Section 2. On the distinction between sensible things and intelligible things in general

§3

Sensibility^g is the receptivity of a subject in virtue of which it is possible for the subject's own representative state to be affected in a definite way by the presence of some object.¹¹ Intelligence^h (rationality) is the faculty of a subject in virtue of which it has the power to represent things which cannot by their own quality come before the senses of that subject. The object of sensibility is the sensible; that which contains nothing but what is to be cognised through the intelligence is intelligible. In the schools of the ancients, the former was called a *phenomenon* and the latter a *noumenon*. Cognition, in so far as it is subject to the laws of sensibility, is *sensitive*, and, in so far as it is subject to the laws of intelligence, it is *intellectual* or rational.¹²

§4

In this way, whatever in cognition is sensitive is dependent upon the special character of the subject in so far as the subject is capable of this or that modification by the presence of objects: these modifications may differ in different cases, according to the variations in the subjects. But whatever cognition is exempt from such subjective conditions relates only to the object. It is thus clear that things which are thought sensitively are representations of things *as they appear*, while things which are intellectual are representations of things *as they are*. In a representation of sense there is, first of all, something which you might call the *matter*, namely, the *sensation*, and there is also something which arises according as the various things which affect the senses are co-ordinated by a certain natural law of the mind.¹³ Moreover, just as the sensation which constitutes the *matter* of a sensible representation is, indeed, evidence for the presence of some-

Kant's hylomorphism

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² Sensualitas / A: Sensibilité / B: Sensibility / C: Sensorialità / H: Sinnlichkeit / K: Sensuality.

h intelligentia / (alt: power of the understanding).

^{&#}x27; species / A: configuration / B: general configuration / C: specie / E: appearance / H: Gestalt / Ha: general characteristic / K: specificity.

thing sensible, though in respect of its quality it is dependent upon the nature of the subject in so far as the latter is capable of modification by the object in question, so also the form of the same representation is undoubtedly evidence of a certain reference or relation in what is sensed, though properly speaking it is not an outline or any kind of schema, of the object, but only a certain law, which is inherent in the mind and by means of which it co-ordinates for itself that which is sensed^k from the presence of the object. For objects do not strike the senses in virtue of their form or aspect. Accordingly, if the various factors in an object which affect the sense are to coalesce into some representational whole there is needed an internal principle in the mind, in virtue of which those various factors may be clothed with a certain *aspect*, in accordance with stable and innate laws.

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There thus belong to sensory cognition¹ both matter, which is sensation and in virtue of which cognitions are called sensory," and form, in virtue of which, even if it were to be found free from all sensation, representations are called sensitive." On the other hand, in so far as that which belongs to the understanding^o is concerned, it must above all be carefully noted that the use of the understanding, or the superior faculty of the soul, is twofold. By the first of these uses, the concepts themselves, whether of things or relations, are given, and this is the REAL USE. By the second use, the concepts, no matter whence they are given, are merely subordinated to understanding each other, the lower, namely, to the higher (common characteristic marks), and compared with one another in accordance with the principle of contradiction, and this use is called the LOGICAL USE.¹⁴ Now, the logical use of the understanding is common to all the sciences, but not so the real use. For when a cognition has been given, no matter how, it is regarded either as contained under or as opposed to a characteristic mark common to several cognitions, and that either immediately and directly, as is the case in judgements, which lead to a distinct cognition,¹⁵ or mediately, as is the case in *ratiocinations*, which lead to a complete⁹ cognition.¹⁶ If, therefore, sensitive cognitions are given, sensitive cognitions are subordinated by the logical use of the understanding to other sensitive cognitions, as to common concepts, and phenomena are subordinated to more general laws of phenomena. But it is of the greatest importance here to have noticed that cognitions must always be treated as sensitive cognitions, no matter how extensive the logical use of the understanding may have been in relation to them. For they are called sensitive on account of their genesis based on its *origin* and not on account of their *comparison* in respect of identity or opposition.

sensitive cognition

real vs. logical use of

sensitive cognition as

¹ adumbratio aut schema. k sensa. ¹ sensualem . . . cognitionem. ^m sensuales. ⁿ sensitivae.

o intellectualia. p adaequatam.

