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Aristotle and the reality of time*

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Sommario: *1. The aporias about the reality of time. 2. Preparing the resolution of the aporias: movement and time. 3. Resolving the aporias: the analogy between substance and instant. 4. Final remarks.*

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According to Heidegger, Aristotle laid the foundations of the notion of time which was to dominate the history of metaphysics down to Hegel or even Bergson. In it time appears as a succession of different nows. Heidegger considers this to be a vulgar notion of time against which he sets his own theory. According to Heidegger, time is something ecstatic in that, in remembering the past and, above all, caring for the future, man is outside himself. Besides, whereas in the Aristotelian notion of time the stress is put on the present, in Heidegger's own theory the stress is put on the future. No doubt, this is an important difference. There are still many others. If one looks carefully, however, into Aristotle's treatment of time in Book Four of the *Physics* — which Heidegger surely did many times before writing *Being and Time* — one sees that in it the idea of a succession of nows appears derivative; derivative, that is, with respect to the more fundamental notion of a now which, being something continuous, cannot be in itself (*ut sic or ut ens*) in any relation of succession to any other now, but remains one and the same throughout. On the other hand, taken not in itself but only in the sense of *ens ut verum*, the single now can be rightly considered to be two or more instants following one another. In other words, the idea of a succession of many present nows — now this, now this, etc. — would be false as soon as one leaves its abstract character out of the account.

Here the adjective "abstract", or the substantive "abstraction", is to be understood in the sense in which Thomas Aquinas spoke of *abstractio totius* and *abstractio partis seu formae* (generalization and formalization) as the means by which the sciences of physics and mathematics are respectively constituted. Consequently, we may also say that there are two possibilities of viewing the present now. Metaphysically viewed, the now is one and the same, it is unique; but physically, or even mathematically viewed, one can and indeed must speak of a multiplicity of

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nows following one another in some way or other, i.e. either in the sense of contiguity or in that of consecutiveness (*haptomenon* and *ephexes* respectively). *A parte rei* (or actually, or really) the present now is only one, but there are many nows *secundum rationem* (or potentially, or abstractly). As we shall see, here all depends on Aristotle's analogy between the relationship of the one now to many nows and the relationship of the substance to the accidents.

1. The aporias about the reality of time

To see why this is so and to what extent the analogy is valid, one has to follow the aporias about the reality of time with which Aristotle begins his treatment. There are three of them. The most important is the last. It is the only one to which Aristotle explicitly refers in the resolution of all three. Nevertheless, the first two also contain important elements for the resolution. So I shall start with both of them and then concentrate on the third aporia. The two first are closely connected with each other. Each one shows that time consists of what is not, for the past is no more and the future is not yet, whereas, as the second aporia explains, the present which is the only real thing as regards time, seems to be only the limit between past and future and therefore not time or part of it itself.

Now, one important feature of Aristotle's first aporia is that he distinguishes between an infinite time and any finite stretch of time one may choose. Each one of them is composed of past and future, i.e. of what is not. So "infinite time" (*apeiros chronos*) does not mean here the real time which consists of a permanent, though ecstatic, present. Nevertheless, the distinction made in this first aporia between time as something limited and time as something unlimited is important.

As for the second aporia, it contains two important features: first the explicit introduction of the concept of parts in connection with time; and, second, the implicit comparison between instants of time and points on a line. As Aristotle says, «...time is not thought to be composed of nows» (218a 7 f., Hussey's tanslation in the Clarendon Aristotle Series throughout), any more than a line is composed of points. The comparison between points and nows will be made more explicit in the third aporia. The only reason given in this second aporia for the non-existence of time is that for anything composed of parts to exist at least some of them ought to exist themselves; but the only possible parts of time, viz. past or future (or parts of both) are not real, whereas the only real thing with respect to time, viz. the present now, is not extended time. So much for the two first aporias.

Let us turn now to the third aporia. It begins as follows: «The instant seems to divide (or delimit: *dioritsein*) the past from the future» (218a 9). Here "instant", or present now, does not refer only to the present instant right now but also to the present instants belonging to the past or the future. To borrow some Augustinian expressions, the present instant does not refer only to the *praesens de praesentibus* but also to the *praesens* (or rather, in plural, *praesentes*) *de praeteritis* as well as to the *praesentes de futuris*. They all seem to divide the past from the future. But whereas the absolutely present now (i.e. the *praesens de praesentibus*) is only one (Hussey's "permanent present"), there are many abstractly present nows (Hussey's "unrepeatable instant[s]").

The reason for there being only one really present now but many abstractly present nows is that the former (i.e. the *praesens de praesentibus*) is shifting (or changing, in the sense of altering — just as a substance is also, even if at rest, at least relatively altering), whereas the latter (i.e. the *praesentes de praeteritis* or *de futuris*) cannot shift or change at all, since neither the past nor the future really exist. And it is because they do not really exist that, unlike the real now as well as any real substance, the *praesentes de praeteritis* and *de futuris* do not change in the sense of altering while remaining the same, but only in the sense of substituting for, or succeeding, one another. They do it, of course, not of their own (for they do not really exist), but only owing to the abstracting, remembering or expecting, powers of the soul.

