

Articles

ETERNITY, TIME, AND SPACE

by Wolfhart Pannenberg

Abstract. The concepts of space and time are important in physics and geometry, but their definition is not the exclusive prerogative of those sciences. Space and time are important for ordinary human experience, as well as for philosophy and theology. Samuel Clarke, Gottfried Wilhelm Leibniz, Isaac Newton, Immanuel Kant, and Albert Einstein are important figures in shaping our understandings of space, time, and eternity. The author subjects their arguments to critical examination. Space is neither an infinite and empty receptacle (Newton) nor a system of relations in the mind (Leibniz). Infinite space and time can be interpreted as expressing God's eternity and omnipresence in relating to the creation (Clarke), but such an interpretation is enhanced by Kant's thinking, to clarify that even though time and space are differentiated in individual events, the whole is at the same time present. Even human experience recognizes this wholeness, and for God eternity is the simultaneous presence and possession of the wholeness. The temporal existence of finite entities is also related to a future participation in God's eternal life. Concepts of contingency are brought into the discussion as well.

Keywords: Samuel Clarke; contingency, Albert Einstein; God's eternity and omnipresence; Immanuel Kant; space; spacetime; time.

The concepts of space and time are important not only in physics and in geometry but in all human experience. It is not self-evident that the definition of these concepts is an exclusive prerogative of geometry and physics. Certainly, the measurement of spatial and temporal relations is a matter of special competence of geometers and physicists, but it is by no means

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certain that the measurement of spatial and temporal relations exhausts the concepts of space and time.

In ordinary human experience, space is the order of togetherness of simultaneous phenomena, and time is the order of their sequence. It has often been said, with good reason, that time is the more fundamental of the two, because the concept of space as order of togetherness presupposes already the temporal notion of simultaneity. Space is the order of togetherness of simultaneously existing phenomena, especially of physical bodies. Therefore, the theory of relativity's proposal that there is no exact simultaneity has had incisive consequences for the concept of space. Our concepts of space in distinction from time have become approximations of what more accurately is described as spacetime. Still, the distinction of space from time retains its importance in human experience.

Certain conditions of space and time also apply to the concept of spacetime. One such condition was emphasized by Immanuel Kant in his analysis of our concepts of space and time in his *Critique of Pure Reason* ([1781] 1956). He argued that all of our conceptions of spaces and of specific times presuppose a prior intuition of space as an infinite whole and of time as an infinite whole, because different spaces can be distinguished and related only within some prior space, and different times are conceived as parts of one and the same time. Spatial division and composition can occur only within some comprehensive space, and only within time can temporal distinctions be made. Therefore, some infinite and undivided whole of space and time is a prior condition in forming any conception of spatial or temporal units. An important consequence of this is that the concepts of time and space as infinite wholes are prior to all geometry, because the spatial and temporal units needed for measurement are themselves parts of space and of time, which precede as infinite wholes all notions of partial spaces and times.

At this point it should be evident that the description of space does not belong exclusively to geometry but is also and even primarily a matter of philosophy. In the case of Kant, the thesis that space and time as infinite wholes are required as preconditions in conceiving of any partial spaces or times belongs to his analysis of human consciousness. But the validity of the thesis is not restricted to human consciousness of space and time. It applies also to the objective content of experience. Kant took his argument from Samuel Clarke's correspondence with Gottfried Wilhelm Leibniz. When defending Isaac Newton's notion of space and of its relation to deity in expressing the omnipresence of the creator with his creatures, Clarke argued that in all spatial division and composition some infinite and undivided space is presupposed, a space within which operations of division and composition become possible. Clarke considered this infinite and undivided space to be the space of God's omnipresence, an effect of God's infinity in his relationship with the world of his creatures.