Hence, even the most general empirical laws are nonetheless sensory; and the principles of sensitive form which are found in geometry (determinate relations in space), no matter how much the understanding may operate upon them by reasoning according to the rules of logic from what is sensitively given (by pure intuition), nonetheless do not cease to belong to the class of what is sensitive. But in the case of sensible⁴ things and phenomena, that which precedes the logical use of the understanding is called appearance," while the reflective cognition, 17 which arises when several appearances are compared by the understanding, is called *experience*. Thus, there is no way from appearance to experience except by reflection in accordance with the logical use of the understanding. The common concepts of experience are called *empirical*, and the objects of experience are called *phenomena*, while the laws both of experience and generally of all sensitive cognition are called the laws of phenomena. Thus empirical concepts do not, in virtue of being raised to greater universality, become intellectual in the *real sense*, nor do they pass beyond the species of sensitive cognition; no matter how high they ascend by abstracting, they always remain sensitive.

§6

real use of the understanding

As for that which belongs strictly to the understanding,³ and in the case of which the use of the understanding is real: such concepts, whether of objects or of relations, are given by the very nature of the understanding: they contain no form of sensitive cognition and they have been abstracted' from no use of the senses. It is, however, necessary to notice here the extreme ambiguity of the word 'abstract'," and I think that it would be better to eliminate this ambiguity beforehand lest it spoil our investigation into that which belongs to the understanding." Properly speaking, we ought, namely, to say: to abstract from some things, but not: to abstract something.¹⁸ The former expression indicates that in a certain concept we should not attend to the other things which are connected with it in some way or other, while the latter expression indicates that it would be given only concretely, and only in such a way that it is separated from the things which are joined to it. Hence, a concept of the understanding abstracts from everything sensitive, but it is not abstracted from what is sensitive. Perhaps a concept of the understanding would more rightly be called abstracting[®] rather than abstracted.^x For this reason, it is more advisable to

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reflection & appearance vs. experience

^a in sensualibus / A: les données propres à la connaissance sensible / B: in things of sense / C: Nei fatti sensoriali / E: sense-percepts / H: Bei den Sinneserkenntnissen / Ha: in things sensual / K: in sensual things.

^r apparentia. ^s intellectualia stricte talia. ^s abstracti. ^w abstracti. ^v de intellectualibus.

*[»] abstrahens. * abstractus* (alt: abstracted).

call concepts of the understanding 'pure ideas', and concepts which are only given empirically 'abstract' concepts'.

\$7

sensory representations are not a specie of intellectual representation

ļ

The

metaphysics

From this one can see that the sensitive is poorly defined as that which is more confusedly cognised, and that which belongs to the understanding as that of which there is a *distinct* cognition. For these are only logical distinctions which do not touch at all the things given, which underlie every logical comparison. Thus, sensitive representations² can be very distinct and representations which belong to the understanding^a can be extremely confused.¹⁹ We notice the first case in that paradigm of sensitive cognition, geometry, and the second case in the organon of everything which belongs to the understanding, metaphysics. And it is obvious how much effort is devoted by metaphysics to dispelling the clouds of confusion which darken the common understanding, although it is not always so happily successful as geometry is. Nonetheless, each and every one of these cognitions preserves the sign of its ancestry, so that those belonging to the first group, however distinct they be, are called sensitive because of their origin, while those belonging to the second group continue to belong to the understanding, even though they are confused. Such, for example, is the case with *moral* concepts, which are cognised not by experiencing them but by the pure understanding itself. But I am afraid it may be that the illustrious WOLFF has, by this distinction between what is sensitive and what belongs to the understanding, a distinction which for him is only logical, completely abolished, to the great detriment of philosophy, the noblest of the enterprises of antiquity, the discussion of the character of phenomena and noumena, and has turned men's minds away from that enquiry to things which are often only logical minutiae.²⁰

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Now, the philosophy which contains the first principles of the use of the understanding & pure understanding is METAPHYSICS. But its propaedeutic science is that science which teaches the distinction between sensitive cognition and the cognition which derives from the understanding; it is of this science that I am offering a specimen in my present dissertation. Since, then, empirical principles are not found in metaphysics, the concepts met with in metaphysics are not to be sought in the senses but in the very nature of the pure understanding, and that not as innate concepts but as concepts abstracted from the laws inherent in the mind (by attending to its actions on

acquisition of metaphysical concepts by attention to acts of the mind

y abstractos (alt: abstracted). z sensitiva. ^a intellectualia. the occasion of an experience), and therefore as *acquired* concepts. To this genus belong possibility, existence, necessity, substance, cause *etc.*, to-gether with their opposites or correlates. Such concepts never enter into any sensory representations as parts, and thus they could not be abstracted from such a representation in any way at all.