Up until now I have only referred to the sentence introducing the third aporia. As for the aporia itself, it consists of a dilemma inside of which one can discern other dilemmas (cf. Appendix I). The two horns of the whole or main dilemma are the following: first, there cannot be many nows, nor, second, there can be there only one now. And given that according to the first two aporias the present is the only remaining candidate for real time, time seems not to be anything real at all.

Each horn of this main dilemma contains in its turn two parts. Both horns are, as it were, split. In fact, as we shall see, the first horn contains inside it some smaller dilemmas. That is not the case with the second horn of the main dilemma. It is itself split as well, but not in the way of containing in it other dilemmas. Since this second horn is easier to understand intuitively, I shall start with it. It reads: «(...) Yet it is not possible either that the same now should always persist.» The first reason given for this runs as follows: «For (i) nothing that is divisible and finite (*peperasmenou*) has only one limit, and it is possible to take a finite time (*chronon labein peperasmenos*)» (218a 22-25).

The last words echo the first aporia, in which, as already said, both, infinite time as well as time taken as finite (*kai ho apeiros kai ho aei lambanomenos chronos*) consists of past and future parts, none of which, as the second aporia explains, exists. At this stage of the third aporia, Aristotle concentrates on time as limited or finite, for it is only finite time that needs two limits or nows. But the important concept is that of the infinite or, if possible at all, the infinite limit. True, the concept of an infinite or unlimited limit seems to be paradoxical. But so also is the notion of the unlimited (*apeiron*) itself. In Book Three, chapter 6 (206b 17 f., 207a 1 ff.), the unlimited had been already defined by way of contrasting it to the limited or perfect whole (207a 9 f.). The limited is that which always has something, namely something else, outside itself. By contrast, the *apeiron* is that of which (*hou*) something is always outside (207a 7 f.), viz. outside itself. In other words, the real present is, one might say, ecstatic — a word which Aristotle himself use in other contexts in connection with time (222b 15, 16, 21). On the other hand, real time is different from magnitude in that it is always ceasing to be (206b 1-3). Now, it is, I would say, only by referring to the limited or abstract, but not to the unlimited, ecstatic, or apeiron, present, that the possibility of there being only one now seems to be excluded.

Let us look at the second part of this second horn of the main dilemma. The point here is, perhaps, even easier to grasp intuitively. It is that, if there were only one now, nothing would be either previous or subsequent (*oute proteron oute hysteron*) so that events that happened thousands of years ago would be still happening

today. With regard to this conclusion one may, I think, put forward two remarks. First, if there were only one absolutely present now in the sense of the ecstatic present, it would not just remain but also shift, i.e. start as well as cease to be at once. In other words, it would not be a *nunc stans* but a *nunc fluens*. This would be fully in agreement with the paradoxical notion of the ecstatic apeiron. Second, events like the Thirty Years War (later on Aristotle speaks in a similar context of the capture of Troy) do not exist as such (or *ut sic*). The Thirty Years War, like any other past war, or more generally, any other past event, extends over some limited time, i.e. over many abstractly present nows of the past. But nothing extended over time, be it past or future, can take place in the really present now. Being outside itself, this real now is not itself extended like a whole having *partes extra partes*, as it is the case with any limited or abstract time. Events are processes which (like Hussey's "change[s]"; cf. Appendix II) do not exist of their own, any more than accidents do. In fact, events, like movements or changes, are accidents. So, the issue of the reality of events turns, in the end, on the question of the reality of accidents. It is, I think, the most important aspect of the resolution of the whole third aporia. But, before going on to the resolution, we still have to deal with the first and most complex horn of the main dilemma in which, as I said, other minor dilemmas are contained.

This first horn shows definitively the impossibility of numerically distinctive real nows succeeding one another. A little surprisingly, though, Aristotle start by speaking of parts, but not of nows. "Surprisingly" because the parts of time (past and future as well as, by implication, their own parts) had been already excluded from the present now as the only remaining candidate for real, but not limited, time. Real time, not having *partes extra partes* , cannot be extended, just as an event, being extended over a limited period of time, cannot as such (*ut sic*) being real. Now, Aristotle says that the parts of a limited period of time cannot be simultaneous, except in the sense in which one would say that a smaller extension of time (e.g. the present day) is contained in a greater one (e.g. in the present year). For, since parts, like the past and the future, are not present in any absolute sense of the word "present", i.e. right now, nor were they ever present in this very sense, there are no days or years either in the sense of *ens ut ens*, any more than events exist in the absolute sense of "present".

Before switching from parts of limited times to present instants or nows proper, Aristotle builds a dilemma inside this first horn of the main dilemma — a middle sized dilemma, so to speak. For in the process of switching from parts to nows he builds yet another dilemma inside the middle sized dilemma — a mini-dilemma, as it were.

