided upon the existence of things, with the materials for it. These materials contain within them an extraordinary adaptedness^f to harmony; the essences of these materials themselves contain within them a harmony with a whole which is orderly and beautiful in many different ways. The fact that an atmosphere exists can be attributed to God as its moral ground because of the purpose attainable by it. But that the essence of a single ground, which is so simple, should be so fruitful, and that so much adaptedness^g and harmony should inhere in its possibility and not require special interventions to be made in order to harmonise with the other possible things in the world, in accordance with manifold rules of order – that is certainly not to be attributed to a free choice. For every decision of a will presupposes cognition of the possibility of that which is to be decided upon.

Anything, the ground of which has to be sought in a free choice must, for that very reason, be contingent. Now, the union of numerous diverse consequences, which issue of necessity from a single ground, is not a contingent union. It cannot, therefore, be ascribed to a determination which is the product of a free will.^h We have already seen the same thing above when we saw that the possibilities of the pump, respiration, the conversion of liquids, when present, into vapours, the winds, and so on, are inseparable from each other, for they all depend on a single ground, namely, the elasticity and pressure of the atmosphere. This harmony of the manifold in oneⁱ is thus in no wise contingent, and it is, therefore, not to be attributed to a moral ground.

My only concern here is the relation which holds between the essence of the atmosphere, or of any other thing at all, and the *possible* production of so many excellent consequences. That is to say: I am only considering the *adaptedness*^j of their nature to so many purposes. The harmony of a single ground with so many possible consequences makes unity in such a case necessary; and to that extent the possible consequences are inseparable from each other and from the thing itself. As far as the actual production of these advantages is concerned: it is contingent either in so far as one of the things to which the thing relates may be absent, or in so far as the effect may be prevented from occurring by an outside force.

Beautiful relations inhere in the properties of space; and in the measure-

less manifold of its determinations there is to be found a unity which is worthy of wonder. In so far as matter must fill space, the existence of all this harmoniousness along with all its consequences,^k is to be attributed to the power of choice of the first cause. As for the union of so many consequences with each other, all of which stand in such great harmony with the things of the world: it would be absurd to attribute this, again, to a will. The characteristic of air, in virtue of which it offers resistance to the material bodies moving in it, is also to be regarded as a necessary consequence of its nature. Raindrops, in falling from a great altitude, are impeded in their fall by the air, and they descend with a moderate velocity. If they were not retarded in this way they would, in falling from such an altitude, acquire a very harmful force. This advantage is not combined with the other properties of air by a special decree, for air could not exist at all without this property. The cohesiveness^l of the parts of matter may, in the case of water, for example, be a necessary consequence of the possibility of matter in general, or it may be an arrangement which has been specially instituted. Whichever the case, the immediate effect is the spherical configuration of small quantities of water such as raindrops. The possibility of the lovely, many-hued rainbow is a product of the very general laws of motion. With a splendour and a regularity which moves the heart, it hangs suspended above the horizon when the unclouded sun shines into the shower of raindrops falling opposite. The existence of liquids and heavy bodies can only be attributed to the wish^m of this mighty Author. But that a celestial body in its liquid state should, entirely necessarily and as a result of such universal laws, strive to assume a spherical form – a form which subsequently harmonises with the other purposes of the universe better than any other possible form, a spherical surface being capable, for example, of the most uniform dispersion of light – that is inherent in the essence of the thing itself.

The cohesiveness and resistance of matter, which the parts of matter combine with their separability, renders friction necessary. Friction is of great use, and it harmonises with the order which prevails in all the numerous changes which take place in nature; and its harmony with this order is as great as that of something which was not the consequence of such general principles but had been instituted by a special provision. If friction did not impede motions, everything would eventually be reduced to chaos: forces, once generated, would continue as a result of their being communicated to other bodies by repulsion, continuous collisions and concussions. Surfaces which support bodies would always have to be perfectly horizontal (and that is seldom possible), for otherwise the bodies

^f Tauglichkeit. ^g Schicklichkeit. ^h freiwilligen Bestimmung.

ⁱ Übereinstimmung des Mannigfaltigen in Einem. ^j Tauglichkeit.

^k Das Dasein aller dieser Wohlgereimtheiten, in so fern Materie den Raum erfüllen sollte, ist mit allen ihren Folgen.

^l Zusammenhang. ^m Begehren.

2:103 would always be sliding off. Spun threads only hold together as a result of friction, for the fibres, not running the whole length of the thread, would be torn apart by the least force, were they not held together by friction proportionate to the force with which the fibres are pressed against each other by being twisted together.

The reason why I have discussed such humble effects which are so little esteemed and which take their rise from the simplest and most general laws of nature, is this: I have in part been concerned to show how, from these lowly effects, one may infer the great and infinitely extended harmony of the essences of things and the important effects attributable to that harmony, even in cases where one is unable, for lack of skill, to trace many a natural order back to such simple and general grounds. But, in part, I have also been concerned to show the absurdity of attributing these same harmonies to the wisdom of God as their special ground. The fact that things, which are so beautifully related to each other, should exist at all, is to be attributed to the wise choice of Him who created them on account of that harmony. But that each of these things should, in virtue of simple grounds, contain such an extensive adaptedness to harmony of many different kinds, and that a wonderful unity in the whole should, as a result, be able to be maintained – that is inherent in the very possibility of the things in question. And since the element of contingency, presupposed by any choice, here disappears, it follows that the ground of this unity, while it may be sought in a wise being, is not to be sought in that being through the mediation of its wisdom itself."

THIRD REFLECTION: CONCERNING THE DEPENDENCY OF THE THINGS OF THE WORLD UPON GOD, EITHER THROUGH THE MEDIATION OF THE ORDER OF NATURE OR INDEPENDENTLY OF THAT ORDER

1. *Division of the events of the world according to whether they are subsumed under the order of nature or not so subsumed*

2:104 Something is subsumed under the order of nature if its existence or its alteration is sufficiently grounded in the forces of nature. The first requirement for this is that the force of nature should be the efficient cause of the thing; the second requirement is that the manner in which the force of nature is directed to the production of this effect should itself be sufficiently grounded in a rule of the natural laws of causality. Such events are also called, quite simply, *natural* events of the world. On the other hand, when this is not the case, that which is not subsumed

" aber nicht vermittelt seiner Weisheit.

under such a ground is something supernatural. This is either because the immediate efficient cause is external to nature, that is to say, the divine power produces it immediately; or, alternatively, it is because the manner in which the forces of nature are directed to producing the effect is not itself subject to a rule of nature. In the first case, I call the event *materially supernatural*, and in the second case *formally supernatural*. I shall adduce examples of the latter case, for it alone seems in need of some explanation, for the other is clear of itself. There are many forces in nature which have the power to destroy individuals, states, or even the entire human race. Earthquakes, hurricanes, tempests at sea, comets, and so on, are examples of such destructive forces. Furthermore, the occurrence of these events from time to time is sufficiently grounded in the constitution of nature, according to a universal law. But the vices and moral corruption of the human race are not *natural* grounds connected with the occurrence of these events, nor are they to be numbered among the laws in accordance with which they take place. The wickedness of a city has no effect upon the fires concealed within the bowels of the earth, nor was the debauchery of the first world⁴ an efficient cause which could have drawn the comets out of their orbits down to earth. If such an event should occur, it is attributed to a natural cause. And that attribution implies that the event in question was a misfortune, not a punishment: man's moral conduct cannot be a cause of earthquakes according to a natural law, for there is no connection here between the cause and the effect.⁵ Take for example, the destruction of the town of Port Royal in Jamaica by an earthquake.* If someone calls it a natural event he would mean that, although, according to the testimony of their preacher, the vicious deeds of the inhabitants of Port Royal would have deserved the chastisement of such a devastation, this particular event is to be regarded, nonetheless, as one of many such events which happen from time to time in accordance with a general law of nature. For earthquakes periodically convulse various regions of the earth, and it sometimes happens that there are cities located in those regions, and occasionally some of those cities are extremely wicked. On the other hand, if the earthquake is to be regarded as a punishment, then it follows that, since these forces of nature cannot, according to any natural law, have any connection with the conduct of man, they must in each individual case be especially instituted by the Supreme Being. And then the event is supernatural in the formal sense of the word, even though the intermediate cause of the event was a force of nature. And even if this event did eventually occur in the form of a punishment as a result of a protracted series of arrangements especially implanted in the causal

* See Raj, *Von der Welt Anfang, Veränderung und Untergang*.⁵¹

⁴ die Üppigkeit der ersten Welt.

forces of the world; and even if one assumed that at the creation of the world God had already made all the provisions requisite for the later occurrence of the event at the right time as a result of the forces of nature directed to that end (as one can imagine in the case of Whiston's theory of the flood, where the flood is supposed to have been caused by a comet)⁵² – even so the supernatural is in no way thereby diminished. On the contrary, the supernatural character of the event is simply shifted a long way back to the original act of creation, and, as a result, inexpressibly increased. This whole sequence of events, in so far as the manner of its ordering refers to its outcome, and in so far as the results of this sequence of events cannot be regarded as a consequence of more general laws of nature – this whole sequence of events indicates an immediate and even greater divine providential care, which is focused upon this long chain of events, with a view to avoiding the impediments which might have prevented the exact attainment of the desired effects.

On the other hand, there are punishments and rewards which are in accordance with the order of nature, because the moral behaviour of man is connected with them through the law of cause and effect. Unbridled licentiousness and immoderation lead to a debilitated and tormented life. Intrigues and deceit ultimately miscarry, and honesty is, indeed, the best policy in the end. And in all this, the effects are connected with each other according to the laws of nature. But as for those punishments, rewards and all those other events in the world in the case of which the natural forces involved would always have to be especially directed to the realisation of each individual case: even if a certain uniformity should be found among many of them, they would be subject to an immediate divine law, namely, that of the wisdom of God, but not to any natural law.

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2. *Division of natural events according to whether they are subsumed under the necessary or the contingent order of nature*

All natural things are contingent in their existence. The combination of different kinds of thing, for example, the combination of air, earth, and water, is, without doubt, likewise contingent, and is, therefore, simply to be attributed to the power of choice of the Supreme Author.⁵³ But, although the laws of nature, like the things themselves of which they are the laws, accordingly appear to have no necessity, and although, again, the connections in which these laws can be exercised are contingent, there nonetheless remains a kind of necessity which is very remarkable. There are, namely, many laws of nature, of which the unity is necessary. Such is the case, specifically, in those instances where the principle of harmony with one law is precisely the same principle which renders other laws necessary as well. For example: the self-same elasticity and pressure of the air, which

⁵² *der Willkür des obersten Urhebers.*

is the ground of the laws of respiration, is also of necessity the ground of the possibility of pumps, of the generation of clouds, of the maintenance of fire, of the winds, and so on. It is necessary that, as soon as the ground of even merely one of them be present, the ground of the others should also be present. On the other hand, if the ground of the effects of a certain kind, which are similar, according to one law, is not at the same time the ground of effects of a different kind in the same being, according to another law, then the agreement of these laws with each other is contingent, and the unity which prevails among these laws is merely contingent. What happens in the thing in accordance with these laws happens in accordance with a contingent order of nature. Human beings see, hear, smell, taste, and so on. But the properties which are the grounds of seeing are not the grounds of tasting as well. Man has to have other organs in order to hear, and likewise in order to taste. The union of such different faculties is contingent, and, because their union aims at perfection, their union is artificial in character. And then again, in the case of each organ individually, there is a unity which is artificial. In the eye, the part which permits light to enter is different from the part which refracts it, and the part which receives the image is, in its turn, different from the other parts. On the other hand, it is not one set of causes which gives the earth its spherical form, and another which prevents bodies flying off the earth as a result of the centrifugal force of its rotation,⁵⁴ and yet others again which keep the moon in its orbit. Gravity by itself⁵⁵ is a cause which is, of necessity, sufficient to produce all these effects. Now, the fact that grounds are to be found in nature for all these effects is, without doubt, a perfection. And if the same ground which determines the one thing should also be sufficient to determine the others, then the unity which accrues to the whole is so much the greater. But this unity and, along with it, the perfection as well, are, in the present case, necessary, and they attach to the essence of the thing. And all the harmoniousness, fruitfulness and beauty, which are in so far due to that unity,⁵⁶ depend upon God either through the mediation of the essential order of nature, or through the mediation of that which is necessary in the order of nature. I hope that I shall be rightly understood. My wish is to extend this necessity, not to the existence of these things themselves, but merely to the harmony and unity which inhere in their possibility, and which constitute the necessary ground of such an extraordinary extensive adaptedness and fruitfulness. The creatures of the plant- and animal-kingdoms everywhere offer the most admirable examples of a unity which is at once contingent and yet in harmony with

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⁵⁴ *Drehungsschwingung.* ⁵⁵ *die einzige Schwere.*

⁵⁶ *Diese Einheit aber und mit ihr die Vollkommenheit ist in dem hier angeführten Falle nothwendig und klebt dem Wesen der Sache an, und alle Wohlgerheimtheit, Fruchtbarkeit und Schönheit, die (i.e., alle Wohlgerheimtheit, Fruchtbarkeit und Schönheit) ihr (i.e., der Einheit) in so fern zu verdanken ist.*

great wisdom. Consider the vessels which draw up sap, vessels which take in air, those which process the sap and those which exhale it, and so on. These various vessels make up a great manifold, where none is capable of producing the effects of the others, and where their combination into a unified and perfect whole is artificially devised,¹ so that the plant itself, which is related to such a diversity of purposes, constitutes a unity which is contingent in character and the product of choice.²

On the other hand, it is inorganic nature, in particular, which furnished numberless proofs of a necessary unity in the relation between a simple ground and a multiplicity of appropriate consequences. Indeed, the case is such that one is inclined to suppose that perhaps even when, in organic nature, many perfections may seem to be the product of provisions which have been especially made, they may, notwithstanding, be the necessary effects of a single ground, a ground which, in virtue of its essential fruitfulness, connects those perfections with many other beautiful effects. The result is that one is constrained to suppose that there may be more necessary unity even in these realms of nature than one perhaps thinks.

2:108 The forces of nature and the causal laws which govern them, contain the ground of an order of nature. This order of nature, in so far as it embraces a complex harmony in a necessary unity, has the effect of turning the combination of much perfection in *one* ground into a law. Thus, different natural effects are, in respect of their beauty and usefulness, to be regarded as subsumed under the essential order of nature, and, by that means, as subsumed under God. By contrast, there are many perfections in a given whole, which are not possible in virtue of the fruitfulness of a single ground but require a variety of different grounds, which have been deliberately³ combined to this end. For this reason, many arrangements which have been artificially instituted⁴ will be the cause of a law. The effects which occur in accordance with that law will be subsumed under an order of nature which is contingent in character and the product of artifice;⁵ and in virtue of that subsumption they will also be subsumed under God.

FOURTH REFLECTION: EMPLOYMENT OF OUR ARGUMENT IN JUDGING THE PERFECTION OF A WORLD ACCORDING TO THE COURSE OF NATURE

1. *What can be inferred from our argument in support of the superiority of the order of nature over the supernatural order*

It is a well-known rule of philosophers, or rather of common sense in general, that nothing is to be regarded as a miracle or as a supernatural

¹ künstlich. * ein zufälliges und willkürliches Eine. ° willkürlich.

² manche künstliche Anordnung. * der zufälligen und künstlichen Ordnung der Natur.

event, unless there are weighty reasons for doing so. This rule implies, firstly, that miracles are rare; and secondly, that the whole perfection of the universe can, in conformity with the will of God and in accordance with the laws of nature, be attained without many supernatural influences. For everybody knows that if the world were not to achieve the purpose of its existence without the assistance of numerous miracles, then supernatural events would have to be a commonplace.⁷ There are some who are of the opinion that the formal element in the natural connection of consequences with their grounds is in itself a perfection, and that this is, indeed, preferable even to a better outcome, if that can only be attained in a supernatural fashion.⁸ They attach an immediate advantage to the natural as such. Everything supernatural, construed as an interruption of the order of nature, seems of itself to constitute a deformity.⁹ But this difficulty is only imaginary. The good is to be found in the attainment of the end alone; and if goodness is attributed to the means, then only on account of the end. The natural order, if it does not produce perfect effects, does not contain any immediate ground of superiority in itself, for it can only be regarded as a kind of means, and a means admits no value of its own, but only a derivative value borrowed from the magnitude of the end which it realises. The sense of effort¹⁰ which people experience in their immediate exertions has surreptitiously insinuated itself here. It is this which invests that which can be entrusted to outside forces with an advantage, even when the outcome lacks something of the usefulness intended. However, if the man who takes his wood to the saw-mill to be converted into planks could just as well effect this conversion immediately, then all the art of this machine would be but an idle plaything,¹¹ for its whole value consists exclusively in its being the means to this end. Thus, a thing is not good simply because it occurs in accordance with the course of nature. Rather is it the case that the course of nature is good in virtue of the fact that that which issues from it is good. God's decree included a world in which everything, for the most part, satisfied the rule of the best as a result of a natural connection. For this reason, God considered it worthy of His choice, not, indeed, because the good consisted in the world's being naturally connected, but because the world's natural connection most truly effected its perfect purposes, without the assistance of frequent miracles.