§9

The two ends of the concepts of understanding

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The concepts of the understanding^b have, in particular, two ends. The first is *elenctic*, in virtue of which they have a negative use, where, namely, they keep what is sensitively conceived distinct from noumena, and, although they do not advance science by the breadth of a fingernail, they nonetheless preserve it from the contagion of errors. The second end is dogmatic, and in accordance with it the general principles of the pure understanding, such as are displayed in ontology or in rational psychology, lead to some paradigm,^c which can only be conceived by the pure understanding and which is a common measure for all other things in so far as they are realities. This paradigm is NOUMENAL PERFECTION. This, however, is perfection either in the theoretical sense* or in the practical sense. In the former sense, it is the Supreme Being, GOD; in the latter sense, it is MORAL PERFECTION. Moral philosophy, therefore, in so far as it furnishes the first *principles of judgement*,^d is only cognised by the pure understanding and itself belongs to pure philosophy. Epicurus, who reduced its criteria to the sense of pleasure or pain,²¹ is very rightly blamed, together with certain moderns, who have followed him to a certain extent from afar, such as Shaftesbury²² and his supporters. In any genus of things, the quantity of which is variable, the maximum is the common measure and principle of cognising. The maximum of perfection is nowadays called the ideal, while for Plato it was called the idea (as in the case of his idea of the state). It is the principle of all things which are contained under the general concept of some perfection, in as much as the lesser degree, it is held, can only be determined by limiting the maximum. But, although God, as the ideal of perfection, is the principle of cognising, He is also, at the same time, in so far as He really exists, the principle of the coming into being of all perfection whatsoever.

^c exemplar. ^d diiuducandi.

^{*} We consider something theoretically in so far as we attend only to those things which belong to being, whereas we consider it practically if we look at those things which ought to be in it in virtue of freedom.

^b intellectualium / A: Les notions intellectuelles / B & E: intellectual concepts / C: concetti intellectualium / H: die Verstandeserkenntnisse / Ha: concepts of the understanding / K: Things intellectual.

§10

no intellectual intuition

There is (for man) no *intuition* of what belongs to the understanding,^e but only a symbolic cognition; and thinking is only possible for us by means of universal concepts in the abstract, not by means of a singular concept in the concrete. For all our intuition is bound to a certain principle of form, and it is only under this form that anything can be apprehended by the mind immediately or as singular, and not merely conceived discursively by means of general concepts.²³ But this formal principle of our intuition (space and time) is the condition under which something can be the object of our senses.²⁴ Accordingly, this formal principle, as the condition of sensitive cognition, is not a means to intellectual intuition. Moreover, since it is only through the senses that all the matter of our cognition is given, the noumenon as such cannot be conceived by means of representations drawn from sensations. Thus, the concept of the intelligible as such is devoid of all that is given in human intuition. The intuition, namely, of our mind is always passive. It is, accordingly, only possible in so far as it is passivity of intuition possible for something to affect our sense. Divine intuition, however, which is the principle of objects, and not something governed by a principle, since it is independent, is an archetype and for that reason perfectly intellectual.

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§11

Now, although phenomena, properly speaking, are aspects^s of things and not ideas, and although they do not express the internal and absolute quality of objects, nonetheless cognition of them is in the highest degree true. For, first of all, in so far as they are sensory concepts or apprehensions, they are, as things caused, witnesses to the presence of an object, and this is opposed to idealism.²⁵ Consider, however, judgements about things which are sensitively cognised. Truth in judging consists in the agreement of a predicate with a given subject. But the concept of a subject, in so far as it is a phenomenon, would only be given through its relation to the sensitive faculty of cognising, and it is in accordance with the same relation that predicates would be given which were sensitively observable. It is, accordingly, clear that representations of a subject and a predicate arise according to common laws; and they thus furnish a foothold^{*h*} for cognition which is in the highest degree true.

^e intellectualium. ^f intellectio.

^g species / A: apparences / B: semblances / C: apparenze / H: Abbilder / K: species.

h anseam praedere / (lit.: provide a handle).

