ANCIENT BOUNDARIES AND THE ECOLOGY OF STONE

HOROS

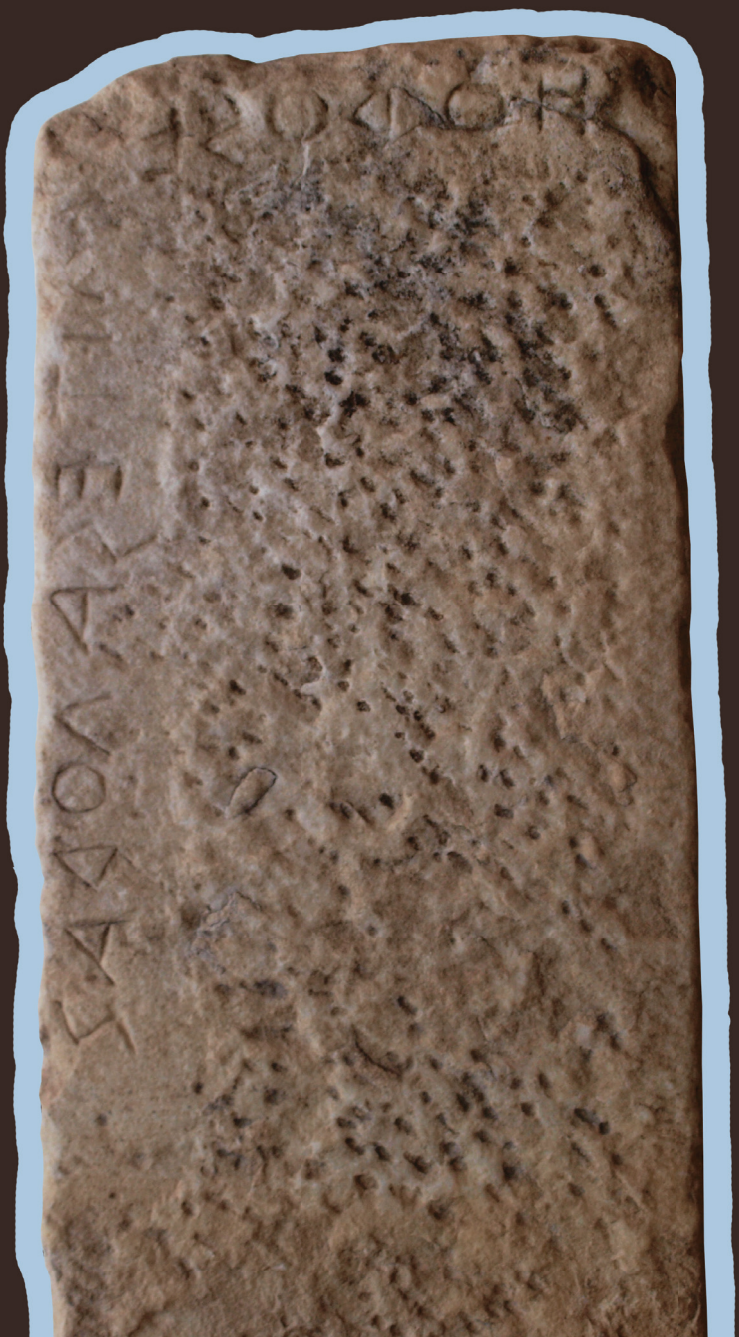

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Fig. 5. ΟΡΟΣ ΛΕΤΟΣ '[h]oros of Leto'. Photograph courtesy of Paulos Karvonis, The Island of Delos, Ephorate of Antiquities of Cyclades, © Hellenic Ministry of Culture and Sports/Hellenic Organization of Cultural Resources Development (H.O.C.R.E.D.)

5. The Presence of the Lithic

> ὁ ὅρος—*the time within which* one may marry [...]the *notes which limit* the intervals in the musical scale[...] I set the *limit* of human life at seventy years [...] Astrol, οἱ τρεῖς ὅ. the three *terms*, used in various calculations.[1]

The diagnostic of the Anthropocene as a new age in the geologic timescale introduces the human as an equivalent, nonhuman force of intemperate geological interference. Not only is the human being rendered as a subject of geomorphic and geological change but also as an intrinsic agent interacting within the geological materiality of the earth in such a way that the lithic record of time is both altered by human activity and is inherent to human agency. The rocks are changing, and the surface strata are being read differently by us, in a way that for the first time raises human beings to the position that human culture has long claimed us to be—as a dominant force, rewriting the fate of the world.

