

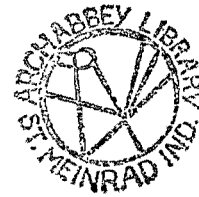
Time

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One of the most fundamental and most important requirements of all physical bodies is that they must have existence in time, for time is most important to creatures in existence. Time is the universal requirement for all things that exist in the physical universe, for without time the existence of a physical created entity would not be able to come about. Time is referred to by Bittle as the, "fourth dimension"¹. Space and time would naturally always be found together, for anything that would affect time would affect space.

Time is one of the most mysterious things there is. We feel it and run into it all the time that we exist on this earth, but in the very attempt to define it and to fully explain it, time seems to have eluded us. For when we go to consider the present it is immediately past. Therefore, to arrive at a full explanation and complete understanding of time has been one of the main aims of the philosophers throughout the centuries.

Since time is a species of duration it would be best to start with duration. Per se duration has a very close relation to existence. It would almost be beyond the realm of the human mind to try and conceive of anything on the material level without existence and still have duration and likewise to have duration and still not have existence. For a person to admit that a thing would

exist for a period of time would necessarily imply that duration was also affirmed, but this is not so from the viewpoint of God, for God could make a thing exist for a fraction of a second and then annihilate it. In this case the being has existence for a fraction of a second, but it does not have duration, because it did not endure in its existence. For in duration a continued existence is² required.

Duration, which would necessarily imply existence, cannot be spoken of unless you would bring in the concept of time. This would, therefore, bring in the three divisions that are usually applied to duration. The first would, therefore, be the duration of God's existence, which is so completely and finely expressed in the famous definition of Boethius who calls it, "the full and perfect³ possession of interminable life". This would mean that God's existence would be without beginning and without end. God would be He who is. His existence would be without any form of change in it. There would be no past and future for God; it would be only the present. The measurements of time simply do not apply to the duration of God's existence. God co-exists with the millions of years of time. The eternity of God is absolute, that is to say, independent of all relation of time and space. As St. Augustine says, "Thy years neither go nor come; they

stand together, nor are departing thrust out by coming years, for they pass not away. Thy years are one day; and Thy day is not daily, but To-day seeing Thy To-day gives not place unto tomorrow, for neither doth it replace yesterday. Thy To-day is eternal.⁴"

The second division, in regards to duration, applies to spiritual beings. However, these spiritual beings do not have any substantial parts on the material level, but they have form and existence. This spiritual being has a natural existence which, though it had a beginning, has no end. They cannot be destroyed unless by complete annihilation, for they are independent of matter. However, they are still ens ab alio. Therefore, in some ways they are like unto God, for they are unchangeable and are not connected with matter. However, they are still distinct from God, and are called aeviternal. It could also be called participated eternity. Therefore, time as a duration applies to them in a wider sense than it would to a physical being.

The third division applies to physical bodies. In this division time is applied to the duration of physical bodies. Physical bodies arrive at this concept of time by the observation of the existence of other bodies and of themselves. Through our sensations, we are aware of our own body and of other bodies in these moving and changing states. God and the other spiritual beings are measured

by us in time, but this measurement is only one of analogy.

The question now arises concerning a real or only a logical distinction between duration and existence in beings that exist for a long period of time. Would duration be a reality which, when added to existence, renders the latter stable? The problem, therefore, is this; Do beings hold their duration from their own existence, without anything being added to them, and solely because their existence is not destroyed; or from a reality added to existence? The Thomastic theory is that there is no real distinction between the duration and existence of a being, but it is only a logical distinction. According to St. Thomas continuous existence and duration are absolutely the same, and they mean one and the same reality. The additions we make to pure existence, when we say continuous existence, belongs to the logical or ideal order, and this can neither change or alter the existence. This distinction, however, is suggested to the mind when the mind would contrast the existence of a thing with extrinsic temporal succession.