And now the following question arises. How does it come about that the universal laws of nature, in accordance with which the course of events in the world occurs, should correspond so beautifully with the will of the Supreme Being? And what reason has one for attributing to these laws the

⁷ etwas Gewöhnliches.

⁸ welcher allenfalls ein besserer Erfolg, wenn er nicht anders als übernatürlicher Weise zu erhalten stünde, hintangesetzt werden musste.

⁹ Übelstand. ¹⁰ Die Vorstellung der Mühsamkeit. ¹¹ Spielwerk.

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adaptedness of which we are speaking, so that one does not have to admit more frequently the existence of mysterious, supernatural provisions, constantly rectifying the deficiencies of those laws.* Our concept of the dependency of the very essences themselves of all things upon God here turns out to be of even greater use than expected in this question. The things of nature, even in the most necessary determinations of their internal possibilities, display the characteristic mark of dependency upon that Being, in which everything harmonises with the attributes of wisdom and goodness. One may expect to find harmony and beauty in the combination of natural things, and necessary unity in the many advantageous relations of a single ground to many appropriate laws. Where nature operates in accordance with necessary laws, there will be no need for God to correct the course of events by direct intervention; for, in virtue of the necessity of the effects which occur in accordance with the order of nature, that which is displeasing to God cannot occur, not even in accordance with the most universal laws. For how could the effects of things be contrary to the will of God, when one remembers that the contingent connection of those things depends upon the will of God, while their essential relations, as the grounds of what is necessary in the order of nature, derive from that in God which harmonises most fully with His properties in general? And so all the changes which take place in the world and which are mechanical in character and thus necessary, since they derive from the laws of motion – all such changes must always be good, for they are naturally necessary. And it is to be expected that the consequence will not be susceptible to improvement,† once their occurrence has become inevitable according to the order of nature.‡ I would, however, add the following remark in order to avoid any misunderstanding. The alterations which occur in the world are either necessary, and necessary in virtue of the initial order of the universe and of

* This question is far from being satisfactorily answered by appealing to the wisdom of God's choice, which ordered the course of nature once and for all, and ordered it so well that frequent improvements were unnecessary. For the chief difficulty is this: how could it even have been possible to unite such great perfection in a single combination of world-events according to universal laws? How, particularly considering the number of natural things and considering the immeasurable length of the series of their alterations, could a harmony have arisen, which was the product of the universal laws of the reciprocal causality^d of things, but which had no need of frequent supernatural influences?

† Even if, as Newton maintained, it is naturally inevitable that a system such as the solar system will eventually run down and arrive at a state of complete stagnation and universal rest, I would not follow him in adding that it is necessary that God should restore it again by means of miraculous intervention. For, since it is an outcome to which nature is of necessity destined as a result of its essential laws, I assume from this that it is also good. This final state of the solar system ought not to strike us as a loss to be lamented, for we are ignorant of the measurelessness of nature. Ever developing in other regions of the universe, nature may, for all we know, richly compensate for this running down of the universe by great fruitfulness elsewhere.

^d gegenseitigen Wirksamkeit. † unverbesserlich.

the laws of nature, both general and particular – and everything which takes place mechanically in the corporeal world is of this character – or, alternatively, these same alterations possess, notwithstanding, an inadequately understood contingency – a case in point being the actions which issue from freedom and of which the nature is not properly understood. Changes in the world of this latter kind, in so far as they appear to have about them an indeterminacy^f in respect of determining grounds and necessary laws, harbour within themselves a possibility of deviating from the general tendency of natural things towards perfection. And, for this reason, it can be expected that supplementary supernatural interventions may be necessary, for it is possible that the course of nature, looked at in this light, may, on occasion, run contrary to the will of God. However, even the forces of freely acting beings are not, in their connection with the rest of the universe, entirely emancipated from all laws. They are always subject, if not to necessitating grounds, yet to such grounds as render their execution certain, albeit in a different fashion and in accordance with the rules governing the power of choice. Since this is the case, it follows that the general dependency of the essences of things upon God is here, too, always a major ground for regarding the consequences as on the whole appropriate and in harmony with the rule of the best. Even in the present case, the consequences occur in accordance with the course of nature (and there is no need to be misled by apparent deviations in particular cases). Thus it is only rarely that the order of nature needs to be improved or supplemented by immediate divine intervention. Even revelation only mentions such interventions as occurring at specific times and among specific nations. Experience, too, confirms the dependency of even the freest actions upon a major natural rule. For, contingent as the decision to marry may be, it is nonetheless found that in a given country the proportion of marriages to the number of those living is fairly constant, provided that one operates with large numbers. For examples, it will be found that among one hundred and ten persons of both sexes there will be one married couple.^g The extent to which man's freedom contributes to the lengthening or shortening of life is a matter of common knowledge. Nonetheless, even these free actions must be subject to a greater order, for, on average, if one operates with large numbers, the number of mortalities stands in a very exact and constant ratio to the number of the living. These few proofs may suffice in some measure to explain the fact that even the laws of freedom do not, in respect of the rules of the general order of nature, involve any such indeterminacy.^h Such an indeterminacy would imply that the ground, which in the rest of nature establishes in the very essences of things themselves an inevitable relation

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^f Ungebundenheit.

^g und das z.E. unter 110 Menschen beiderlei Geschlechts sich ein Ehepaar findet.

^h Ungebundenheit.

to perfection and harmoniousness, would not, in the natural course of free behaviour, produce at least a greater tendency to delight the Supreme Being, without the assistance of numerous miracles. However, I am more concerned about the course of natural events, in so far as they owe their necessity to laws which are implanted in them. In such an order, miracles will either not be necessary at all or only occasionally so, for it would be improper to admit that such imperfections, needing miracles to correct them, should naturally occur.

If I subscribed to the commonly held concept of natural things, according to which their internal possibility is independent and without any external ground, I should not be at all surprised if it were said that a world of unitary perfection¹ would be impossible unless there were large numbers of supernatural interventions. Indeed, I should find it strange and beyond comprehension that, in the absence of a continuous series of miracles, anything useful could be achieved as a result of a great and natural connection in such a world. For it would be an astonishing coincidence if the essences of things, each possessed of its own separate necessity, should harmonise with each other and do so in such a way that it was possible even for the Supreme Wisdom to unite them together into a great whole, irradiating a faultless harmony and beauty, in accordance with universal laws and in spite of the complexity of its relations of dependence. On the other hand, I am persuaded that it is only because there is a God that anything else is possible at all. Accordingly, I expect even the possibilities of things themselves to display a harmony which is concordant with their great principle; and I also expect these possibilities to be adapted to each other by means of universal arrangements so as to constitute a whole which properly harmonises with the wisdom of the Being, from which they derive their ground. Indeed, I should find it amazing if anything occurred or could occur in the course of nature in accordance with general laws which was displeasing to God, or in need of a miracle to improve it. And were such an event to occur, even its cause² would be one of those things which, while happening from time to time, would be utterly incomprehensible to us.

If one has grasped the essential reason why miracles can rarely be necessary to the perfection of the world, one will have no difficulty in understanding that this also applies to what, in the previous reflection, we called supernatural events in the formal sense of the term. Such supernatural events are frequently admitted in ordinary judgements. The admission is made on the basis of a mistaken concept which leads one to

¹ von einiger Vollkommenheit / B: any perfection / C: una certa perfezione / F & Z: tant . . . peu parfait / T: some perfection / (Kant is using the word *einig* in the sense of 'unified', 'unitary', or 'cohesive', and thus suggesting the harmoniousness or concordant nature of the perfection. Cf. Grimm: *einig* [5]).

² Veranlassung.

suppose that there is something natural in such formally supernatural events.

2. What can be inferred from our argument to the advantage of one or other of the two orders of nature

In the procedure of purified philosophy there prevails a rule which, even if it is not formally stated, is nonetheless always observed in practice. The rule maintains that in investigating the causes of certain effects one must pay careful attention to maintaining the unity of nature as far as possible. In other words, the rule maintains that one must derive a variety of effects from a single cause which is already known, and not immediately suppose the existence of new and diverse operative causes to explain different effects because of some seemingly important dissimilarity between them. Accordingly, it is presumed that there exists a great unity in nature, in respect of the adequacy of a single cause to account for many different kinds of consequences. It is thought that one is justified in regarding the union of different kinds of appearance with each other as for the most part necessary, and not as the effect of an artificial or contingent order. How many different effects derive from the single force of gravity, where it was once thought necessary to postulate different causes (as, for example, in the case of the rising of some bodies and the falling of others). Vortices for maintaining the heavenly bodies in their orbits were abandoned once that simple force of nature was recognised to be the cause of the planetary orbits.³ It is with good reason presumed that the expansion of bodies as a result of heat, that light, electrical energy, thunderstorms, and perhaps even the force of magnetism, are many different manifestations of one and the self-same operative matter present in all of space, namely, the aether.⁴ And if one finds oneself constrained to postulate a new principle to explain a type of effect, one feels a sense of thorough dissatisfaction. Even when a very precise symmetry seems to require the postulation of a specially instituted and artificially devised arrangement,⁵ one is still inclined to regard it as the necessary result of more general laws and to continue to observe the rule of unity, before resorting to an explanation in terms of an artificial provision. Snowflakes⁶ are composed of crystals which are so regular, so delicate, so far removed from all the clumsiness⁷ which blind chance would bring about, that one would be inclined to doubt the honesty of those who have furnished us with portrayals⁸ of them, were it not for the fact that every winter affords us with numberless opportunities to verify the accuracy of these diagrams from our own experience. There are few flowers which, to speak only of external appearance, display greater delicacy and proportion; and art has nothing at all to offer which displays

³ eine besondere künstliche Anordnung. ⁴ Schneefiguren. ⁵ alles Plumpe.

⁶ Abzeichnungen.

greater precision^o than these products, which nature scatters with such profusion over the face of the earth. And yet it has occurred to no one to explain their origin in terms of a special snow-seed, or to imagine an artificially constituted arrangement of nature to account for them. They are rather construed as the incidental consequences of more general laws, which subsume under themselves with necessary unity the formation of this product.*

Nonetheless, nature is rich in another kind of production. And here, when philosophy reflects on the way in which this kind of product comes into existence, it finds itself constrained to abandon the path we have just described. There is manifest in this case great art and a contingent combination of factors which has been made by free choice in accordance with certain intentions.⁷ Such art and free choice are the ground of a particular law of nature, which itself belongs to an artificial order of nature.⁸ The structure of plants and of animals displays a constitution of this kind; and it is a constitution which cannot be explained by appeal to the universal and necessary laws of nature. Now, it would be absurd to regard the initial generation of a plant or animal as a mechanical effect incidentally arising from the universal laws of nature; nonetheless, there is a two-fold question, which has remained unanswered for the reason mentioned.⁵⁸ Is each individual member of the plant- and animal-kingdoms directly formed by God, and thus of supernatural origin, with only propagation, that is to say, only the periodic transmission for the purposes of development, being entrusted to a natural law?⁵⁹ Or do some individual members of the plant- and animal-kingdoms, although immediately formed by God and thus of divine origin, possess the capacity, which we cannot understand, actually to generate their own kind in accordance with a regular law of nature, and not merely to unfold them?⁶⁰ There are difficulties on both sides, and it is perhaps impossible to make out which difficulty is the greatest. But our concern here is merely to determine the relative weight of the various reasons, in so far as they are metaphysical in character. For example: in the light of everything we know, it is utterly unintelligible to us that a tree should be able, in virtue of an internal mechanical constitution, to form and process its sap in such a way that there should arise in the bud or the seed something containing a tree like itself in miniature, or something

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* The similarity of form which exists between mildew and plants has induced many people to count mildew among the products of the plant-kingdom.⁵⁶ However, according to other observations, it is much more likely that, in spite of its apparent regularity, it, like the Tree of Diana,⁵⁷ is an effect of the universal laws of sublimation.

^o Richtigkeit. ^p eine zufällige Vereinbarung durch freie Wahl gewissen Absichten gemäß.

^q welches zur künstlichen Naturordnung gehört / (künstlich has the force of 'produced by art or skill' and is to be contrasted not with 'genuine' but with 'natural').

^r und nur die Fortpflanzung, das ist, der Übergang von Zeit zu Zeit zur Auswicklung einem natürlichen Gesetze anvertraut sei.

^s auszuwickeln.

from which such a tree could develop. The internal forms proposed by Buffon,⁶¹ and the elements of organic matter which, in the opinion of Maupertuis, join together as their memories dictate and in accordance with the laws of desire and aversion,⁶² are either as incomprehensible as the thing itself, or they are entirely arbitrary inventions. But, leaving aside such theories, is one obliged for that reason to develop an alternative theory oneself, which is just as arbitrary, the theory, namely, that, since their natural manner of coming to be is unintelligible to us, all these individuals must be of supernatural origin? Has anyone ever offered a mechanical explanation of the capacity of yeast to generate its kind? And yet one does not appeal for that reason to a supernatural ground.

In this case, the origin of all such organic products is regarded as completely supernatural; it is, nonetheless, supposed that the natural philosophers have been left with something when they are permitted to toy with the problem of the manner of gradual propagation.⁶³ But consider: the supernatural is not thereby diminished; for whether the supernatural generation^u occurs at the moment of creation, or whether it takes place gradually, at different times, the degree of the supernatural is no greater in the second case than it is in the first. The only difference between them relates not to the degree of the immediate divine action but merely to the *when*. As for the natural order of unfolding^v mentioned above: it is not a rule of the fruitfulness of nature, but a futile method of evading the issue.^w For not the least degree of an immediate divine action is thereby spared. Accordingly, the following alternatives seen unavoidable: either the formation of the fruit is to be attributed immediately to a divine action, which is performed at every mating, or, alternatively, there must be granted to the initial divine organisation of plants and animals a capacity, not merely to develop^x their kind thereafter in accordance with a natural law, but truly to generate^y their kind.

The purpose of these considerations has simply been to show that one must concede to the things of nature a possibility, greater than that which is commonly conceded, of producing their effects in accordance with universal laws.

FIFTH REFLECTION: IN WHICH THE INADEQUACY OF THE USUAL METHOD OF PHYSICO-THEOLOGY IS DEMONSTRATED

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1. Of physico-theology in general

All the ways in which the existence of God can be cognised from the effects He produces can be reduced to the three following kinds. Firstly:

¹ allmählichen Fortpflanzung. ^u übernatürliche Erzeugung. ^v Auswicklung.

^w eine Methode eines unnützen Umschweifs. ^x entwickeln. ^y erzeugen.

this cognition is arrived at through the perception of that which interrupts the order of nature and directly refers to the power to which nature is subject; this conviction is produced by *miracles*. Secondly: the contingent order of *nature*, which one clearly recognises as having been possible in many other ways but in which great art, power and goodness shine forth, leads to the Divine Author. Thirdly: the *necessary* unity perceived in *nature*, and the essential order of things, which is in accordance with great rules of perfection, in short, that which is necessary in the regularity of nature, leads to a supreme principle, not only of this existence, but, indeed, of all possibility.

When people have fallen into complete savagery, or when their eyes have been sealed by stiff-necked wickedness,² only the first method seems to have any power to persuade them of the existence of the Supreme Being. On the other hand, a well-disposed soul contemplating things in the correct fashion and seeing so much contingent beauty and purposeful combination presented by the order of nature, finds proof enough there to infer the existence of a will accompanied by great wisdom and power. This conviction, in so far as it is supposed to be sufficient to produce virtuous behaviour, that is to say, is supposed to be morally certain, can be arrived at by means of the ordinary concepts of the understanding. As for the third method of inference: its necessary precondition is philosophy, and it is a higher degree of philosophy alone which is able, with the distinctness and conviction appropriate to the magnitude of the truth concerned, to attain to the object in question.³

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The last two methods can be called physico-theological, for they both point out the way which leads from reflections on nature to knowledge of God.