A science of phenomena

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Eleatic School 26

Whatever, as object, relates to our senses is a phenomenon. But things which, since they do not touch the senses, contain only the singular form of sensibility, belong to pure intuition (that is to say, an intuition devoid of sensation but not for that reason deriving from the understanding). Phenomena are reviewed and set out, first, in the case of the phenomena of external sense, in PHYSICS, and secondly, in the case of the phenomena of inner sense, in empirical PSYCHOLOGY, But pure (human) intuition is not a universal or logical concept under which, but a singular concept in which. all sensible things whatever are thought, and thus it contains the concepts of space and time. These concepts, since they determine nothing as to the quality of sensible things, are not objects of science, except in respect of quantity. Hence, PURE MATHEMATICS deals with space in GEOMETRY, and time in pure MECHANICS. In addition to these concepts, there is a certain concept which in itself, indeed, belongs to the understanding but of which the actualisation' in the concrete requires the auxiliary notions of time and space (by successively adding a number of things and setting them simultaneously side by side). This is the concept of number, which is the concept treated in ARITHMETIC. Thus, pure mathematics, which explains the form of all our sensitive cognition, is the organon of each and every intuitive and distinct cognition. And since its objects themselves are not only the formal principles of every intuition, but are originary intuitions, it provides us with a cognition which is in the highest degree true, and, at the same time, it provides us with a paradigm of the highest kind of evidence, in other cases. Thus there is a science of sensory things, * although, since they are phenomena, the use of the understanding is not real but only logical. It is, hence, clear in what sense we are to suppose that science was denied in the case of phenomena by those who drew their inspiration from the

¹ actuatio. ¹ summae evidentiae. ^k sensualium.

Section 3. On the principles of the form of the sensible world

§13

The principle of the form of the universe is that which contains the ground of the universal connection,¹ in virtue of which all substances and their states belong to the same whole which is called a world. The principle of the form of the sensible world is that which contains the ground of the universal connection of all things, in so far as they are phenomena. The form of the *intelligible* world recognises an objective principle, that is to say, some cause in virtue of which there is a combining together^m of the things which exist in themselves. But the world, in so far as it is regarded as phenomenon, that is to say, the world in relation to the sensibility of the human mind, does not recognise any other principle of form than a subjective one, that is to say, a fixedⁿ law of the mind, in virtue of which it is necessary that all the things which can be objects of the senses (through the qualities of those objects) are seen as *necessarily* belonging to the same whole. Accordingly, whatever the principle of the form of the sensible world may, in the end, be, its embrace is limited to actual things, in so far as they are thought capable of falling under the senses. Accordingly, it embraces neither immaterial substances, which are already as such, by definition, excluded from the outer senses, nor the cause of the world, for, since it is in virtue of that cause that mind itself exists and is active through all its senses, that cause cannot be an object of the senses. These formal principles of the *phenomenal universe* are absolutely primary and universal; they are, so to speak, the schemata and conditions of everything sensitive in human cognition. I shall now show that there are two such principles, namely, space and time.

subjective principles as

"fixed laws" of the mind

§14

On time27

1. The idea of time does not arise from but is presupposed by the senses. For it is only through the idea of time that it is possible for the things which come

¹ rationem nexus universalis. ^m colligatio. ⁿ certam.

2:399 before the senses to be represented as simultaneous or successive. Nor does succession generate the concept of time; it makes appeal to it. And thus the concept of time, regarded as if it had been acquired through experience, is very badly defined, if it is defined in terms of the series of actual things which exist one *after* the other. For I only understand the meaning of the little word *after* by means of the antecedent concept of time. For those things come *after* one another which exist at *different times*, just as those things are *simultaneous which exist at the same time*.

2. The idea of time is singular and not general. For no time is thought of except as a part of the same one boundless time. If you think of two years, you can only represent them to yourself as being in a determinate position in relation to each other; and if they should not immediately succeed each other, you can only represent them to yourself as joined to one another by some intermediate time. But among different times, the time which is *earlier* and the time which is *later* cannot be defined in any way by any characteristic marks which can be conceived by the understanding, unless you are willing to involve yourself in a vicious circle. The mind only discerns the distinction between them by a singular intuition. Moreover, you conceive all actual things as situated *in* time, and not as contained *under* the general concept of time, as under a common characteristic mark.

3. Therefore, *the idea of time is an intuition*. And since, in so far as it is the condition of the relations to be found in sensible things, it is conceived prior to any sensation; it is not a sensory but a *pure intuition*.

4. Time is a continuous magnitude, and it is the principle of the laws of what is continuous^o in the changes of the universe. For the continuous is a magnitude^o which is not composed of simples. But by means of time it is nothing but relations which are thought, granted that there are no beings which stand in relation to each other. Thus, in time as a magnitude there is composition; and should this composition be conceived as wholly cancelled, it would leave nothing at all behind it. But if nothing at all is left of a compound when all composition has been cancelled, then this compound is not composed of simple parts. Therefore, *etc.* Accordingly, any part whatever of time is itself a time. And the things which are in time, simple things, namely *moments*, are not parts of time, but *limits*^q with time between them.²⁸ For if two moments are given, time is only given if actual things succeed one another in those moments. Therefore, in addition to a given moment, there must be a time, in the later part of which there is another moment.

