

SECOND PART OF THE MAIN TRANSCENDENTAL QUESTION

How is Pure Natural Science Possible?

§ 14. *Nature* is the *existence* of things, so far as it is determined according to universal laws. Should nature signify the existence of things in themselves, we could never cognize it either *a priori* or *a posteriori*. Not *a priori*, for how can we know what belongs to things in themselves, since this never can be done by the dissection of our concepts (in analytic judgments)? For I do not want to know what is contained in my concept of a thing (for that belongs to its logical being), but what in the actuality of the thing is superadded to my concept and by what the thing itself is determined in its existence outside the concept. My understanding and the conditions on which alone it can connect the determinations of things in their existence do not prescribe any rule to things in themselves; these do not conform to my understanding, but it would have to conform to them; they would therefore have to be first given to me in order to gather these determinations from them, wherefore they would not be cognized *a priori*. A cognition of the nature of things in themselves *a posteriori* would be equally impossible. For if experience is to teach us laws to which the existence of things is subject, these laws, if they refer to things in themselves, would have to refer to them of necessity even outside our experience. But experience teaches us what exists and how it exists, but never that it must necessarily exist so and not otherwise. Experience therefore can never teach us the nature of things in themselves.

§ 15. We nevertheless actually possess a pure natural science in which are propounded, *a priori* and with all the necessity requisite to apodeictic propositions, laws to which nature is subject. I need only call to witness that propaedeutic to natural

knowledge which, under the title of universal natural science,⁹ precedes all physics (which is founded upon empirical principles). In it we have mathematics applied to appearances, and also merely discursive principles (from concepts),¹⁰ which constitute the philosophical part of the pure cognition of nature. But there is much in it which is not quite pure and independent of empirical sources, such as the concept of *motion*, that of *impenetrability* (upon which the empirical concept of matter rests), that of *inertia*, and many others, which prevent its being called a quite pure [transcendental] natural science. Besides, it only refers to objects of the external senses, and therefore does not give an example of a universal natural science in the strict sense; for such a science must bring nature in general, whether it regards the object of the external senses or that of the internal sense (the object of physics as well as psychology), under universal laws. But among the principles of this universal physics there are a few which actually have the required universality; for instance, the propositions that "substance is permanent," and that "every event is determined by a cause according to constant laws," etc. These are actually universal laws of nature, which subsist completely *a priori*. There is then in fact a pure [transcendental] natural science, and the question arises: how is it possible?

§ 16. The word *nature* assumes yet another meaning, which determines the object, whereas in the former sense it only denotes the conformity to law of the determinations of the existence of things generally. Nature considered *materialiter* is the *totality of all objects of experience*. And with this only are we now concerned; for, besides, things which can never be objects of experience, if they were to be cognized as to their nature, would oblige us to have recourse to concepts whose meaning could never be given *in concreto* (by any example of possible experience). Consequently, we would have to form for ourselves a list of concepts of their nature, the reality whereof (i.e., whether they actually referred to objects or were mere creations of thought) could never be determined. The cognition of what can-

9. [Contained in Kant's *Metaphysical Foundations of Natural Science* (1786)]

10. [Rather than intuitive principles, like mathematics]

not be an object of experience would be hyperphysical, and with things hyperphysical we are here not concerned, but only with the cognition of nature, the actuality of which can be confirmed by experience, though this cognition is possible *a priori* and precedes all experience.

§ 17. The formal aspect of nature in this narrower sense is therefore the conformity to law of all the objects of experience and, so far as it is cognized *a priori*, their necessary conformity. But it has just been shown that the laws of nature can never be cognized *a priori* in objects so far as they are considered, not in reference to possible experience, but as things in themselves. And our inquiry here extends, not to things in themselves (the properties of which we pass by), but to things as objects of possible experience, and the totality of these is properly what we here call nature. And now I ask, when the possibility of cognition of nature *a priori* is in question, whether it is better to arrange the problem thus: how can we cognize *a priori* that things as objects of experience necessarily conform to law? or thus: how is it possible to cognize *a priori* the necessary conformity to law of experience itself as regards all its objects generally?

Closely considered, the solution of the question represented in either way amounts, with regard to the pure cognition of nature (which is the point of the question at issue), entirely to the same thing. For the subjective laws, under which alone an empirical cognition of things is possible, hold good of these things as objects of possible experience (not as things in themselves, which are not considered here). Either of the following statements means quite the same: a judgment of perception can never rank as experience without the law that, whenever an event is observed, it is always referred to some antecedent, which it follows according to a universal rule; or else, everything of which experience teaches that it happens must have a cause.