The middle sized dilemma consists in showing that there cannot be real parts of time, because they would have to stand in a relation either of simultaneity or of temporal succession to each other, neither of which is possible. Aristotle takes for granted the impossibility of simultaneous parts except in the abstract sense mentioned above of smaller parts inside greater parts like days in years. Indeed, it seems intuitively obvious that parts of time ought to be successive. Nevertheless, Aristotle has an argument to prove it. Since time is as such (*ut sic*) infinite, if its parts were simultaneous, they would form an infinite actuality or actual infinitude, like a spatial accumulation or infinite heap, a thing that he never accepted. (In fact, Aristotle did not take into consideration even the possibility of an expanding universe, which would amount only to a potential infinitude.)

The second horn of this middle sized dilemma refers to the impossibility not of a simultaneous, but of a successive multiplicity of nows as regards time. It is here that Aristotle switches from parts to instants proper. And in doing so he builds yet another dilemma, the smallest but perhaps the most important of all of them. Both horns of this mini-dilemma turn on the impossibility for each successive now of ceasing to be. First, no now can cease to be while still being (or, as Aristotle express himself, in itself, *en hautooi*). This seems to be not less obvious than the fact that parts, or even nows, if real at all, ought to be not simultaneous but successive. Provided one leaves aside the possibility of an unlimited, ecstatic or always shifting now, this seems to be not less obvious than the fact that parts,or even nows, if real at all, ought to be not simultaneous but successive.

As for the other horn of this smallest dilemma, the reason given for the impossibility that any now cease to be in a now other than itself is that no instant can be related to any other instant in any kind of immediate sequence. Here the expression "immediate sequence" is a translation of the Greek "*echomena*" which sometimes has been mistaken for "*synechomena*" and translated "continuous". Hussey chooses the neutral "adjoining" and translates the passage as follows: «...it is impossible for the nows to be adjoining one another, as it is for a point to be adjoining a point» (218a 18 f.). I take this to mean the impossibility not, of course, of a relation of continuity, but of one either of contiguity (*haptomena*) or, still worse, of maximal or next neighborhood (*ephexees*) between the alleged many nows. My fingers, for instance, would be in such a relation of neighborhood if I were to spread them out, because between each two no other thing of the same sort, i.e. no other finger, would be there, whereas, were I to put them together, they would be contiguous to each other not having anything of the same or of a different sort between them. In this case, the edges would touch, but not be identical with each other as in the case of a relation of continuity (cf. 226b 34 - 227a 10-14). Now, that is precisely the reason why two nows cannot be in the relation of contiguity or succeed one another. As Aristotle explains in Book Six, chapter 1, of the *Physics* (231b 2), two indivisible items, e.g. points or instants, if they were to touch each other, would merge into one. Being indivisible, each one of them could touch the other only as a whole. In other words, the relation of contiguous succession between nows would collapse in that of continuity, in which the two edges do not merely touch each other but are rather one and the same, as it would be the case with one big finger composed, e.g., of index and middle finger.

Here, however, a difference is to be noticed between two points on a line merging into one and two temporal nows doing the same thing. In both cases contiguity — let alone next neighborhood — is excluded. But whereas the line still has parts (cf. 231b 5 f.), it is only the abstract or extended time which has parts and is hence divisible in parts. By contrast, real time consists of only one present now and is, in this respect, indivisible. Its continuity or endless divisibility is not like that of an extended line coinciding with Hussey's "ubiquitous point", but rather like that of a continuously shifting point. Since it cannot be detained or interrupted, this continuously shifting point can be only mentally but never actually divided into parts like a line. Therefore, a more adequate analogy to the shifting now or permanent present instant ceasing and starting to be at once, would be rather that of the drawing of an infinite or unlimited line by means of a pencil with an eraser rubber attached to it.

Inasmuch as the drawing and erasing takes place at once, there is only one and the same point (Hussey's "ubiquitous point"), but one that is not just permanent (as Hussey's expression "permanent present" suggests) but passing away as well.

Put briefly, the argument about the impossibility of contiguous instants or present nows is as follows: since instants, unlike fingers, or houses put together in a row, do not have parts, any more than points do, they cannot touch one another without melting into one; in other words, the previous now (which under the already mentioned circumstances — i.e. leaving aside the unlimited now — could not cease to be in itself) cannot cease to be in the next now either, for there is no next now at all. The consequence of this is that between two instants there must be another instant and so forth *ad infinitum*. But then, again, at least with regard to the past, the intermediate instants would form an infinite actuality of simultaneous nows. As Aristotle says: «...since the now has not ceased to be in the next now but in some other one, it will be simultaneously in the nows in between, which are infinitely many; but this is impossible» (218a 18-21).

A consequence of this smallest but most important of all three dilemmas is — as Hussey points out — that «straightforward realism about the past is no longer possible...» (p. XXV of the introduction to his Clarendon Series Translation; cf. p. 157 of the Commentary appended to it). This could pose some problems to the view attributed to Aristotle according to which the world exists, as it is called, *ab aeterno*, i.e., that it has been eternally there. On the supposition of a non-straightforward realism with respect to the past, however, the contention that the world has always existed would rather mean that there can be no time at which nothing existed, or nothing was moving, just as there can be nothing, or nothing moving, without time. It is, I think, primarily in the sense of this interconnection between time and movement that both always existed and will indeed always exist, viz. together. This does not necessarily imply that both exist *ab aeterno*.