Now, the metaphysical law of *continuity* is as follows: *All changes are continuous* or flow: that is to say, opposed states only succeed one another through an intermediate series of different states. For two opposed states

are in different moments of time. But between two moments there will always be an intervening time, and, in the infinite series of the moments of that time, the substance is not in one of the given states, nor in the other, and yet it is not in no state either. It will be in different states, and so on to infinity.

The celebrated Kästner,29 with a view to subjecting this law of Leibniz30 to examination, challenges its defenders* to show that the continuous movement of a point along all the sides of a triangle is impossible. For, if the law of continuity were granted, such continuous motion would unquestionably require proof. Here, then, is the demonstration asked for. Let the letters abc denote the three angle-points of a rectilinear triangle. If something moveable passes in continuous motion along the lines *ab*, *bc*, and *ca*, that is to say, along the whole perimeter of the figure, it necessarily follows that it moves through point b in the direction ab and also through the same point b in the direction bc. But since these movements are diverse they cannot exist simultaneously. Therefore, the moment of the presence of the moveable point at the vertex b, in so far as it is moving in the direction ab, is different from the moment of the presence of the moveable point at the same vertex b, in so far as it is moving in the direction bc. But between the two moments there is a time. Therefore, the moveable point is present at the same point through some time, that is to say, it is at rest, and therefore it does not proceed in a continuous motion. And this is contrary to the hypothesis. The same demonstration is valid for motion along any specifiable straight lines which form an angle. Therefore, according to the doctrines of Leibniz, a body does not change its direction in a motion which is continuous, except along a line no part of which is straight, in other words, along a line which is a curve.

5. *Time is not something objective and real*,³¹ nor is it a substance, nor an accident, nor a relation. Time is rather the subjective condition which is necessary, in virtue of the nature of the human mind, for the co-ordinating of all sensible things in accordance with a fixed law. It is a *pure intuition*. For it is only through the concept of time that we co-ordinate both substances and accidents, according to both simultaneity and succession. And, thus, the concept of time, as the principle of form, is prior tor the concepts of substance and accident. But as for relations or connections⁴ of any kind: in so far as they confront the senses they contain nothing which tells us whether they are simultaneous with or successive to each other, apart from their positions in time, and those positions have to be determined as being either at the same or at different points of time.

* Höhere Mechanik, p. 354.

^r antiquior.

^s relationes . . . s. respectus / (relatio and respectus are synonyms; elsewhere they have both been translated by 'relation').

Those who assert the objective reality of time either conceive of time as some continuous flux within existence,¹ and vet independently of any existent thing (a most absurd fabrication) - this is a view maintained, in particular, by the English philosophers³² – or else they conceive of it as something real which has been abstracted from the succession of internal states - the view maintained by Leibniz³³ and his followers. Now, the falsity of the latter opinion clearly betrays itself by the vicious circle in the commonly accepted definition of time. Moreover, it completely neglects simultaneity,* the most important corollary^o of time. It, thus, throws into confusion all use of sound reason, for, rather than requiring that the laws of motion should be determined by reference to the measure of time, it demands that time itself should be determined, in respect of its own nature, by reference to things which are observed to be in motion or in any series of internal changes. In this way, all the certainty of our rules is completely destroyed. That we are only able to calculate the quantity of time in the concrete, namely, either by motion or by a series of thoughts, is due to the fact that the concept of time rests exclusively on an internal law of the mind, and is not some kind of innate intuition.^w Accordingly, the action of the mind in co-ordinating what it senses^x would not be elicited without the help of the senses. Indeed, far from its being the case that anyone has ever vet deduced the concept of time from some other source. or explained it with the help of reason, the very principle of contradiction itself presupposes the concept of time and bases itself on it as its condition. For A and not-A are not inconsistent unless they are thought simultaneously (that is to say, at the same time), about the same thing, for they can belong to the same thing after one another (that is to say, at different times). Hence, it is only in time that the possibility of changes can be thought, whereas time cannot be thought by means of change, only vice versa.

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* Simultaneous things are not simultaneous because they do not succeed one another. For if succession is removed, then some conjunction, which existed in virtue of the series of time, is, indeed, abolished; but *another* true relationship, such as the conjunction of all things, does not instantly spring into existence as a result. For simultaneous things are joined together at the same moment of time, just as successive things are joined together by different moments. Accordingly, though time has only one dimension, yet the *ubiquity* of time (to speak with Newton),³⁴ in virtue of which *all* the things which can be thought sensitively are at *some time*, adds a further dimension to the magnitude⁴⁴ of actual things, in so far as they hang, so to speak, from the same point of time. For, if you were to represent time by a straight line extended to infinity, and simultaneous things at any point of time by lines drawn perpendicular to it, the surface thus generated would represent the *phenomenal world* in respect both of substance and of accidents.