It is, however, more convenient to choose the first formula. For we can *a priori* and before all given objects have a cognition of those conditions on which alone experience of them is possible, but never of the laws to which things may in themselves be subject, without reference to possible experience. We cannot, therefore, study the nature of things *a priori* otherwise than by investigating the conditions and the universal (though sub-

jective) laws, under which alone such a cognition as experience (as to mere form) is possible, and we determine accordingly the possibility of things as objects of experience. For if I should choose the second formula and seek the *a priori* conditions under which nature as an object of experience is possible, I might easily fall into error and fancy that I was speaking of nature as a thing in itself, and then move round in endless circles, in a vain search for laws concerning things of which nothing is given me.

Accordingly, we shall here be concerned merely with experience and the universal conditions of its possibility, which are given *a priori*. Thence we shall determine nature as the whole object of all possible experience. I think it will be understood that I here do not mean the rules of the observation of a nature that is already given, for these already presuppose experience. I do not mean how (through experience) we can study the laws of nature; for these would not then be laws *a priori* and would yield us no pure natural science; but [I mean to ask] how the conditions *a priori* of the possibility of experience are at the same time the sources from which all the universal laws of nature must be derived.

§ 18. In the first place we must state that while all judgments of experience are empirical (i.e., have their ground in immediate sense-perception), yet conversely, all empirical judgments are not therefore judgments of experience; but, besides the empirical, and in general besides what is given to sensuous intuition, special concepts must yet be superadded—concepts which have their origin quite *a priori* in the pure understanding, and under which every perception must be first of all subsumed and then by their means changed into experience.

Empirical judgments, so far as they have objective validity, are judgments of experience; but those which are only subjectively valid I name mere judgments of perception. The latter require no pure concept of the understanding, but only the logical connection of perception in a thinking subject. But the former always require, besides the representation of the sensuous intuition, special concepts originally generated in the understanding, which make the judgment of experience objectively valid.

All our judgments are at first merely judgments of perception;

Aristotle derived?

they hold good only for us (i.e., for our subject), and we do not till afterwards give them a new reference (to an object) and want that they shall always hold good for us and in the same way for everybody else: for if a judgment agrees with an object, all judgments concerning the same object must likewise agree with one another, and thus the objective validity of the judgment of experience signifies nothing else than its necessary universal validity. And, conversely, if we have reason to hold a judgment to be necessarily universally valid (which never rests on perception, but on the pure concept of the understanding under which the perception is subsumed), we must consider it to be objective also, that is, that it expresses not merely a reference of our perception to a subject, but a quality of the object. For there would be no reason for the judgments of other men necessarily to agree with mine, if it were not the unity of the object to which they all refer and with which they accord; hence they must all agree with one another.

§ 19. Therefore objective validity and necessary universal validity (for everybody) are equivalent concepts, and though we do not know the object in itself, yet when we consider a judgment as universally valid, and hence necessary, we understand it thereby to have objective validity. By this judgment we cognize the object (though it remains unknown as it is in itself) by the universally valid and necessary connection of the given perceptions. As this is the case with all objects of sense, judgments of experience take their objective validity, not from the immediate cognition of the object (which is impossible), but merely from the condition of the universal validity of empirical judgments, which, as already said, never rests upon empirical or, in short, sensuous conditions, but upon a pure concept of the understanding. The object in itself always remains unknown; but when by the concept of the understanding the connection of the representations of the object, which are given by the object to our sensibility, is determined as universally valid, the object is determined by this relation, and the judgment is objective.

To illustrate the matter: when we say, "The room is warm, sugar sweet, and wormwood nasty,"¹¹ we have only subjectively

11. I freely grant that these examples do not represent such judgments of perception as ever could become judgments of experience, even though a con-

valid judgments. I do not at all expect that I or any other person shall always find it as I now do; each of these sentences only expresses a reference of two sensations to the same subject, i.e., myself, and that only in my present state of perception; consequently, they are not intended to be valid of the object. Such are judgments of perception. Judgments of experience are of quite a different nature. What experience teaches me under certain circumstances, it must always teach me and everybody; and its validity is not limited to the subject nor to its state at a particular time. Hence I pronounce all such judgments as being objectively valid. For instance, when I say the air is elastic, this judgment is as yet a judgment of perception only—I do nothing but refer two sensations in my senses to one another. But if I would have it called a judgment of experience, I require this connection to stand under a condition which makes it universally valid. I desire therefore that I and everybody else should always necessarily connect the same perceptions under the same circumstances.