2. Preparing the resolution of the aporias: movement and time

This brings us to the intermediate passage after the exposition of the aporias before Aristotle goes on to the resolution of the whole difficulty about the reality of time. It is in those intermediate passages that the well known definition of time as counted number of movement according to before and after is given. This definition applies to the physical time which can be measured by any sort of clocks, i.e. to the extended time, rather than to the permanent but uninterruptedly fleeting now. Accordingly, it leaves the changing thing out of consideration and concentrates on the change which, taken in itself, is but a product of our abstracting powers. But though the resolution proper turns precisely on the analogy between "the permanent present", "the changing thing" (or substance) and the "ubiquitous point" rather than on the abstract movement (abstracted, that is, from the changing thing) and its *analogata* ("magnitude" and "time"), those intermediate passages are nevertheless important for the resolution itself.

The important thing about the relationship between time and movement as regards the resolution of the aporias is twofold: first, time is never completely detached from nor completely attached to movement; in other words, the difference

between the two is relative; and, as a result, secondly, the difference between movement and rest is relative as well. For Anaxagoras as well as for Empedocles, but not for Aristotle, there could have been, and indeed had been, a time in which nothing was in motion, but all things were at rest (cf. 250b 24-29), just as for Newton absolute time could be flowing without anything moving or, indeed, existing. (In Anaxagoras, e.g., all things — or rather qualities of which things are supposed to be composed — had been for some indefinite time completely at rest before starting to move under the influence of the *nous* in order to build up the things of every day's experience.) By contrast, for Aristotle there can be no absolute rest just as there cannot be absolute time either. According to him, rest is relative not only in the sense that only things capable of moving can rest but also in the sense that, were something absolutely cut off from moving things, it would be impossible to consider it resting at all. That means that resting things move as well, at least externally or relatively. In some way, this also applies to a body changing places without itself internally altering. For places, unlike forms, are external to bodies. But it applies no less, say, to a unmoved bottle or to a frozen particle, for they change at least their relative position to things which themselves do change. For there to be something resting, i.e. remaining in the same state during a period of time, the turning of the potter's wheel, to borrow an example from St. Augustine, would be sufficient, though, of course, not necessary. What is necessary is that, if not the potter's wheel, something else do move in relation to which even the changing thing would change if only relatively or externally.

The fact that nothing in the real world, including the inner world of the soul, can be absolutely at rest is necessary because otherwise real time, as a continuously running away now, would be detained and hence destroyed. Time can and must be stopped, i.e. considered limited, for purposes, e.g., of measurement; but it cannot be in itself stopped. In itself it is limitless, a limitless instant or limit. On the other hand, though time is not completely detached from movement, it is not completely attached to it either. Neither is time the same thing as movement nor is the only one continuously shifting now identical with changing things or substances, any more than, to use an Aristotelian example (220a 23 f.; cf. 220b 8-12), the number ten is identical with ten horses, for it applies also to ten dogs, etc., or the measuring unity is identical with one horse. This does not mean that one has to take the limitless now as the measure of time or movement. It rather means that one has to take the comparisons summarized in Hussey's table with some precautions. This applies above all to the analogy between time and magnitude. For real, as opposed to abstract, time is in itself not extended; it is not a magnitude proper. For it to be extended, it would have to have *partes extra partes* in the sense of a sequence of contiguous nows. But it has been already shown that that is not possible.

With respect to this there is an important aspect in which the analogy between magnitude and (real) time fails, but not that between substances and the permanent present now (cf. 206b 1-3). It is this: one can actually divide a straight line into two or more parts. In this case the line would be interrupted, but the parts would not disappear by that; they would still remain, though no longer as one but as two or more lines. On the other hand, one never can actually divide, or interrupt, real time; it would be to destroy it altogether. No parts would then remain, for real time has no parts. As already said, the indivisible now is continuous not in the sense of being extended, but in that of being always flowing, i.e. ceasing and starting to be at once

— as long as there is something moving in the world. Now, though a substance is not simply composed of parts, any more than real time is, it is in some way composed of properties, which, in any case, is something completely different. To say this, however, is not to criticize Hussey's table. On the contrary. A look at it rather confirms it. For, as long as the line remains the same, it has to remain unaltered as well (at least internally, i.e. not relatively to other changing things), whereas every substance survives the accidental changes that modify it, and it survives precisely because of those very changes or modifications — just as the one and same now survives because of its uninterrupted (and uninterrupteable) ceasing and starting to be at once. That means, once more, that real time is not magnitude, and this is rather confirmed by Hussey's table itself, for in it "time" underneath "magnitude" is no real time, any more than, without some changing substance, "change" can be anything real on its own. And now to the resolution itself.