By insisting on the priority of infinite and undivided space in all perception of spaces, Clarke met the criticism of Leibniz, who had objected to Newton's theological interpretation of absolute space as a *sensorium*, or organon, of God's presence with creation (see Pannenberg 1993, esp. 61f. and 70 n. 51). Leibniz had argued that on such an assumption God would have to be composed of parts and divisible into parts. Clarke's response was that no, God is neither composed of parts nor divisible into parts, because the infinite space of God's omnipresence is undivided, prior to all division and composition. The point of this argument was that Newton's theological interpretation of space in terms of organon of God's presence with his creatures did not have any pantheistic implications. But Clarke's insistence that the space of God's omnipresence was not only infinite but also undivided made it difficult to identify this space with Newton's own concept of absolute space, because that absolute space had to have a metrical structure in order to guarantee the concept of straight lines involved in Newton's principle of inertia, according to which bodies tend to continue their movement in a straight line unless disturbed by other forces.

In a modern perspective, the difference of Clarke's infinite space as undivided from Newton's concept of absolute space saves Clarke's argument from falling prey to the abolition of the idea of absolute space by the theory of general relativity. Even the relativistic concept of spacetime works with measurement, which needs units of measurement that are conceivable only within some prior, infinite, and undivided space, according to Clarke and Kant. Therefore, the spacetime concept of relativity theory does not unsettle this basic philosophical analysis of space and time. Although relativity has an impact on the philosophical issues of space and time, as I will argue, still it does not completely reconstitute our notions of space and time. William Lane Craig writes, "At best, scientific accounts describe our *measures* of time, but not time itself" (2001, 66), and "Curved space-time is just a geometrical model of gravity" (2001, 178).

But how is Clarke's theological interpretation of infinite space and time to be evaluated? Kant already struggled with this question. Ten years before his *Critique of Pure Reason* was published, he still shared Clarke's theological interpretation of the infinite and undivided whole of space and time that is presupposed in all of our spatial and temporal perceptions. In his dissertation *De Mundi Sensibilis atque Intelligibilis Forma et Principiis* (1770) Kant affirmed that the infinite and undivided space as condition of all spatial conception is the form in which the divine omnipresence appears in the world ("spatium dici potest omnipraesentia . . . Phaenomenon"). Similarly, the infinite whole of time was said to express the divine eternity in its relation to the world ("conceptus temporis tamquam unici infiniti et immutabilis, in quo sunt et durant omnia, est causae generalis aeternitas phenomenon," § 22). In his *Critique of Pure Reason* ten years later, however, this theological interpretation of space and time was silently eliminated.

Instead, the unity of infinite space and time was reconceived as based on the unity of the human subject of experience, though it remained unclear how the human subject, which is finite, can account for the objective validity of our conception of the infinite unity of space and time that is presupposed in all experience. The change of Kant's thought on the issue of theological implications of the concepts of infinite time and space has been explained as a result of Kant's concern for God's transcendence regarding the world.

Assuming that the infinite unity of time and space presupposed in all human experience expresses divine eternity and omnipresence could result in a pantheistic conception of God's immanence in the world. However, this consequence could occur only if that infinite space were identified with the space of Euclidean geometry and with Newton's absolute space. Kant could have protected himself against such a consequence by insisting, as Clarke did, on the undivided nature of the space of God's omnipresence. In this case he would have been left with the problem of how that undivided infinite space is related to Newton's concept of absolute space as a receptacle or container of things. Kant tried to avoid the idea of space as an infinite and empty receptacle of things and so opted for the alternative idea of Leibniz that space is a system of relations in the mind, but, according to Kant, no longer in the mind of God but in the human subject of experience, the transcendental ego. The difficulty with this position, as already mentioned, is how the human subject, which is finite, can guarantee the objective unity of the spatial and temporal world we experience.

Kant did not have at his disposal an alternative that has been available since Albert Einstein's theory of relativity: the concept of spacetime, which integrates not only the metrical systems of space and time but also the concepts of mass and energy, since the metrical structure of space and time is no longer conceived in abstraction from the presence of physical objects (Jammer 1960, 178f.); rather, those physical objects are accounted for as effects of the gravitational field of spacetime. In his preface to Max Jammer's book on the concept of space, Einstein emphasized the importance of the field concept in replacing the fundamental role of the concept of physical bodies in physics and eliminating at the same time the concept of space as an empty container of physical bodies (Jammer 1960, xiv f.).