Before going into the actual and correct definition and division of time, it would first be well to go into the errors that have arisen over the definition of time. Kant belongs to the school of those who hold that time is merely a subjective, ideal, or logical form of the mind. Kant is one of the main opponents to the Thomastic point of view, and most objections come from his system. Kant

holds that all time is a priori in origin and is understood only by the faculties of the internal senses and not by the intellect. When Kant attributes an intuition of duration to an inner sense, he is laying the ground for his theory of subjectivism.

Another theory is that of Leibniz. Leibniz opposed the system of Clarke and Newton; yet he was unable to avoid the pitfalls of idealism. Because he professed idealistic monism, Leibniz was forced to reduce both space and time to states or acts of the thinking subject. The definition of time according to Leibniz is, "Time is the order of successions." Time was relation between things which succeed one another, and was purely subjective, existing only in the ideal order. Leibniz himself wrote; "How can we say that a thing exists when no part of that thing exists? In time only a few seconds exist, and a second is not even a part of time. Anyone who ponders these observations will understand that time exists only in the ideal order." In another part he also states; "Uniform things or things which admit of no variations are mere abstractions like time, space, and the other purely mathematical designs." ⁶ Leibniz does away with the essential distinction between our physical time and the duration of spiritual beings. All bodies are composed of monads and the activities of these monads is essentially immanent and can be reduced to acts of perception and appetite.

Descartes is even more of an idealist than Leibniz was. "Duration", according to him, "is identical with the substantial existence of things; it expresses the manner⁷ in which we represent a being maintaining its existence." Time is distinguished from duration only by a mode of thought. Time, however, would be nothing more than a extrinsic measure, a mode of evaluation which adds nothing to a real being and modifies it in no manner. Time is nothing more than a ideal being. Descartes brought this mental distinction even into metaphysics, for he said that the distinction between accidents and substance is purely in the ideal order. Therefore, only substantial existence is permanent and endowed with indivisible duration.

John Locke believed only in intrinsic time. "By reflecting on the appearing of various ideas one after another in our understanding, we get the notion of succession; which, if anyone would think we did get rather from our observation of motion by our senses, he will perhaps be of my mind, when he considers that even motion produces in his mind an idea of succession, not otherwise than as it produces there a continuous train of distinguishable ideas; for a man looking upon a body really moving, perceives yet no motion at all, unless that motion⁸ produces a constant train of successive ideas." Therefore, according to John Locke the origin of our idea of

time is purely psychological. It is objective only in the form of conscious facts. Locke defines time as a portion of infinite duration determined or gauged by a periodic measurement; and infinite duration is purely imaginary duration whose idea is suggested to us by the infinite ideal repetition of a finite duration.⁹

Herbert Spencer's idea of time somewhat resembles that of John Locke. Spencer completely rejects cosmological time. According to Spencer a particular time is a relation of position between some two states in the series of consciousness.¹⁰ In his study of time Spencer confounds two essential things: the objective reality of the concept and its intrinsic quantitative value; and the evaluation we ourselves put on it.

Bergson distinguishes two kinds of time: homogeneous time and heterogeneous time. Homogeneous time is only a symbolic expression of heterogeneous time. Real time or heterogeneous time is found only in the acts of consciousness. These conscious states are purely quantitative in character and cannot be known by us without altering their nature. Time is referred to the conscious life of man. Therefore, since it is impossible to measure the conscious states of man; it is impossible to measure time. Bergson denies the existence of any type of duration outside of us. Space alone is homogeneous, and in space there is neither real duration nor even succession. There are two main

characteristics found in the world which are opposed to real time. The first one is that beings of the world form a distinct multitude, while real time is one and not divided. In the second case the world is perpetually becoming, so that as soon as one state appears the others disappear. Bergson is very explicit on this point. "No doubt external things change, but their movements do not succeed one another, if we retain the ordinary meaning of the word, except for a consciousness which keeps them in mind. We observe outside us at a given moment a whole system of simultaneous positions; of the simultaneities which have preceded them nothing remains. To put duration in space is really to contradict oneself and place succession within simultaneity. Hence we must not say that external things endure, but rather that there is in them some impressible reason in virtue of which we cannot examine them at successive moments of our own duration without observing that they have changed." Bergson substitutes instead of the general universal concept of time a pure invention, which is both arbitrary and useless.