' in exsistendo / A: d'existence / B & Ha: - / C: nella sua existenza / E: in what exists / K: in existence.

" quanto. " consectarium. " intuitus quidam connatus. * sua sensa.

6. Now, although time, posited in itself and absolutely, would be an imaginary being, yet, in so far as it belongs to the immutable law of sensible things' as such, it is in the highest degree true. And it is a condition, extending to infinity, of intuitive representation^z for all possible objects of the senses. For since simultaneous things as such cannot come before the senses except with the help of time, and since changes can only be thought by means of time, it is clear that this concept contains the universal form of phenomena. Hence, it is clear that all observable events in the world, all motions and all internal changes necessarily accord with the axioms which can be known about time and which, in part, I have already expounded. For it is only under these conditions that they can be objects of the senses and can be co-ordinated with each other. It is, therefore, contradictory to wish to arm reason against the first postulates of pure time, for example, continuity, etc., for they are the consequences of laws which are more primary and more fundamental than anything else.^a And reason itself, in using the principle of contradiction, cannot dispense with this concept. To that extent, therefore, the concept of time is fundamental and originary.

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7. Time, therefore, is an absolutely first *formal principle of the sensible morld*. For all things which are in any way sensible can only be thought as either simultaneous or as placed after each other, and, thus, as enfolded, as it were, by a period of one single time, and as related to one another by a determinate position in that time. Thus, there of necessity arises as a result of this concept, which is primary in respect of everything sensitive, a formal whole which is not a part of another whole; that is to say, there arises the *phenomenal world*.

§15

On space35

A. The concept of space is not abstracted from outer sensations. For I may only conceive of something as placed outside me by representing it as in a place which is different from the place in which I am myself; and I may only conceive of things outside one another by locating them in different places in space. The possibility, therefore, of outer perceptions as such *presupposes* the concept of space; it does not *create* it. Likewise, too, things which are in space affect the senses, but space itself cannot be derived from the senses.

y sensibilium. z in infinitum patens intuitivae representationis.

^a quibus nihil prius, nihil antiquius reperitur. ^b primitivus et originarius.

B. The concept of space is a singular representation embracing all things *within itself;* it is not an abstract common concept containing them *under itself.* For what you speak of as *several places* are only parts of the same boundless space related to one another by a fixed position. And you can only conceive to yourself a cubic foot if it be bounded in all directions by the space which surrounds it.

C. The concept of space is thus a pure intuition, for it is a singular concept, not one which has been compounded from sensations, although it is the fundamental form of all outer sensation. Indeed, this pure intuition can easily be seen in the axioms of geometry, and in any mental construction of postulates, even of problems. That space does not have more than three dimensions, that between two points there is only one straight line, that from a given point on a plane surface a circle can be described with a given straight line, etc. - none of these things can be derived from some universal concept of space; they can only be *apprehended* concretely, so to speak, in space itself. Which things in a given space lie in one direction^e and which things incline in the opposite direction cannot be described discursively nor reduced to characteristic marks of the understanding^d by any astuteness of the mind. Thus, between solid bodies which are perfectly similar and equal^e but incongruent, ^f such as the left and right hands (in so far as they are conceived only according to their extension), or spherical triangles from two opposite hemispheres, there is a difference, in virtue of which it is impossible that the limits of their extension should coincide – and that, in spite of the fact that, in respect of everything which may be expressed by means of characteristic marks intelligible to the mind through speech,^g they could be substituted for one another. It is, therefore, clear that in these cases the difference, namely, the incongruity, can only be apprehended by a certain pure intuition.³⁶ Hence, geometry employs principles which are not only indubitable and discursive, but which also fall under the gaze of the mind.^h And the evidence in demonstrations (evidence being the clarity of certain cognition, in so far as it is likened to sensory cognition) is not only greatest in geometry; it is the only evidence there is in the pure sciences, and it is the *paradigm* and the means of all evidence in the other sciences. For, since geometry contemplates relations of space and since the concept of space contains within itself the very form of all sensory intuition, nothing can be clear and distinct' in things perceived by outer sense unless it be by the mediation of the same intuition, the contemplation of which is the function of the science of geometry. But geometry does not demonstrate its own universal propositions by thinking an object through a universal concept, as happens in the case of what is

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^c plaga. ^d notas intellectuales. ^e similibus atque aequalibus. ^f discongruentibus.

^g quanquam per omnia, quae notis menti per sermonem intelligibilis effere licet.

