

## *The Copernican Revolution*

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### **Immanuel Kant (1724-1804)**

The Critique of Pure Reason (1781) is Kant's best known work. In this monumental work, he begins a Copernican-like revolution in the field of epistemology. He provides a synthesis of the competing theories of the rationalists and the empiricists. The rationalists, like Descartes, argued that reason alone is the ultimate source of knowledge, while the empiricists like Locke and Hume, argues that experience is the only source of knowledge. Are there innate ideas already in the mind that we are born with as Descartes held? Or is the mind a blank slate (*tabula rasa*) as Lock held?

Kant tells us that Hume "woke me from my dogmatic slumbers." Although Kant argues that all our knowledge begins with experience, he also argues that it does not necessarily follow that all our knowledge arises from experience. Kant sought to demonstrate that the rationalists had an invaluable insight, which had been lost in their speculation, that there is an *a priori* structure to the mind that causes us to know what we know.

Kant argued that this *a priori* structure of the human mind imposes interpretive categories on all our experience. We do not simply experience the world as the empiricists thought, but rather we interpret that sense data the experience gives to us. This is sometimes referred to as Kant's Copernican Revolution.

#### ***Vocabulary:***

|                 |                         |
|-----------------|-------------------------|
| A priori:       | before all experience   |
| Supposition:    | assumption              |
| Intuition:      | sense perception        |
| Transcendental: | universal and necessary |

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| Universality: | when something must always be            |
| Genus:        | a kind or class having common attributes |
| Cursory:      | not thorough; hasty                      |
| Demurred:     | to object; to disagree with              |
| Apodeictic:   | absolutely certain or necessarily true   |

***Concepts:***

A priori  
A posteriori  
A priori Synthetic Knowledge  
Space  
Time  
Pure Knowledge  
Empirical Knowledge  
Transcendental Philosophy  
Intuition  
Analytic Judgment  
Synthetic Judgment

***Questions:***

- 1. What is the difference between pure and empirical knowledge?*
- 2. What is the difference between analytic and synthetic judgments?*
- 3. What are synthetic a priori judgments?*
- 4. What does Kant mean when he says that space is a necessary condition for our perceptions?*
- 5. What does Kant mean when he says that time is a necessary condition for our perceptions?*

Until now it has been assumed that all our knowledge must conform to objects. But all attempts to extend our knowledge of objects by establishing something in regard to them a priori, by means of concepts, have, on this assumption, ended in failure. We must, therefore, see whether we may not have more success in the tasks of metaphysics, if we suppose that objects must conform to our knowledge. This would agree better with what is desired, namely, that it should be possible to have knowledge of objects a priori, determining something in regard to them prior to their being given. We should then be proceeding in the same way as Copernicus' primary hypothesis. Failing to make progress in explaining the movements of the heavenly bodies on the supposition that they all revolved round the spectator, he considered whether he might not have better success if he made the spectator to revolve and the stars to remain at rest. A similar experiment can be tried in metaphysics, as regards the intuition of objects. If intuition must conform to the constitution of the objects, I do not see how we could know anything of the latter a priori; but if the object (as object of the senses) must conform to the constitution of our faculty of intuition, I have no difficulty in conceiving such a possibility.

### **INTRODUCTION. THE DISTINCTION BETWEEN PURE AND EMPIRICAL KNOWLEDGE**

There can be no doubt that all our knowledge begins with experience. For how should our faculty of knowledge be awakened into action did not objects affecting our senses partly of themselves produce representations, partly arouse the activity of our understanding to compare these representations, and, by combining or separating them, work up the raw material of the sensible impressions into that knowledge of objects which is entitled experience? In respect to time, therefore, no knowledge of ours is before experience, but begins with it. But though all our knowledge begins with experience, it does not follow that it all arises out of experience.

### **THE IDEA OF TRANSCENDENTAL PHILOSOPHY**

Experience is, beyond all doubt, the first product to which our understanding gives rise, in working up the raw material of sensible impressions. Experience is, therefore, our first instruction, and in its progress is so inexhaustible in new information, that in the interconnected lives of all future generations there will never be any lack of new knowledge that can be thus gathered. Nevertheless, it

is by no means the sole field to which our understanding is confined.