Time draws its real being from successive continuous movement and especially from local movement. Time is not completely identified with continuous movement, or as St. Thomas said, "Patet igitur tempus nec esse motus nec sine¹¹ mutatione." The main characteristic of movement is that it is the actuation of a perfectible being, tending to

further perfect itself. However, there is only a logical distinction between real time and continuous movement.

St. Thomas always stressed the fact that time has the same reality as movement, and since movement exists outside of us, so must time. "If movement", writes Aristotle, "exists independently of the mind, time must enjoy the same sort of existence; the past and the future indeed, exist in movement, and in so far as they are susceptible of being
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computed, they constitute time."

Movement presents two features. First it is the coming into actuality of something which is capable of being realized and tending to be further realized. Therefore an actuality has a twofold relationship. It has a relationship to the potentiality whose actualization it imitates and to the further perfection in which the potentiality finds its completion. Understanding movement as an uninterrupted progress bearing the characteristic of unity proper to all real beings, movement is not identified with time nor does it suggest the idea of time. The second essential in movement is that it is virtually multiple. It does not consist in a collection of parts really distinct from one another, but it is multiple by the reason that by a simple extrinsic designation one can separate it out into an indefinite number of parts. These parts when viewed by the mind become as actual parts. The parts of the multiple have the

feature of following one another according to a relation of past and future.

What our understanding of time consists in is in understanding this continuous foundation which is real movement. Parts that succeed one another without any interruption are linked together according to a fixed and invariable relation of before and after: "cum enim intelligimus extrema diversa alicuius medii, et anima dicat, illa esse duō nunc, hoc prius, illud posterius, quasi numerando prius et posterius in motu, tunc hoc¹⁴ dicimus ess tempus." The two words, "prius", and, "posterius", express the relationship of one to another when they come before the mind. Thus time is composed of two elements, the one number, the other material.

Time is not a real being which would be able to exist in nature completely independent of the mind. For if we would understand time as extending without limit, God would not be able to create bodies. However, bodies do exist in time. Also if time was without limit there would be an infinite number of bodies. But an infinite number of bodies is impossible. If time was also a real being it would be a substance completely existing independent of all other bodies. But since time is a continuous process of movement and change, a being like time would have to be constantly changing. However, changing bodies are, nevertheless, in time. Therefore, this would demand

another and another being for time, for a changing being demands a absolute being into which it can inhere. This would lead to a infinite number of times, which would be repugnant to the human mind and to the natural order of things in the universe.

Time is not a purely mental being without any foundation in a definite reality, for it is based on the different and definite processes of motion and change which actually take place in a certain number of bodies. This is proven from experience. We are not beings without any movement and change. Our minds are constantly changing in the formation of new ideas and opinions. Our bodily and mental states are constantly changing, for if we would doubt this, it would be the same as to doubt our own existence. We observe that there is a gradual progression and not an instantaneous movement, and from that comes our idea of time. If realities exist that move from place to place in a series of movements, time has a foundation in reality. If this was not so these realities would be nothing more than ideal beings, but our consciousness tells us that these are real beings.

Astronomical science also shows us that there is actual movement of elements and planets in the physical world. A planet moves from place to place in a successive series of movements. The earth revolves around the sun once every 365 days. This is the foundation for our earthly

division of time. This motion is based on the standard measurement of other bodies in motion. Thus in this way we are able to divide our days and months. Also we see that new compounds form other compounds, and this would naturally lead to the idea of movement. Therefore, time is not purely a mental classification into which beings would naturally fall. To attempt to deny that time would not have a foundation in reality and to assert that it is purely a conceptual being is to deny the existence of motion in the world itself. Such a denial would mean the end to all scientific study and research. In view of this, the idea of Kant, that time is nothing more than an innate, subjective sense form, is completely ungrounded. Time must have a foundation in reality.