There is a complex of problems in this assertion of the new age of the *anthropos*. First, there are the problems that have to do with the human presence in the lithic: there is an underlying assumption that rocks present to us as a script that can be deciphered, interpreted and understood; stratigraphy requires humans to read into stone as if the earth's crust is a book. The other side of this problem is the authenticity of our rock-reading and the supposed equivalence between the human reader and the human content assumed within the Anthropocene. Since it was humans doing the reading, they were already superimposed upon or within the geological strata as those who read, interpret and make sense of a natural phenomenon. The Anthropocene reiterates the already intentional human presence in the lithic. Second, there are the problems that have to do with the measurement or definition of

1 Taken from LS: ὅρος.

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geologic time and the question of whether this can ever be more than relative to the human act of reading. Is there such a thing as absolute time and if there is, is it possible for humans to experience it as such and transform it into a comprehensible measurement? Time itself has a habit of reconfiguring itself every time into space or spatial metaphors. Perhaps this is more essential to time than we allow. With this in mind this chapter will investigate the relation between rocks and time. In which case I will begin with the *horos* in the works of Aristotle, and its task of defining the present moment, or 'now.' Given the slippery nature of time, it should not come as a surprise if that is where I end up as well.

There can be no doubt that human beings are changing the surface of the earth through chemical use, industrial farming methods, fossil fuel extraction, and deforestation. That is not the issue. The issue is this: what lesson do we take from the introduction of a new name for a new age, and will it assist us in some way to make the necessary changes in our relations with the geomorphology of the earth? My suspicion is that this reiteration of the human as an age-inducing agent only reinforces the dangerous and destructive structures of belief endemic to the majority of human institutions (science, religion, architecture, politics) that actively segregate the human from the nonhuman. What would be more beneficial would be a reworking of a non-horizontal, non-vertical, non-linear history of human/nonhuman interrelations and interactions that is not just between humans and nonhumans but also between animals and rocks, plants and fungi, bacteria and viruses and so on—an entirely new multi-dimensional project that calls for the embeddedness of life and matter.

Perhaps the main problem with the designation of the Anthropocene is that it forebodes (nominally) an era in which humans presume to hold centre stage, when what it should really be suggesting is how we can reinvest ourselves within the subtle chain of life. The way climate change is being presented seems to suggest two possibilities only, on the one hand there is the technocratic, corporate world geo-engineered to suit humanity alone, on the other there is the imminent climatic chaos spawned by the rise of earthly, chthonic forces that do not give a damn about human lives or humanity as a whole. Climate change might be the scientific term for an aggregate of shifting climatic forces, but what we experience is a series of threateningly powerful interventions

in the natural world: the disappearance of pollinators, barren oceans, genetically modified plant species spreading seeds across neighbouring fields, poisoned rivers, rising flood waters, out-of-season snow, firestorms of hellish proportions, chemicals that saturate the land, enter water sources and modify the reproductive health of our children and standing over it all devils with little resemblance to humanity, buying up land and expanding their dominion to the ends of the earth. The ancient monsters and old chthonic gods are awakening to fight a battle that will ravage our days and haunt our nights. All we need to do is keep our feet on the ground and stand firm to protect what is wild around and within us. 'The chthonic ones are precisely not sky gods, not a foundation for the Olympiad, not friends to the Anthropocene or Capitalocene, are definitely not finished. The Earthbound can take heart—as well as action.'[2] Donna Haraway proposes a new term, therefore, for the underside of the Anthropocene, a term that covers these chthonic forces and powers, the Chthulucene. As far as I understand, however, if we are diagnosing a problem rather than simply attributing a novel name to a time period then a name can be given but only to a small proportion of humanity whose cartel we could call the capitalocene. The conceptualisation of time since Aristotle and culminating in the designation of the Anthropocene reflects a human desire to flatten our experience of the world into a linear process of narcissistic complacency devoid of respect or mindfulness of the other beings and nonbeings that contribute to, or indeed form the very substrate of, our existence.

Here I will briefly outline the origins of the relation between stone and time in an attempt to rehabilitate the relation of present, dominant conceptualisations with the primordial intellectual and chemical swampland of geomorphous thought. In the geosciences, stratigraphy is the most important tool for measuring time, in which information contained within layers (strata) of rock is used to reconstruct the history of the earth. Similarly, biostratigraphy is the use of the palaeontological or fossil content of the stratigraphic record for the purpose of correlating a relative age of the stratigraphic unit (a body of rock characterised as a distinct entity, of identifiable origin and relative age). An abundance of fossils is designated a biozone, and the biohorizons are delimited by the first and last appearance of a particular fossil taxon. These biohorizons

2 Haraway (2016) 53.

are defined both spatially and temporally, and this duality generates the overarching concept of time as a linear, horizontal process. That said, evolution, as read in the geosciences, is anything but a linear process; on the contrary it is punctuated by flourishings, extinctions, dead-end evolutionary developments, about-faces, singular instances and interruptions. Nonetheless, how time is measured in the geosciences sets the stage for the representation of all biological, botanical and climatic events in earth's history.

The theory of time in the geosciences tends to begin and end here. However, cross-fertilisation between mineral and organic life goes in both directions, all the more so now that our technologies insinuate themselves within our own bodies. Human interraction with geology goes much deeper than merely extracting the earth's mineralogical deposits, exhuming them and exhausting them into the air we breathe and fail to sufficiently filter out. Is there something more than this infiltration between solid deposits of the past and the gaseous future of climatic destabilisation that changes the way time is inscribed in the rocks? The axiom of the Anthropocene is that human-geologic change is superficial or at least can be read superficially. But that is possibly because psychic disturbances on a planetary scale are not legible, at least not for any formally recognised science. Perhaps deeply embedded interaction between human activity and lithic life is always already present in the conceptualisation of time itself, at least since Aristotle defined it, if not from the beginning. Getting the moral in before the story is told: unbalanced interactions between creatures and rocky deposits on a cosmic scale cannot be solved by technological advances that require further destabilisation of natural beings and mineral entities.