For it may well be that even our empirical knowledge is made up of what we receive through impressions and of what our own faculty of knowledge (sensible impressions serving merely as the occasion) supplies from itself. If our faculty of knowledge makes any such addition, it may be that we are not in a position to distinguish it from the raw material, until with long practice of attention we have become skilled in separating it. This, then, is a question which at least calls for closer examination, and does not allow for any off-hand answer: — whether there is any knowledge that is thus independent of experience and even of all impressions of the senses. Such knowledge is entitled *a priori*, and distinguished from the empirical, which has its sources *a posteriori*, that is, in experience.

Experience tells us, indeed, what is, but not that it must necessarily be so, and not otherwise. It, therefore, gives us no true universality; and reason, which is so insistent upon this kind of knowledge, is, therefore, more stimulated by it than satisfied. Such universal modes of knowledge, which at the same time possess the character of inner necessity, must in themselves, independently of experience, be clear and certain. They are, therefore, enti-

tled knowledge *a priori*; whereas, on the other hand, that which is borrowed solely from experience is, as we say, known only *a posteriori*, or empirically. Now we find, what is especially noteworthy, that even into our experiences there enter modes of knowledge which must have their origin *a priori*, and which perhaps serve only to give coherence to our sense-representations. For if we eliminate from our experiences everything which belongs to the senses, there still remain certain original concepts and certain judgments derived from them, which must have arisen completely *a priori*, independently of experience, inasmuch as they enable us to say, or at least lead us to believe that we can say, in regard to the objects which appear to the senses, more than mere experience would teach — giving to assertions true universality and strict necessity, such as mere empirical knowledge cannot supply.

The expression ‘*a priori*’ does not, however, indicate with sufficient precision the full meaning of our question. For it has been customary to say, even of much knowledge that is derived from empirical sources, that we have it or are capable of having it *a priori*, meaning thereby that we do not derive it immediately from experience, but from a universal rule — a rule which is itself, however, borrowed by us from experience. Thus

we would say of a man who undermined the foundations of his house, that he might have known a priori that it would fall, that is, that he need not have waited for the experience of its actual falling. But still he could not know this completely a priori. For he had first to learn through experience that bodies are heavy, and therefore fall when their supports are withdrawn. In what follows, therefore, we shall understand by a priori knowledge, not knowledge independent of this or that experience, but knowledge absolutely independent of all experience. Opposed to it is empirical knowledge, which is knowledge possible only a posteriori, that is, through experience. A priori modes of knowledge are entitled pure when there is no admixture of anything empirical. Thus, for instance, the proposition, 'every alteration has its cause,' while an a priori proposition, is not a pure proposition, because alteration is a concept which can be derived only from experience.

**WE ARE IN POSSESSION OF CERTAIN MODES OF A PRIORI KNOWLEDGE, AND EVEN THE COMMON UNDERSTANDING IS NEVER WITHOUT THEM**

What we here require is a criterion by which to distinguish with certainty between pure and empirical knowledge.

Experience teaches us that a thing is so and so, but not that it cannot be otherwise. First, then, if we have a proposition which, in being thought is thought as necessary, it is an a priori judgment; and if, besides, it is not derived from any proposition except one which also has the validity of a necessary judgment, it is an absolutely a priori judgment. Secondly, experience never confers on its judgments true or strict but only assumed and comparative universality, through induction. We can properly only say, therefore, that so far as we have hitherto observed, there is no exception to this or that rule. If, then, a judgment is thought with strict universality, that is, in such manner that no exception is allowed as possible, it is not derived from experience, but is valid absolutely *a priori*.

Empirical universality is only an arbitrary extension of a validity holding in most cases to one which holds in all, for instance, in the proposition, 'all bodies are heavy.' When, on the other hand, strict universality is essential to a judgment, this indicates a special source of knowledge, namely, a faculty of a priori knowledge. Necessity and strict universality are thus sure criteria of a priori knowledge, and are inseparable from one another. But since in the employment of these criteria the contingency of judg-

ments is sometimes more easily shown than their empirical limitation, or, as sometimes also happens, their unlimited universality can be more convincingly proved than their necessity, it is advisable to use the two criteria separately, each by itself being infallible.