§ 20. We must therefore analyze experience in general in order to see what is contained in this product of the senses and of the understanding, and how the judgment of experience itself is possible. The foundation is the intuition of which I become conscious, i.e., perception (*perceptio*), which pertains merely to the senses. But in the next place, there is judging (which belongs only to the understanding). But this judging may be twofold: first, I may merely compare perceptions and connect them in a consciousness of my state; or, secondly, I may connect them in a consciousness in general. The former judgment is merely a judgment of perception and is of subjective validity only; it is merely a connection of perceptions in my mental state, without reference to the object. Hence it is not, as is commonly imagined, enough for experience to compare perceptions and connect

cept of the understanding were superadded, because they refer merely to feeling, which everybody knows to be merely subjective and which, of course, can never be attributed to the object and, consequently, never can become objectively valid. I only wished to give here an example of a judgment that is merely subjectively valid, containing no ground for necessary universal validity and thereby for a relation to the object. An example of the judgments of perception which become judgments of experience by superadded concepts of the understanding will be given in the next note.

them in consciousness through judgment; there arises no universal validity and necessity, by virtue of which alone consciousness can become objectively valid and be called experience.

Quite another judgment therefore is required before perception can become experience. The given intuition must be subsumed under a concept which determines the form of judging in general with regard to the intuition, connects the empirical consciousness of the intuition in consciousness in general, and thereby procures universal validity for empirical judgments. A concept of this nature is a pure *a priori* concept of the understanding, which does nothing but determine for an intuition the general way in which it can be used for judging. Let the concept be that of cause; then it determines the intuition which is subsumed under it, e.g., that of air, with regard to judging in general, viz., the concept of air as regards its expansion serves in the relation of antecedent to consequent in a hypothetical judgment. The concept of cause accordingly is a pure concept of the understanding, which is totally disparate from all possible perception and only serves to determine the representation contained under it with regard to judging in general, and so to make a universally valid judgment possible.

Before, therefore, a judgment of perception can become a judgment of experience, it is requisite that the perception should be subsumed under some such concept of the understanding; for instance, air belongs under the concept of cause, which determines our judgment about it with regard to its expansion as hypothetical.¹² Thereby the expansion of the air is represented, not as merely belonging to the perception of the air in my present state or in several states of mine, or in the state of perception of others, but as belonging to it necessarily. The judgment that air is elastic becomes universally valid and a judgment of experience only because certain judgments precede it which subsume

12. As an easier example, we may take the following: when the sun shines on the stone, it grows warm. This judgment, however often I and others may have perceived it, is a mere judgment of perception and contains no necessity; perceptions are only usually conjoined in this manner. But if I say: the sun warms the stone, I add to the perception a concept of the understanding, viz., that of cause, which necessarily connects with the concept of sunshine that of heat, and the synthetic judgment becomes of necessity universally valid, viz., objective, and is converted from a perception into experience.

the intuition of air under the concepts of cause and effect; and they thereby determine the perceptions, not merely as regards one another in me, but as regards the form of judging in general (which is here hypothetical), and in this way they render the empirical judgment universally valid.

If all our synthetic judgments are analyzed so far as they are objectively valid, it will be found that they never consist of mere intuitions connected only (as is commonly supposed) by comparison into a judgment; but that they would be impossible were not a pure concept of the understanding superadded to the concepts abstracted from intuition, under which pure concept these latter concepts are subsumed and in this manner only combined into an objectively valid judgment. Even the judgments of pure mathematics in their simplest axioms are not exempt from this condition. The principle that a straight line is the shortest distance between two points presupposes that the line is subsumed under the concept of quantity, which certainly is no mere intuition but has its seat in the understanding alone and serves to determine the intuition (of the line) with regard to the judgments which may be made about it in respect to the quantity, that is, to plurality (as *iudica pluralitatis*).¹³ For under them it is understood that in a given intuition there is contained a plurality of homogeneous parts.