In the history of philosophy spatial metaphors are deeply embedded within conceptualisations of time presumably because the extraction of matter from time is fundamentally problematic, if not inconceivable.

Heidegger criticises Aristotle's conception of time as 'vulgar,' by which he means cyclical. Nonetheless, as Derrida reveals, Heidegger's attempts to free time from its vulgar conception become themselves tangled once again because he wants to discover an originary but non-spatial time. He wants to, but cannot, divorce time from an economy of exteriority. I argue that at the crux of this dilemma (*aporia*) is the *horos*, which joins the terminology interminably, and the attempted

determinations of time to the economy of exteriority in the base materiality of the *horos*, stone and boundary.

Predetermined by the Now

According to Aristotle, time is akin to a universal order, insofar as it consists of changes, and changes are all related to one another. All change exists within time, says Aristotle, but time is 'something of change.'[3] Ursula Coope also points out another sense in which time is a universal order, as all rational humans are able to count time by counting an order of defined 'nows.'[4] The 'now,' '*nun*' in Greek, something like an instant, is able to be distinguished temporally from other 'nows,' while the definition of all 'nows' remains the same. Put otherwise, all 'nows' are the same except insofar as they differ temporally, and this ordered series of similitude between 'nows' creates the temporal continuum. Because the 'nows' are all the same, there cannot be said to be any discrete parts of time, and so while the continuum can be divided into instants and between these instants further instants can be divided and therefore counted, time itself cannot be separated or interrupted. Ursula Coope explains this difference.

> What, then, is involved in dividing something continuous into parts? On Aristotle's view, we can only divide something into two by creating in it two boundaries: one boundary for each of the two parts. There are two different ways to create a double division of this sort in a line. One way is physically to cut the line in two, so that the two parts are separate from each other and each of them has its own boundaries. The other way is to move over the line, stopping when we are part way through the movement. By stopping at a certain point on a line and then starting out from that point, we create a double boundary. When we stop and then start at a point, we treat the point as two, allowing it to serve both as a boundary of the part to one side of it and as a boundary of the part to the other side.[5]

The original text that suggests this is in Aristotle's *Physics* Book IV, where he states that time is continuous 'in the now' (συνεχής τε δὴ ὁ χρόνος τῷ νῦν) and is divided according to the now (διῄρηται κατὰ τὸ

3 Coope (2005) 31.
4 Ibid. 172.
5 Ibid. 11.

νῦν).[6] But beyond explaining how 'division' operates in the continuous line, Coope adds the idea of creating 'boundaries' on each side of the division. The word 'boundaries' here relates to the verb *horizo*, as it is used by Aristotle to describe the movement of an object. If a single object is being moved, its movement will be continuous not because the object remains the same but because it remains the same while it is moved, and this is what defines— *horizei*—the movement before and the movement after (ὁριζει δὴ τὴν πρότερον καὶ ὕστερον κίνησιν τοῦτο).[7] In much the same way, a moment, or point, both constitutes and defines linearity (ἡ στιγμὴ και συνέχει τὸ μῆκος καὶ ὁρίζει) by tracing a path from beginning to end. This is where the concept of time as a continuous line with the now as an indivisible point on that line would seem to originate. On this line, each point is distinct (though not separate) from all others by a period of time, and hence, no two points can coexist temporally nor succeed one another immediately. What must distinguish each now from the others is the boundary that defines them temporally in relation to the line. Hence,

> τὸ δὲ νῦν ὅρος τοῦ παρήκοντος καὶ τοῦ μέλλοντος.[8]
>
> the now is the boundary [*horos*] of the past and future.

In this formulation, it appears that the 'now' and the 'boundary,' *horos*, are in an identical relation. Rather than there being an independent boundary on either side of the now giving definition to the now in contrast with whatever falls to either side, it is the now itself that marks the division between the past and the future, and it does so as boundary. Coope suggests that time can be attributed parts without actual divisions because it is impossible to actually interrupt time. Instead time can be understood by marking a 'potential division,' or as Aristotle puts it 'the "now" of time is on the one hand a divider according to potentiality, and on the other hand a limit (*peras*) and unifier of both future and past' (οὕτω καὶ τὸ νῦν τὸ μὲν τοῦ χρόνου διαίρεσις κατὰ δύναμιν, τὸ δὲ πέρας ἀμφοῖν καὶ ἑνότης).[9] In itself the 'now' is at once a unifier and a divider (κατὰ ταὐτὸ ἡ διαίρεσις καὶ ἡ ἕνωσις), but it is not identical to itself.