2. The advantages and defects of ordinary physico-theology

The chief characteristic of the physico-theological method, as it has been practised until now, consists in this: to start with, perfection and regularity are suitably understood in terms of their contingency. The artificial character of the order is then demonstrated by reference to all the purposeful relations it contains. The existence of a wise and benevolent will is thereupon inferred from that artificial order. The concept of the immeasurable power of the Author is then subsequently combined with the above concept of a wise and benevolent will. The combination of the two concepts is effected by means of a supplementary reflection on the magnitude of the creation.

² *halsstarrige Bosheit*.

³ *Zu der dritten Art zu schliessen wird nothwendiger Weise Weltweisheit erfordert, und es ist auch einzig und allein ein höherer Grad derselben fähig, mit einer Klarheit und Überzeugung, die der Grösse der Wahrheit gemäss ist, zu dem nämlichen Gegenstand zu gelangen.*

This method is admirable. Firstly: the conviction it produces makes a strong appeal to the senses; it is, as a consequence, very vivid and persuasive. This method is, therefore, easy to grasp and intelligible even to the most ordinary understanding. Secondly: it is more natural than any other method, for, without doubt, it is with this proof that everybody initially starts. Thirdly: it furnishes a very intuitive concept⁴ of the great wisdom, providence and even power of the Being who is worthy of our worship.⁵ This intuitive concept takes possession of the soul, and fills it, in the most powerful fashion, with wonder, humility and reverence.* The method is also much more practical than any other, even from the point of view of the philosopher. It is true that he encounters here no determinate abstract idea of the Deity for his inquiring and brooding understanding. It is also true that the certainty of the proof is not mathematical in character, but moral. Nonetheless, so many proofs, each of such great force, take possession of the philosopher's soul; and speculation, with certain trust, follows quietly in the footsteps of the conviction which has already been established in his soul. It is unlikely that anyone would venture his whole happiness upon the pretended correctness of a metaphysical proof, especially if that proof were opposed by vivid objections which appealed to the senses. The power of the conviction produced by this method is, for the very reason that it appeals to the senses, so firm and unshakeable as to be unperturbed by any threats to it posed by syllogistic discourses⁶ and distinctions, and inaccessible to the power of the objections produced by sophistry.⁷ Notwithstanding, this method has its defects, and they are considerable enough, although these defects only belong, properly speaking, to the procedure of those who have employed this method.

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1. Physico-theology regards all the perfection, harmony and beauty of nature as contingent and as an arrangement instituted by wisdom, whereas many of these things issue with necessary unity from the most essential rules of nature. The factor which is here most damaging to the

* When, among other things, I consider the microscopic observations of Dr Hill, which are to be found in the *Hamburger Magazin*,⁵⁶ when I see numerous animal species in a single drop of water, predatory kinds equipped with instruments of destruction, intent upon the pursuit of their prey, but in their turn annihilated by the still more powerful tyrants of this aquatic world; when I contemplate the intrigues, the violence, the scenes of commotion in a single particle of matter, and when from thence I direct my gaze upwards to the immeasurable spaces of the heavens teeming with worlds as with specks of dust – when I contemplate all this, no human language can express the feelings aroused by such a thought; and all subtle metaphysical analysis falls far short of the sublimity and dignity characteristic of such an intuition.

⁴ *einen sehr anschauenden Begriff*.

⁵ *Schlussreden* / B: syllogisms / C: *sillogismi* / F: *épilogues* / T: *epilogues* / Z: *arguties* / (the word *Schlussrede* may mean 'epilogue' [which would make scant sense in this context], but it also means 'syllogism').

⁶ *die Macht der spitzfindiger Einwürfe*.

purpose of physico-theology is this: it regards the contingency of nature's perfection as in the highest degree necessary to the proof of the existence of a Wise Author. The consequences of this assumption is that all the necessary harmonies which exist between the things in the world come to be regarded as dangerous objections.

In order to convince oneself that this is an error, consider the following argument. Writers who adopt this method can be seen to be intent upon wresting the products of the plant- and animal-kingdoms, which are rich in numberless final intentions,^e not only from the power of chance, but also from the mechanical necessity of the universal laws of material nature. And in this they have not the least difficulty. The preponderance of grounds on their side is too decisive. When, however, they turn from organic to inorganic nature, they continue to employ the same method. But here they almost always find themselves enmeshed in difficulties from which they cannot extricate themselves because of the changed character of the things being examined. They continue to talk of the harmonious agreement instituted by great wisdom between the numerous useful properties of the atmosphere, the clouds, rain, winds, the dusk, and so forth. And they talk as if the property, by means of which the air is responsible for producing the winds, and that by means of which it draws up vapours, or that by means of which it becomes rarer at higher altitudes, were united together by a wise choice. And they construe this uniting together of useful properties in precisely the same way as they construe the uniting together of various characteristics in an animal, for example, in the case of the spider, the uniting together into a system of the different eyes by means of which it watches out for its prey, the wart from which the spider's thread is drawn out as through a nipple, the delicate claws and even the balls of its feet by means of which it sticks the thread together or holds on to it. In this latter case, the unity of all the combined advantages (in which perfection consists) is obviously contingent and ascribable to a wise choice, whereas in the first case it is necessary: if only one of the above capacities is attributed to the air, the others cannot possibly be separated from it. Just because no other method of judging nature's perfection is admitted except that which involves appeal to the provision made by wisdom, it follows that any widely extended unity, in so far as it is obviously recognised as necessary, constitutes a dangerous exception. We shall soon see that, according to our method, too, Divine Wisdom is inferred from such unity. That unity is not, however, inferred from the wise choice as its cause; it is rather derived from a ground in the Supreme Being which is such that it must also be a ground of great wisdom in Him. Unity is thus derived from a Wise Being, but not through His wisdom.^{f67}

2. This method is not sufficiently philosophical in character. Further-

^e *Endabsichten.* ^f *wohl von einem weisen Wesen, aber nicht durch seine Weisheit.*

more, it has often constituted a serious impediment to the dissemination of philosophical knowledge. As soon as a provision of nature is recognised as useful, there is a general tendency to explain it directly in terms of the intention of the Divine Will, or, at any rate, in terms of an order of nature which has been especially and artificially instituted. This explanation is adopted for one of two reasons: either one has got the idea fixed in one's mind that natural events could not produce such harmony merely by means of nature's most general laws alone, or, alternatively, it is felt that if one admitted that the operations of nature could produce such results, the admission would be tantamount to ascribing the perfection of the universe to blind chance, and the consequence of that would be that the Divine Author would remain unrecognised.^g As a consequence, limits are imposed upon natural research in such cases. Humiliated reason distances itself from any further investigation, for it regards such investigation here as prying curiosity.^h And the prejudice is all the more dangerous for furnishing the lazy with an advantage over the tireless enquirer; it does so under the pretext of piety and of just subjection to the great Author, in knowledge of whom all wisdom must be united.⁶⁸ The numberless uses of mountains, for example, are enumerated. As soon as a goodly number of them have been brought together, including those indispensable to the human race, one thinks that one is entitled to regard them as an arrangement directly instituted by God. For, in their view, to regard them as the effect of the universal laws of motion (and, since it is not thought that these latter are supposed to have any relation to consequences which are beautiful or useful, unless accidentally so) would be tantamount to ascribing a use which was crucial to the human race to blind chance.⁶⁹ The same thing holds true of what is said about the earth's rivers. If one listened to what the physico-theological authors have to say, one would be persuaded to imagine that the river-beds had all been hollowed out by God.⁷⁰ Nor is one proceeding in a philosophical fashion if, in regarding each individual mountain or each individual river as a special intention of God which could not have been attained by the operation of universal laws, one proceeds to imagine the means which God may have employed in order to produce these individual effects. For, according to what has been shown in the Third Reflection of this section, such a product would still be supernatural. Indeed, since it cannot be explained in terms of an order of nature (for it only arose as an individual event as a result of a special provision), it follows that such a procedure of judging is based upon a mistaken idea of the superiority of nature itself if it is construed as having to be steered by force towards an individual case. Such an approach, in our considered opinion, can only be regarded as a means of avoiding the

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^g *verkannt.* ^h *Vorwitz.*

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issue,¹ not as a procedure of wisdom.* *Newton*, by means of incontrovertible proofs, convinced himself that the shape of the earth was such that the direction of all the gravitational forces, modified by the centrifugal force of rotation,² remained vertical relative to the surface of the earth. He concluded from this that the initial state of the earth had been liquid, and that it had assumed just this form as a result of its rotation according to the laws of statics. No one knew better than he the advantages inherent in a heavenly body's having this spherical form. He was also as familiar as anyone with the flattening of the sphere at the poles, a flattening which was in the highest degree necessary if the deleterious effects of axial rotation were to be prevented. These are all of them arrangements worthy of a wise author. Nonetheless, *Newton* did not hesitate to regard them as the effects of the most necessary laws of mechanics. Nor did he fear that in so doing he would lose sight of the great ruler of all things.⁷²

It can thus surely be supposed that *Newton*, in attempting to explain the structure of the planets, their revolutions and the position of their orbits, would not have had immediate recourse to an explanation in terms of a divine provision, unless he had judged that a mechanical explanation was impossible – impossible, not because it was incapable of explaining regularity and order generally (for otherwise why did this incapacity not worry him in the previously mentioned case), but because the celestial spaces were empty and because in such a state there could have been no causal interaction between the planets to establish their orbits.⁷³ But suppose that it had occurred to him to ask whether these spaces had always been empty, and whether, at least in the earliest state of all when these spaces had perhaps been filled and connected with each other, it would not have been possible for the above mentioned effect to have been produced and thereafter maintained in existence,⁷⁴ and suppose that he had had good reason to accept this hypothesis concerning the initial state of the universe – if these suppositions are made, it is certain that *Newton* would, in a philosophically proper manner, have sought the grounds of the constitution of the structure of the universe in the universal laws of mechanics.⁷⁵ Nor

* In those cases where revelation tells us that something which has happened in the world is an extraordinary and divinely instituted event, it is to be desired that the eagerness of the philosophers to make a public show of their physical speculations should be restrained. They do religion no service. On the contrary, their speculations simply arouse the suspicion that the event which they have sought to explain by natural causes may, indeed, be a natural accident. Such is the case where the destruction of *Sanherib's* army is attributed to the wind *Samyél*. In such instances, philosophy frequently finds itself in difficulties, as happens in *Whiston's* theory, where astronomical knowledge of the comets is employed to explain the Bible.⁷¹

¹ ein Mittel des Umschweifs.

² alle durch den Drehungsschwingung veränderte Richtungen der Schwere.

would he, for that reason, have been concerned that this explanation would have taken the origin of the world out of the hands of the Creator and surrendered it to the power of chance.⁷⁶ Lazy self-complacency is not, therefore, entitled to employ *Newton's* well-known example as a pretext for treating an overhasty appeal to a divinely and directly instituted provision as if it were an explanation in the philosophical sense of the word.

There are, of course, innumerable arrangements in nature which are, from the point of view of the universal laws of nature, contingent. As such they have no other foundation than the wise intention of Him who willed that they should be connected thus and not otherwise. However, the converse conclusion may not be drawn. If a natural connection harmonises with what accords with a wise choice, it does not follow that it is also, from the point of view of the universal laws of causality, contingent, or that it has been especially instituted by an artificial provision. It can often happen with this way of thinking that mistakes are made about the imagined purposes of the law. Apart from the error itself, there is then the added disadvantage that one fails to notice the efficient causes which are at work, while adhering directly to an intention which is merely fictitious. *Süssmilch* once thought that he had discovered the reason why there is a preponderance of male births over female. He supposed that the reason lay in the providential purpose of compensating by their greater number for the loss which the male sex suffers to a higher degree than the female as a result of war and engaging in the more dangerous kinds of occupation.⁷⁷ However, later observations taught this careful and reasonable man that the surplus of boys was so diminished by death during the years of infancy that an even smaller number of males than females arrived at that age when the previously mentioned factors could begin to explain the loss.⁷⁸ There is reason to believe that this remarkable phenomenon is a case which may be subsumed under a much more general rule, namely, that the stronger part of the human species has a larger share in the activity of procreation, so that its own kind becomes predominant in the products of the two sides. On the other hand, if something has the potentiality for greater perfection, more will be required if, in the course of its development, it is to encounter all the conditions necessary to attain that perfection. For this reason, the number of those of less perfect kind who attain the degree of perfection appropriate to their kind will be greater than that of those whose perfection requires for its attainment a greater concurrence of grounds.⁸ Be that as it may, it can at least be remarked that appealing to moral grounds impedes the extension of philosophical under-

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⁸ dass aber dagegen, weil mehr dazu gehört, dass etwas welches die Grundlage zu grösserer Vollkommenheit hat, auch in der Ausbildung alle zu Erreichung derselben gehörige Umstände antreffe, eine grössere Zahl derer von minder vollkommener Art den Grad der Vollständigkeit erreichen werde, als derjenigen, zu deren Vollständigkeit mehr Zusammentreffung von Gründen erfordert wird.

standing. In other words, the extension of philosophical understanding is hindered by resorting to explanations in terms of purposes, in cases where physical causes may be supposed to determine the effect as a result of their being connected with necessary and more general laws.

2:123 3. The physico-theological method can only serve to prove the existence of an Author of the connections and artificial combinations in the world; it does not prove the existence of an Author of matter itself, nor does it prove the origin of the constituent parts of the universe.⁷⁹ This considerable defect must expose all those who avail themselves of this method alone to the error known as 'refined atheism'.¹ According to this brand of atheism, God is strictly regarded as the Architect of the world, not as its Creator: He orders and forms matter, but He does not produce or create it. Since I shall be considering this inadequacy in the next reflection,⁸⁰ I shall satisfy myself with merely having noted it here.

Incidentally, the method we are considering is one of a number of methods which are most in harmony both with the dignity and with the weakness of the human understanding. There are, indeed, innumerable arrangements in nature, of which the immediate ground must be the ultimate purpose of their Author. The path which leads most easily to Him is the one which considers those provisions which are immediately subject to His wisdom. It is, therefore, right and proper that one should try to perfect the method rather than to attack it, to correct its errors rather than to despise it because of them. It is this which is the purpose of the following reflection.

SIXTH REFLECTION: THE REVISED METHOD OF PHYSICO-THEOLOGY

1. *Order and appropriateness are indications of an intelligent creator, even when they are necessary.*

Nothing can be more prejudicial to the idea of a Divine Author of the universe, nor can anything be more unreasonable, than the willingness to attribute to blind chance a great and fruitful rule of appropriateness, usefulness and harmony. An example of such a theory is the swerve of the atoms in the system of *Democritus* and *Epicurus*.⁸¹ I do not propose to linger over the absurdity and deliberate blindness of this way of thinking, for it has been made clear by others. However, I would remark that the necessity perceived in the relation of things to regular combinations, and the connection of useful laws with a necessary unity, afford proof of a Wise Author, just as well as the most accidental and artificially devised provision, although the nature of the dependency on God must be understood

¹ den feineren Atheismus.

2:124 differently in the two cases. Let me explain my meaning. The existence of order and a diverse advantageous harmony in general point to the existence of an Intelligent Author; and it does so even before one has considered whether this relation is necessary to things or contingent. According to the judgements of ordinary sound reason, the series of modifications which the world undergoes, or that connection of events which is such that an alternative connection is possible in its place, while furnishing a clear proof of contingency, has little effect in causing the understanding to suppose that there is an Author. Philosophy is required for this purpose, though, in this case, even its employment is an involved and delicate^a matter. On the other hand, great regularity and the harmoniousness of a complex harmony^a is perplexing, and even common sense itself finds it inconceivable in the absence of an Intelligent Author. Whether or not one rule of appropriateness essentially inheres in another, and whether or not their connection is the product of choice, both the chance occurrence of order and regularity, and their spontaneous emergence in a multiplicity of things, each of which has its own distinct existence, is regarded as simply impossible. The reason is that, from the point of view of its possibility, extensive harmony is never adequately given in the absence of an intelligent ground. And in this there is to be seen a direct expression of a major difference between ways of judging perfection according to its origin.

2. *The necessary order of nature itself points to^a an Author of the matter which is so ordered.*

The order of nature, in so far as it is regarded as contingent and arising from the power of choice of an intelligent being, is in no way proof that the things of nature, which are widely connected in such an order, also owe their existence to this Author. For it is the combination alone which presupposes an intelligent plan. It was for this reason, too, that Aristotle, along with many other philosophers of antiquity, derived, not the matter or stuff of nature, but only its form, from God.⁸² It is, perhaps, only since revelation has taught us the complete dependency of the world upon God that philosophy has also made the requisite effort to regard the origin of the things themselves, which constitute the raw material of nature, as something not possible independently of an Author. I doubt whether anybody has succeeded in establishing this thesis, and I shall produce the reasons for my view in the final section.⁸³ At any rate, the contingent order of the parts of the world, in so far as that order indicates that it originated from the power of choice, can contribute nothing

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^a verwickelt und schlüpferig. ^a Wohlgerimtheit in einem vieltimmichten Harmonischen.
^b bezeichnet.

