

Kant on Time – Copernicus or Ptolemy?

by Nigel Humphreys

In the Preface to the Second (1787) Edition of the *Critique of Pure Reason*¹, Kant explains his project to set metaphysics on the ‘secure path of science’. The primary metaphysical question for him was clearly *epistemological*, concerned with our *knowledge of objects*², as he explains when proposing his revolutionary ‘Copernican’ experiment:

‘Hitherto it has been assumed that all our knowledge must conform to objects. But all attempts to extend our knowledge of objects ... have, on this assumption, ended in failure. We must therefore make trial whether we may not have more success in the tasks of metaphysics, if we suppose that objects must conform to our knowledge.’ (Bxvi)

Time plays a fundamental part in the resulting cognitive framework of the *Critique*. Although space plays an important and similar role, time is finally the formal epistemic condition of everything which appears to us in our immediate sensibility. The data (the ‘manifold’) of sensation are, for Kant, necessarily framed in *time*.

Kant further seeks to show that the synthesis, or cognitive combination, of sensory data occurs *through* time - as Sebastian Gardner puts it, ‘Kant’s primary concern is with unity *across* time, synthetic unification of the temporal manifold ..’³.

Finally, through the faculty of what Kant calls the *imagination*, and via the *schemata*, time becomes the key to the engagement of what is given to us in sensibility with the purely *intellectual* concepts of our understanding.

¹ Kant, I., *Critique of Pure Reason* (trans.) N Kemp-Smith, Macmillan, 1933/78, hereafter the *Critique*.

References in this essay will be to the A and/or B ‘Kant numbers’ in this text.

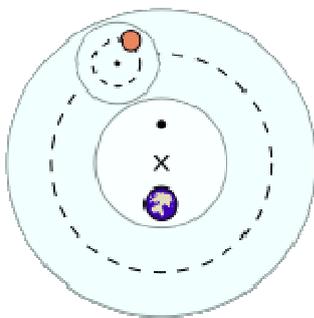
² For Kant ‘objects’ may be *objects given in experience* or *objects thought solely through reason* (Bxvii). Here I take him to mean the first kind of object – *external* objects, given in experience.

³ Gardner, S., *Kant and the Critique of Pure Reason*, Routledge, 1999, hereafter *Gardner*, p.139. Emphasis mine.

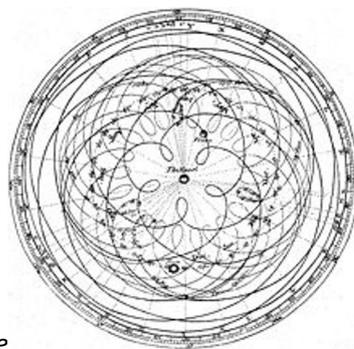
So for Kant time is both our universal sensory frame, and the key facilitator of our intellectual knowledge and understanding of the world. But he rejected the contemporary ontological understanding of time, as expressed by Newton and Leibniz, who saw time either as an independently real existence, or as a quality or relation of independent objects.

So was Kant denying that time has any real existence? Is there actually no time 'out there'? Henry Allison⁴ argues, and perhaps most interpreters now agree, that Kant was not proposing an alternative ontology of time: rather, an alternative *to* ontology, which enabled him to continue successfully to assert both the empirical reality and the objective validity of time in a completely new sense – the only sense available to us.

I will argue however that Kant's theory of the *schemata* stretches the transcendental theory of time to its thinnest, introducing a flavour of circularity, and finally a Ptolemaic rather than a Copernican turn. Bertrand Russell famously made this accusation on the ground that Kant had put '... Man back at the centre from which Copernicus had dethroned him'⁵. But I make it on the different ground that the schemata look rather like Ptolemy's epicycles⁶.



The epicycle



The complexity of Ptolemy's system

Time as our Sensory Frame

Kant's Copernican experiment starts by considering our immediate awareness of the external world. According to him, this is only possible through our *sensibility*, our 'capacity ...

⁴ Allison, H., *Kant's Transcendental Realism*, Yale University Press, 2004, hereafter *Allison*

⁵ Russell, B., *Human Knowledge: Its Scope and Limits* .