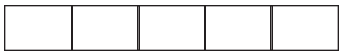
3. Resolving the aporias: the analogy between substance and instant

As I just mentioned, a substance is as little composed of parts as real time is. Instead, a substance has properties changing over time in the way in which real time has nows succeeding one another. But just as the properties are only different *secundum rationem* from each other as well as from the substance, so the nows are only different *secundum rationem* from each other as well as from the permanent present. "*Secundum rationem*" does not mean, of course, that the difference between the properties of a substance, or the nows of real time, is a fictitious one. It only means that there is an identity betwen them, though a contingent one. Coriscus in the market place — to take Aristotle's own example — and Coriscus in the Lyceum are not really different any more than nows succeeding one another in a relation either of contiguity or neighborhood are really different from one another.

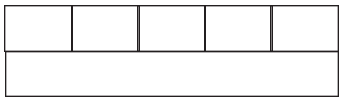
The crucial text in this connection as well as for the resolution of the aporia reads as follows: «Just as the change is always other and other, so the time is too, though the whole time in sum is the same. For the now is the same X, whatever X it may be which makes it what it is.» (The Greek expression for "whatever X it may be..." reads "*ho pote on*". In his commentary Hussey, relying on other passages of the Aristotelian corpus as well, says that it «is used to pick out the substantial reality beneath a phased sortal concept.» With the exception of the word "beneath", as I shall presently explain, I agree with Hussey's paraphrase.) The passage continues as follows: «...but its being is not the same.» (219b 9-11). "Being" (*einai*) means here the same as the expression "*logooi*" (dative, i.e. "*secundum rationem*") used shortly afterwards, when Aristotle continues: «The moving thing is, in respect of what makes it what it is, the same (as the point is, so is a stone or something else of that sort); but in definition [*tooi logooi*] it is different, in the way in which the sophists assume that being Coriscus-in-the-Lyceum is different from being Coriscus-in-the-market-place. That, then, is different by being in different places, and the now follows the moving thing as the time does change.» The passage ends by saying: «So the now is in a way the same always, and in a way not the same, since the moving thing too [is so]» (219b 9-31 with omissions).

It is to be conceded that in other passages Aristotle seems to be saying

something different. This applies above all to the italicized section of the following passage: «For the change and the motion too are one by virtue of the moving thing, because that is one (*not [one] X, whatever X it may be that makes it what it is* — for then it might leave a gap — *but* [*one*] *in* definition (*alla tooi logooi*))» (220a 6-9, my italics). The explanation given here (inside the brackets) seems indeed to reverse the situation, as if the unity were this time supposed to be only *secundum rationem*. However, since "definition," like "being" (as shorthand for "*to ti een einai*"), can refer to different things (definition or being of either the substance or the accidents), I do not think that there is necessarily any inconsistency there. So I shall stick this time, too, to the interpretation I have being suggesting from the beginning. That is to say, Coriscus in a particular state and Coriscus in another state (where "state" can mean "place" but also any other contingent situation), are not really different, since the substance is always the same. If they were different not only *ratione* but also *a parte rei*, then the situation would be rather like that of space-temporal rings of a four-dimensional worm as in Quine. One can picture it like this:



(but preferentially without gaps suggesting a relation of neighborhood rather than contiguity). In such a case, there would be only succeeding accidents or nows without any real unity. Yet it cannot be the case either that the unitary substance or now remains unaltered underneath the changing properties or nows respectively — like this:



What is wrong with either way of picturing the relation is that both — like perhaps the word "stage[s]" in Hussey's chart as well as the expression "beneath" in the paraphrase quoted some moments ago — suggest the idea of a discontinuous substituting of accidents one for another instead of that of a continuous altering of the substance or the present now itself — as if properties or nows were some sort of temporal parts that, after lasting for a while in a static or frozen present, would give way to others — the picture suggested by the Zenonian paradox of the flying arrow. To be sure, on the abstract level, one may consider the replacement of universal properties in such a way. Universal properties are placed next, or even outside of, each other in some sort of logical space. However, *a parte rei* there cannot be temporal but only spatial parts next or outside each other. That is why real, i.e., spatially extended, parts can be cut off and still exist. But, as Aristotle himself pointed out in the second chapter of the *Categories*, this cannot happen with properties, any more than with nows, except in our thinking of them. And so, just as there is no next now to any given now, except by way of abstracting from the one now and making two out of one (220a 12, 18; cf. 222a 10-20) — as if the end of the past now were a different now from the beginning of the future —, so there is no next contingent state of Coriscus succee-

ding the previous one. There is only Coriscus continuously changing in the sense of altering, even if we mostly do not notice it.