The past and the future constitute the essential elements of time. They are essentially relative, since to fully understand them as they should be understood, we must connect them with a real present. This present must be something that is actually existing in the world. Compared to the present, which is actually passing, all previous parts are completely past, and all succeeding parts are really to come. This relationship is independent of the mind. Therefore, as St. Augustine says: "If nothing went by, there would be no past, and if nothing came, there would be no future time: the present would always remain present, this would not be true, for it would be eternity."

Time, therefore, is an imperfect reality. All the concrete elements of movement are really present in time, but the reality common to both time and movement is on the very edge of non-being. Therefore, time is the result of a synthesis. The mind unites into one and the same whole the past, the present which is passing, and the future which will yet come. The small reality to which the being of time can be reduced is affected by a twofold relationship. It is a relationship completely devoid of any actuality, and a relationship with the past and a relationship with the future. There is objective reality in time. This, therefore, leads to the universal and fundamental definition of time as a logical being with a foundation in reality.

Time is considered also as a measure of the imperfection of beings. In a general way it can be said of created beings that they are more perfect in proportion as they are less subject to time, or to put it inversely, the imperfection of creatures is greater if the notion of time applies to them with greater vigor and to a higher degree.¹⁶ Real time is identical with local movement. Movement greatly approaches non-being because it pertains to quantity. Quantity increases the dependence of being because it adds more integral parts to being and thus strengthens its existence. Movement, however, only possesses a small perfection on the part of quantity. Movement never possesses more than a small part of that which goes to strengthen

being. Time also places a limitation on material substances. By such a limitation a material substance will not be able to exist for a longer time than it was destined to by God. In spiritual beings there is no intrinsic time. They are endowed with permanent duration by God. However, these spiritual beings are subject to a continuous creation. At the head of all this is God, who is pure and immutable act. Here is the distinction between divine and temporal duration. God excludes even the intrinsic and extrinsic possibility of any change. This very immutability is the foundation
¹⁷
of God's eternity.

Time is above all the measurement of the duration of beings. In the abstract notion of time it cannot be taken as a measurement, but time must be taken in its concrete setting. The two essentials of time are, of course, the relation of the before and the after. These two essentials are found only in movement. It is impossible to discover a real time and a real measurement of time outside of
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movement.

From the practical standpoint there is only one thing which contains within itself movement which is subject to temporal measurement. This is the movement of the heavenly bodies. This movement is the only extrinsic measure we have to completely determine all other temporal durations. For all other durations are taken as a measure to it. Local movement is the only movement which actually takes

place in time and is actually subjected to real measurement of time. The quantitative and qualitative movements of mineral and living beings are the only things which really take place in time and are actually subjected to real measurement. The question then arises concerning the measurement of psychic acts. These are on a higher scale than the other forms of mineral and living substances, but they are still dependent on matter for their sensations. They, however, contain a quantitative element. A quantity is able to be subjected to measurements of time. The higher activities of mental life, such as thoughts and volitions, do not have any traits of temporal duration when only considered in themselves. However, they are extrinsically dependent upon bodily organisms. This would make them extrinsically dependent upon them and would subject them to an indirect measurement of time. Spiritual beings, however, are completely independent of any measurement of time. There is no quantitative element contained within them. Continuity, which is the basic element of objective time, cannot be predicated of them.