6 Ar.*Phys*.220a5.
7 Ar.*Phys*.220a10.
8 Ar.*Phys*.223a7.
9 Ar.*Phys*.222a20.

> First, for Aristotle, indivisible things like points and instants exist only in so far as they are boundaries, divisions, or potential divisions, of a continuum. They are, thus, essentially dependent entities. A boundary must always be a boundary of something or other. Second, for a boundary to be (and hence for the part it bounds to be), it must be marked out in some way from its surroundings. A continuous thing that contains no such boundaries will not contain any parts (although it will, of course, be divisible). Third, when I mark a now I create a potential division, both in time and in whatever changes are then going on. It is thus by marking nows that we create parts in time and in changes.[10]

From the very moment when Aristotle gives form to the problem, he takes it as a problem of determination, of formulating a 'definition' of time. And, just as in English, so in Greek, this form is presupposed as one of boundaries, terms and limits. In short, he is putting the *horos* to work, both verbally and nominally, in order to draw up the boundaries of time. But can time itself not merely *have* but *be* a 'definition'? Can time itself be said to have boundaries? Not exactly. What Aristotle says is that we sense boundaries or limits of motion, and only from distinguishing these boundaries do we get a 'sense' of time.

> ἀλλὰ μὴν καὶ τὸ χρόνον γε γνωρίζομεν, ὅταν ὁρίσωμεν τὴν κίνησιν τὸ πρότερον καὶ ὕστερον ὁρίζοντες· καὶ τότε φαμὲν γεγονέναι χρόνον, ὅταν τοῦ προτέρου καὶ ὑστέρου ἐν τῇ κινήσει αἴσθησιν λάβωμεν. ὁρίζομεν δὲ τῷ ἄλλο καὶ ἄλλο ὑπολαβεῖν αὐτὰ καὶ μεταξύ τι αὐτῶν ἕτερον· ὅταν γὰρ ἕτερα τὰ ἄκρα τοῦ μέσου νοήσωμεν καὶ δύο εἴπῃ ἡ ψυχὴ τὰ νῦν—τὸ μὲν πρότερον τὸ δ᾽ ὕστερον—τότε καὶ τοῦτό φαμεν εἶναι χρόνον· τὸ γὰρ ὁριζόμενον τῷ νῦν χρόνος εἶναι δοκεῖ·[11]
>
> We recognise a lapse of time when we determine [*horisōmen*] a movement by defining [*horizontes*] its first and last limit; and then we say that time has passed when we have a sense of a prior and posterior limit. And we distinguish between the initial limit and the final one, interpreting that what lies between them is distinct from both; for when we comprehend the difference between the extremes and what is between them, and the soul states that the "nows" are two—an initial and a final one—it is then that we say that there is time; for that which is determined [*horizomenon*] by a "now" seems to be time.

10 Coope (2005) 13.
11 Ar.*Phys*.219a25–30.

Not only the sense of time, but the sense of 'now' is thus subsequent to the determination of boundaries, and time is itself none other than this determining (*horizomenon*). The Greek text here is full of different forms of the *horos*. It is all about distinguishing and determining limits. There is a further question that would seem to present itself in the *Physics*; that is, to what do we owe this ability to determine limits? And what exactly *are* these limits (of past and future) that appear to present themselves to us without them actually being present as anything beyond the 'now'? For Aristotle, it is key to recognise that our experience of time is absolutely dependent upon our experience of change or our lapse in perception between one state and another. This lapse, or gap, is what provides us with the possibility to determine a change.

> συνάπτουσι γὰρ τὸ πρότερον νῦν τῷ ὕστερον νῦν καὶ ἓν ποιοῦσιν, ἐξαιροῦντες διὰ τὴν ἀναισθησίαν τὸ μεταξύ. ὥσπερ οὖν εἰ μὴ ἦν ἕτερον τὸ νῦν ἐπεὶ λανθάνει ἕτερον ὄν, οὐ δοκεῖ εἶναι τὸ μεταξὺ χρόνος. εἰ δὴ τὸ μὴ οἴεσθαι εἶναι χρόνον τότε συμβαίνει ἡμῖν ὅταν μὴ ὁρίζωμεν μηδεμίαν μεταβολὴν ἀλλ᾽ ἐν ἑνὶ καὶ ἀδιαιρέτῳ φαίνηται ἡ ψυχὴ μένειν, ὅταν δ᾽ αἰσθώμεθα καὶ ὁρίσωμεν, τότε φαμὲν γεγονέναι χρόνον, φανερὸν ὅτι οὐκ ἔστιν ἄνευ κινήσεως καὶ μεταβολῆς χρόνος.[12]
>
> So we join the former "now" to the latter "now" and make them one, making an exception of what comes between them since it is unperceived [*anaisthēsia*]. So, just as there would be no time if there were nothing other between this now and that now; since the other escapes our notice, there would appear to be no time in between. Since we do not suppose that time happens to us when we do not determine [*horisōmen*] any change, but the soul appears to remain in unity and undifferentiation, but when we sense and determine, then we say time has become, it is thus clear that time is not without movement and change.