But how is the concept of spacetime related to eternity? How could it have helped Kant to avoid pantheistic consequences of Clarke's theological interpretation of infinite space and time as expressing God's eternity and omnipresence in his relationship with the creation? The first step toward an answer is to realize that spacetime should not be seen in the line of Clarke's concept of infinite and undivided space (and time) as a comprehensive precondition of any discernment of particular spaces (and times). Spacetime as a geometrical concept describes the comprehensive field of

all finite phenomena, especially of matter and masses. Thus it is already distinct from Clarke's infinite and undivided space (and time), which is prior to all geometry and consequently to spacetime also. It is because of the connection of the spacetime concept with the occurrence of material phenomena, of masses, in the universe that I said that Kant could have been helped by the concept of spacetime in his struggle for an unambiguous distinction between God and the world. He could have been more confident in aligning himself with Clarke's insistence on the *undivided* nature of the space of God's omnipresence, if he could have distinguished the world of finite experience, the world of nature, from God's eternity and omnipresence in terms of the geometrical field of spacetime. To be sure, there is also a possibility of a pantheistic interpretation of spacetime itself, as the example of Einstein with his sympathies for Spinoza shows. But spacetime is not eternity. The geometric description of time in terms of a further dimension in addition to the three dimensions of Euclidean space may suggest a similarity of spacetime to the concept of eternity, where everything is simultaneous. But this is only the effect of spatialization of time, where the differences of tense, the distinctions between present, past, and future, are removed from the picture. In the eternal present simultaneity is not bought at such a price of abstraction, but in the eternal possession of the whole of life the distinctions of tense, like other forms of differentiation, are preserved.

A pantheistic view of spacetime suggests itself only if the undivided nature of infinite space (and time) is not distinguished as it should be from all geometrical descriptions of space (and time). Therefore, the priority of undivided infinite space (and time) with regard to any specific conceptions of spatial and temporal units and as a condition of their possibility is so important. It also means that the space of God's omnipresence is not a container space. Ideas of God's omnipresence are inexplicable without some connection with the concept of space, but it has to be a concept of space and time that is different from geometrical space and time, prior to all measurement, if the distinction between God and the world is to be observed. The eternal God is present in creation without becoming a component of the physical world with the exception, perhaps, of God's incarnation in one individual human person.

This relationship of transcendence and immanence may be more deeply elucidated in a discussion of the concept of eternity in its relation to time. The concept of eternity is certainly opposed to the transience in the temporal succession of events. Therefore, it often has been assumed that eternity is completely opposed to time, a present that does not change (*nunc stans*) in contrast to our present that is continuously changing (*nunc fluens*). This was the Augustinian view of eternity that was bound up with the concept of divine immutability.

There is a different view of eternity, however, that should not be confused with that timeless eternity. Here, I do not think of the idea of a life everlasting, because that notion is deeply ambiguous. If it means a life that is going on without end, but otherwise similar to our present form of life, there is no idea of eternity at all, only of time without end. By contrast, the alternative to timeless eternity that I have in mind is bound up with the totality of life as presently experienced. It is a view that was developed in the Platonic tradition of thought like that of Augustine, but somewhat earlier. It is the Plotinian idea of eternity as simultaneous presence and possession of the wholeness of life, an idea that Plotinus developed in his *Enneads* III, 7, 3: What in our experience is separated by the course of time, in the sequence of temporal events, is present all at once in eternity. This idea is echoed in the famous sentence of Boethius from his *Consolation of Philosophy*, that eternity is the complete possession all at once of interminable life (V, 6, 4: *interminabilis vitae tota simul et perfecta possessio*).

This idea of eternity should not be confused with timelessness, because it does not exclude the notion of a sequence of events, provided that such a sequence is enjoyed simultaneously as a whole. As in the case of timeless eternity the idea of unchanging identity is included, but the reference to the wholeness of life allows for a plurality of events in that life, events that may form a sequence among themselves but are integrated in the wholeness of that life that is enjoyed as present in its wholeness and therefore not subject to change. This idea of eternity could be called omnitemporal, since it comprehends the wholeness of life, but not in the sense of an everlasting process, but rather as continuous presence of the whole of life.