§ 21. To prove, then, the possibility of experience so far as it rests upon pure *a priori* concepts of the understanding, we must first represent what belongs to judgments in general and the various moments (functions) of the understanding in them, in a complete table. For the pure concepts of the understanding must run parallel to these moments, inasmuch as such concepts are nothing more than concepts of intuitions in general, so far as these are determined by one or other of these moments of judging, in themselves, i.e., necessarily and universally. Hereby also

13. This name seems preferable to the term *particularia*, which is used for these judgments in logic. For the latter already contains the thought that they are not universal. But when I start from unity (in singular judgments) and proceed to totality, I must not (even indirectly and negatively) include any reference to totality. I think plurality merely without totality, and not the exclusion of totality. This is necessary, if the logical moments are to underlie the pure concepts of the understanding. In logical usage one may leave things as they were.

the *a priori* principles of the possibility of all experience, as objectively valid empirical cognition, will be precisely determined. For they are nothing but propositions which subsume all perception (conformably to certain universal conditions of intuition) under those pure concepts of the understanding.

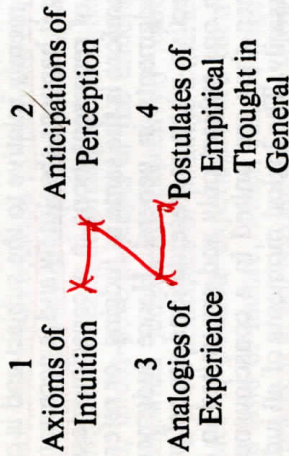
LOGICAL TABLE OF JUDGMENTS

1	2
<i>As to Quantity</i>	<i>As to Quality</i>
Universal	Affirmative
Particular	Negative
Singular	Infinite
3	4
<i>As to Relation</i>	<i>As to Modality</i>
Categorical	Problematic
Hypothetical	Assertoric
Disjunctive	Apodeictic

TRANSCENDENTAL TABLE OF THE CONCEPTS OF THE UNDERSTANDING

1	2
<i>As to Quantity</i>	<i>As to Quality</i>
Unity (Measure)	Reality
Plurality (Quantity)	Negation
Totality (Whole)	Limitation
3	4
<i>As to Relation</i>	<i>As to Modality</i>
Substance	Possibility
Cause	Existence
Community	Necessity

PURE PHYSIOLOGICAL¹⁴ TABLE OF THE UNIVERSAL PRINCIPLES OF NATURAL SCIENCE



§ 21a. In order to comprise the whole matter in one idea, it is first necessary to remind the reader that we are discussing, not the origin of experience, but what lies in experience. The former pertains to empirical psychology and would even then never be adequately developed without the latter, which belongs to the critique of cognition, and particularly of the understanding.

Experience consists of intuitions, which belong to the sensibility, and of judgments, which are entirely a work of the understanding. But the judgments which the understanding makes entirely out of sensuous intuitions are far from being judgments of experience. For in the one case the judgment connects only the perceptions as they are given in sensuous intuition, while in the other the judgments must express what experience in general and not what the mere perception (which possesses only subjective validity) contains. The judgment of experience must therefore add to the sensuous intuition and its logical connection in a judgment (after it has been rendered universal by comparison) something that determines the synthetic judgment as necessary and therefore as universally valid. This can be nothing but that concept which represents the intuition as determined in itself with regard to one form of judgment rather than another, viz., a concept of that synthetic unity of intuitions which can only be represented by a given logical function of judgments.

14. [See last sentence of § 23.]

§ 22. The sum of the matter is this: the business of the senses is to intuit, that of the understanding is to think. But thinking is uniting representations in a consciousness. This unification originates either merely relative to the subject and is contingent and subjective, or it happens absolutely and is necessary or objective. The uniting of representations in a consciousness is judgment. Thinking therefore is the same as judging, or referring representations to judgments in general. Hence judgments are either merely subjective when representations are referred to a consciousness in one subject only and are united in it, or they are objective when they are united in a consciousness in general, that is, necessarily. The logical moments of all judgments are so many possible ways of uniting representations in consciousness. But if they serve as concepts, they are concepts of the necessary unification of representations in a consciousness and so are principles of objectively valid judgments. This uniting in a consciousness is either analytic by identity, or synthetic by the combination and addition of various representations one to another. Experience consists in the synthetic connection of appearances (perceptions) in consciousness, so far as this connection is necessary. Hence the pure concepts of the understanding are those under which all perceptions must first be subsumed before they can serve for judgments of experience, in which the synthetic unity of the perceptions is represented as necessary and universally valid.¹⁵