The question then arises concerning the possibility of arriving at a determinate uniform movement in material substances. Uniform movement is movement which traverses equal spaces in equal periods of time. However, in an attempt to determine the existence of such a movement, it is necessary to presuppose the knowledge of a definite

temporal unit always identical with itself. This concrete unit must completely coincide with movement, but it is impossible to show a continuous movement unless we already know of one. Thus a vicious circle. In local movement it would almost be an impossibility to determine uniformity of movement, for we must suppose in the movement the very uniformity that we are trying to prove. Now local movement is best suited to suggest the idea of time, as Aristotle has observed, "the mind obtains its first concept of time from movements which occur in space, it is also certain that the first measure of time is borrowed from the external
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world."

Cosmological time precedes psychological time. Therefore, it would seem that when the mind has gained an idea of time there would be a determinate uniform movement which the mind applies to external objects. However, since the mind depends on the external senses and since the measurement of a particular duration may vary with different individuals, no complete determinate measurement of uniform movement is able to be arrived at. This is why we depend on watches and other instruments. These instruments indicate only a particular measurement which depends upon the movement of the heavenly bodies. The movement of the heavenly bodies establishes a more general measurement from which is derived the movement of our clocks and other instruments. Therefore, after establishing as exact a measure as possible

between the daily movement of the earth on its axis and the movement of our instruments, we are able to divide the space traversed into twenty-four hours or equal parts. Therefore, we have been able to arrive at a practical uniform movement, but it is impossible to arrive at an absolute determinate uniform movement.

Time is divided into two main divisions. These divisions are intrinsic and extrinsic. Intrinsic time is the duration²⁰ of any particular motion as the thing measured. Thus when a man is walking a certain definite distance, he may be able to walk over this definite distance in a certain period of time. In this case it is not the measure of anything else, but it is the thing measured. The time depends upon the man in the sense that he is able to increase his speed or decrease it as he wishes to. Thus a man would be able to walk a certain definite distance in a hour or in ten minutes depending upon whether or not he was in a hurry. The measure, however, is extrinsic time. This extrinsic time does not vary. This is the measurement of the time that it takes a man to walk from one point to another. Extrinsic time is a standard rate of change which is used as the²¹ measure of the duration of other things. Thus it is the watch or other instruments that are used to measure the time it takes one man to walk a certain definite distance.

Time is also divided into real time which is time that actually and really concides with the actual changes in the

material universe. This time extends from the beginning of motion up to the actual present. This time is being constantly added on to. Thus this is the time that began when God created the world out of nothing and extends up to the actual present. It would follow that it would be constantly increasing from the fact that the world is constantly growing older and our lives are being added on to. Real time is the most important in the divisions of time, for real time is the one that is constantly being used the most. Real time is the measure from which we draw all of our important measurements.

Possible time is the second division into which time is placed. This is the time that was before the creation of the universe, or time which is to come. It can also be conceived of as time which is outside the universe. Thus our idea of time that is to exist in the future. The child that will be born a thousand years from now. People wonder about the conditions of the world that will be brought about in the next century. This is, of course, possible time, for it is quite impossible for it to be considered as real time, for this type of time does not as yet exist, but the possibility of this type of time existing has not been taken away. Thus it is possible that such things will come about in the future.

The next division is absolute time. This type of time is a combination of both possible time and real time. Therefore, it is all time. This is nothing more than the idea of time

as such. This is time which is completely distinguished from quantitative and qualitative changes. In absolute time there is seen the analogy between time and space; each of the ideas is formed by seizing upon a phenomenon of bodies, then abstracting the phenomenon from the body, taking it away, and representing it as something existing apart by itself. Having done this we proceed to make each a container or measure of real or possible worlds; but while things are contained in space by occupying it, they are contained in time by existing in it.

The last division is imaginary time. This is time without any foundation in reality. It is purely a logical concept. It exists only in the mind and is purely a product of the mind. Thus it does not have any foundation in reality, except when considered only under one circumstance. This would be that nothing can be in the mind unless through the senses. However, it is only a compoundment of two or more concepts into a new concept. And thus we have imaginary time. This imaginary time can either be actual, real, or possible time. A good example of this would be the idea of father time with his scythe and long beard. This is, of course, a concept of something that can exist purely on the level of ideal beings.