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to proving it. Take the example of the structure of an animal. Its organs of sense perception are connected with the organs of voluntary movement and life, and connected in such an ingenious fashion that once one's attention has been drawn to it, one would have to be of an ill-natured disposition^p (for no one could be so unreasonable) not to recognise the existence of a Wise Author, who had so excellently ordered the matter of which the animal was constituted. Nothing more than this can be inferred from our example. Whether this matter has existed eternally and independently in its own right, or whether it has also been generated by this same Author – these are issues which cannot be decided by reference to our example. However, one's verdict is quite different when one recognises that not all natural perfection is the work of artifice, but that the rules of great usefulness are also connected together with necessary unity, and that this agreement inheres in the possibilities of the things themselves. How is one to judge in the case of this perception of things? Is this unity, is this fruitful harmoniousness, possible independently of a Wise Author? The formal element of such great and varied regularity forbids such a conclusion. Since, however, this unity is itself, nonetheless, grounded in the possibilities of the things themselves, there must be a Wise Being, in the absence of which none of these natural things would themselves be possible, and in which, as in a great ground, the essences of such a multiplicity of natural things are united into such regular relations. But then it is clear that not only the manner of their connection, but the things themselves, are possible only in virtue of this Being. That is to say, they can only exist as the effects of this Being. It is this argument which first reveals the complete dependency of nature upon God. Now, if it be asked: 'How do these natures depend upon such a Being so that I can understand their harmony with the rules of wisdom?' – if this question be raised, I should reply: 'They depend upon something in this Being which, in virtue of its containing the ground of the possibility of things, is also the ground of that Being's own wisdom; for this wisdom presupposes the possibility of things in general.* But granted that the ground, which underlies not only the essence of all things but also the essence of wisdom, goodness and power, is a unity, it follows that all possibility must of necessity harmonise with these properties'.

* Wisdom presupposes that harmony and unity are possible in the relations. That Being which is by nature completely independent can only be wise in so far as it contains the grounds of even the *possible* harmony and perfections which offer themselves for realisation by that Being. If there were no such relation to order and perfection to be found in the possibilities of things, wisdom would be a chimaera. But if this possibility were not in itself grounded in the Wise Being, then this wisdom could no longer be independent in every respect.

^p boshafft.

3. Rules of the revised method of physico-theology

I shall briefly summarise the rules of the revised method of physico-theology as follows. Confidently assuming that the universal laws of nature are, in virtue of their dependency upon the Divine Being, fruitful in character, one may proceed in the following manner:

1. Even in the case of those constitutions in nature which are the most advantageous, one will always seek the cause of such advantageous dispositions among those universal laws which, in addition to producing other appropriate consequences, are also related, and related with a necessary unity, to the production of these particular effects as well.

2. One will note the element of necessity in this combination of different forms of adaptedness in a single ground. It is important to do so for two reasons. Firstly, the way in which the dependency of things upon God is inferred from this necessary combination of different forms of adaptedness in a single ground is different from the way in which that same dependency is inferred from a unity which has been artificially devised and deliberately chosen. Secondly, there is a distinction to be drawn between that which is the effect of constant and necessary laws and that which is the product of blind chance.

3. One will presume that the necessary unity to be found in nature is greater than strikes the eye. And that presumption will be made not only in the case of inorganic^q nature, but also in the case of organic^r nature as well. For even in the case of the structure of an animal, it can be assumed that there is a single disposition, which has the fruitful adaptedness to produce many different advantageous consequences.^s Initially, we may have supposed that a variety of special provisions must have been necessary to produce such effects. Careful attention to the necessary unity of nature is both consonant with philosophy and advantageous to the physico-theological method of inference.

4. An order which is obviously artificial will be employed to infer the wisdom of an Author, construed as the ground of that order. On the other hand, the essential and necessary unity, which is to be found in the laws of nature, will be employed to infer the existence of a Wise Being, construed as the ground of this unity. The latter inference, however, will be mediated, not by the wisdom of this Being, but by that in him which must harmonise with that wisdom.

5. From the *contingent* connections of the world one will infer the existence of a Being who has originated the manner in which the universe is assembled.^t From the *necessary* unity of the world, however, one will infer

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^q unorganischen. ^r organisierten.

^s dass eine einzige Anlage eine fruchtbare Tauglichkeit zu viel vorteilhaften Folgen haben werde.

^t zusammengefügt.

the existence of that self-same Being, construed as the Author even of the matter and fundamental stuff of which all natural things are constituted.

6. This method will be extended by means of the universal rules which will be able to explain the grounds of the harmoniousness which exists between that which is necessary, either mechanically or geometrically, and the supreme good of the whole. And, in this connection, one will not omit to consider the properties of space itself, or to elucidate our fundamental thesis by appealing to the unity of the vast manifold of space.

4. Clarification of these rules

I should like to introduce some examples in order to render the above method more intelligible. The mountains of our planet are one of its most useful features.⁸⁴ *Burnet* regarded them as nothing more than a wild devastation inflicted upon man as a punishment for his sins, but he was obviously mistaken.⁸⁵ The usual method of physico-theology begins with an enumeration of the extensive advantages afforded by these mountainous tracts; it then proceeds to construe them as a divine provision instituted by the wisdom of God and designed to be of use in a variety of ways. This manner of arguing leads one to suppose that, in the absence of a special provision artificially devised to produce this effect, the universal laws of nature would have been incapable of giving the surface of the earth such a form. This appeal to the will of the Almighty imposes a reverential silence upon reason in its enquiries. On the other hand, according to a more enlightened way of thinking, the use and beauty of this natural provision do not constitute a reason for ignoring the universal and simple causal laws of matter, so that this arrangement can be regarded as something other than an incidental consequence of those same causal laws. The question whether the earth's spherical form does not in general produce benefits and have consequences which are even greater than those produced by the irregularities which cause its surface to deviate somewhat from a precisely spherical form – this is a question which is difficult to resolve. In spite of this, no philosopher has any reservations about regarding the earth's spherical form as the product of the most universal laws of statics, operative at the earliest period of the earth's history. Why should these unevennesses and prominences not also be the product of processes which are not artificially devised but purely natural? In the case of all large celestial bodies, it seems that the gradual transition from the liquid to the solid state is necessarily connected with the production of extensive cavities.⁸⁶ Such cavities necessarily form beneath its already solidified crust, when the lightest materials of the still molten mass within it, including air, slowly separate out and rise towards the surface. It further seems that, since the extensiveness of these cavities must be related to the size of the celestial body concerned, the collapse of these solid vaulted cavities will be correspondingly extensive.

Nor need we be taken aback or surprised by even a kind of regularity, or at least a series of unevennesses, where such productive forces are operative. For it is known that when light kinds of matter rise towards the surface at one point in a large amalgam, it has an influence upon the same movement in the adjacent region of the mixture.⁸⁷ I am not going to linger over this type of explanation, for I have no wish to express any particular attachment here to this kind of explanation. My only intention is to offer a brief explanation of the method of judging, which employs this type of argument.

The entire surface of the earth, not covered by water, is threaded in the most beneficial fashion by the courses of rivers as by furrows.⁸⁷ However, there are also so many inequalities, so many valleys and plains covering the surface of the earth that, at first sight, it looks as if the courses, in which the waters of the rivers flow, must of necessity have been especially constructed and ordered to that end.⁸⁸ Otherwise, it is argued, the waters flowing from the heights would, of necessity, have strayed far and wide in all directions, following the irregularities of the land, flooding many areas, converting valleys into lakes, and rendering the land wild and useless, rather than beautiful and well-ordered. Who can fail to notice the strong appearance of a necessary and extraordinary arrangement here? On the other hand, to assume that these things had been supernaturally instituted would be to put an end to all scientific research into the causal factors which bring rivers into existence. Not allowing myself to be misled by this kind of regularity, and not immediately assuming that the cause of such regularity must lie outside the sphere of the universal laws of mechanics, I shall, on the contrary, rely upon observation to teach me something about the way in which rivers are produced. If I adopt this procedure, I shall notice that the courses of many rivers are, even to this day, still in the process of formation, raising the height of their banks until they no longer flood the surrounding land as much as they once did. Observation convinces me that all the rivers of antiquity must really once have wandered over the surface of the earth in the way we feared they would unless special provisions were made to prevent them from doing so. This leads me to suppose that no such extraordinary provision was ever made. The river Amazon,⁸⁹ in one stretch of several hundred miles, shows clear signs that it once had no restricted river-bed, but that it must have flooded the land in all directions; for the land on both sides of the river is, to a great distance, as flat as the surface of a lake, and consists of river-sediment where pebbles are as rare as diamonds. Exactly the same is the case with the Mississippi.⁹⁰ And, in general, the Nile⁹¹ and other rivers show that their channels have been greatly extended in length with the passage of time; rivers seem to have started constructing their channels and extend-

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⁸⁷ Denn man weiss, dass das Aufsteigen der leichten Arten in einem grossen Gemische an einem Orte einen Einfluss auf die nämliche Bewegung in dem benachbarten Theile des Gemenges habe.

ing them from the point where they appear to have their estuaries, for near the sea, where they spread out over the flat surface of the land, rivers gradually build a channel and then flow on in an extended river-bed.^v Experience having put me on the right scent, I think that I can now reduce the entire mechanics, governing the formation of the channels of rivers, to the following simple principles. Spring-waters and rain-waters, flowing from the heights, initially poured down in an irregular fashion, following the gradient of the ground, filling up many valleys and spreading out over many flat regions. Where the water flowed most quickly, it was not so well able, because of its speed, to deposit its sediment; instead, it deposited it far more plentifully on both sides. In this way the height of the river-banks was raised, the strongest current of water staying within its channel. With the passage of time, when the supply of water was itself diminished (something which was bound to happen for reasons which are familiar to geologists), the river no longer overflowed the banks which it had itself built up. Regularity and order emerged from wild chaos. Even today, the process can be clearly observed, particularly in river-estuaries, which are the most recently formed part of a river. The depositing of sediment must, according to this scheme, occur more frequently near those places where the river initially overflowed its new banks than further away. It will likewise be observed that where a river flows through flat country, its channel will, in many places, actually be higher than the surrounding plains.

2:130 There are certain universal laws regulating the processes of nature, which are capable of throwing some light on the relation between the laws of mechanics, on the one hand, and order and harmoniousness, on the other. One such law is: the forces of motion and resistance continue to operate on each other until they afford each other the least impediment.⁹² The reasons for this law are very easy to understand. But the relationship which the consequences of this law have to regularity and advantage is amazingly large and extensive. The epicycloid, an algebraic curve, is of the following character. To take the example of teeth and gearwheels: when they are curved epicycloidically, friction is reduced to a minimum. The celebrated Professor Kästner⁹³ somewhere mentions⁹⁴ that an experienced mining expert⁹⁵ showed him, from machines which had been in use a long while, that this epicycloidic form was indeed eventually produced by the friction arising from protracted motion. The epicycloidic curve, which is based upon a fairly complicated construction, is, with all its regularity, the effect of a common law of nature.

Let me adduce one of the effects caused by rivers as an instance of a simple^w effect produced by nature which displays a tendency to regularity,

^v weil er sich zur See über den flachen Boden ausbreitete, baue er allmählich seine Laufrinne aus und fließt weiter in einem verlängerten Fluthbette.

^w schlecht / B: bad / C: semplice / F & Z: nuisibles / T: bad / (only C recognises that Kant is using *schlecht* in the now archaic sense of 'simple' or 'straightforward').

for it is subject to the above mentioned law. All the regions of dry-land vary greatly in gradient; it is thus to be expected that the rivers which flow over these sloping surfaces should now and again flow over precipices and cataracts.⁹⁶ And indeed precipices and cataracts really do occur, albeit only rarely. They display great irregularity and involve considerable inconvenience. But it can easily be seen that, although (as may be surmised) such waterfalls must have been frequent occurrences in the initial state of chaos, the violence with which the water plunged downwards will have eaten into and washed away the loose earth, even eroding certain types of rock which were not hard enough to resist the force of the waters. This process would have continued until the river had reduced its channel to a fairly uniform gradient. And this is why, where waterfalls are still to be found, the terrain is rocky and why the river, in very many stretches of its course, flows between sheer cliffs, into which it has probably cut its own deep channel. The fact that almost all rivers, for the greatest part of their courses, do not exceed a certain moderate velocity, and are thereby rendered navigable, has been found very useful to man. Now, to start with, the navigability of rivers was scarcely something which could have been expected to have arisen of its own accord from the extreme unevenness of the ground over which they flowed, without the intervention of art. Nonetheless, it can easily be seen that, with the passage of time, rivers would, of their own accord, reach a velocity which they could not easily exceed. Such a state would have been attained no matter how steeply the ground may have initially sloped. All that would have been important was that it was capable of erosion. For rivers will continue to wash away the ground, eating their way into the surface, lowering their courses in some places and raising their channels in others, until what they tear away when they are swollen is more or less equal to what they deposit when they are more sluggish. Force continues to be operative until greater moderation has been attained and equilibrium established as a result of the reciprocal effects of action and reaction on each other.

Nature offers countless examples of a single thing being extremely useful in a wide variety of employments. It is a great mistake to suppose, without further ado, that these advantages are purposive or the sort of effect which involves motives, for the sake of which the divine choice ordered their causes in the world. One advantage among others, of which the moon is the cause, is this: ebb and flow set ships in motion both against and in the absence of wind by means of currents flowing through straits and near to the mainland. Longitude at sea can be calculated by means of the moon and the satellites of Jupiter. The things produced in all the realms of nature have, each of them, great usefulness, and some of them we employ. It would be absurd to suppose, as is commonly the case, that all these benefits are motives for the divine choice. It would be ridiculous to appeal to the wisdom of the Author for having provided us with the means to calculate longitude,

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because of the use to which we can put the moons of Jupiter. One should take care not to incur the legitimate mockery of a Voltaire who, in a similar tone, asks: 'Why do we have noses?' and then replies: 'No doubt so that we can wear spectacles'.⁹⁷ The appeal to the divine power of choice does not adequately explain why a given means, necessary to the achievement of a single end, is advantageous in so many other respects as well. There is an admirable community to be found among the essences of all created things. This community is such that the natures of things are not alien to each other but are united in a complex harmony. They spontaneously agree with each other. Their essences contain within themselves an agreement which is extensive and necessary, and which aims at the perfection of the whole.⁹⁸ It is this which is the foundation of such a variety of benefits. If we adopt our revised method of physico-theology, these benefits can, indeed, be regarded as proofs of the existence of a supremely Wise Author. But these benefits cannot, in all cases, be regarded as provisions which have been instituted by a special wisdom, and instituted in such a way that they constitute a unity with the other provisions, made for the sake of special ancillary advantages. Without doubt, the reasons why Jupiter should have moons are complete, and they would have been complete even if the moons of Jupiter had never, as a result of the invention of the telescope, been employed for calculating longitude. Although these uses are to be construed as ancillary consequences, they are, notwithstanding, relevant to establishing the infinite greatness of the Author of all things. For they, along with millions of other things of like kind, are proofs of the great chain which links together, in the very possibilities of things, parts of the creation which seem to have no connection with each other. For the uses which emerge from the result of a freely instituted arrangement, which are known to the Author, and which are included in his decision, cannot always, on that account, be included among the motives for such a choice. They cannot be included, namely, if the motives of the choice are already, independently of the ancillary consequences, complete.⁹⁹ Certainly, water does not by nature adopt a horizontal position to enable us to see our own reflections in it. If one is to argue in a rational fashion, and if one adopts the restricted physico-theological method which we are employing here, the uses of the kind which we have observed cannot be put to the purpose envisaged. Only if that method is supplemented in the way we have specified can observations of the kind collected be effectively employed as the foundation of the important conclusion that all things are universally subject to a supremely

⁹⁷ sich zu einander von selbst schicken und eine ausgebreitete nothwendige Vereinbarung zur gesamten Vollkommenheit in ihren Wesen enthalten.

⁹⁸ denn sonst kann man auch nicht allemal die Nutzen, die der Erfolg einer freiwilligen Anstalt nach sich zieht und die der Urheber kennt und in seinem Rathschlusse mit befasst, um deswillen zu den Bewegungsgründen solcher Wahl zählen, wenn diese nämlich auch unangesehen solcher Nebenfolgen schon vollständig wären.