This concept of eternity corresponds to the infinite unity of time that according to Kant is presupposed in every distinct notion of particular times. But Kant's idea of infinite time was conceived as empty time, while the idea of eternity comprises the differentiated fullness of life as simultaneously present. Applied to the doctrine of God, this concept of eternity comprises not only the atemporal existence of God prior to the creation of the world (a priority that is causal but not temporal), because the act of creation should be understood, with Augustine, as involving the creation of time itself. The concept of eternity as simultaneous possession of the fullness of life that is otherwise divided in the sequence of events also comprises the participation of the eternal God in the history of his creation, the divine economy that is finally to be consummated in the eschatological participation of creation in God's own eternal life. This is the destiny of all creation that the apostle Paul speaks about in Romans 8, which involves an element of judgment and of transformation on the part of the creatures, because the perishable cannot inherit the imperishable (1 Corinthians 15:50) without a profound transformation, because "this perishable nature must put on the imperishable," as Paul says (1 Corinthians 15:53).

Thus the eternal God is both transcendent and immanent in the world of his creation. Temporal sequence is the appropriate form of existence in the case of finite entities, whose present is different from their past and different from their future. But this temporal existence is related to a future of participation in God's eternal life. And the eternal God is active in the history of his creatures by drawing them into that future from the first moment of their existence. Thus, the future of God, which is identical with his eternal present when it becomes the destiny of his creatures, is already the creative source of their existence. It is the source of the contingent existence of each creature, corresponding to the contingency of creation at large, but also the source of the definitive identity of each creature. If the divine eternity in the sense of simultaneous presence and possession of the wholeness of life is understood as eternity of the trinitarian God, whose identity allows for differentiation and self-differentiation, then it also allows for a world of creatures that are different from God as well as from one another and yet exist in the orbit of God's omnipresence and are destined to participate finally in God's eternity without losing their finite nature and identity in difference from their Creator. They are destined to participate in God's eternity, God's eternal life, precisely by accepting and acknowledging their difference from the eternal God, because such acceptance is a condition of having communion with that God.

The time of the creatures is thus not completely cut off from eternity. Rather, as Plotinus already noted, the transition from one moment to the next requires an encompassing unity in the process, a reminder of the unity of life that otherwise seems lost in the incessant perishing of each present into the past that is no more and in the face of a future that is not yet. Plotinus thought that the loss of the wholeness of life in the separation of present, past, and future is a result of a "fall" from the original wholeness of life that nevertheless continues to be present to some extent in the sequence of events. Therefore, in his view, the separation of time from eternity is not absolute. Later, Kant contributed an argument to the same effect: Even the single moment of time would not be conceivable except for an awareness of time as a whole, for only within that encompassing whole one moment or part of time can be discerned from others. Thus the unity of time as an infinite whole, which is conceived as realized in the concept of eternity, is somehow present in the flow of time. It is particularly present in the experience of duration, which is always colored by memory and anticipation, as Augustine argued in his analysis of time in Book XI of his *Confessiones*, where the experience of duration in spite of the brokenness of the temporal process is illustrated by the example of how we experience the unity of a piece of music, a melody, an experience that would not be possible in our attention without the help of memory and anticipation. Such an experience of duration can be a reminder of eternity, the simultaneous presence and possession of the wholeness of life,

although in our temporal experience such duration is always limited and gets interrupted.

The experience of duration as in the case of perceiving a melody is much closer to the concept of eternity than the mere fact of continuity in the process of time is, though even here, as Plotinus said, the eternal unity of life is still present in the background as condition of the cohesiveness in the sequence of time. Even in this case there is a distant similarity with eternity, because the temporal process in spite of its constitution by succeeding events may be conceived as a whole. It is a more distant similarity, however, because it is not experienced as a whole by any member of the process, as in the case of experiencing the unity of a melody while it is sung. Still, the analogy with a melody could be applied to the process of the universe, conceived as a “song of the universe,” *carmen universitatis*.

The model of a temporal process perceived by an observer as a whole seems to apply also to the model of spacetime. In the geometrical model of spacetime the process of the universe is perceived as a quasi simultaneous unity. It appears as such to the eyes of the theorist, however, not within itself. It is a spatialization of the natural process that can be taken as an analogy to the way everything is present to the eternal God. The difference is that in the case of God’s knowledge of the world of his creation, as far as we can imagine it, the temporal differentiation between earlier and later as well as the differences between past, present, and future—relative to each creature—are preserved. Time is not an illusion in the eyes of the Creator, to whom all things are present.