In regards to time in relation to the world, the question always arises concerning whether or not time will come to an end. According to the Apolcalypse of St. John: "The Angel

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swore.... that time shall be no longer." But time, in the strict sense, is synonymous with the apparent movement of the planets; in the broad sense, it finds its concrete expression

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in continuous movement. The majority of Scripture scholars understand the above words as meaning that the mortal life of man will come to an end. Also the apparent movements of the planets, which serve as the common measurement of time, will come to an end. They conclude that extrinsic time, as we know it, will someday come to an end.

Philosophy confirms these predictions. According to modern science, someday the light of the sun will be extinguished. This will cause destruction of all physical and plant life. Thus even modern science agrees that extrinsic time will finally be forced to come to an end.

There are several causes that may hasten the cause of the destruction of the world. For instance, it might come about that the earth would collide with another planet that has strayed from its course. Also the earth might of itself start to lose some of the gravitational pull that is being exerted upon it, and thus it would shoot off into space destroying all forms of living plant life. We do not conclude, however, that the earth will forever remain in this state of arid desolation and death. Nothing prevents the Creator from endowing both heaven and earth with new properties that will set up between them relations more harmonious and magnificent than the present ones. This might

be the meaning of the prophecy: "And I saw a new heaven and a new earth. For the first heaven and the first earth
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were gone."

If the common measure of things in the world, which is extrinsic time comes to an end, it will necessarily follow that intrinsic time will also come to an end. Intrinsic time is that which is in contingent bodies. Even if the hypothesis of perfect equalization of energy and absolute equilibrium was true, bodies would still have their invisible energy. This energy is the countless atomic or molecular movements which will be the last form of all transformed energy. As our faith tells us, our bodies will rise on the last day of judgment from dust and be cloaked in immortality. Our bodies will then have senses in full activity, but their organic character will be continuous. Moreover, it is difficult to imagine that in their future state bodies will not occupy space, and as a consequence
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move in time. Therefore, in this restricted sense, we may say that intrinsic time will not come to an end.

Footnotes

-25. Apoc., 21:1.

-26. St. Thomas, Supplementum, q. 84, a. 3.

Footnotes

1. Bittle, O.F.M. Cap., From Aether to Cosmos, p. 134.
2. Bittle, O.F.M. Cap., From Aether to Cosmos, p. 136.
3. Boetius, De Consolatione Philosophia, Lib. V, part 6, Migne, Pat. Lat., vol. 63, p. 858.
4. St. Augustine, Confessions, vol. XI, c. 13.
5. Leibniz, Philosophical Works, p. 600.
6. Leibniz, New Essays, p. 40.
7. Cartesius, Principiorum Philosophiae, vol. I, p. 55.
8. Locke, Essay Concerning Human Understanding, Lib. II, ch. 14.
9. Locke, Essay Concerning Human Understanding, Lib. II, ch. 14.
10. Spencer, Principles of Psychology, vol. II, p. 210.
11. Bergson, Time and Free Will, p. 227.
12. St. Thomas, Physics, Book IV, Lect. 17.
13. Aristotle, Naturalis Auscultationis, Lib. IV.
14. St. Thomas, Physics, Book IV, Lect 17.
15. St. Augustine, Confessions, Book II, Ch. 14.
16. St. Thomas, Summa Theologica, I(A), q. 10, a. 4.
17. St. Thomas, Summa Theologica, I(A), q. 10, a. 1.
18. St. Thomas, Physicorum, Lib. IV, Ch. 17 and 19.
19. Aristotle, Naturalis Auscultationis, Lib. VIII, a. 7 & 9.
20. McWilliams, Cosmology, p. 112.
21. McWilliams, Cosmology, p. 113.
22. McWilliams, Cosmology, p. 114.
23. Apoc., 10:5,6.
24. St. Thomas, Summa Theol., I(A), q1 67, a. 1& 3.

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