^h sub obtutum mentis cadentibus. ['] perspicuum.

INAUGURAL DISSERTATION

rational; it does so, rather, by placing it before the eyes by means of a singular intuition, as happens in the case of what is sensitive.*

D. Space is not something objective and real, 39 nor is it a substance, nor an accident, nor a relation; it is, rather, subjective and ideal; it issues from the nature of the mind in accordance with a stable law as a scheme, so to speak, for co-ordinating everything which is sensed externally.ⁿ Those who defend the reality of space either conceive of it as an absolute and boundless receptacle of possible things - an opinion which finds favour with most geometers, following the English⁴⁰ – or they contend that it is the relation *itself* which obtains between existing things, and which vanishes entirely when the things are taken away, and which can only be thought as being between actual things^o – an opinion which most of our own people, following Leibniz,⁴¹ maintain. As for the first empty fabrication of reason: since it invents an infinite number of true relations without there being any beings which are related to one another, it belongs to the world of fable. But the error into which those who adopt the second opinion fall is much more serious. To be specific, the proponents of the first view only put a slight impediment in the way of certain concepts of reason, or concepts relating to noumena, and which are in any case particularly inaccessible to the understanding, as for example questions about the spiritual world, about omnipresence, etc. The proponents of the second view, however, are in headlong conflict with the phenomena themselves, and with the most faithful interpreter of all phenomena, geometry. For, without mentioning the obvious circle in the definition of space in which they are necessarily entangled, they cast geometry down from the summit of certainty, and thrust it back into the rank of those sciences of which the principles are empirical. For if all the properties of space are merely borrowed by experience from outer relations, then there would only be a comparative universality to be found in the axioms of geometry, a universality such as is obtained by induction, that is to say, such as extends no further than observation. Nor would the axioms of geometry possess any necessity apart from that which was in accordance with the estab-

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* It is easy to demonstrate that space must necessarily be conceived of as a continuous magnitude, and I shall pass over it here.³⁷ But the result of this is that the simple in space is not a part but a limit.¹ Now, a limit^t in general is that which, in a continuous magnitude, contains the ground of its boundaries.¹ A space, which is not the limit of another space, is *complete (solid)*.³⁸ The limit of a solid is a *surface*; the limit of a surface is a *line;* the limit of a line is a *point*. There are, therefore, three sorts of limits in space, just as there are three dimensions. Of these limits, two (surface and line) are themselves spaces. The concept of a *limit* does not enter^m any other magnitude apart from space and time.

¹ terminus. ^k Terminus.

¹ limitum / (Terminus and limes are synonyms and have elsewhere both been translated by 'limit').

[&]quot; ingreditur. " omnia omnino externe sensa. o nonnisi in actualibus cogitabilem.

lished laws of nature, nor any precision apart from that which was arbitrarily constructed.^{*p*} And we might hope, as happens in empirical matters, one day to discover a space endowed with different fundamental properties, perhaps even a rectilinear figure bounded by two straight lines.

E. Although the concept of space as some objective and real being or property be imaginary, nonetheless, relatively to all sensible things whatsoever, it is not only a concept which is in the highest degree true, it is also the foundation of all truth in outer sensibility. For things cannot appear to the senses under any aspect⁴ at all except by the mediation of the power of the mind which co-ordinates all sensations according to a law which is stable and which is inherent in the nature of the mind. Since, then, nothing at all can be given to the senses unless it conforms with the fundamental axioms of space and its corollaries^r (as geometry teaches), whatever can be given to the senses will necessarily accord with these axioms even though their principle is only subjective. For it will only accord with itself, and the laws of sensibility will only be the laws of nature, in so far as nature can come before the senses.^s Accordingly, nature is completely subject to the prescriptions of geometry, in respect of all the properties' of space which are demonstrated in geometry. And this is so, not on the basis of an invented hypothesis but on the basis of one which has been intuitively given, as the subjective condition of all phenomena, in virtue of which condition alone nature can be revealed to the senses. Assuredly, had not the concept of space been given originarily by the nature of the mind (and so given that anyone trying to imagine any relations other than those prescribed by this concept would be striving in vain,

2:405 for such a person would have been forced to employ this self-same concept to support his own fiction), then the use of geometry in natural philosophy would be far from safe. For one might then doubt whether this very concept of space, which had been derived from experience, would agree sufficiently with nature, since the determinations from which it had been abstracted might perhaps be denied. And, indeed, a suspicion of this kind has even entered the minds of some.⁴² Accordingly, *space is* an absolutely first *formal principle of the sensible world*, not only because it is only in virtue of this concept that the objects of the universe can be phenomena but above all for this reason, that by its essence space is nothing if not unique, embracing absolutely all things which are externally sensible;^{*u*} it thus constitutes a principle of *entirety*,^{*v*} that is to say, a principle of a whole which cannot be a part of another whole.