⁶ Ptolemy sought to save pre-Copernican cosmology by means of the epicycle, to explain the apparently aberrant movements of the heavenly bodies.

for receiving representations⁷ through the mode in which we are affected by objects '(A19). Sensibility requires, however, both the empirical data of *sensation*, which Kant calls the 'matter' or 'manifold' of appearance (A20/B34), and the *form* which orders or 'determines' the manifold to make it cognisable to us. While the *matter* of appearance is given to us *a posteriori* through sensation, its *form* 'must lie ready for the sensations *a priori* in the mind' (A20/B34). He calls this form 'pure intuition', and he promises that in the course of his investigation:

'... it will be found that there are two pure forms of sensible intuition, serving as principles of *a priori* knowledge, namely space and time.' (A22)

Space is the form of our intuition of objects as outside us – the form, that is to say, of our outer sense. Time is the form of our intuition of our inner states of mind, that is to say of our inner sense (A23).

The Metaphysical Exposition of Time

By a Metaphysical Exposition, Kant explains that he means to show that space and time are *given a priori* (B38). For both space and time he argues:

- (i) that they are not *empirical* in origin, that is they are not derived from outer experience, but they are instead the *a priori conditions of the possibility* of such experience (B38-39/A24: A31/B46) – Allison calls this the *Apriority Thesis* (Allison p.39);
- (ii) that they are not *concepts of the understanding*, but *pure forms of immediate sensible intuition* (A25/B40: A32/B48) – Allison calls this the *Intuition Thesis* (Allison p.108).

At the beginning of the Metaphysical Exposition, Kant sets out what seem to be four⁸ exhaustive ontological alternatives for the nature of space and time:

⁷ 'Representation (*Vorstellung*) is Kant's generic term for a constituent or element of cognition, similar in scope to 'idea' in the writings of the rationalists and empiricists: anything subjective that can play a role in a judgment or knowledge claim': Gardner, p.29. However representations are not ontologically mental objects, but 'subjective elements of cognition considered transcendently, ie as making cognition of objects possible': *Ibid.* p.278.

⁸ Allison, p.97. (Allison refers to the translation of P.Guyer and A.W.Wood, Cambridge University Press, 1997, rather than that of Kemp-Smtih). Gardner argues that Kant sets out only three alternatives, which Allison however essentially agrees, that is the alternative views of Newton, Leibniz or Kant himself.

‘What, then, are space and time? Are they real existences? Are they only determinations or relations of things, yet such as would belong to things even if they were not intuited? Or are space and time such that they belong only to the form of intuition, and therefore to the subjective constitution of our mind, apart from which they could not be ascribed to anything whatsoever?’ (A23/B37-38)

His four alternatives are thus:

- (i) that space and time are real, independent existences;
- (ii) that they are determinations (or *accidents*) of things;
- (iii) that they are *relations* of things (in the case of (ii) or (iii), the determinations or relations would not depend on our perception or intuition of things, but would belong to them independently)
- (iv) that they are only the form of our intuition (Kant’s view).

Options (i) and (ii) represent the Newtonian view of the absolute reality of time and space, option (iii) that of Leibniz, that time and space are relations between objects, existing independently of us.

Kant concludes (A33-36/B49-53, § 6) that ‘Time is not something which exists of itself, or which inheres in things as an objective determination’. He does hold that time ‘... has to do ... with the *relation* of representations in our inner state’ (B50, emphasis mine), but denies that it is ‘... an order inhering in things themselves’ (A33). ‘Time is nothing but the form of inner sense’ (A33).

However time has for Kant an epistemic precedence over space, in that it ‘... is the formal *a priori* condition of all appearances whatsoever’ (A34). This follows for Kant because all our representations, including representations of outer objects (of which space is our form of intuition), are determinations of the mind, belonging to our ‘inner state’. Time is the ‘...immediate condition of inner appearances ... and thereby the mediate condition of outer appearances ..’ as well (A34).

Transcendental Idealism

While denying that space or time are either ‘real existences’ or the independent ‘relations of things’, Kant nevertheless asserts their ‘empirical reality’ and ‘objective validity’ (A28, B52) in a wholly new way.

Any external object which can be presented or given to us in intuition must, on Kant's hypothesis, conform to the sensible conditions of space and time, which enable us to experience it. These conditions are *a priori*, and so universally valid of all possible experience. This is what constitutes the transcendental ideality of space and time (A28, A36) – *ideal*, because all our representations must be determinations of the mind, but *transcendental* because space and time are the necessary conditions which make possible our knowledge of non-mental objects:

'I entitle *transcendental* all knowledge which is occupied not so much with objects as with the mode of our knowledge of objects in so far as this mode of knowledge is to be possible *a priori*' (A11-12/B25).