§ 23. Judgments, when considered merely as the condition of the unification of given representations in a consciousness, are

15. But how does the proposition that judgments of experience contain necessity in the synthesis of perceptions agree with my statement so often before inculcated that experience, as cognition *a posteriori*, can afford contingent judgments only? When I say that experience teaches me something, I mean only the perception that lies in experience—for example, that heat always follows the shining of the sun on a stone; consequently, the proposition of experience is always so far contingent. That this heat necessarily follows the shining of the sun is contained indeed in the judgment of experience (by means of the concept of cause), yet is a fact not learned by experience; for, conversely, experience is first of all generated by this addition of the concept of the understanding (of cause) to perception. How perception attains this addition may be seen by referring in the *Critique* itself to the section on the transcendental faculty of judgment, B 176 *et seq.*

rules. These rules, so far as they represent the unification as necessary, are rules *a priori*, and so far as they cannot be deduced from higher rules, are principles. But in regard to the possibility of all experience, merely in relation to the form of thinking in it, no conditions of judgments of experience are higher than those which bring the phenomena, according to the different form of their intuition, under pure concepts of the understanding, and render the empirical judgments objectively valid. These are therefore the *a priori* principles of possible experience.

The principles of possible experience are then at the same time universal laws of nature, which can be cognized *a priori*. And thus the problem in our second question: How is pure natural science possible? is solved. For the systematization which is required for the form of a science is to be met with in perfection here, because, beyond the above-mentioned formal conditions of all judgments in general and of all rules in general, that are offered in logic, no others are possible, and these constitute a logical system. The concepts grounded thereupon, which contain the *a priori* conditions of all synthetic and necessary judgments, accordingly constitute a transcendental system. Finally, the principles by means of which all appearances are subsumed under these concepts constitute a physiological system, that is, a system of nature, which precedes all empirical cognition of nature, first makes it possible, and hence may in strictness be called the universal and pure natural science.

§ 24. The first¹⁶ of the physiological principles¹⁷ subsumes all appearances, as intuitions in space and time, under the concept of *quantity*, and is so far a principle of the application of mathematics to experience. The second¹⁸ subsumes the strictly empirical element, viz., sensation, which denotes the real in intuitions, not indeed directly under the concept of *quantity*, because sensation is not an intuition that contains either space or time, though

16. The three following paragraphs will hardly be understood unless reference be made to what the *Critique* itself says on the subject of the principles; they will, however, be of service in giving a general view of the principles, and in fixing the attention on the main moments. [See *Critique*, B 187–294.]

17. [The Axioms of Intuition. See *Critique*, B 202–207.]

18. [The Anticipations of Perception. See *ibid.*, B 207–218.]

it puts the object corresponding to sensation in both space and time. But still there is between reality (sense-representation) and zero, or total lack of intuition in time, a difference which has a quantity. For between any given degree of light and darkness, between any degree of heat and complete cold, between any degree of weight and absolute lightness, between any degree of occupied space and of totally empty space, ever smaller degrees of unconsciousness (psychological darkness) ever smaller degrees can be thought, just as even between consciousness and total absence. Hence there is no perception that can show an absolute absence: for instance, no psychological darkness that cannot be regarded as a consciousness only surpassed by a stronger consciousness. This occurs in all cases of sensation; and so the understanding can anticipate sensations, which constitute the peculiar quality of empirical representations (appearances), by means of the principle that they all have a degree, consequently, that what is real in all appearance has a degree. Here is the second application of mathematics (*mathesis intensivum*) to natural science.

§ 25. As regards the relation of appearances merely with a view to their existence, the determination is not mathematical but dynamical, and can never be objectively valid and fit for experience, if it does not come under *a priori* principles¹⁹ by which the cognition of experience relative to appearances first becomes possible. Hence appearances must be subsumed under the concept of substance, which as a concept of the thing itself is the foundation of all determination of existence; or, secondly—so far as a succession is found among appearances, that is, an event—under the concept of an effect with reference to cause; or, lastly—so far as coexistence is to be known objectively, that is, by a judgment of experience—under the concept of community (action and reaction). Thus *a priori* principles form the basis of objectively valid, though empirical, judgments—that is, of the possibility of experience so far as it must connect objects as existing in nature. These principles are properly the laws of nature, which may be called dynamical.