Time appears before all else as the question of determining or defining the present 'now.' And yet, determination is first (and simultaneously) a sense or feeling of something other than the 'now,' which would provide a sense of definition between one 'now' and another. This is why Coope rests her interpretation of the continuity of time in Aristotle upon the idea that it is we who count time.

This sense would seem to work both ways, as a feeling of lapse, it would appear as a caesura, or a broken cog in the machine, interrupting

12 Ar.*Phys*.218b25–220a.

the continuous series of (undifferentiated) 'nows,' forward and back. It is therefore a feeling (of absence as well as of movement) that interrupts time, and brings time into distinction. And yet it is a feeling, a sense, and can be said to give time to us, by separating our sense that there is something other than immediacy but also something outside of perpetual motion. That time and movement are sensed, in a sense a matter of aesthetics (even if the matter itself is unperceived or unfelt), means that the exteriority of time is no longer an issue, it exists in us. Though this cannot be the end of the matter. As Derrida states, 'the transcendental exposition of time places this concept in an essential relation with movement and change, even while rigorously distinguishing it from them.'[13] The nature of time in Aristotle raises the problem of the matter of time, or time's exteriority as a problem of 'definition.'

According to Book IV of the *Physics* the present 'now' is not actually a part of time, although it pertains to time by bringing time into definition.

> τὸ δὲ νῦν οὐ μέρος· μετρεῖ τε γὰρ τὸ μέρος, καὶ συγκεῖσθαι δεῖ τὸ ὅλον ἐκ τῶν μερῶν· ὁ δὲ χρόνος οὐ δοκεῖ συγκεῖσθαι ἐκ τῶν νῦν. [14]
>
> [T]he now is not part [of time], for a part measures the whole, and the whole must be made up of the parts, but we cannot say that time is made up of nows.

And yet with its presence, the 'now' gives definition to time by joining past with future, which are themselves nonexistent, insofar as they only have been or will be a present 'now.' That is, they exist only by virtue of having crossed or potentially crossing over the boundary of the 'now.' Aristotle concedes that the future and the past have a common boundary (*koinos horos*) and that this boundary is identified as the present 'now.' What divides past from future is therefore also taken to be what gives definition to time as a whole. Still, this does not provide a continuous sense of time. For it is not enough to distinguish the boundary between past 'now' and future 'now'; one must also join them.

This is where the use of the word *horos* becomes pertinent because if the now were a limit as in the sense *peras*, which is a more finite type of limit, then there would be nothing to bind the past with the

13 Derrida (1984) 49.
14 Ar.*Phys*.218a5.

future; they would not have a common boundary. But since Aristotle identifies the 'now' with *horos*, he is able to create a definition of time that simultaneously divides and joins, that distinguishes and unites. Nonetheless, the leap in the definition is the synonymity between the present as a point or line of demarcation that distinguishes past from future, the definition itself (i.e. *horos*) and the 'now.'

> Φανερὸν δὲ καὶ ὅτι εἴτε χρόνος μὴ εἴη, τὸ νῦν οὐκ ἂν εἴη, εἴτε τὸ νῦν μὴ εἴη, χρόνος οὐκ ἂν εἴη·[...] καὶ συνεχής τε δὴ ὁ χρόνος τῷ νῦν, καὶ διήρηται κατὰ τὸ νῦν·[15]
>
> It is clear that there would be no time if there were no "now," nor would "now" be if there were no time [...] and time owes its continuity to the "now," and yet is divided by reference to it.

In this sense the 'now' appears to give definition to time but problematically. By joining past and future, it ensures the continuity of time, and yet it is not itself part of time. And then also, the 'now' gives definition to time by dividing it up into past 'nows' and future 'nows,' but is not itself the definition of time. The 'now' is supposed to do the double task of both dividing and connecting past and future into a continuous sequence of 'nows.' This lapse of consciousness, however, gives Aristotle the grounds to separate the 'determination' of time into two limits, the double point or 'dyad' (τῇ γὰρ μέσῃ στιγμῇ ὡς δυσὶ χρήσεται).[16] At this point the now diverges as *peras*, the twofold limit, the beginning of time-to-come, and the end of time-past. Here the now is framed by similitude, 'the now is like a limit (*peras*), which is not time but only accidental to it' (ᾗ μὲν οὖν πέρας τὸ νῦν, οὐ χρόνος ἀλλὰ συμβέβηκεν).[17] But it is only temporarily like a limit for, as he stated from the very beginning, consciousness or its lapse joins the former now to the latter and makes them one excepting the non-sensation in between.

One 'now' differs from another, but in its actual holding of time continuously together it always remains the same; the 'now' is thus the contradiction of similars affirmed, it simultaneously divides and unites until we must accept that the 'now' is and is not the same. Therefore, as Derrida recognises, 'the very signification of coexistence or of presence

15 Ar.*Phys*.220a1–5.
16 Ar.*Phys*.219a20, 220a15, 30.
17 Ibid.220a20.

is constituted by this limit. Not to be able to coexist with an other [*sic*] (the same as itself), with an other [*sic*] now, is not a predicate of the now, but its essence as presence.'[18] However, as Aristotle himself notes, it is not at all clear whether the 'now' that divides (*diorizein-* from *dia-horizein*) past and future remains always one and the same 'now' or is somehow subject itself to change.[19] According to Derrida, the question is whether 'in overturning the hypothesis, in demonstrating that the now is not part of time, does Aristotle extract the problematic of time from the "spatial" concepts of part and whole, from the predetermination of the *nun* as *meros* or even as *stigmé*?'[20] The problem does not lie with time as much as it does with the task of the definition (and its associated words) of time.