If the objective validity of Kantian time derives from its *a priori* necessity, its empirical reality derives from the necessary contribution of experience. The empirical '...has its sources *a posteriori*, that is, in experience', which 'awakens' our faculty of knowledge into action (B1-2). But '... Since our intuition is always sensible, no object can ever be given to us in experience which does not conform to the condition of time' (B52).

An Alternative Ontology?

In rejecting the leading contemporary ontologies, Kant appears to be proposing an alternative ontology - an alternative theory about the real nature of time and space. But the presentation of time and space as *a priori* conditions of sensibility fits much better with the view that Kant is proposing an alternative *to* ontology,...

'... according to which space and time are understood in terms of their *epistemic* functions ... rather than as "realities" of one sort or another.' (Allison, p.98, emphasis mine)

Certainly in the Transcendental Analytic (Book II, Chapter III) Kant argues that:

'... the most the understanding can achieve *a priori* is to anticipate the form of a possible experience in general ... Its principles are merely rules for the exposition of appearances; and the proud name of an Ontology ... must, therefore, give place to the modest title of a mere Analytic of pure understanding' (A247/B303).

It would be inconsistent with this express rejection of ontological status for the forms of understanding, as well as with his general approach in the *Critique*, to read him as presenting an alternative ontology of time and space. He is rather proposing that we

understand time and space from the only viewpoint available to us, our own, as the conditions of our engagement with the external world. In the case of time,..

‘I can ... say, from the principle of inner sense, that all appearances whatsoever, that is all objects of the senses, are in time, and necessarily stand in time relations’ (B51).

Synthesis, the Imagination and Time

The sensible intuitions of space and time are for Kant, like all intuitions, merely the means by which our knowledge is in *immediate relation* to objects (A19). They are not enough on their own to constitute or to secure *knowledge*, which ...

‘ ... springs from two fundamental sources of the mind; the first is the capacity of receiving representations ..., the second is the power of *knowing* [emphasis mine] an object through these representations (... in the production ...of concepts). Through the first an object is *given* to us, through the second the object is *thought* ... [emphases Kant’s]. Intuition and concepts constitute, therefore, the elements of all our knowledge’ (Transcendental Logic, A50/B74).

Even space and time themselves, as objects of thought rather than forms of intuition, can only be known through understanding. In Kant’s famous words, ‘Without sensibility no object would be given to us, without understanding no object would be thought. Thoughts without content are empty, intuitions without concepts are blind’ (A51).

Kant’s exhaustive inventory of the concepts of thought or understanding are named by him as *categories*, following Aristotle’s example (A80), and set out in a Table of Categories (B106).

The grasp of concepts on intuition is not, however, direct: it is necessary that the material or ‘manifold’ of sensibility be ‘gone through, taken up and connected’, in a process which Kant calls *synthesis*, to enable our knowledge to arise through the *unity* of the categories of understanding (A77/B103:B104/A79). Synthesis, ‘in its most general sense’, is understood by Kant as ‘the act of putting different representations together’ (B103).

We are here introduced to the faculty of the *imagination*, the means by which the synthesis of the manifold is effected. The *imagination* is ‘... a blind but indispensable function of the soul, without which we should have no knowledge whatsoever, but of which we are scarcely

ever conscious' (A78). Kant also defines the imagination as 'the faculty of representing in intuition an object that is *not itself present*' (B151, emphasis Kant's).

The imagination performs a mediating role between intuition and understanding, producing *schemata*, as presented in the Schematism chapter.

Kant distinguishes between the *image* and the *schema*. So for example in considering number, the image we might have of the number 5 as 'five points set alongside one another, thus, ' (A140) is contrasted with the representation of a large number, such as a thousand, as a *method* whereby a number may be represented in an image 'in conformity with a certain concept', rather than the image itself. Such a representation of a ' .. procedure of imagination ..' is entitled a schema (B180). For Kant,

' ...the *image* is a product of the empirical faculty of reproductive imagination; the *schema* ... a product ... of pure *a priori* imagination, through which ... images themselves first become possible' (B181/A142).