Coriscus' being in the market place does not succeed Coriscus' being in the Lyceum, nor indeed does Coriscus' starting to leave the Lyceum succeed Coriscus' still being there. There is no moment immediately following, or next, any other in which this could happen. Even the accident called "Coriscus' being in the market place" is an abstraction from the contingent state comprehending it as well as many other accidents. There are no accidents giving way to one another as if some were ceasing to be before others could start to be. It is the substance itself, in this case Coriscus, which bears the whole burden of changing, and its changing is not a discontinuous substitution of contingent states one for another but a continuous altering (not only in the particular sense of qualitative alteration). The accidents or comprehensive states themselves do nothing of their own. There are no accidents of accidents: *symbebeekos ou symbebeekoti symbebeekos*, as the key sentence of Aristotelian metaphysics in this contxt reads, any more than there are, contrary to Quine's theory, variable numbers or movements of movements. It is not the movement itself that speeds up or down but, e.g., the locomotive, just as it is not the number of inhabitants of Berlin that increases or decreases but Berlin itself — a point already made by Frege which Quine, owing to his theory of spatio-temporal slices, felt compelled to disregard.

The impossibility for there being movements of movements or events of events is pointed out by Aristotle in Book Five of the *Physics* (225b 15 f.). This impossibility is, of course, in full agreement with his metaphysics of substance, according to which accidents do not pile one upon another nor upon the substance — e.g., the quality upon the quantity. It is not the accident white, nor is the white man, that becomes educated, but just the man, Socrates or Coriscus, and only he that remains as well changes throughout changes, just as there is only one now that keeps going indefinitely. Those are standard examples of Aristotle's, but the principle that each accident modifies the substance immediately and not through intermediate stages or accidents applies generally. It is not just that substance alone bears the whole burden of continuous change, it is substance alone which accounts for the continuity of change. So, too, it is not the extension of whatever extended thing, nor the thing plus its extension, which becomes white, but the thing itself and nothing else. True, the thing has to be extended in order to be, e.g. colored, but that is a different point. So much as for the analogy between substance and real time. But there are also some differences.

An obvious difference between substances and real time is that only the latter exists always, that is, uninterruptedly, whereas the former can cease to be despite the fact that time goes on. But this is only a consequence of the relative detachment of time from change. Owing to the relative detachment of time from movement and the moving substances as well, for real time to be it is not necessary that the same substance always keeps going. Consequently, there may be a discontinuity between ceasing to be and starting to in the case of substances, but not in that of time. In the former, but not in the latter, case both, starting to be and ceasing to be, may be different even *a parte rei*. Similarly, with the exception of circular movement, no change can go on for ever; it has to end somewhere. This does not apply to time. Like circular movement time, as Aristotle says,"is always at a beginning and at an end" (222b 4). In the case of both, time and circular movement, beginning and end are only different

secundum rationem. To quote Aristotle: «...time will be like the circle — the convex and the concave are in what is in a sense the same — so time is always at a beginning and at an end» (222b 2 f.) This poses the problem of whether, as Aristotle continues, «opposites would hold simultaneously and in respect of the same thing» (b 4f.). But, of course, the problem poses generally whenever there is a change of state. For even if, except in the case of circular movement and under the supposition of an expanding universe, there is no movement that goes on for ever, whereas every rectilinear movement has to end somewhere, the question arises as to whether in the moment of changing from movement to rest — however relative those distinctions may be — the changing thing is still moving or already resting. And the same applies to the moment in which a substance starts or ceases to be. Does it already exist at that moment or does it not yet exist?

Those are the same questions Plato asked in the second part of the *Parmenides* after the second section of the first hypothesis. To answer them Plato took recourse to the notion of suddenness (*exaiphnees*), which appears to be outside time as well as to contravene the principle of excluded third, since, according to Plato, in this extra-temporal instant neither the previous nor the subsequent state of the changing thing occurs. And with such difficult questions Aristotle is still wrestling in Book Six and Book Eight (especially chap. 8, 262 a 12 ff.) of the *Physics*.

One could try to picture the problems involved here by means of two figures, an angular and a round arch. The angular arch means that the changing from one state to another, e.g., from the state of being moving into the state of being at rest, are not thouroughly continuous. Take, e.g., a ball thrown upwards. It cannot go on indefinitely. It has to go downwards somewhere, and the question is what happens then. If the ball were not to stop in between, the two movements upward and downward would be continuous to each other; in other words, they would be one and the same rectilinear movement which, unless the ball stopped somewhere below or above, would be, moreover, potentially infinite. But Aristotle was not prepare to accept even that. So for him, at the point of return, the ball has to rest for some time. The horizontal line at the top of the angular arch would stand for that period of rest however short. But this is not the end of the matter. For the question is what happens at the juncture of changing states represented this time not by the straight line at the top of the figure but by the angles. Letting aside the extra-temporal *exaiphnees* of Plato's, there are two alternative possibilities left: either both states coincide or they do not coincide at that juncture. The first case would be one of continuity, the second one of discontinuity. As regards rectilinear, but not circular, movement or time Aristotle takes sides, naturally, with the latter alternative. But then the question arises as to which one of both states takes place there, that of rest or that of movement. One answer to this question is: only the following, but not the previous, state. But then one might ask again whether the decision would not be arbitrary. Now, one possibility for answering this question negatively would be by taking recourse to the following analogy: the first moment of the following state is like being at a given point on a line, whereas the last moment of the previous state is like being at the next point away from the former. For, just as there is no such next point, so there is no last moment of the previous state either. This is the solution favored, e.g., by Richard Sorabji. It, undoubtedly, avoids at least having to accept a succession of nows *a parte rei*. But whatever its merits, it cannot be straightaway applied to the case either of

time or of circular movement. For in each case a straightforward continuity is neeeded, which is not yet warranted by only avoiding either contiguity or next neighborhood. The required continuity would have to be no longer represented by an angular but rather by a round arch. The upshot of this is that, since real time cannot be actually interrupted, this solution cannot be accepted without further qualifications.