Wise Being. Extend your gaze as far as you can over the limitless uses which a created thing may, at least potentially, offer in a thousand different ways. (The palm-tree alone confers innumerable benefits on the Indians.) And then connect the most remote members of the creation with each other in relations such as these. And when you have suitably admired the products of the provisions which have been directly instituted by art, do not allow even the delightful spectacle of the fruitful relation which holds between the possibilities of created things and thoroughgoing harmony, nor the delightful spectacle of the natural sequence of beauty, which is so manifold and presents itself spontaneously to our admiration – do not allow these delightful spectacles to distract you from admiring and worshipping that power, in the eternal and ultimate fountain-head of which the essences of things lie ready prepared, as it were, for use in an excellent plan.

I would remark in passing that the great reciprocal relationship which is to be found among the things in the world does not deserve to be surveyed quite so cursorily, in the light of the frequency with which those same things occasion similarities, analogies, parallels, or however else one chooses to designate them. Without pausing to consider its employment in the play of wit – an employment which is often only imaginary – there is, nonetheless, it seems to me, an important topic for philosophical reflection to be found here. The question is this: how is it possible that an agreement, which is rooted in a certain common ground of uniformity and which holds between very different things, should be so great, so extensive, and yet also so precise? These analogies also constitute a very crucial means to the acquisition of cognition. Mathematics itself offers instances of such analogies. I shall, however, forbear from adducing any examples, for it is to be feared that, because of the various ways in which such similarities may be experienced, they may strike the understanding of different people in different ways. In any case, the idea which I have casually mentioned here is incomplete and not fully intelligible as it stands.

If one were to ask about the use which could be made of the great unity which prevails among the many different relations of space and which are investigated by geometry, I suspect that the universal concepts of the unity of mathematical objects might also reveal the grounds of the unity and perfection of nature. For example, of all figures, the circle is the one in which the circumference encloses the greatest possible area which can be enclosed by a line of that length. The reason, namely, is that the distance between the centre and the circumference is strictly constant throughout the figure. If a figure is to be bounded by straight lines, then the greatest possible equality in respect of the distance between the sides and the centre of the figure can only occur if the following conditions are satisfied: not only must the distances between the angles and the centre of the

⁹⁹ ungekünstelt. * Spiele des Witzes.

figure be exactly equal to each other, but the perpendicular lines extended from the centre to the sides must also be exactly equal to each other. If these conditions are satisfied, a regular polygon is the product. Geometry shows that another polygon^b with the same number of sides and the boundary of which was of the same length as its regular counterpart would always enclose a smaller space than that regular counterpart.^c Another and, indeed, the simplest kind of equality of distance from the centre is possible: namely, when it is only the distance of the angles of the polygon from the common centre which is equal throughout. Here it appears that any irregular polygon which can be enclosed within a circle embraces the greatest space which can be encompassed by those same sides.^d In addition to this, consider, finally, the polygon in which the length of the sides is equal to the distance of the points of the angles from the centre, in other words, the regular hexagon. Of all figures whatever, this is the only figure which bounds the greatest space with the shortest boundary so that if it is externally juxtaposed with other figures which are the same as itself no interstices will be left. The following observation immediately suggests itself: the reciprocal relationship between the greatest and the smallest in space depends upon equality. And since nature offers many other cases of such a necessary equality, it follows that the rules derived from the aforementioned geometrical cases relating to the universal grounds of such a reciprocal relation between the greatest and smallest, may also be applied to the necessary observance of the law of parsimony in nature.^e In the laws of impact, a certain equality is always necessary, for the following truths hold: in the case of rigid bodies, the velocity of the two bodies after impact is always equal; in the case of elastic bodies, they are always propelled away from each other with equal force by their elasticity, the force with which they rebound from each other being that with which the impact occurred; the centre of gravity of both rigid and elastic bodies, whether they be at rest or in motion, is in no way affected by the impact; and so on, and so forth. The variety of spatial relations is so infinite and yet it yields a cognition which is so certain and an intuition which is so clear that, just as these relations have often served admirably as symbols of cognitions of quite a different kind (for example, in the expression of probabilities), these same spatial relations can also enable us to recognise, from the simplest and most universal principles, the rules of perfection present in naturally necessary causal laws, in so far as they depend upon relations.

Before I conclude this section, I should like to enumerate all the differ-

^b ein anderes Polygon.

^c und es zeigt sich durch die Geometrie, dass mit eben demselben Umkreise ein anderes Polygon von eben der Zahl Seiten jederzeit einen kleineren Raum einschliessen würde als das reguläre.

^d und da zeigt sich, dass ein jedes irreguläre Polygon welches im Kreise stehen kann, den grössten Raum einschliesst unter allen der von eben denselben Seiten nur immer kann beschlossen werden.

^e des Gesetzes der Sparsamkeit.

ent degrees of the philosophical mode of explanation of the appearances of perfection, which occur in the world, in so far as these appearances are all regarded as being subsumed under God. I shall do so by beginning with that mode of judging where the philosophy is still concealed, and ending with that in which the philosophical effort is the greatest. I am speaking of order, beauty and appropriateness, in so far as they constitute the ground for subsuming things in the world under a Divine Author in a fashion which is appropriate to philosophy.

Firstly: An individual event in the course of nature can be regarded as something issuing immediately from a divine action. In such a case as this, the only business of philosophy is that of presenting an argument in favour of this extraordinary dependency.

Secondly: An event occurring in the world may be regarded as an individual case, the mechanism of the world having been, from the start, so organised at creation as specifically to bring about this event. An example of such an event would be the flood, as it is construed in the systems of various modern philosophers.¹⁰⁰ The event, however, is not the less supernatural for having been produced by mechanical laws. Natural science is employed by the philosophers we have just mentioned. But it merely furnishes them with an opportunity to display their own dexterity, and provides them with a means for imagining a process, which could occur in accordance with the universal laws of nature, and issue in the extraordinary event envisaged beforehand. Normally, such a procedure is incompatible with the divine wisdom, which never sets out to make a parade of itself with superfluous art. Such a procedure would be criticised even in a human being. An example of such superfluous art would be the case of someone who, perfectly able to fire off a cannon directly, attached a clockwork mechanism to the firing-device so that the cannon would be discharged at a given time by means of this ingenious mechanical arrangement.

Thirdly: Certain features of nature are regarded as provisions which have existed since the creation, and which have issued immediately from the hand of the Great Architect.¹⁰¹ More specifically, these features are regarded as individual provisions; they are not regarded as arrangements which have been introduced in accordance with constant law. An example of this view would be the claim that God had at the very beginning of things directly ordered the mountains,¹⁰² the rivers, the planets and their motions.¹⁰³ In so far as it is certain that there must have been some state of nature which was the first state, where both the form and the matter of things were immediately dependent on God – to that extent there is a philosophical basis to this mode of judging. However, this method is philosophical to only a very slight degree: it is the mark of excessive haste to ascribe an arrangement immediately to the act of creation just because

it is advantageous and orderly, and to do so without first examining the suitability which belongs to things in accordance with universal laws.

2:136 *Fourthly:* Something is attributed to an artificially devised order of nature before it has been properly established that nature is incapable of producing that phenomenon in accordance with her universal laws. For example, when something which could perhaps be accounted for in terms of ordinary mechanical forces, is explained in terms of the plant- and animal-kingdoms, simply because order and beauty are prominent there.⁸ The philosophical character of the mode of thought which maintains that each individual animal or plant is immediately subsumed under a special act of creation is then even less than that of the view which maintains that, with the exception of a few directly created organisms, all other creatures are subsumed under them in accordance with a law which governs the ability to generate (not merely one which governs the capacity to unfold).⁹ This latter type of theory is more philosophical because it explains a greater number of phenomena in terms of the order of nature. Its philosophical superiority could only be challenged if it could be clearly demonstrated that the order of nature was incapable of explaining the phenomenon under examination. All explanations of provisions in the world, not just those relating to the animal- and plant-kingdoms, which are presented in terms of laws which have been artificially instituted with a view to realising some specific objective – all such explanations belong to this degree of the philosophical mode of explanation.* An example of this type of explanation would be the supposition that the order of nature, which produces the phenomena of snow and the *aurora borealis*, had been introduced specifically in order to benefit the Greenlanders and the Lapps (so that they need not spend the long winter nights in darkness) – a supposition made in spite of the fact that these phenomena are probably convenient ancillary consequences arising with necessary unity from other laws. One is almost always in danger of falling into error when one alleges that certain forms of usefulness to man are the reason for some special

* In the second number of the third reflection of this section, I have only adduced cases from the plant- and animal-kingdoms as examples of an artificially devised order of nature. It is, however, to be remarked that any law which is instituted for the sake of some special use is artificially devised, for it is then no longer connected with the other laws of nature with necessary unity. This is evident from a number of the examples mentioned here.

⁸ z.B. wenn man etwas aus der Ordnung des Pflanzen- und Thierreichs erklärt, was vielleicht in gemeinen mechanischen Kräften liegt, bloss deswegen weil Ordnung und Schönheit darin gross sind / (the crucial phrase is *aus der Ordnung*; it means not 'belonging to the order' but 'in terms of or by reference to the order').

⁹ Das Philosophische dieser Art zu urtheilen ist alsdann noch geringer, wenn ein jedes einzelne Thier oder Pflanze unmittelbar der Schöpfung untergeordnet wird, als wenn ausser einigem unmittelbar Erschaffenen die andere Producte denselben (i.e., einigem unmittelbar Erschaffenen) nach einem Gesetze der Zeugungsfähigkeit (nicht bloss des Auswickelungsvermögens) untergeordnet werden.

divine arrangement. Take, for example, the supposition that the forests and fields are for the most part green in hue because green is the one colour which has an intermediate intensity and which thus does not strain the eye. The objection may be raised that the inhabitants of the Davis Straits get almost blinded by the snow and have to resort to the use of snow-spectacles. What is objectionable is not that useful consequences are sought out and attributed to a Benevolent Author. What is objectionable is rather the fact that the order of nature which produces these useful consequences is construed as being artificially and deliberately connected with other orders of nature,⁷ whereas, in fact, it may perhaps be necessarily connected with them.

Fifthly: The spirit of true philosophy is most powerfully manifest in the following method of judging the perfect provisions of nature. This method is at all times ready to admit the occurrence of even supernatural events. It is likewise always ready to recognise the existence of any genuinely artificially devised order of nature. Above all, it allows neither nature's aiming at interest, nor all its harmoniousness, to hinder it from trying to discover their foundations in necessary and universal laws. And in the attempt to discover these grounds, it always pays careful attention to the preservation of unity, displaying a rational aversion to multiplying the number of natural causes in order to explain the benefits and harmony of nature. If, in addition to this, the physico-theological mode of judging also concentrates its attention on the universal rules which are capable of explaining the ground of the necessary connection, which holds between, on the one hand, that which occurs naturally without special provision, and, on the other hand, the rules relating to the advantage and convenience of rational beings, and if one then proceeds to ascend to the Divine Author – if all these conditions are satisfied, then this mode of judging will fulfil its obligations in a fitting fashion.*

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SEVENTH REFLECTION: COSMOGONY¹⁰⁵

A mechanical hypothesis to explain the origin of the celestial bodies and the causes of their movements, in accordance with the rules established above

The form of the celestial bodies, the mechanics in accordance with which they move and constitute the system of the universe,⁸ and likewise the

* All that I am saying here is that this must be the path followed by human reason. For who will ever be able to save it from falling into frequent error in matters such as these? As Pope puts it:

Go teach eternal Wisdom how to rule—
Then drop into thyself, and be a fool!¹⁰⁴

⁷ künstlich und willkürlich. ⁸ mit andern (sc. Ordnungen) verbunden. ¹⁰⁵ Weltsystem.

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numerous changes to which the positions of their orbits are subject with the passage of time – all this now forms a part of natural science and is understood with great distinctness and certainty. So great, indeed, is this distinctness and certainty that there is no other view of the matter which can be adduced to explain any natural object (which even approximates to the complexity of the present object) in such an undubitably correct fashion and with such self-evidence. If one bears this in mind, must not the idea also occur to one that the state of nature, in which this structure¹ took its rise and in which there was first impressed on that structure the movements which now continue to occur in accordance with such simple and intelligible laws – that this state of nature will be easier to understand and grasp than perhaps the majority of the things of which we also seek the origin in nature. The reasons which favour this supposition are obvious. As far as we know, all these celestial objects are spherical masses, which are neither organic in structure^{ms106} nor mysteriously magical in origin. The force which moves these bodies is, in all probability, a fundamental force, which is a property of matter itself. As such, it may not and, indeed, it cannot be explained. The projectile motionⁿ with which they pursue their flight, the direction of the momentum^o imparted to them are, along with the formation of their respective masses, the chief, indeed, almost the only phenomena, for which the first natural causes are to be sought. These phenomena are all of them simple effects. They are not nearly so complex as the majority of the other phenomena of nature, in the case of which the laws governing them are not normally known with mathematical accuracy. The phenomena with which we are concerned here, in contrast, lie plainly before our eyes in a highly comprehensible scheme of things. Our enquiry, holding out such promise of success, is faced with but one impediment – the impression made upon our minds by the stirring grandeur of a natural phenomenon such as the solar system. In such a system, the natural causes are all the subject of suspicion: they seem to be too flimsy to attain their purpose, and they seem not to be compatible with the creative rights of the Supreme Author. But could not the same objection also be raised against the laws of mechanics, which enable the great system of the universe, once it has come into existence, to maintain its movements in existence? Their continuation depends upon precisely the same law which prescribes the trajectory of a stone thrown into the air. This simple law, the fruitful source of the most regular

¹ *Bau*.

ⁿ *ohne Organisation* / (the German word *Organisation* is related to the notion of a living organism, and that in a much more intimate fashion than the English word 'organisation' [See Grimm, *Organisation*]).

ⁿ *Wurfbewegung* / B: projectile motion / C: *moto di proiezione* / F: *mouvement de progression* / T: motion / Z: *mouvement d'impulsion*.

^o *Schwung*.

effects, is worthy of being entrusted with the maintenance of the entire system of the universe.

On the other hand, it will be said, one is incapable of rendering distinct the natural causes which bring the humblest plant into existence in accordance with completely comprehensible mechanical laws, and yet one dares to explain the origin of the entire system of the universe. But has any philosopher ever been able to render even the laws, which govern the growth and inner motion of an already existent plant, as clear and mathematically certain as those which regulate the motions of the celestial bodies? The nature of the objects in the two cases are completely different. In the present instance, the great and the astonishing are infinitely more accessible to the understanding than the tiny and the marvellous. The generation of a planet, together with the cause of the momentum^a with which it is projected so as to run in a circular orbit, can, it seems, be more easily and more clearly understood than the generation of a single snow-flake. The precise proportions of a six-pointed star-shaped snow-crystal are, to all appearances, more exact than the curvature of the planetary orbits; and the axes of the snow-crystal relate to their common plane more precisely than the orbits of the celestial bodies relate to the common plane of their orbital motions.^a

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I am going to present an attempt to explain the origin of the system of the universe in terms of the general laws of mechanics. The explanation relates, not to the entire order of nature, but only to the great masses of matter and their orbits, which constitute the most primitive foundation of nature. In spite of the crudity and incompleteness of my sketch, I hope to say something which may stimulate others to make important observations of their own. Some of what I say has, in my opinion, a degree of probability which, in the case of a smaller object, would leave little room for doubt. The only possible objection which might be raised is the prejudice that the origin of the universe requires for its explanation more art than that ascribable to the universal laws of nature. It often happens that, although one does not find what one is really looking for, one stumbles in the course of one's search on other unexpected advantages. Even an unexpected advantage of this kind, if it presented itself to the reflection of someone else, would be profit enough. And even if in the process the chief purpose of the hypothesis were demolished, the benefit gained would still be profit enough. In this undertaking, I shall presuppose the universal gravitation of matter as formulated by *Newton* and his followers. If there are any who think that, by employing a definition drawn from

^a *Wurfbewegung* / B: projectile motion / C: *moto di proiezione* / F & Z: *force de projection* / T: impulse.

^a *Kreisbewegungen*.

metaphysics^r and formulated according to their own taste, they can demolish the conclusions established by men of perspicacity on the basis of empirical observation and by means of mathematical inference – if there are such persons, they may ignore what follows as something which has only a remote bearing on the main purpose of this book.