Now it is easy to show that there actually are in human knowledge judgments which are necessary and, in the strictest sense universal, and which are, therefore, pure a priori judgments. If an example from the sciences be desired, we have only to look to any of the propositions of mathematics; if we seek an example from the understanding in its quite ordinary employment, the proposition, 'every alteration must have a cause,' will serve our purpose. In the latter case, indeed, the very concept of a cause so manifestly contains the concept of a necessity of connection with an effect and of the strict universality of the rule, that the concept would be altogether lost if we attempted to derive it, as Hume has done, from a repeated association of that which happens with that which precedes, and from a custom of connecting representations, a custom originating in this repeated association, and constituting, therefore, a merely subjective necessity. Even without appealing to such examples, it is possible to show that pure a priori princi-

ples are indispensable for the possibility of experience, and so to prove their existence a priori. For whence could experience derive its certainty, if all the rules, according to which it proceeds, were always themselves empirical, and, therefore, contingent? Such rules could hardly be regarded as first principles. At present, however, we may be content to have established the fact that our faculty of knowledge does have a pure employment, and to have shown what are the criteria of such an employment.

Such a priori origin is manifest in certain concepts, no less than in judgments. If we remove from our empirical concept of a body, one by one, every feature in it which is [merely] empirical, the colour, the hardness or softness, the weight, even the impenetrability, there still remains the space which the body (now entirely vanished) occupied, and this cannot be removed. Again, if we remove from our empirical concept of any object, corporeal or incorporeal, all properties which experience has taught us, we yet cannot take away that property through which the object is thought as substance or as inhering in a substance (although this concept of substance is more determinate than that of an object in general). Owing, therefore, to the necessity with which this concept of substance

forces itself upon us, we have no option save to admit that it has its seat in our faculty of a priori knowledge.

### THE DISTINCTION BETWEEN ANALYTIC AND SYNTHETIC JUDGMENTS

In all judgments in which the relation of a subject to the predicate is thought, this relation is possible in two different ways; either the predicate to the subject A, as something which is contained in this concept A; or outside the concept A, although it does indeed stand in connection with it. In the one case I entitle the judgment analytic, in the other, synthetic. Analytic judgments are, therefore, those in which the connection of the predicate with the subject is through identity; those in which this connection is thought without identity should be entitled synthetic. The former adds nothing to the predicate in the concept of the subject, but merely breaks it up into those constituent concepts that have all along been thought in it. The latter, on the other hand, add to the concept of the subject a predicate which has not been in any wise thought in it, and which no analysis could possibly extract from it. If I say, for instance, 'All bodies are extended,' this is an analytic judgment. For I do not require to go beyond the concept which I connect

with 'body' in order to find extension as bound up with it. To meet with this predicate, I have merely to analyse the concept, that is, to become conscious to myself of the manifold which I always think in that concept. The judgment is, therefore, analytic. But when I say, 'All bodies are heavy,' the predicate is something quite different from anything that I think in the mere concept of body in general; and the addition of such a predicate, therefore, yields a synthetic judgment.

Judgments of experience, as such, are one and all synthetic. For it would be absurd to found an analytic judgment on experience. Since, in framing the judgment, I must not go outside my concept, there is no need to appeal to the testimony of experience in its support. That a body is extended is a proposition that holds a priori and is not empirical. For, before appealing to experience, I have already in the concept of body all the conditions required for my judgment. I have only to extract from it, in accordance with the principle of contradiction, the required predicate, and in so doing can at the same time become conscious of the necessity of the judgment — and that is what experience could never have taught me. On the other hand, though I do not include in the concept of a body in general the predicate 'weight,' none the less

this concept indicates an object of experience through one of its parts, and I can add to that part other parts of this same experience, as in this way belonging together with the concept.

Thus it is evident: 1. that through analytic judgments our knowledge is not in any way extended, and that the concept which I already have is merely set forth and made intelligible to me; 2. that in synthetic judgments I must have, besides the concept of the subject, something else (X), upon which the understanding may rely, if it is to know that a predicate, not contained in this concept, nevertheless belongs to it. In the case of empirical judgments, judgments of experience, there is no difficulty whatsoever in meeting this demand. This X is the complete experience of the object which I think through the concept A — a concept which forms only one part of this experience.