But, first, what about the other alternative, i.e. what about the possibility of both, the previous and the following state, taking place at the juncture of changing from one to the other? To say that the continuity of real time, like that of circular movement, compels one to accept that before and after are both at the juncture of changing from one to another seems to contravene the principle of non-contradiction. But it is not necessarily so, and this for two reasons: first, the principle of non-contradiction is not contravened by simply saying that "F" and "not-F", e.g. being there and not being there, or before and after, take place at the same moment. It is only contravened if one says that "being there" and "being not there", "before" and "after", or, in general, "F" and "not-F" mean the same. For it is only then that one would not only affirm and deny the same predicate of the same subject, which, as in the case not only of movement or time but also in many other cases, e.g. of Christian theology, is all right, but also in the same respect, i.e. *eadem ratione* (*kata to auto*). In other words, both, before and after, here and there, God and man, one and three, etc., do coincide *a parte rei*, but not *secundem rationem*, which is precisely what Aristotle had said in the key passage of the resolution.

Once the continuity at the juncture of changing states has been thus saved, one might try to see whether this would not provide the qualifications needed for accepting Sorabji's solution according to which there is a first moment of the following state but not a last moment of the previous one. After all, the resolution explicitly said that in one sense, viz. precisely *secundum rationem*, there is truly a succession of moments or a distinction between before and after, and such a distinction is by no means a fictitious one. They may be indistinguishable from, or mixed up with, one another, but both, before and after, are nevertheless there. (One might picture this by means of letters typed on one another. Though not longer recognisable, the typed letters, e.g., "A" and "B" are, together with many other shapes, there, but not, e.g., a shape like "C".). Besides, to return to the special case of changing between movement and rest in both possible directions, the difference between movement and rest is not absolute. In fact, the problem of seemingly incompatible states arises not only at the juncture represented by the angles of the angular arch but all along the lines upwards and downwards themselves. On the other hand, the similarity between points and instants is not perfect. True, there are neither next points nor next instants; nevertheless, the point remains unchanged along with the line, whereas no single instant endures for any period of time. And since there are only spatial, but not temporal, real parts, infinite divisibility cannot mean in the case of real time, as in the case of a line and abstract time, that the action of dividing results in smaller parts each time.

One way of giving the gist of the resolution is to say with Aristotle: «time is both continuous, by virtue of the now, and divided at the now» (220a 4 f.). According to the interpretation given, this means that it is a unity *a parte rei* and divided *secundum rationem* or abstractly. So it is not one and many in the same respect (*kata to auto*). Inasmuch as time is continuous there is only one now; but inasmuch as it is

divided there are two or many nows, according to the way one chooses to divide it. It could not be otherwise. For, if it were actually divided, then, as Aristotle says (220 a 13, 17), time would come to a halt and, as a result, be destroyed in thought as well as in actuality. So time «divides potentially, and qua such the now is always different, but *qua* binding together it is always the same, just as it is the case in mathematical lines: [a point is] not always the same point *in thought* [my stress: F.I.], for if one divides the line it is different in different cases, but inasmuch as [the line] is one, [the point] is the same everywhere» (222a 13-17). «...And for that reason it is in *thought* [my stress: F.I.] always different, for the now is not the beginning and the end of the same thing [*autou*]; otherwise opposites would hold simultaneously and with respect to the same thing. And so time will not give out, for it is always at the beginning» 222b 2-7).

4. Final remarks

I started with some remarks about the way Heidegger interpreted Aristotle's theory of time. I would like to finish in the same way. On the one hand, I have stressed the untenability of considering Aristotle's theory of time to be, as Heidegger had it, merely that of a succession of nows, but, on the other hand, I have also stressed the importance of the present for Aristotle, and in this respect, I think, one cannot but be fully in agreement with Heidegger. Now, as far as I know, no one, perhaps not even Aristotle, took the primordial importance of the present now for real time as seriously as Brentano. For him, only the present right now is real, but it is not a empty now. Brentano himself spoke of a *pleroma* (fullness) with which the present now is endowed. For, as far as the past is real, it is inside the now like year-rings inside a tree. And the same might apply to the necessary aspects of the future inasmuch as they exist already *in causa*. That [together with Wittgenstein's metaphor], could perhaps help to understand how it is that in the only one now there are, nevertheless, many nows different from it only *secundum rationem*. It might also help to understand the relation between the being of the present and the not-being of past and future. In this respect Heidegger, but not Brentano, came once to recognize the paramount importance of Hegel's notion of negativity with respect to time. Before, he had harshly derided Hegel's theory of time based on that of Aristotle's using almost the same words of contempt Brentano had used himself against Hegel's theory. But while still teaching in Marburg Heidegger wrote: «In the end [one has to acknowledge] that Hegel was on to a fundamental truth when he said that Being and Nothing are the same thing...» (Lecture published in 1975, p. 443). And referring to time in the same context he asked: «...to what extent is time itself the condition of possibility of Nothingness [Hegel's "negativity"] as such?» (*ibid*.). Now, against the exclusion of negativity from Being as such, Hegel explicitly protested as forcibly as Heidegger was later to protest. I quote some key words of Hegel in this respect: «...it is therefore said that although nothing is in thought or in imagination, yet for that very reason it is not *nothing* that is, being does not belong to nothing as such, but only thought or imagination is this being (...) that nothing does not possess an independent being of its own, is not being *as such* [my stress: F.I.]» (*Science of Logic*, p. 101 f.). For Hegel, on the contrary, being and nothing belong together in thought as well as in