The line, as the solution of the problem of the nows, is the dialectical affirmation of the aporetic structure of time. The line resolves opposites: the now that is and is not the same, time is continuous and divided by the now, the now is only the point in terms of nonspatial spatiality.[21] Time is the name for the impossibility of the continuation of all these nows that are and are not the same, always flowing on from being into nonbeing, from presence into nonpresence. This is the *aporia* of time, that there are all these 'nows' that cannot be at the same time because then what happened a thousand years ago would be co-present with this 'now,' which it is not. And yet for time to be, rather than not be, it has to be possible to determine in the limit of the present 'now' and in the absence of a relation between the infinite number of 'nows' a continuously extended series of 'nows.' But it also needs to pass over this limit. Aristotle's conception of time is transitivity, transgression of a limit, passing over to ever more limits. The line cannot be a series of points, but only sensed as a series of potential 'nows,' a line 'thought on the basis of its extremities (*ta eskhata*) and not of its parts.'[22]

Heidegger explains, in a note to *Being and Time*, that the priority that is given to the 'now' contributes to the 'manner in which time is *ordinarily* understood.'[23]

18 Derrida (1982) 55
19 Ar.*Phys*.218a10.
20 Derrida (1984) 46.
21 Derrida (1984) 54.
22 Ibid. 60.
23 'Ousia and Grammé: Note on a Note from Being and Time' in Derrida (1984) 36.

> Aristotle sees the essence of time in the νῦν, Hegel in the "now". Aristotle takes the νῦν as ὅρος; Hegel takes the "now" as a boundary [*Grenze*]. Aristotle understands the νῦν as στιγμή; Hegel interprets the "now" as a point. Aristotle describes the νῦν as τόδε τι; Hegel calls the "now" the "absolute this". Aristotle follows tradition in connecting χρόνος with the σφαῖρα; Hegel stresses the "circular course" of time. [24]

The problem of the 'now,' as well as its importance in contributing to the 'traditional' definition of time, has normally overlooked the significance of its definition, that is the materiality of its definition, as *horos*. Heidegger does not reference the *horos* beyond the exclusionary, as well as foundational zone of the footnote. And yet the definition of the 'now' as the boundary, given its quiddity, its matter and its meaning (*to ti en einai*) remains within any subsequent determinations of time, haunting metaphysical determinations with base materiality. The problem of materiality, or, as Protevi puts it 'exteriority,' remains as an intimate exclusion within the definition of time, as much for Aristotle as for Hegel and Heidegger. This intimacy, a ghost in the room of Being, haunts Heidegger's hopes to remain terminologically vigilant, keeping vulgarity and originality, the line and the vector separate and at a distance.[25]

> This acceptation [of the mark "temporality"] must be kept clear from the vulgar time-concept by a rigorous policing of the terminological use of certain expressions that find their way into temporal discourse: "The conceptions of 'future,' 'past,' and 'present' have first arisen in terms of the authentic way of understanding time. In terminologically delimiting the primordial and authentic phenomena which correspond to these, we have to struggle against the same difficulty which keeps all ontological terminology in its grip". In such a policing of terminology, "violences [*Gewaltsamkeiten*]" are unavoidable here, Heidegger concedes.[26]

Such vigilance, however, requires the dematerialising of the terminology itself, but this is impossible. The words 'before' and 'after' create Aristotle's paradigm of the continuous flow of 'nows.' However, if, as Derrida notes in the word *hama* 'at the same time' 'together,' these words already have a spatial sense as well as a temporal sense, any definition of time that is generated on the basis of such words will necessarily bind a

24 Heidegger (1962) 500 note xxx.
25 Protevi (1984) 137.
26 Ibid.

spatial understanding of time with a temporal one. 'Time is that which is thought on the basis of being as presence, and if something—which bears a relation to time but is not time—is to be thought beyond the determination of being as presence, it cannot be a question of something that could still be called time.'[27] Since Aristotle already defined time as sensible, not in the sense of touch (though this is not absent from the word) but as a question of being determined by us, whether this is by counting or measuring, or 'sensing' movement in the soul, it seems vain to try to extract the question of 'sense' from the system of understanding being. Sense is irreducibly bound to the system of presence.

This is what Barad suggests when she says that there is a haunting within quantum physics. Haunting is the disruption of discontinuity; however, it is a destabilising that, like the 'now,' 'makes for the stability of existence itself.'