From the start I can apprehend the concept of body analytically through the characters of extension, impenetrability, figure, etc., all of which are thought in the concept. Now, however, looking back on the experience from which I have derived this concept of body, and finding weight to be invariably connected with the above characters, I attach it as a predicate to the concept; and in doing so I attach it synthetically, and am, therefore, extending

my knowledge. The possibility of the synthesis of the predicate 'weight' with the concept of 'body' thus rests upon experience. While the one concept is not contained in the other, they yet belong to one another, though only contingently, as parts of a whole, namely, of an experience which is itself a synthetic combination of intuitions. But in a priori synthetic judgments this help is entirely lacking. [I do not here have the advantage of looking around in the field of experience.] Upon what, then, am I to rely, when I seek to go beyond the concept A, and to know that another concept B is connected with it? Through what is the synthesis made possible? Let us take the proposition, 'Everything which happens has its cause.' In the concept of 'something which happens,' I do indeed think an existence which is preceded by a time, etc., and from this concept analytic judgments may be obtained.

For though I do not include in the concept of a body in general the predicate 'weight,' the concept none the less indicates the complete experience through one of its parts; and to this part, as belonging to it, I can therefore add other parts of the same experience. By prior analysis I can apprehend the concept of body through the characters of extension, impenetrability, figure, etc., all of which

are thought in this concept. To extend my knowledge, I then look back to the experience from which I have derived this concept of body, and find that weight is always connected with the above characters. Experience is thus the X which lies outside the concept A, and on which rests the possibility of the synthesis of the predicate 'weight' (B) with the concept (A).

But the concept of a 'cause' lies entirely outside the other concept, and signifies something different from 'that which happens,' and is not therefore in any way contained in this latter representation. How can I then predicate of that which happens something quite different, and to apprehend that the concept of cause, though not contained in it, yet belongs, and indeed necessarily belongs to it? What is the unknown = X which gives support to the understanding when it believes that it can discover outside the concept A a predicate B foreign to this concept, which it yet at the same time considers to be connected with it? It cannot be experience, because the suggested principle has connected the second representation with the first, not only with greater universality, but also with the character of necessity and, therefore, completely a priori and on the basis of mere concepts. Upon such synthetic judg-

ments all our a priori speculative knowledge must ultimately rest; analytic judgments are very important, and indeed necessary, but only for obtaining that clearness in the concepts which is requisite for such a sure and wide synthesis as will lead to a genuinely new addition to all previous knowledge.

A certain mystery lies here concealed; and only upon its solution can the advance into the limitless field of the knowledge yielded by pure understanding be made sure and trustworthy. What we must do is to discover, in all its proper universality, the ground of the possibility of a priori synthetic judgments, to obtain insight into the conditions which make each kind of such judgments possible, and to mark out all this knowledge, which forms a genus by itself, not in any cursory outline, but in a system, with completeness and in a manner sufficient for any use, according to its original sources, divisions, extent, and limits. So much, meantime, as regards what is peculiar in synthetic judgments.

If it had occurred to any of the ancients even to raise this question, this by itself would, up to our own time, have been a powerful influence against all systems of pure reason, and would have saved us so many of those vain attempts, which have been blindly undertaken with-

out knowledge of what it is that requires to be done.

**IN ALL THEORETICAL SCIENCES OF REASON SYNTHETIC A PRIORI JUDGMENTS ARE CONTAINED AS PRINCIPLES**

1. All mathematical judgments, without exception, are synthetic. This fact, though incontestably certain and in its consequences very important, has hitherto escaped the notice of those who are engaged in the analysis of human reason, and is, indeed, directly opposed to all their conjectures. For as it was found that all mathematical inferences proceed in accordance with the principle of contradiction (which the nature of all apodeictic certainty requires), it was supposed that the fundamental propositions of the science can themselves be known to be true through that principle. This is an erroneous view. For though a synthetic proposition can indeed be discerned in accordance with the principle of contradiction, this can only be if another synthetic proposition is presupposed, and if it can then be apprehended as following from this other proposition; it can never be so discerned in and by itself. First of all, it has to be noted that mathematical propositions, strictly so called, are always judgments a priori, not empirical; because

they carry with them necessity, which cannot be derived from experience. If this be demurred to, I am willing to limit my statement to pure mathematics, the very concept of which implies that it does not contain empirical, but only pure a priori knowledge. We might, indeed, at first suppose that the proposition  $7 + 5 = 12$  is a merely analytic proposition, and follows by the principle of contradiction from the concept of a sum of 7 and 5. But if we look more closely we find that the concept of the sum of 7 and 5 contains nothing save the union of the two numbers into one, and in this no thought is being taken as to what that single number may be which combines both. The concept of 12 is, by no means, already thought in merely thinking this union of 7 and 5; and I may analyse my concept of such a possible sum as long as I please, still I shall never find the 12 in it. We have to go outside these concepts, and call in the aid of the intuition which corresponds to one of them, our five fingers, for instance, or, as Segner does in his Arithmetic, five points, adding to the concept of 7, unit by unit, the five given in intuition. For starting with the number 7, and for the concept of 5 calling in the aid of the fingers of my hand as intuition, I now add one by one to the number 7 the units which I previously took together to form the number 5, and