Time is not an illusion, because the Creator wanted the independent existence of creatures and therefore created time itself. Time is a condition of the existence of finite entities. They exist each in their own time and their own place. Except for the most primitive forms of created existence, the creatures also enjoy some duration and hence some form of permanence, though limited, an existence of their own which is intended in the very act of creation. Creating something means bestowing some degree of independent existence upon the creature. Organic creatures enjoy a higher degree of such an independent existence when they organize their own life to preserve and nourish themselves in relation to their environment. This requires time. Thus it is in a given span of time that these creatures can organize their own being and acquire a more differentiated form of existence. We can understand that this aim of creation is obtainable only in time. Afterward, after a creature has acquired a form of existence of its own, it may be preserved in eternity, as is promised in the Bible. But in order to be obtained, time is a necessary requirement for the formation of finite beings. Thus, time is not, as Plotinus thought, the result of a fall from a primordial unity of life, but a condition of the independent existence of creatures, especially of their formation by self-organization. There-

fore, in a Christian view of creation, time is created by the Creator as a condition of a somewhat independent existence of his creatures.

A similar consideration applies to space. In order to preserve and develop their own existence, creatures also need some space into which to grow and to relate to others. While in God's eternity simultaneity, the principle of space, and everlasting continuity are united, in the world of the creatures they get separated into space and time as conditions of their finite existence.

Space and time, then, in their distinction from eternity, are not independent realities, as the container view of space that goes back to Aristotle suggested. It was rejected by Nicene theology, as Thomas Torrance showed (1969, 13ff.; cf. 7f.), but was adopted in Western medieval thought and also by Newton in his concept of absolute space (1969, 63). Newton's concept of absolute space became the most influential model of a container view of space in its combination with Euclidean geometry. Clarke's idea of an infinite *and undivided* space as a prior condition for any conception of partial spaces was a different matter. His undivided infinite space, if clearly distinguished from geometrical space, was a conception not of an infinite container of bodies but of God's dynamic omnipresence with his creatures. By contrast, an absolute geometrical space is in fact an empty container of things, and this conception was destroyed by the theory of relativity, which taught the philosophy of time and space an important lesson—that there is an interdependence between physical objects and the spatial and temporal dimensions of their existence. There is no measurable time and space without creatures. The geometric description of this connection by the concept of spacetime may be only an approximation, if we consider the alternative interpretations of relativity by Einstein and Neo-Lorentzians (Craig 2000, 105ff.), but the insight into the interrelatedness of space and time with masses and energies will remain a lasting contribution to the understanding of the conditions of finite reality even in the discourse of philosophers and theologians. God created time and space as dimensions of the existence of the world of finite entities.

The last statement applies in any case to measurable time and space. But how does such a view of space and time relate to our earlier affirmation, with Clarke and Kant, that the possibility of any conception of partial spaces or times requires as a prior condition the conception of an infinite and undivided whole of space and time? Is this infinite and undivided whole of space and time, which is prior to all geometrical description, also a property that belongs to the world of finite entities? or is it—as Clarke assumed and Kant also believed until 1770—an effect of God's eternity and omnipresence with his creatures?

Measurable space and time seem to belong to the finite entities that exist in space and time, but the undivided infinite space and time that is prior to them seems closer to the concept of eternity, which also involves

simultaneity and therefore omnipresence as soon as creatures are called into existence. Their finite existence involves their setting in measurable time and space, which is created with them, but takes place within some more comprehensive, infinite, and undivided space and time. It takes place within the orbit of God's eternity and omnipresence—which is not, however, to be mistaken for an infinite container, because that could not be without divisibility. Rather, God's eternity and omnipresence are the medium of God's powerful presence with his creatures at the place and time of their existence. In his eternity, then, God is transcendent as well as immanent regarding the world of his creation. The creatures exist in their measurable time and space and in the universe of spacetime within the presence of the eternal God who infinitely transcends them and yet is not far from any of them.

NOTE

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