> Or rather, to put it a bit more precisely, if the indeterminate nature of existence by its nature teeters on the cusp of stability and instability, of possibility and impossibility, then the dynamic relationality between continuity and discontinuity is crucial to the open ended becoming of the world which resists acausality as much as determinism.[28]

According to Aristotle, there is only one way to get between two points, and that is by starting out at your home point and then moving across all the points in between until you arrive at your destination. The problem is that it is not the only way. On the one hand, because you were never at home, and on the other hand, because that was not actually your destination, the destination is always over there, deferred. But there is also a third way: because motion need not be continuous, and the 'now' need not be the divisive force it was cut out to be.

> In particular, the electron is initially at one energy level and then it is at another *without having been anywhere in between*. Talk about ghostly matters! A quantum leap is a dis/continuous movement, and not just any discontinuous movement, but a particularly queer kind that troubles the very dichotomy between discontinuity and continuity. Indeed, *quantum dis/continuity* troubles the very notion of *dicho-tomy*–the cutting into two–itself (including the notion of 'itself'!).[29]

27 Derrida in Protevi (1984) 150.
28 Barad (2010) 248.
29 Ibid. 246.

The quantum leap is a sure way to overcome an *aporia*, accept/except the problem and pass on.

Aristotle began his *Physics* with a series of *aporias*. Aristotle's basic *aporia* was that time is not among things or beings. The definition of time is that it is nothing because it is past or to come. In the words of Derrida, 'Being has been determined temporally as being-present in order to determine time as nonpresent and nonbeing.'[30] So far I concentrated on the *aporia* of the 'now,' and how the now can be simultaneously identical and nonidentical. However, there were other *aporias* in Aristotle's text, the main one revolving around the non-existence of time: 'one part of it has been and is not, another part of it will be and is not yet [...] But what is composed of non-beings might seem to be incapable of participating in being.'[31] Since, as he said in the beginning, 'we must advance from the concrete and particular,' because 'elements and principles are only accessible to us afterwards, as derived from the concrete' there can be only one place to start any attempt at solving or unravelling such *aporias*.[32] That is 'determination,' concrete, solid definition, *horos.* The point is that this was already there, in the text of Aristotle as the point of difference, the interruption of matter into the discourse on definition: that is what *horos* is. Any attempt to circumvent it only ends up in the sludge of the absolute, the muddy ground of transcendence, a slip or misstep that has us falling short of the path and the well-defined boundaries of the stepping-stone.

> In other words, the discourse that seeks to define and describe time uses terms haunted by the possibility of their iteration in bare spatial contexts. These defining and describing terms are inscribed in economies of exteriority with irreducible bare spatial moments—irreducible precisely because the possibility of iteration in bare spatial contexts cannot, *de jure*, be completely controlled.[33]

Aristotle describes that there is a sequence of dependence of movement upon magnitude (vector) and of time upon movement. The moving object is what brings our awareness to the point, the now and its passing between before and afterwards. This moving object that directs our

30 Derrida (1982) 50.
31 Ar.*Phys*.217b33. See Coope on the other *aporias* (2005) 18ff.
32 Ar.*Phys*.184a24.
33 Protevi (1984) 167.

attention, that shifts our gaze towards the timely is whatever intervenes into conscious thought, whether we call this a "point or a stone" (ἢ στιγμὴ γὰρ ἢ λίθος), it allows us to become aware of movement even while it retains its singular identity in speech (τῷ λόγῳ)[34].

Stone or the matter itself insistently, instantaneously intervenes within the text of Aristotle, interrupting time itself. But if this is so, and stone is also the very term of definition and boundary of the 'now' itself, it also is the foundation for any determination of time as a sequence of continuous nows. It is not a foregone conclusion how time can be said in the same breath as a rock. The lexicon puts the problem otherwise, stating that *horos* also means time as a period or duration of time, for example '*the time within which*' or the 'notes *which limit* the intervals of a musical scale', 'I set the *limit* of human life at seventy years.'[35] Apparently the word can be used to relate to time more broadly than in reference to the 'now' as an indivisible part of time. When considering these temporal translations, we must not forget the other meanings of the word and that the *horos* must always have raised this problem of the limits and of the limits of time even when all we saw was stone, landmark or boundary. This might suggest that the *horos* provides space and context for time, regardless of its content (though never without its form), the material substrate that can cut in on the continuum especially when we are not paying attention, which is most of the time.

In the *Physics*, Aristotle provides another example of the use of the word in relation to time, stating that 'coming to be and passing away are the terms (*horoi*) of being and not being,' γενέσει μὲν καὶ φθορᾷ τὸ ὂν καὶ τὸ μὴ ὂν ὅροι.[36] Meanwhile, in *The Laws*, Plato recommends the age within which marriage is to be permitted, the *horos* of marriage, between a boy and a girl (no doubt an uncomfortable discrepancy for the girl).