1. *An expanded view of the totality^a of the universe*

The six planets, together with their satellites, move in orbits which do not markedly deviate from a common plane of reference,¹ namely, that constituted by the extended equatorial plane of the sun. The comets, on the other hand, pursue courses which deviate very greatly from it, straying in all directions, far from this plane of reference.¹⁰⁷ Now, if instead of this tiny handful of planets and comets, there were several thousand of them belonging to the solar system, the zodiac would appear as a zone illuminated by numberless stars, or as a band fading away into a pale glimmer. Some of the nearer planets in the band would shine fairly brightly, whereas the more remote planets, because of their number and faintness, would only present a misty appearance. For with the orbital motion,² with which all these planets circulated around the sun, every part of the zodiac would always be occupied by some of them, even though others would have changed their position. On the other hand, the comets would occupy the regions on both sides of this bright zone in every possible dispersion.³ Now, with our minds prepared by this fiction (in which we have simply imagined an increase in the number of bodies in our planetary system), let us cast our eyes on the wider expanse of the universe. If we do so, we shall actually see a bright zone in which the stars, though apparently at varying distances from us, are nonetheless concentrated more densely in one particular plane than elsewhere,⁴ while the celestial regions on both sides of this plane are occupied with stars in every kind of dispersion. The Milky Way, for it is this to which I am here referring, has precisely the orientation of a huge circle.¹¹⁰⁸ This characterisation⁵ is worthy of every attention: it enables us to understand that the sun, along with our own planet, is to be found in that multitude of stars which is most densely concentrated in a certain common plane of reference. This analogy provides us with a strong reason for the following suppositions: these suns, of which our own is one, constitute a universe which is ordered on the large scale in accordance with exactly the same laws as those in accordance with which our own solar system is ordered on the

^r eine Definition der Metaphysik / (the German is ambiguous for it is not clear whether Kant means a definition which is furnished by metaphysics or a definition of the notion of metaphysics itself; the present translator inclines to the former reading).

¹ Inbegriff. ² Beziehungsplan. ³ Kreisbewegung. ⁴ Zerstreuung.

⁵ dichter wie anderwärts gehäuft sind. ⁶ die Richtung eines grössten Zirkels.

⁷ Bestimmung / (alt: determination, characteristic).

small scale.¹⁰⁹ All these suns, together with their satellites, will share a focal point common to their orbits. The only reason why they seem not to change their position is their immeasurable distance from the earth and the slowness of their orbital motions, though a certain displacement of position² has actually been observed in the case of some of them. The orbits of these great celestial bodies are likewise related to a common plane, from which they do not significantly deviate, in exactly the same way as the planets of our solar system are related to a common plane. Those bodies which occupy the remaining celestial regions with much less frequency are analogous to the comets of our own planetary system.¹¹⁰

This hypothesis³ has, in my opinion, an extremely high degree of probability. It suggests that if, in addition to the order to which our own sun belongs, and which presents to an observer located within that order the appearance of a Milky Way, there are other such higher cosmic orders,⁴ then some of them will be visible as pale glimmering patches⁵ in the depths of space. It can further be supposed that if the plane of reference⁶ of another constellation of fixed stars should be positioned obliquely in relation to ourselves, then it would present the appearance of an elliptical figure representing, in an area which will appear small because of the vast distances involved, a system of suns similar to our Milky Way.¹¹¹ And, indeed, astronomers have long ago already actually discovered such little patches,⁶ although opinions about them vary considerably, as is evident from the book by *Maupertuis* on the constellation of the stars.¹¹²

I hope that this reflection will be considered with some attention, and that for two reasons. Firstly: the concept of creation suggested by my hypothesis is, to an astonishing degree, a great deal more moving than the usual concept. (A numberless multitude of suns like our own make up a system, of which the members are connected by orbital motions; these systems, of which there are probably countlessly many, though we can only perceive a few of them, may themselves, in their turn, be members of a yet higher order.) Secondly: guided by an hypothesis such as the one we have proposed, even the observation of the fixed stars (or rather the slowly moving suns) near the earth can reveal a great deal which would otherwise escape notice, for lack of some plan of enquiry.⁷

2. *Reasons favouring a mechanical origin of the solar system in general*

All the planets without exception revolve around the sun in the same direction, deviating only slightly from the common plane of reference,

¹ einige Verrückung ihrer Stellen. ² diesem Begriffe. ³ mehr solche höhere Weltordnungen.

⁴ blosse, schimmernde Plätze. ⁵ Beziehungsplan. ⁶ Plätzchen.

⁷ in so fern nicht ein gewisser Plan zu untersuchen ist.

which is the ecliptic. Their motion around the sun is just like that which solid bodies would have if they were swept along by some material substance which, occupying all the available space, executed its motion by rotating vortically on its axis.¹³ The planets are all of them attracted towards the sun, and the magnitude of their centrifugal forces¹⁴ must have a high degree of accuracy, if they are to run in circular orbits.¹⁵ But geometrical precision is not to be expected in mechanical phenomena of this kind, and it is indeed the case that all the orbits deviate, albeit only slightly, from the curvature of a circle.¹⁶ The planets consist of materials which are, according to Newton's reckoning, the less dense the further they are from the sun. And this is exactly what one would expect if the planets had been formed from a cosmic matter¹⁷ dispersed throughout the space in which they are now suspended.¹⁸ For with the tendency with which everything sinks towards the sun, the materials of a denser kind must press more strongly towards the sun and be found more frequently in its proximity than materials of a lighter kind, their descent being slower on account of their lower density. However, according to the observation of *Buffon*, the matter of which the sun is composed has approximately the same density as that which the total mass of all the planets added together would have.¹⁹ This, too, is consonant with a mechanical account of their formation, according to which the planets may have been formed at varying distances from the sun from different types of element. All the other elements, mingled together and occupying this space, may have plunged to their common focus, the sun.

If, regardless of this explanation, someone should allege that such a structure has been formed directly by the hand of God, and be unwilling to entrust anything to the law of mechanics, he will have to offer some sort of explanation as to why he finds such an account necessary here, when he would not normally be willing to admit such an account in natural sciences. He can name no purpose to explain why it should be better for the planets to move in one direction rather than in a number of different directions, nor why they should revolve around the sun in orbits approximating to a single common plane of reference rather than orbiting in all the regions of space.²⁰ The celestial spaces are now empty, and the planets would not, in spite of all these movements, present any impediments to each other. I readily admit that there may be concealed purposes which could not be attained by ordinary mechanical means and which no one can understand. But, be that as it may, no one is entitled to assume that such purposes exist if he wishes to base his opinion on them, unless he is able to specify what those purposes may be. Finally, if God had immediately imparted motion²¹ to the planets and established their orbits, one would not expect to find the character of imperfection and deviation

¹³ Seitenschwung. ¹⁴ Cirkelkreisen. ¹⁵ Cirkelrundung. ¹⁶ Weltstoff. ¹⁷ Wurfkraft.

which is to be met with in all the products of nature. If it had been a good thing for them to relate to a single plane, then one would expect that God would have fixed their orbits in that precise plane. If it had been a good thing for their orbits to approximate to circular motion, one would expect that their orbits would have been exactly circular. It is not clear why there should have been any exceptions to the strictest precision,²² particularly in the case of things which are supposed to be the immediate product of God's own activity as an artist.²³

Those members of the solar system which are located at the greatest distance from the sun, the comets, have very eccentric courses. If their courses were an immediate product of God's activity, they might just as well have moved in circular orbits, even though their courses deviate so much from the ecliptic. Much boldness will be deployed in thinking up uses for such eccentric orbits. For it is easier to understand that a celestial body, no matter what region of the heavens it may occupy, should orbit around its gravitational centre at a constant distance and be ordered in accordance with this distance, than that it should, equally advantageously, be ordered to run in a very eccentric orbit.²⁴ As for the benefits adduced by Newton, it is obvious that they are in the highest degree improbable, unless one assumes that things have been directly arranged by God, so that the advantages alleged may serve at least as some pretence of a purpose.

The error involved in ascribing the structure of the planetary system directly to divine intentions is most clearly apparent in the invention of motives to account for the fact that the density of the planets and their distance from the sun stand in inverse proportion to each other. The effect of the sun, it is argued, decreases as its distance increases; it was proper that the density of the bodies to be heated by the sun should be adjusted proportionately. Now, it is known that the sun penetrates only a small depth beneath the surface of a celestial body. It is not, therefore, possible to infer the density of the whole mass from the sun's power to heat it. The conclusion drawn is out of all proportion to the purpose to be attained. The means employed, namely, the reduced density of the whole mass, involves a provision which is so extensive as to be, relative to the magnitude of the purpose to be attained, excessive and unnecessary.

Everything which is produced by nature, in so far as it tends towards harmoniousness, order and usefulness, agrees, it is true, with God's purposes. But it also displays the characteristic of having originated from universal laws. The effects of such universal laws extend far beyond any such individual case. Accordingly, each particular effect shows signs of an

²¹ von der genauesten Richtigkeit. ²² eine unmittelbare göttliche Kunsthandlung.

²³ denn es ist eher begreiflich, dass ein Weltkörper, in einer Himmelsregion, welche es auch sei, in gleichem Abstände immer bewegt, die dieser Weite gemässe Einrichtung habe, als dass er auf die grosse Verschiedenheit der Weiten gleich vorthellhaft eingerichtet sei.

intermingling of laws, which were not aimed exclusively at producing the individual effect alone. This is why deviations from the greatest possible exactitude in respect of a particular purpose also occur. By contrast, an immediate supernatural provision, since its execution does not at all presuppose the consequences which arise from the universal causal laws of matter, will not be marred by the interference of particular ancillary consequences arising from those laws. Such a provision will rather realise the plan with the greatest possible precision. It is in those parts of the planetary system which are closer to the common centre where a greater approximation to perfect order and strict precision are to be found. But out towards the limits of the system, and far from the plane of reference, this order and precision declines into irregularity and deviations. And this is exactly what one would expect of a constitution which was mechanical in origin. In an arrangement which is the product of an immediate divine intervention one can never encounter purposes which are only imperfectly realised: the greatest precision and accuracy will everywhere be present.¹¹⁷ Such is the case, for example, in the structure of animals.

3. *Brief outline of the most probable way in which a planetary system may have been mechanically formed*

The arguments which have just been adduced in favour of a mechanical account of the origin of the solar system are very weighty – so weighty, indeed, that just one or two arguments on their own have long since sufficed to induce natural scientists to seek the cause of the planetary orbits among the forces of nature. They are induced to do so chiefly because the planets orbit around the sun in the same direction in which the sun itself revolves upon its axis, and because their orbits coincide so closely with the equatorial plane of the sun. *Newton* was the great destroyer of all these vortices,¹¹⁸ although people continued to be attached to them, long after he had demonstrated their superfluity. The celebrated *Mairan* was a case in point.¹¹⁹ The reliable and convincing proofs of the Newtonian philosophy clearly showed that there was no trace of anything in the heavens corresponding to what the vortices, which allegedly carried the planets around on their courses, were supposed to be. *Newton* demonstrated that the absence of such a current of fluidity in these spaces was so complete that even the tails of the comets continued on their way undisturbed right across all these orbits. From this it could certainly be concluded that, since the celestial spaces were now shown to be absolutely empty, or at any rate infinitely rarified, there could be no mechanical cause to impart to the planets their orbital motions.¹²⁰ However, instantly to abandon all the laws of mechanics and set up the rash hypothesis that God had directly imparted motion to the planets so that, in virtue of their gravitational attraction, they continued to move in orbit – this was a step

too large to be contained within the limits of philosophy. It is immediately obvious that there remains one situation in which mechanical causes could originate the constitutions of the solar system, and it is this: if the space which is at present occupied by the planetary system and which is now empty, had previously been filled, so as to produce a community of motive forces^a throughout all the regions of the space now affected by the sun's gravitational attraction.¹²¹

I can now specify the one possible condition under which alone the heavenly motions can be mechanically caused. That there is only one such possible condition is a circumstance of some considerable weight for justifying an hypothesis, and it is not one of which one can often boast. Since space is now empty, it must once have been filled, for otherwise the orbiting motive forces could never have produced their extensive effect. Accordingly, this diffused matter must subsequently have gathered itself together to form the heavenly bodies. In other words, closer examination shows that the heavenly bodies will have formed themselves from the elementary matter which was once diffused throughout the space now occupied by the solar system. The motion possessed by the particles of matter when they were dispersed, continued to be possessed by them after they had been united together to constitute distinct masses of matter.^b Since then this space has been empty; it contains no matter which could serve to impart orbital motion to these bodies. But it has not always been empty. We perceive motions for which there cannot now be any extant natural cause; they are relics of the raw state of nature which dates from the earliest period of its history.¹²²

I should like to take just one more step beyond this remark, with a view to drawing closer to a probable conception both of the way in which these great masses came into being and of the causes of their movements. I shall leave it to the enquiring reader himself to fill in the details of this rough outline. If the matter of which the sun and all the other heavenly bodies are constituted and which is subject to their mighty gravitational attraction were diffused throughout the whole of the space which is now occupied by the planetary system, and if there were some matter which exercised a more powerful gravitational attraction somewhere in the region of the place now occupied by the mass of the sun, then there would occur a universal falling of particles towards that spot, the gravitational attraction of the solar body increasing as its mass increased. It may easily be supposed that in the universal fall of particles, including those from even the remotest regions of the universe, the denser materials will have accumulated in the deeper regions, where everything was pressing forwards to the common centre, and they will have accumulated there with a frequency

^a eine Gemeinschaft der Bewegkräfte. ^b abgesonderte Massen.

^c die aber Überbleibsel des allerältesten rohen Zustandes der Natur sind.

proportionate to their proximity to that centre, although materials of every kind of density were to be found in all the regions of space. For it would only be the heaviest particles which would have the greatest capacity to penetrate the mixture of lighter particles in this chaos, so as to get nearer to the centre of gravity.⁷ In the motions resulting from the fall of particles from differing altitudes within the sphere, the resistance offered by the colliding particles to each other can never be in exact equilibrium. As a consequence, the velocities which the colliding particles have acquired will be converted into lateral motions in one direction or another. This circumstance shows a very common rule at work relating to the effects which materials exercise on each other: they impel each other, change each other's direction, and restrict each other until they afford each other the least resistance.¹²³ As a result of this rule, the lateral motion of the particles must eventually unite to form a common rotation in one and the same direction. And so the particles of which the sun is constituted reached it already invested with this lateral motion; and the sun, formed from this material, must have rotated in exactly the same direction.¹²⁴

It is, however, clear from the laws of gravitation that all the parts of this great rotating mass of cosmic matter¹ must have a tendency to traverse² the plane which passes through the centre of the sun in the direction of their common rotation, and which, according to our reasoning, coincides with the equatorial plane of this celestial body, unless, that is, they are already located on the plane. Thus, all these particles will be concentrated most densely and chiefly in the neighbourhood of the sun, in the region close to its elongated equatorial plane. Finally, it is also very natural that, since the particles of matter³ must either impede or accelerate each other, in a word, must either collide with each other or drive each other on, and must continue to do so until one of them is no longer able to modify the movement of the other, it follows that in the end everything eventually ends up in a state where the only particles⁴ which remain freely suspended are those which have exactly the degree of lateral swing⁵ which is needed, at that distance from the sun, to balance the gravitational attraction⁶ of the sun, so that all these particles rotate freely in concentric circles. This velocity is an effect of the fall; the lateral motion⁷ is an effect of the colliding of the particles, and this situation continues until the resistance offered by everything in the system has been reduced to a minimum. The remaining particles,⁸ which were unable to attain such exact precision, must, as their speed slowly diminished, have sunk to the focus of the general gravitational field,⁹ so as to increase the mass of the sun. The

¹ *Gravitationspunkte* / B: point of gravitation / C: *centro di gravitazione* / F: *noyau central* / T: centre of gravity / Z: *point de gravitation*.