^{*} arbitrario conficta. * specie / A: aspect / B: manner / C: forma / H: Gestalt / K: species. * consectariis.

^s quanquam horum principium non sit nisi subiectivum, tamen necessario hisce consentiet, quia eatenus sibimet ipsi consentit, et leges sensualitatis erunt leges naturae, quatenus in sensu cadere potest.

^{&#}x27; affectiones. " omnia omnino externe sensibilia. " universitatis.

COROLLARY

These, then, are the two principles of sensitive cognition. They are not, as is the case with the representations of the understanding,^m general concepts but singular intuitions which are nonetheless pure. In these intuitions, the parts and, in particular, the simple parts do not, as the laws of reason prescribe, contain the ground of the possibility of a compound. But, following the paradigm of sensitive intuition, it is rather the case that the infinite contains the ground of each part which can be thought, and, ultimately, the ground of the simple, or, rather, of the *limit.*^x For it is only when both infinite space and infinite time are given that any definite space and time can be specified by *limiting* ^{y43} Neither a point nor a moment can be thought in themselves unless they are conceived of as being in an already given space and time as the limits of that same space and time. Therefore, all the fundamental properties^z of these concepts lie beyond the limits^a of reason, and, thus, they cannot in any way be explained by the understanding.^b Nonetheless, these concepts constitute the underlying foundations upon which the understanding rests,^c when, in accordance with the laws of logic and with the greatest possible certainty, it draws conclusions from the primary data of intuition. Indeed, of these concepts the one properly concerns the intuition of an *object*, while the other concerns its state, especially its representative state. Thus, space is also applied as an image^d to the concept of *time* itself, representing it by a *line* and its limits^e (moments) by points.44 Time, on the other hand, more nearly approaches a universal and rational concept, for it embraces in its relations absolutely all things, f namely, space itself and, in addition, the accidents which are not included in the relations of space, such as the thoughts of the mind. Furthermore, whereas time does not dictate laws to reason, it does, nonetheless, constitute the main condition in virtue of which the mind is able to compare its notions, in accordance with the laws of reason Thus, I can only judge what is impossible if I predicate both A and not-A of the same subject at the same time. Above all, if we focuss the understanding on experience, we shall see that the relation of cause and caused, at least in the case of external objects, requires relations of space.45 In the case of all objects, however, whether they be external or internal, it is only with the assistance of the relation of time that the mind can be instructed as to what is earlier and what is later, that is to say, as to what is cause and what is caused.⁴⁶ And we can only render the *quantity* of space itself intelligible

thoughts of the mind are in time

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[»] intellectualibus *x* termini *y* limitando *z* affectiones primitivae

[&]quot; extra cancellos / (cancellus lit lattice, grille in the law courts, fig limit, barrier)

^b intellectualiter ^c sunt substrata intellectus

^d typus / A *umage* / B umage / C *tupo* / H Bild / K diagram / (typus lit bas-relief, surveyor's ground-plan)

e terminos f complectando omnia omnino suis respectibus g advertimus

by expressing it numerically, having related it to a measure taken as a unity.⁴⁷ This number itself is nothing but a multiplicity which is distinctly known by counting, that is to say, by successively adding one to one in a given time.

Finally, the question arises for everyone, as though of its own accord, whether each of the two concepts is innate^h or acquired. The latter view, indeed, already seems to have been refuted by what has been demonstrated. The former view, however, ought not to be that rashly admitted. for it payes the way for a philosophy of the lazy, a philosophy which, by appealing to a first cause, declares any further enquiry futile. But each of the concepts has, without any doubt, been acquired, not, indeed, by abstraction from the sensing of objects' (for sensation gives the matter and not the form of human cognition), but from the very action of the mind, which coordinates what is sensed by it, J doing so in accordance with permanent laws. Each of the concepts is like an immutable image,^k and, thus, each is to be cognised intuitively. For sensations, while exciting this action of the mind, do not enter into and become part of the intuition. Nor is there anything innate here except the law of the mind, according to which it joins together in a fixed manner the sense-impressions made by the presence of an object.48

^h connatus. [†] a sensu . . . objectorum . . . abstrahens. [†] sensa sua.

* typus / A: des sortes de types / B: type / C: tipi immutabili / H: Bild / K: diagram. ¹ influunt.

the concepts of space & time are acquired (but in a special way)