with the aid of that figure [the hand] see the number 12 come into being. That 5 should be added to 7, I have indeed already thought in the concept of a sum = 7 & 5, but not that this sum is equivalent to the number 12. Arithmetical propositions are, therefore, always synthetic. This is still more evident if we take larger numbers. For it is then obvious that, however we might turn and twist our concepts, we could never, by the mere analysis of them, and without the aid of intuition, discover what [the number is that] is the sum. Just as little is any fundamental proposition of pure geometry analytic. That the straight line between two points is the shortest is a synthetic proposition. For my concept of straight contains nothing of quantity, but only of quality. The concept of the shortest is wholly an addition, and cannot be derived, through any process of analysis, from the concept of the straight line. Intuition, therefore, must here be called in; only by its aid is the synthesis possible.

What here causes us commonly to believe that the predicate of such apodeictic judgments is already contained in our concept, and that the judgment is, therefore, analytic, is merely the ambiguous character of the terms used. We are required to join in thought a certain predicate to a given concept, and this necessi-

ty is inherent in the concepts themselves. But the question is not what we ought to join in thought to the given concept, but what we actually think in it, even if only obscurely; and it is then manifest that, while the predicate is indeed attached necessarily to the concept, it is so in virtue of an intuition which must be added to the concept, not as thought in the concept itself. Some few fundamental propositions, presupposed by the geometrician, are, indeed, really analytic, and rest on the principle of contradiction. But, as identical propositions, they serve only as links in the chain of method and not as principles; for instance,  $a = a$ ; the whole is equal to itself; or  $(a \& b) a$ , that is, the whole is greater than its part. And even these propositions, though they are valid according to pure concepts, are only admitted in mathematics because they can be exhibited in intuition.

2. Natural science (physics) contains a priori synthetic judgments as principles. I need cite only two such judgments: that in all changes of the material world, the quantity of matter remains unchanged; and that in all communication of motion, action and reaction must always be equal. Both propositions, it is evident, are not only necessary, and therefore in their origin a priori, but also synthetic. For in the concept of matter I do

not think its permanence, but only its presence in the space which it occupies. I go outside and beyond the concept of matter, joining to it a priori in thought something which I have not thought in it. The proposition is not, therefore, analytic, but synthetic, and yet is thought a priori; and so likewise are the other propositions of the pure part of natural science.

3. Metaphysics, even if we look upon it as having hitherto failed in all its endeavours, is yet, owing to the nature of human reason, a quite indispensable science, and ought to contain a priori synthetic knowledge. For its business is not merely to analyse concepts which we make for ourselves a priori of things, and thereby to clarify them analytically, but to extend our a priori knowledge. And for this purpose we must employ principles which add to the given concept something that was not contained in it, and through a priori synthetic judgments venture out so far that experience is quite unable to follow us, as, for instance, in the proposition, that the world must have a first beginning, and such like. Thus, metaphysics consists, at least in intention, entirely of a priori synthetic propositions...

#### **SPACE**

By means of outer sense, a property of our mind, we represent to our-

selves objects as outside us, and all without exception in space...Space is not an empirical concept which has been derived from outer experiences. For in order that certain sensations be referred to something outside of me (that is to something in another region of space from that in which I find myself), the representation of space must be presupposed. The representation of space cannot, therefore, be empirically obtained from the relations of outer appearance. On the contrary, this outer experience is itself possible at all only through that representation...Space is a necessary a priori representation, which underlies all outer intuitions. We can never represent to ourselves the absence of space.

#### **TIME**

Time is not an empirical concept that has been derived from any experience... Time is a necessary representation that underlies all intuitions... Appearances may one and all, vanish; but time (as the universal condition of their possibility) cannot itself be removed... Time is not a discursive, or what is called a general concept, but a pure form of sensible intuition...Time is the formal a priori condition of all appearances whatsoever...all objects of the senses are in time and necessarily stand in time-relations.

From Immanuel Kant, *Critique of Pure Reason* trans. Norman Kemp Smith, 1929.