² *in diesem herumgeschwungenen Weltstoffe alle Theile.* ³ *durchschneiden.* ⁴ *Partikeln.*

⁵ *Theilchen.* ⁶ *Seitenschwung.* ⁷ *Gravitation.* ⁸ *die Bewegung zur Seiten.*

⁹ *Theilchen.* ¹⁰ *Mittelpunkt der allgemeinen Gravitation.*

density of this latter body will, accordingly, be more or less equal to the average density of the materials found in the space around it. However, the mass of the sun will, if the above circumstances hold, as a matter of necessity, far exceed that of the matter which has remained suspended in the space around it.¹²⁵

This state of affairs seems to me to be natural. Matter is diffused throughout the system. This matter is destined to form the different heavenly bodies in the narrow region immediately contiguous to the elongated plane of the solar equator; the specific gravity of this matter increases proportionately to its proximity to the centre of the system; and its momentum¹ is at all places sufficient, at this distance, to sustain an unimpeded orbital motion around the sun, sometimes at great distances from it, in accordance with the laws of gravitation.² In a situation such as this, if it is supposed that the planets are formed from these particles³ of matter, then the planets cannot avoid having the centrifugal force⁴ which causes them to move in almost circular orbits, though they will deviate slightly from perfect circularity since the planets themselves are constituted of particles of matter which have emanated from different altitudes. It is likewise very natural that those planets which are formed at great altitudes (where the space around them, being so much greater, causes the differences in velocity of the particles to exceed the force with which they are attracted to the centre of the planet) should have come to have even greater masses⁵ than the planets in the neighbourhood of the sun.¹²⁶ I shall not mention the other ways in which my hypothesis harmonises with many other remarkable phenomena in the planetary system, for they are obvious.⁶ Those bodies, the comets, which are formed in the most remote regions of the systems, especially when they are formed at a great distance from the plane of reference, will be incapable of this regularity. In this way, the region of space occupied by the planetary system will become empty, once everything has formed into discrete masses.⁷ However, in later epochs, particles from the most extreme limits of this gravitational

* The above explanation applies to the formation of smaller systems which form constituent parts of the larger planetary system, as is for example the case with Jupiter and Saturn and their axial rotations, for there is an analogy between the larger and the smaller systems.¹²⁷

¹ *Schwung* / (alt: swing, swinging motion).

² *nach den Centralgesetzen* / B: Central laws / C: — / F & Z: *lois centrales du système* / T: laws of central force / (The word *Centralgesetz* is not listed in Grimm either under Kant's spelling or under the more natural *Zentralgesetz*; *Centralkraft* is listed with the meaning: gravitation, attraction. This suggests that *Centralgesetz* must mean 'law of gravitation'.)

³ *Theilchen.*

⁴ *Schwingungskrafte* / B: motive powers / C: *forze centrifughe* / F: *vitesses* / T: motive forces / Z: *forces motrices* / (alt: momentum).

⁵ *auch grössere Klumpen.* ⁶ *in abgesonderten Massen.*

field may still sink downwards, and they will then continue to orbit freely around the sun in the celestial spaces. These will be materials of the most extreme rarification, possibly the matter of which the zodiacal light is constituted.

4. Remark

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The primary intention of this reflection is to give an example of the procedure which our above proofs entitle us to adopt. They remove the baseless suspicion, namely, that explaining any of the major arrangements in the world by appealing to the universal laws of nature opens a breach which enables the wicked enemies of religion to penetrate its bulwarks.¹²⁸ In my opinion, the hypothesis adduced has, to say the least, grounds enough in its favour to invite men of wide understanding to a closer examination of the scheme, a mere rough outline, presented in that hypothesis. I shall have achieved my purpose, as far as this book is concerned, if, with confidence established in the regularity and order which may issue from the universal laws of nature, the reader opens up a wider field to natural philosophy, and can be induced to recognise the possibility of an explanation such as the one offered here, or one like it, and to acknowledge the compatibility of that explanation with knowledge of a wise God.¹²⁹

Incidentally, now that that favourite tool of so many systems, the vortex, has been banished from the sphere of nature¹³⁰ and relegated to Milton's limbo of vanity,¹³¹ it would perhaps be worth the philosophical effort to address ourselves to the following question, and to attempt to answer it without resorting to forces which have been especially invented for the purpose. Does nature offer anything which could explain the fact that the swinging motions^b of the planets all tend in the same direction, whereas all their other motions are explicable in terms of gravitational forces,^c the permanent bond of nature? At least the scheme which we have outlined does not depart from the rule of unity, for even this centrifugal force^d is derived, as a consequence of it, from gravitation; and that is appropriate to contingent motions, for they should be derived from the forces which are inherent in matter, even when it is at rest.

I would furthermore remark that, in spite of its *prima facie* similarity to the outline sketch of our system, the atomistic system of *Democritus* and *Epicurus* bears quite a different relation to the inference that the world has

^b *Schwungsbewegung* / B: centrifugal motion / C: *il muoversi centrifugo* / F & Z: *mouvement tangentiel* / T: (orbital) motion / (Grimm lists *Schwungsbewegung* with the meaning: swinging motion).

^d *Centralkräften*. ^e *Schwungskraft* / (alt: momentum).

a Creator to the one we have outlined.¹³² In the atomistic system, movement is eternal and uncreated, while collision, the rich source of so much order, is a contingency, an accident, for which there is no explanation at all.¹³³ In the system which I have just outlined, a recognised and established law of nature leads necessarily to order, on the basis of an entirely reasonable assumption. And since there is a cause operating here which controls the tendency to regularity, and since there is something which keeps nature on the course of harmoniousness and beauty, one is led to suppose that there is a ground explaining why there is a necessary relation to perfection.

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However, let me adduce another example in order to explain how the operation of gravity is necessarily destined to produce regularity and beauty within the combination of diffused elements. I shall, therefore, add an explanation of the mechanical character of the process which produces the rings of Saturn.¹³⁴ This explanation, it seems to me, has as high a degree of probability as can be expected of an hypothesis. All I ask is that the following points be conceded. Let it be granted that, to begin with, Saturn was surrounded by an atmosphere of the kind which has been observed in the case of various comets which do not approach very close to the sun and which lack a tail. Let it be further granted that the particles of the vapours of this planet (to which we attribute an axial rotation) rose upwards, and that subsequently these vapours, whether because of the planet's cooling down or for some other reason, began to sink downwards to the surface of the planet again. If these concessions are made, then the rest follows with mechanical precision.⁴ If these particles are to orbit around the axis of the planet, then they must all of them have a velocity which is equal to that of the point on the surface from which they have risen. From this it follows that they must all tend, in virtue of this lateral motion, to describe free orbits round Saturn, in accordance with the rules of centripetal force.⁵ But all the particles, of which the velocity is not such as to establish equilibrium by means of centrifugal force⁶ with the gravitational attraction operating at that altitude, must of necessity collide with and impede each other. And they will continue to do so until the only particles left over are those which, rotating around Saturn, are able to orbit in free circular motion, in accordance with the laws of gravitation;⁷ the other particles, however, will gradually fall back to the surface of the planet. Now, all these circular motions must necessarily tend towards the

⁴ Saturn rotates on its axis in accordance with our assumption. Each particle which rises from its surface must therefore have exactly the same lateral motion as the point from which it rose, and it must continue to have that motion at whatever altitude it reaches.

⁵ *mit mechanischer Richtigkeit*. ⁶ *Centralkräfte* / (alt: forces of gravity).

⁷ *Centrifugalkraft*. ⁸ *die in freier Cirkelbewegung nach Centralgesetzen umlaufen können*.

elongated plane of Saturn's equator. This will be familiar to anybody acquainted with the laws of gravitation. Thus, the remaining particles of Saturn's former atmosphere will eventually become concentrated in a circular plane around Saturn, a plane which occupies the extended equator of the planet.¹³⁵ The outer extremity of this plane is limited by precisely the same cause as determines the boundary of the atmosphere in the case of the comets. This belt^a of freely moving cosmic material must inevitably become a ring; or, to express the matter more precisely, the aforementioned motion can issue in no other configuration than that of a ring. For since the particles can only derive the velocity, which enables them to orbit in circles, from the points of the surface of Saturn from which they have risen, it follows that those particles which have risen from the equator of the planet possess the greatest velocity. Now, of all the distances from the centre of the planet there is only one at which this velocity is exactly suited to generate circular motion,^b for at smaller distances the velocity will be too weak. It follows that a circle^c can be drawn within this belt, the centre of which coincides with the centre of Saturn itself;^d all the particles within this circle must fall back to the surface of this planet. However, all those other particles which lie between this same circle and the circle which marks an extreme outer limit (that is to say, all the particles which are contained within a ring-like space) will henceforth continue to revolve around the planet, freely suspended in circular orbits around it.

The adoption of a solution such as this leads to consequences which can be used to calculate the period of Saturn's axial revolution.^e And, what is more, the calculation of this period has the same degree of probability as the grounds, employed in the calculation of the period, themselves possess. For since the particles which occupy the inner edge of the ring have exactly the same velocity as that possessed by a point on Saturn's equator, and since, furthermore, this velocity, according to the laws of gravitation, has a magnitude suitable for circular motion, it follows that one can calculate the period of the orbit^f of the particles which are located on the inner edge of the ring. The calculation is performed by using the relation between the respective distances from the centre of the planet of one of Saturn's satellites and of the inner edge of the ring; one can also use the given period of the revolution^g of the satellite to perform the same calculation. By employing the orbital period of the particles located on the inner edge of the ring and the relation of the shortest diameter of the ring to that of the planet itself, one can establish Saturn's axial rotation. One thus finds by calculation that Saturn must revolve on its axis every five hours and roughly forty minutes.¹³⁶ And if one appeals to the analogy with

^a Limbus. ^b Cirkelbewegung. ^c Cirkelkreis.

^d so wird ein Cirkelkreis in diesem Limbus aus dem Mittelpunkt des Saturns gezogen werden können.

^e Achsendrehung. ^f die Zeit des Umschwungs. ^g der Zeit des Umlaufs.

the other planets, this result seems to harmonise well with the period of their revolutions.^h

Whether or not the assumption be conceded that Saturn may have had a comet-like atmosphereⁱ to begin with, the conclusion I draw from it in order to explain my main proposition is, it seems to me, fairly certain: namely, that if such an atmosphere^j did surround it, then the mechanical production of a floating ring must be a necessary consequence of it, and that, as a result, nature, when left to universal laws, tends to produce regularity out of chaos.

EIGHTH REFLECTION: CONCERNING DIVINE ALL-SUFFICIENCY

The sum of all these reflections leads us to the concept of the Supreme Being. This Supreme Being embraces within itself everything which can be thought by man, when he, a creature made of dust, dares to cast a spying eye behind the curtain which veils from mortal eyes the mysteries of the inscrutable. God is all-sufficient. Whatever exists, whether it be possible or actual, is only something in so far as it is given through Him. If it be permitted to translate the communings of the Infinite with Himself into human language, we may imagine God addressing Himself in these terms: *I am from eternity to eternity: apart from me there is nothing, except it be through me.* This thought, of all thoughts the most sublime, is still widely neglected, and mostly not considered at all. That which is to be found in the possibilities of things and which is capable of realising perfection and beauty in excellent schemes has been regarded as a necessary object of Divine Wisdom but not itself as a consequence of this Incomprehensible Being. The dependency of other things has been limited to their existence alone. As a result of this limitation, a large share in the ground of so much perfection has been taken away from that Supreme Nature, and invested in I know not what eternal absurdity.^k

The fruitfulness of a single ground in generating many consequences, the harmony and adaptedness^l of natures to harmonise in a regular scheme of things^m in accordance with universal laws and without frequent conflict – these are characteristics which must, in the first place, be found in the possibilities of things. It is only afterwards that wisdom can then become active in choosing them. To what limitations, emanating from a separate ground,ⁿ would not the Independent Being be subject, if not even these possibilities were grounded in that Being? And what incomprehensible coincidence it would be if, within the field of possibility and without supposing that there was any existent thing at all,^o unity and fruitful har-

^h der Zeit der Umwendung. ⁱ kometischen Atmosphäre. ^j Dunstkreis. ^k Undinge.

^l Schicklichkeit. ^m in einem regelmässigen Plane. ⁿ fremden Gründe.

^o irgend eines Existirenden.

mony were to come into being – the unity and harmony which would enable the Supremely Wise and Powerful Being, once those external relations had been compared with his inner capacity, to bring great perfection into being. Certainly, such an account no longer places the origin of goodness undiminished in the hand of a single being. When *Hugen* invented the pendulum clock,¹³⁷ he would have found himself unable, had he considered the matter, to attribute to himself alone the regularity which constitutes the perfection of the device. The nature of the cycloid makes it possible that the time taken by free fall through the cycloidal curve is the same, whether the arc traced be long or short; this fact merely rendered *Hugen's* invention possible. The very fact that such a wide range of beautiful effects is even merely possible as a result of the simple ground of gravitation would itself, if it did not depend on the being who actually realised this whole system, obviously diminish and divide God's responsibility for the admirable^a unity and for the great extent of so much order which is based on a single ground.

My amazement at the succession of an effect upon its cause ceases as soon as I directly and easily understand the capacity of the cause to produce its effect.^c On this basis, amazement must cease as soon as I regard the mechanical structure of the human body, or of any other artificially devised^f arrangement whatever, as the work of the Almighty Being, and look merely at the actuality. For, that a Being who can do anything should also be able to produce such a machine, provided that it is possible in the first place, is something which can be easily and distinctly understood. And yet, notwithstanding, some amazement is left over, no matter how we may have adduced the above consideration to render the phenomenon more comprehensible. For it is astonishing that something like an animal body should even be possible. And even if I could fully understand all its springs and pipes, all its nerve ducts and levers, its entire mechanical organisation, I should still continue to be amazed – amazed at the way so many different functions can be united in a single structure, amazed at the way in which the processes for realising one purpose can be combined so well with those by means of which some other purpose is attained, amazed at the way in which the same organisation also serves to maintain the machine and to remedy the effects of accidental injuries, amazed at the way in which it is possible for a human being to be both so delicately constituted and yet be capable of surviving for so long in spite of all the numerous causes which threaten its well-being. Nor, indeed, is the ground of my amazement removed once I have convinced myself that all the unity and harmony I observe around me is only possible because a Being exists which contains within it the grounds not only of reality but also of all possibility. For although it is true that,

^a reizenden. ^c die Zulänglichkeit der Ursache zu ihr (i.e., der Wirkung). ^f künstlichen.

employing the analogy of human behaviour, one can form some concept of how such a Being could be the cause of something real, one cannot form any concept of how that Being should contain the ground of the internal possibility of other things. It is as if this thought rises far higher than mortal creatures can reach.

Even in judging the constitution of possible things, when we lack immediate grounds for decision, this high concept of the Divine Nature, understood in terms of its all-sufficiency, can serve as a means for inferring possibility which is distinct from but construed as a consequence arising from the Divine Nature as from a ground.^g The following question may be raised: among all possible worlds, is there not to be found an endless gradation of degrees of perfection, since no natural order is possible, beyond which there cannot be thought an order which is still more excellent. Furthermore, even if I were to admit the existence of a highest order, there would still be another question which could be raised, namely: whether the different worlds themselves which were unsurpassed by any others would be exactly equal to each other in respect of their perfection.¹³⁸ With questions like these it is difficult, perhaps impossible, to arrive at an answer simply by considering possible things. But when I consider the two questions in relation to the Divine Being and realise that if one world is chosen in preference to another without there being any preference in the judgement of the Being responsible for the choice, or, indeed, chosen in a manner incompatible with the judgement, such a choice would indicate that the various active powers of this Being were not in perfect agreement with each other, that differing modes of action did not correspond to a difference of motive, would, in short, indicate that there was a defect in the Most Perfect Being^h – when I realise all this, then I conclude with strong conviction that the two cases proposed for consideration above must be fictitious and impossible. On the basis of all the preparations we have made above, I can understand why, of the following two arguments, the second will have a great deal more to recommend it than the first. The first argument infers from certain presupposed possibilities which cannot be adequately verified that the Most Perfect Being must of necessity behave in a certain way (this Being is so constituted that the concept of the supreme harmony to be found in it is seemingly weak-

^g Dieser hoher Begriff der göttlichen Natur, wenn wir sie nach ihrer Allgenugsamkeit gedenken, kann selbst in dem Urtheil über die Beschaffenheit möglicher Dinge, wo uns unmittelbar Gründe der Entscheidung fehlen, zu einem Hülfsmittel dienen, aus ihr als einem Grunde auf fremde Möglichkeit als eine Folge zu schliessen.

^h und erkenne, dass der Vorzug der Wahl, der einer Welt vor der andern zu Theil wird, ohne den Vorzug in dem Urtheile eben desselben Wesens, welches wählt, oder gar wider dieses Urtheil einen Mangel in der Übereinstimmung seiner verschiedenen thätigen Kräfte und eine verschiedene Beziehung seiner Wirksamkeit ohne eine proportionirte Verschiedenheit in den Gründen, mithin einen Übelstand in dem vollkommensten Wesen lasse.

ened). The second argument deduces the possibility of that which is recognised to be most appropriate to this Being from the harmony which is acknowledged to exist and which the possibility of things must have with the Divine Nature.¹ I shall, therefore, suppose that, in the possibilities of all worlds, there cannot be any relations which are such as must be a source of embarrassment to the rational choice of the Supreme Being. For it is precisely this Supreme Being which contains within it the ultimate ground of all this possibility. This possibility cannot, therefore, contain anything which does not harmonise with its source.