Finally²⁰ the cognition of the agreement and connection, not

19. [The Analogies of Experience. See *ibid.*, B 218–265.]

20. [The Postulates of Empirical Thought. See *ibid.*, B 265–294.]

only of appearances among themselves in experience, but of their relation to experience in general, belongs to judgments of experience. This relation contains either their agreement with the formal conditions which the understanding cognizes, or their coherence with the material of the senses and of perception, or combines both into one concept and consequently contains possibility, actuality, and necessity according to universal laws of nature. This would constitute the physiological doctrine of method (distinction between truth and hypotheses, and the bounds of the reliability of the latter).

§ 26. The third table of principles drawn from the nature of the understanding itself according to the critical method shows an inherent perfection, which raises it far above every other table which has hitherto, though in vain, been tried or may yet be tried by analyzing the objects themselves dogmatically. It exhibits all synthetic *a priori* principles completely and according to one principle, viz., the faculty of judging in general, which constitutes the essence of experience as regards the understanding, so that we can be certain that there are no more such principles. This affords a satisfaction such as can never be attained by the dogmatic method. Yet this is not all; there is a still greater merit in it.

We must carefully bear in mind the ground of proof which shows the possibility of this cognition *a priori* and, at the same time, limits all such principles to a condition which must never be lost sight of, if they are not to be misunderstood and extended in use beyond what is allowed by the original sense which the understanding places in them. This limit is that they contain nothing but the conditions of possible experience in general so far as it is subjected to laws *a priori*. Consequently, I do not say that things *in themselves* possess a quantity, that their reality possesses a degree, their existence a connection of accidents in a substance, etc. This nobody can prove, because such a synthetic connection from mere concepts, without any reference to sensuous intuition on the one side or connection of such intuition in a possible experience on the other, is absolutely impossible. The essential limitation of the concepts in these principles, then, is that all things stand necessarily *a priori* under the aforementioned conditions only as objects of experience.

Hence there follows, secondly, a specifically peculiar mode of

solely on the reference of the understanding to experience, but with a completely reversed mode of connection which never occurred to Hume: they are not derived from experience, but experience is derived from them.

This is, therefore, the result of all our foregoing inquiries: "All synthetic principles *a priori* are nothing more than principles of possible experience" and can never be referred to things in themselves, but only to appearances as objects of experience. And hence pure mathematics as well as pure natural science can never be referred to anything more than mere appearances, and can only represent either that which makes experience in general possible, or else that which, as it is derived from these principles, must always be capable of being represented in some possible experience.

§ 31. And thus we have at last something determinate upon which to depend in all metaphysical enterprises, which have hitherto, boldly enough but always at random, attempted everything without discrimination. That the goal of their exertions should be set up so close struck neither the dogmatic thinkers nor those who, confident in their supposed sound common sense, started with concepts and principles of pure reason (which were legitimate and natural, but destined for mere empirical use) in search of insights for which they neither knew nor could know any determinate bounds, because they had never reflected nor were able to reflect on the nature or even on the possibility of such a pure understanding.

Many a naturalist of pure reason (by which I mean the man who believes he can decide in matters of metaphysics without any science) may pretend that he, long ago, by the prophetic spirit of his sound sense, not only suspected but knew and comprehended what is here propounded with so much ado, or, if he likes, with prolix and pedantic pomp: "that with all our reason we can never reach beyond the field of experience." But when he is questioned about his rational principles individually, he must grant that there are many of them which he has not taken from experience and which are therefore independent of it and valid *a priori*. How then and on what grounds will he restrain both himself and the dogmatist, who makes use of these concepts and principles beyond all possible experience because they

are recognized to be independent of it? And even he, this adept in sound sense, in spite of all his assumed and cheaply acquired wisdom, is not exempt from wandering inadvertently beyond objects of experience into the field of chimeras. He is often deeply enough involved in them, though in announcing everything as mere probability, rational conjecture, or analogy, he gives by his popular language a color to his groundless pretensions.

§ 32. Since the oldest days of philosophy, inquirers into pure reason have thought that, besides the things of sense, or appearances (*phenomena*), which make up the sensible world, there were certain beings of the understanding (*noumena*), which should constitute an intelligible world. And as appearance and illusion were by those men identified (a thing which we may well excuse in an undeveloped epoch), actuality was only conceded to the beings of the understanding.