themselves. So one is tempted to regard Heidegger's as well as Hegel's thought in this respect as Aristotelian philosophy stripped of the doctrine of *ens ut sic* as distinct from that of *ens ut verum*. With this proviso one could take Hegel's following words as a quintessence not only of Heidegger's but also of Aristotle's notion of ecstatic time: time «is the being which, in that it *is* is *not*, and that it is *not*, is. It is intuited becoming; admittedly, its differences are therefore determined as being simply *momentary*; in that they immediately sublate themselves in their externality however, they are *self*-external» (*Hegel's Philosophy of Nature*, transl. by M.J.Petry, vol.I, Allen and Unwin, London 1970, p. 229 f.). It is a very concise formula for ecstatic time. So much so that one might think that in stressing so much ecstatic time in Aristotle I was more or less unconsciously applying the method called by Gadamer of "melting of horizons" ("Horizontenverschmelzung") throughout my paper. If so, it would not be perhaps completely disadvantageous. After all, no philosophical question is the property of any single philosopher. In that case, I only would hope that the position of Aristotle's has remained recognisable behind the supposedly melted horizons. The resulting pattern would be, too, one of actual samneess (*Selbigkeit*) and differences *secundum rationem*. Undoubtedly, I have stressed the importance of the flowing now much more than Aristotle did. He had not even an expression for the corresponding concept. But, besides the analogy between the present now and the substance, there are, I think, at least four reasons which justify speaking of it. The first reason is that, although one can take time also as limited, it is in itself unlimited; the second reason is the definition of the unlimited itself ("*hou aei ti exo*"), which in the case of time is to be taken differently than in that of magnitudes (206b1-3); the third reason is the fact that, while limited time, although it is not a counting but a counted number, depends nevertheless on the counting soul, real time, like movement (cf. 223a 25-29), would exist also in case there were no counting souls at all, for then it would exist at least as countable number, which seems to apply primarily to the infinite time, but does not coincide with the movement even of the last sphere; finally, the fourth reason is that the fact that time is one in definition means that it is always the limit of past and future, i.e. an unlimited limit. For this is, once again, the paradoxical concept of *apeiron* applied to time. Where my interpretation perhaps departed from Aristotle is in that, unlike him, I was trying to see what a metaphysics, but not the physics, of time would be like, taking "metaphysics", as in Heidegger, in the strong sense of a theory of the present or presence. To assess the extent of the departure, if any, one would have to approach the question of the relationship between Physics and Metaphysics in Aristotle.

APPENDIX I

Third aporia:			
		simultaneous	
	many		in itself
		successive	
			in other
impossible			
		finite time = two limits	
	one		
		thousand of years ago = now	

APPENDIX II

Continuum	*Unifying particular*	*'Phase' of unifying particular*
Magnitude	Ubiquitous point	Located point
Change	Changing thing	Stage of changing thing
Time	Permanent present ('the before and after in change')	Unrepeatable instant

[Chart taken from E. Hussey's Commentary on *Physics* III and IV in the Clarenden Aristotle Series]

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Abstract: *L'autore considera, in primo luogo, l'opinione di Heidegger riguardo al concetto aristotelico di tempo e segnala alcune differenze fra i due sulla considera - zione del presente. Afferma che il presente (ora), può essere considerato* ut sic, *oppu - re anche dal punto di vista dell'* ens ut verum; *e in questo modo l'idea di successione di una pluralità di presenti sarebbe falsa nella stessa misura in cui si abbandona il suo carattere astratto. Attendendo però al tipo di astrazione, da un punto di vista metafisico, il presente è uno e unico, mentre da un punto di vista fisico e anche mate - matico, si può parlare di una molteplicità di presenti. La questione dipende quindi in buona misura, continua l'autore, dalla concezione aristotelica dell'analogia fra il rapporto di un presente alla molteplicità di presenti, e dal rapporto fra sostanza e accidenti. A differenza di come Heidegger interpreta Aristotele, il tempo, secondo quest'ultimo, non può essere interpretato come una pura successione di presenti (ora), anche se non si può però diminuire l'importanza del presente nella teoria ari - stotelica del tempo.*