The concept of divine *all-sufficiency*, expanded to include all that is possible or real, is a far more appropriate expression for designating the supreme perfection of the Divine Being than the concept of the *infinite*, which is commonly employed. For no matter how this latter concept be interpreted, its fundamental meaning is manifestly mathematical. It signifies the relation of one magnitude to another, which is taken as a measure; this relation is greater than any number. Hence, divine cognition would be called infinite, in the strict sense of the term, if, compared with some other alleged type of cognition, it has a relation to it which surpasses every possible number. Now, such a comparison as this brings the divine determinations into an improper relationship of homogeneity² with those of created things. Furthermore, the comparison fails to convey with precision what one is hoping to establish, namely, the undiminished possession of all perfection. The expression 'all-sufficiency', on the other hand, designates everything which can be conceived under the notion of perfection. However, the designation 'infinity' is beautiful and genuinely aesthetic.³ Extension beyond all numerical concepts stirs the emotions, and, in virtue of a certain embarrassment which it causes, it fills the soul with astonishment. The expression we are commending, on the other hand, is one which satisfies the demands of logical rigour to a greater degree.

¹ als aus der erkannten Harmonie, die die Möglichkeiten der Dinge mit der göttlichen Natur haben müssen, von demjenigen, was diesem Wesen am anständigsten zu sein erkannt wird, auf die Möglichkeit zu schliessen.

² Gleichartigkeit. ³ schön und eigentlich ästhetisch.

Section 3. In which it is shown that there is no other possible argument in support of a demonstration of the existence of God save that which has been adduced

1. Classification of all possible arguments in support of a demonstration of the existence of God

The conviction of the great truth, *There is a God*, if it is to have the highest degree of mathematical certainty, has this peculiarity: it can only be reached by a single path.¹ It confers on this reflection an advantage: once one is convinced that there is no choice possible among a variety of arguments, philosophical efforts will have to be united in a single argument. These endeavours will aim to correct mistakes which may have crept into the argument in the course of its elaboration, not to reject it.

With a view to showing this, I would begin by reminding the reader that he must not lose sight of the requirement which must actually be satisfied. What has to be proved, namely, is the existence, not merely of a very great and very perfect first cause, but of the Supreme Being who is above all beings. Furthermore, what has to be proved is the existence, not of one or more such beings, but of one unique such Being. And, finally, these things must be proved with mathematical certainty and not by appealing to grounds which are merely probable.

All arguments for the existence of God must derive from one or other of two sources: either from the concepts of the understanding of the merely *possible*, or from the empirical concept of the *existent*. In the first case, the argument may proceed either from the possible as a *ground* to the existence of God as a *consequence*, or from the possible as a *consequence* to the divine existence as a *ground*. In the second case, the argument may proceed from that, the existence of which we experience, to the existence merely of a first and *independent cause*, and then, by subjecting that concept to analysis, proceed to the derivation of its divine characteristics; alterna-

¹ Die Überzeugung von der grossen Wahrheit: es ist ein Gott, wenn sie den höchsten Grad mathematischer Gewissheit haben soll, hat dieses Eigne: dass sie nur durch einen einzigen Weg kann erlangt werden.

tively, the argument may proceed directly from that which experience teaches us to both the existence and the properties of the Divine Being.

2. Examination of the arguments of the first kind

If the argument is to proceed from the concept of the merely possible as a ground to existence as a consequence, then that same existence must be discoverable in the concept by means of analysis, for the only way in which it is possible to derive a consequence from a concept of the possible is by logical analysis. But then existence would have to be contained in the possible as a predicate. But, since according to the First Reflection of the First Section of this book this is never the case, it is obvious that a proof of the truth we are examining is not possible in this manner.

There is, however, a famous proof constructed on this foundation, the so-called Cartesian proof.¹³⁹ In it one begins by thinking the concept of a possible thing, in which one imagines that all true perfection is united. It is now assumed that existence is also a perfection of things. The existence of a Most Perfect Being is thus inferred from the possibility of such a Being. One could draw the same inference from the concept of anything which was merely imagined to be the most perfect thing of its kind. One could, for example, infer the existence of a most perfect world from the mere fact that such a world can be thought. Without entering into an elaborate refutation of this proof, which is to be found in other philosophers,¹⁴⁰ I would merely refer the reader to the explanation given at the beginning of this work, namely, that existence is not a predicate at all, and therefore not a predicate of perfection either. Hence, it is in no wise possible to infer from a definition,¹⁴¹ which contains an arbitrary combination of various predicates¹⁴² used to constitute the concept of some possible thing, the existence of this thing, nor, consequently, the existence of God either.

On the other hand, the inference from the possibilities of things as consequences to the existence of God as ground is an argument of quite a different kind. What is under investigation here is whether the fact that something is possible does not presuppose something existent, and whether that existence, without which not even internal possibility can occur, does not contain such properties as we combine together in the concept of God. To begin with, it is clear in this case that I cannot infer an existence from conditioned possibility, unless I presuppose the existence of that which is possible only under certain circumstances. For conditioned possibility merely signifies that something can exist only in certain connections; the existence of the cause is only demonstrated in so far as the consequence exists. But here the cause is not to be inferred from the

¹³⁹ Erklärung. ¹⁴⁰ eine willkürliche Vereinbarung verschiedener Prädikate.

existence of the consequence.¹⁴³ Hence, such a proof can only be conducted from internal possibility, if it is to occur at all. It will further be noticed that it must spring from the absolute possibility of all things in general.¹⁴⁴ For it is only internal possibility itself by reference to which we are supposed to come to know¹⁴⁵ that it presupposes some existence, and not from the particular predicates, in virtue of which one possible thing differs from another. For a difference of predicates occurs even in the case of what is merely possible, and never designates anything existent. Accordingly, a divine existence would have to be inferred in the manner mentioned from the internal possibility of everything which can be thought. The whole of the First Section of this work demonstrated the possibility of this happening.

3. Examination of the arguments of the second kind

The proof employing the rules of causal inference¹⁴⁶ proceeds from the empirical concepts of that which exists to the existence of a first and independent cause, and then, by subjecting that concept to logical analysis,¹⁴⁷ it proceeds to the properties of that cause which designate divinity. This is a famous proof, and it enjoys considerable prestige as a result of the work of the philosophers of the school of Wolff in particular.¹⁴⁸ Nonetheless, the proof is wholly impossible. I admit that the argument is valid as far as the proposition: *If something exists, then something else also exists which does not itself depend on any other thing.* I thus admit that the existence of some one or several things, which are not themselves the effects of something else, is well established. Now, the second step of the argument which proceeds as far as the proposition that this independent thing is absolutely necessary, is far less reliable, for the argument has to employ the principle of sufficient reason which is still contested.¹⁴⁹ Nonetheless, I am ready to subscribe to everything, even up to this point. Accordingly, there exists something necessarily. The qualities of supreme perfection and unity must now be derived from this concept of the absolutely necessary Being. But the concept of absolute necessity, which is the foundation of the argument, can be taken in two ways, as has been shown in the first section of this work. According to the first way, which we called logical necessity, it must be shown that the opposite of that thing, in which all perfection or reality is to be found, contradicts itself, and that therefore that being whose predicates are all truly affirmative is, alone and uniquely, absolutely necessary in existence. And since, from the self-same thorough-

¹⁴³ und das Dasein der Ursache wird nur in so fern dargethan, als die Folge existirt, hier aber soll sie (i.e., die Ursache) nicht aus dem Dasein derselben (i.e., der Folge) geschlossen werden.

¹⁴⁴ aus der absoluten Möglichkeit aller Dinge überhaupt.

¹⁴⁵ von der (sc. Möglichkeit) erkannt werden. ¹⁴⁶ nach den Regeln der Causalschlüsse.

¹⁴⁷ logische Zergliederung.

going union of all reality¹ in one Being, it must be established that it is a unique Being, it is clear that the analysis of the concepts of that which is necessary will be based on such grounds as must enable me to draw the converse conclusion: that that in which all reality is, exists necessarily. Now, according to the previous number, this inference is impossible. But not only that; it is in particular remarkable that in this kind of proof the empirical concept, which is presupposed but not actually employed, is not the foundation upon which the argument is based at all. This proof, like the Cartesian proof, is based exclusively on concepts, in which the existence of a Being is supposed to be found in the identity or conflict of its predicates.*

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It is not my intention to analyse the proofs themselves, which a number of philosophers employ in accordance with this method. It is easy to uncover their fallacies, and, indeed, this has already, in part, been done by others. But it may, nonetheless, be hoped that the errors of these proofs can be remedied by making a number of corrections. Our reflection, however, makes it plain that, no matter how they be revised, these proofs can never be anything but arguments from concepts of possible things, not inferences from experience. At best, therefore, they are to be counted among the proofs of the first kind.¹⁴³

Now, as for the second proof of this kind, where the existence of God, together with His properties, is inferred from the empirical concepts of existent things, the situation is quite different. This proof is not only possible, it also wholly deserves to be brought to proper perfection by the concerted efforts of philosophers. The things of the world, which reveal themselves to our senses, display distinct characteristic marks of their contingency. Not only this, they also, by means of the magnitude, order and purposeful provisions, which are everywhere to be encountered, afford proofs of the existence of a rational Author endowed with great wisdom, power and goodness. The great unity of such an extensive whole permits one to conclude that all these things have been brought into existence by one single Author. And even if these inferences lack geometrical rigour,⁴ their force is nonetheless indisputably such that no rational creature, employing the rules of natural common sense,⁵ will be left for one moment in any doubt about these matters.

* This is the most important of the conclusions I wish to establish. If I equate the necessity of a concept with the fact that the opposite is self-contradictory, and if I then assert that such is the constitution of the infinite, then to presuppose the existence of a necessary Being would be completely superfluous for it already follows from the concept of the infinite. Indeed, that premiss existence is completely superfluous in the proof itself, for, in the course of its presentation, the concepts of necessity and infinity are regarded as interchangeable notions. It follows that infinity is actually derived from the existence of what is necessary, for the infinite (and, indeed, the infinite alone) exists necessarily.

¹ Vereinbarung aller Realität. ⁴ geometrische Strenge. ⁵ natürliche gesunde Verstand.

4. *There are only two possible proofs of the existence of God*

From all these judgements it is evident that, if one wishes to argue from the concepts of possible things, the only possible argument for the existence of God is that in which the internal possibility of all things is itself regarded as something which presupposes some existence or other. This has been shown in the first section of this work. It is likewise evident that, if the argument, which takes as its starting point what experience of existing things teaches us, is to ascend to the very same truth, then the proof can only establish the existence and constitution of the supreme cause if it starts out from the properties which things within the world are perceived to possess, and from the accidental arrangement of the universe as a whole. Permit me to call the first of these two proofs the ontological and the second the cosmological proof.

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The cosmological proof is, it seems to me, as old as human reason itself. It is so natural, so persuasive, and extends its reflections so far, as it keeps pace with the progress of our understanding, that it must endure as long as rational beings wish to engage in that noble contemplation, the aim of which is to come to know God from his works. The efforts of *Derham*,¹⁴⁴ *Nieuwentijt*¹⁴⁵ and many others, have conferred honour on human reason in this respect. Nonetheless, a great deal of vanity has sometimes crept in: under the catchword of religious enthusiasm,⁶ an appearance of respectability has been conferred on all kinds of natural cognition and even on pure figments of the imagination.⁷ But, in spite of all its excellence, this mode of proof will never be capable of mathematical certainty or precision. It will never establish more than the existence of some incomprehensibly great Author of the totality which presents itself to our senses. It will never be able to establish the existence of the most perfect of all possible beings. That there is only one first Author, may be the most probable thing in the world; but the conviction it produces will never attain the completeness necessary to challenge the most insolent scepticism.⁸ This means that we cannot infer the existence of properties in the cause which are more in number or greater in quantity than is necessary to understand the degree and the nature of the effects arising from that cause – assuming, that is, that the only reason we have for supposing that this cause exists is that afforded us by the effects. Now, we recognise the existence of much perfection, greatness⁹ and order in the world. But the only conclusion we can draw from this with logical rigour¹⁰ is that the cause of these things must possess a high degree of understanding, power and goodness; we are not, however, entitled to conclude that this same cause is omniscient, or omnipotent, and so on. The whole, in which we

⁶ durch die Lösung des Religionseifers.

⁷ allerlei physischen Einsichten oder auch Hirngespinnsten. ⁸ der frechesten Zweifelsucht.

⁹ Grösse. ¹⁰ mit logischer Schärfe.

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descri unity and thoroughgoing connectedness,^b is immeasurable. We can with good reason conclude from this that a single Author was responsible for the whole. We must, however, acknowledge that we are not acquainted with the whole of creation. We must judge accordingly and say that that part of creation with which we are familiar entitles us to infer the existence of but one Author, and that this encourages us to suppose that that part of creation with which we are not acquainted will be similarly constituted. And although it is highly reasonable to think in this fashion, it is not strict inference.

On the other hand, and without flattering ourselves too much, our outline of the ontological proof seems to be capable of the rigour required of a demonstration. However, if the question were raised, which of the two proofs was the superior, our reply would be this: if it is logical exactitude and completeness which is at issue, then the ontological proof is superior. If, however, one is looking for accessibility to sound common sense,^c vividness of impression, beauty and persuasiveness in relation to man's moral motives, then the advantage must be conceded to the cosmological proof. It is doubtless more important, while also convincing sound understanding, to inspire man with noble feelings, which are richly productive of noble actions, than to instruct him with carefully weighed syllogisms, so that the demands of a subtler speculation are satisfied. If one is going to proceed with fairness, then the advantage of general utility cannot be denied to the well-known cosmological proof.

It is, accordingly, not a flattering strategy which is eager for the applause of others, but honesty, when I willingly concede superiority in respect of usefulness to an exposition of the important knowledge of God and his qualities, such as *Reimarus* offers in his book on natural religion^{14b} – an advantage which it enjoys over every other proof, including my own, in which greater attention is paid to logical rigour. I shall not consider the value of this or the other writings of *Reimarus*, which chiefly consists in an unaffected employment of a sound and admirable common sense. It must, however, be said that such reasons do have great demonstrative power^d and stimulate more intuition than do logically abstract concepts, though such concepts do explain the object with greater precision.

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An enquiring understanding, once it is engaged on the track of an investigation, will not rest satisfied until everything around it has become clear, until, if I may so express myself, the circle which circumscribes his question closes completely. For this reason, no one will dismiss an endeavour such as this present one, addressing itself as it does to logical exactitude in a cognition which is as important as this, as futile or unnecessary – particularly since there are many cases where, without such care, the application of concepts would remain uncertain and doubtful.

^b durchgängige Verknüpfung. ^c Fasslichkeit für den gemeinen richtigen Begriff.

^d Beweiskraft.

5. *There is not more than a single demonstration of the existence of God possible; the argument which serves as its foundation has been given above.*

There are four possible arguments for the existence of God, and we have reduced them to two main types. It is evident from what we have said so far that both the Cartesian proof and the proof which proceeds from the empirical concept of existence, and involves the analysis of the concept of an independent thing, are both false and utterly impossible. And by this I do not mean that they are proofs which simply lack proper rigour; I mean that they prove nothing at all.^e It has further been shown that the proof which derives the existence of God and the properties of the Divine Being from the properties of the things to be found in the world contains an argument which is at once powerful and very beautiful; unfortunately, it is incapable of the rigour required of a demonstration. Now, there is only one alternative left: either no strict proof of the existence of God is possible at all, or the proof must be based upon the argument we have adduced above. Since we are speaking simply of the possibility of a proof, no one will maintain the former, and the outcome of the matter harmonises with what we have shown. There is only one God, and there is only one argument which enables us to apprehend His existence and to apprehend it with the perception of the necessity which absolutely destroys everything which opposes it – a judgement to which the very nature of the object of our enquiry could immediately lead us. All other things which exist could also not exist. The experience of contingent things cannot, therefore, furnish us with an effective argument by means of which we can apprehend the existence of that Being, of which it is impossible that it should not be. The difference between the existence of God and that of other things is to be found simply in the fact that the denial of the divine existence is absolutely nothing. The inner possibility, the essence of things, is that of which the cancellation eliminates all that can be thought. In this, therefore, consists the distinctive characteristic mark of the existence of the essence of all beings.^f It is in this that the proof of God's existence ought to be sought. And should you come to think that the proof is not to be found here after all, then abandon this unbeaten path and follow the broad highway of human reason. It is absolutely necessary that one should convince oneself that God exists; that His existence should be demonstrated, however, is not so necessary.

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^e sondern gar nicht beweisen. / einsehen.

^f das eigene Merkmal von dem Dasein des Wesens aller Wesen / (the word *Wesen* may mean either 'essence' or 'being' [in the sense of 'entity']; the final phrase may thus be translated 'the essence of all essences').