And we indeed, rightly considering objects of sense as mere appearances, confess thereby that they are based upon a thing in itself, though we know not this thing as it is in itself but only know its appearances, viz., the way in which our senses are affected by this unknown something. The understanding therefore, by assuming appearances, grants also the existence of things in themselves, and thus far we may say that the representation of such things as are the basis of appearances, consequently of mere beings of the understanding, is not only admissible but unavoidable.

Our critical deduction by no means excludes things of that sort (*noumena*), but rather limits the principles of the Aesthetic²² in such a way that they shall not extend to all things (as everything would then be turned into mere appearance) but that they shall hold good only of objects of possible experience. Hereby, then, beings of the understanding are admitted, but with the inculcation of this rule which admits of no exception: that we neither know nor can know anything determinate whatever about these pure beings of the understanding, because our pure concepts of the understanding as well as our pure intuitions extend to

22. [The principles of sensibility (space and time). See *Critique of Pure Reason*, B 33-B 73.]

inculcation = to implant ideas or habits by persistent urging

experience. This is the reason why young thinkers are so partial to metaphysics in the truly dogmatical manner, and often sacrifice to it their time and their talents, which might be otherwise better employed.

But there is no use in trying to moderate these fruitless endeavors of pure reason by all manner of cautions as to the difficulties of solving questions so occult, by complaints of the limits of our reason, and by degrading our assertions into mere conjectures. For if their impossibility is not distinctly shown, and reason's knowledge of itself does not become a true science, in which the field of its right use is distinguished, so to say, with geometrical certainty from that of its worthless and idle use, these fruitless efforts will never be entirely abandoned.

§ 36. *How is nature itself possible?* This question—the highest point that transcendental philosophy can ever reach, and to which, as its boundary and completion, it must proceed—properly contains two questions.

FIRST: How is nature possible in general in the *material* sense, i.e., according to intuition, as the totality of appearances; how are space, time, and that which fills both—the object of sensation—possible in general? The answer is by means of the constitution of our sensibility, according to which it is in its special way affected by objects which are in themselves unknown to it and totally distinct from those appearances. This answer is given in the *Critique* itself in the Transcendental Aesthetic, and in these *Prolegomena* by the solution of the first main question.

SECONDLY: How is nature possible in the *formal* sense, as the totality of the rules under which all appearances must come in order to be thought as connected in an experience? The answer must be this: it is only possible by means of the constitution of our understanding, according to which all those representations of sensibility are necessarily referred to a consciousness, and by which the peculiar way in which we think (viz., by rules) and hence also experience are possible, but must be clearly distinguished from an insight into the objects in themselves. This answer is given in the *Critique* itself in the Transcendental Logic, and in these *Prolegomena* in the course of the solution of the second main question.

But how this peculiar property of our sensibility itself is possible, or that of our understanding and of the apperception which is necessarily its basis and also that of all thinking, cannot be further analyzed or answered, because it is of them that we are in need for all our answers and for all our thinking about objects.

There are many laws of nature which we can only know by means of experience, but conformity to law in the connection of appearances, i.e., nature in general, we cannot discover by any experience, because experience itself requires laws which are *a priori* at the basis of its possibility.

The possibility of experience in general is therefore at the same time the universal law of nature, and the principles of experience are the very laws of nature. For we know nature as nothing but the totality of appearances, i.e., of representations in us; and hence we can only derive the law of their connection from the principles of their connection in us, that is, from the conditions of their necessary unification in a consciousness, which constitutes the possibility of experience.

Even the main proposition expounded throughout this section—that universal laws of nature can be cognized *a priori*—leads of itself to the proposition that the highest legislation of nature must lie in ourselves, i.e., in our understanding; and that we must not seek the universal laws of nature in nature by means of experience, but conversely must seek nature, as to its universal conformity to law, in the conditions of the possibility of experience, which lie in our sensibility and in our understanding. For how would it otherwise be possible to know *a priori* these laws, as they are not rules of analytic cognition but truly synthetic extensions of it? Such a necessary agreement of the principles of possible experience with the laws of the possibility of nature can only proceed from one of two reasons: either these laws are drawn from nature by means of experience, or conversely nature is derived from the laws of the possibility of experience in general and is quite the same as the mere universal conformity to law of the latter. The former is self-contradictory, for the universal laws of nature can and must be cognized *a priori* (that is, independent of all experience) and must be the