On Kant's account, the application of the categories to sensible intuitions rests on the schemata. The concepts of the understanding, '... being quite heterogeneous from ... all sensible intuitions, can never be met with in any intuition' (A137/B176), so that the 'subsumption' of intuitions under concepts requires a mediating representation or *schema*. The schema must be both sensible *and* intellectual, to make the bridge between intuition and understanding.

Time, as the formal condition ultimately of all appearances, is universal and *a priori*, and so homogeneous with the intellectual categories. As an intuition itself, it is ' .. contained in every empirical representation of the manifold'(B178/A139), and so homogeneous with the sensible. It is therefore the obvious candidate within Kant's epistemology to realise or to inform the schema, as a 'transcendental determination of time' (A139).

Kant proceeds in the Schematism chapter to connect each of the categories to sensible intuition by schemata, as *a priori* determinations of time. Thus for example the schema of *substance* is permanence of the real in time, the schema of *cause* consists in the temporal

succession of the manifold, and the schema of *actuality* (or existence) is existence in some determinate time (B183-184/A144-145).

So time, which started as the necessary form of all appearances, is also in Kant's account the key to the engagement of the sensible given with the intellectual concepts of the understanding.

So what is time for Kant?

Kant was clear that he was proposing a radically new way of approaching our knowledge and understanding of the external world – a new way of setting metaphysics on the right path. In doing so, he expressly rejected the ontological understanding of time as a mind-independent reality which was commonly held then, and, I suggest, is still commonly held now. Instead he gave time a quite different but crucial epistemic role.

Kant remarked:

‘Against this theory, which admits the empirical reality of time, but denies its absolute and transcendental reality, I have heard men of intelligence so unanimously voicing an objection, that I must suppose it to occur spontaneously to every reader to whom this way of thinking is unfamiliar.’(B53)

The objection he had in mind was that, since the reality of alterations in our own subjective representations⁹ cannot be denied, and since alterations are possible only in time, then time too must be something real (B53/A37). Kant's answer to this is easy within his analysis of time - ‘Certainly time is something real, namely, the real form of inner intuition’ (A37).

But an equally spontaneous objection, more difficult to respond to, is the thought that time cannot surely be just a feature of our subjective world – ‘nothing but the form of our inner intuition’ (B54). Time must surely exist independently of us – the universe surely must have existed in time before we were created or evolved, and would (or at least surely could) continue to exist in time if we were to become extinct.

⁹ See footnote 7 above

I suggest, however, that Kant's account answers this objection. We clearly do not think of time as an external object of sensation such as a tree or a chair, nor can we think of it (as we might space) as an independently existing receptacle of such objects. It does seem to have an essential *ordering* role in our understanding of the external world, without which such a world seems inconceivable. But this is just Kant's point, that time is necessary for our understanding or knowledge of the world, and is therefore a necessary cognitive feature of it for us, from our point of view. Kant never seeks to deny the real independent existence of the external world, indeed his project is to save metaphysics from such scepticism. But Kant's is an epistemological project, and it is a mistake to project our necessary temporal ordering of the world beyond our own understanding of it.

The Role of Time in the Schematism

As Gardner points out, the thesis that the categories need to gain application through determinations of *time* '...may at first seem quite arbitrary, because on Kant's own account, there is nothing intrinsic to time *qua* form of intuition to suggest an imminent connection with the categories' (Gardner, p.168). Allison makes a similar point - '[It] is often wondered why Kant is preoccupied with time in the schematism and appears to ignore space (Allison, p. 217).

Both answer this objection by reminding us that within Kant's system only pure intuition can play the mediating role between sensation and understanding, as it is both *a priori* and directly intuited; and that of the two forms of pure intuition, time has epistemic priority as the condition of inner appearances. Allison also makes the point that '...the synthesis of the imagination is, after all, concerned with the determination of the manifold of inner sense, and thus with the manifold *qua* temporal' (Ibid, p.218)

Nevertheless, to justify the essentially temporal determination of the schemata by reference to the overall coherence of the transcendental theory has a flavour of circularity about it, and a suspicion finally of a Ptolemaic rather than a Copernican turn – a saving of the theory by the enumeration of 'epicycles'.

Kant himself suggested that the schematism is '... an art concealed in the depths of the human soul, whose real modes of activity nature is hardly likely ever to allow us to discover'.