> γάμου δὲ ὅρον εἶναι κόρῃ μὲν ἀπὸ ἐκκαίδεκα ἐτῶν εἰς εἴκοσι, τὸν μακρότατον χρόνον ἀφωρισμένον, κόρῳ δὲ ἀπὸ τριάκοντα μέχρι τῶν πέντε καὶ τριάκοντα.
>
> the time [*horos*] of marriage for a girl is from sixteen until twenty years of age, the longest determined [*aphōrismenon*] time, and for a boy from thirty until thirty-five.[37]

34 Ar.*Phys*.219b20.
35 LS: 1255.
36 Ibid.261a34.
37 Pl.*Laws*.785b.

Herodotus also uses the same word (in dialect) when he has Solon give the limit (*horos*) of human life as seventy years (ἐις γὰρ ἑβδομήκοντα ἔτεα οὖρον τῆς ζόης ἀνθρώπῳ προτίθημι).[38] In English, we are able to pose this temporal aspect in similar terms, such as in the phrase, 'for the term of his natural life.' This term would seem to open up a determined space, describing as it does both the limits to either side as well as the monotonous time within. In all these examples, the time within is marked as common, characterised as identical or of a standard nature, comprehensively delimited for procreation, life or incarceration.

All these examples, nonetheless, reveal that the *horos* does not itself define time. On the contrary, it would appear to open up the possibility of bounded time, more often than not to be followed by determinative limits, such as 'from sixteen years of age until twenty' (ἀπὸ ἐκκαίδεκα ἐτῶν εἰς εἴκοσι). If the number of years or determinate boundaries of one type or another are required to give the limits on top of the temporal boundary itself, what kind of definition would the *horos* give to time beyond its arithmetical calculation? Is the horos the material form that opens up the potentiality of measuring time, that which we actually sense when we feel time passing, or a material, lithic substitute for the absence of an actual, tangible sense? Perhaps the *horos* is the equivalent on the level of the singular life, to the general conception of the horizon as the determination of a shared existence, as *that within whose limits we live*? Does the simple noun correspond to the particular, while its verbal form corresponds to all being under the vault of the heavens?

The question that should be posed, then, is how the *horos* was supposed to maintain or enforce itself as boundary, as place or (im) position between? This question of the maintenance or force of place presents us with the problem as to whether the past inscription of the *horos* is recognised in the present. There can be no doubt that the *horos*, even now as we read it in classical texts and see it in the museums, raises the question of time and perhaps all the more so now that the materiality of the terminus is increasingly indecipherable for us on account of the wear and tear, the scars of time passed. How is time supposed to fill out the space between two limits, when the *horos* leaves neither room nor space but on the contrary is itself already filled with brute matter? How can a concrete, spatial relation be forged between stone and time, if not in a relation of substitution?

38 Hdt.1.32.2.

The form of the letter provides epigraphists with a *terminus post quem* or a *terminus ad quem*. But in the *horos*, it is exactly the letter (H) that perplexes the indisputable determination of such *termini*. These *termini* are supposed to constrict the possibility of the archaeological object's extension in time to a space between an *ad* (or an *ante*) and a *post*; between a *before* and an *after*. The question of dating, which lingers with the *horos* in the absence of the inscription or in the presence of an archaic letter, is not merely accidental to the *horos*. The marking of the boundary and the materiality of definition cannot be sufficiently comprehended as a spatial metaphor of drawing up limits or of limiting extension. And yet we have seen enough examples that should make it evident that the *horos* was *placed*, that it was 'given' a determined site, that first of all it takes place substituting stone for the boundary and then substituting the letters of the inscription for the stone. The substitution of one thing for another or deferring of the original meaning in matter seems to be a movement that is natural to horos, whether the originary meaning is coincident with matter, inscribed upon the land, read on stone or written in the soul. We might say that the *horos* takes place as stone, but remains by raising the problem of the substitutability of temporal limits and spatial boundaries.

Geologic Time

Contemporary concepts of time might be helplessly indebted to Aristotle. However, it is Aristotle interpreted by Ibn Sina that has most significantly changed our conception of universal time experienced on earth, that is the longer, geologic timescale. In geology, time is immediately associated with rocks, rock strata and the contents of rocks. It does not seem too much of a stretch to state that here time is identified with and by rocks, and an assemblage of rocks is what allows geologists and archaeologists to presuppose the existence of temporal continuity, whether this allows for catastrophism or not. It is rocks as writing, 'stratigraphy,' that provides not just a tool but the content of measurement with which a definition of time can be isolated and temporal definition construed.

In al-Kindi's book *On the Definitions* (*Fi hudud al-ashya'*), as well as in Ibn Sina's larger *Book of Definitions* (*Kitab al-hudud*), the word employed to translate the Greek, or more particularly Aristotelian term *horos* is the

Arabic *hadd*. As Kennedy-Day puts it, Ibn Sina 'explicitly indicates his debt to Aristotle in the *Topics* in his technical definition of *hadd*.'

> The definition of definition [*hadd*] is what the wise man (Aristotle) mentions in the book, *Topics*: it is a *statement indicating* (*pointing to*) *the quiddity* (*mahiyya*) *of a thing*, that is, regarding the perfection of its essential existence. It (definition) is what is obtained from its proximate definition and its differentia (*fasl*).[39]

The word *hadd* is an astonishingly apposite translation for the *horos*. The lexicon entry gives its principal meanings in limiting terms: 'hindrance, impediment, boundary, frontier,' and so forth, but it also comes to mean the restrictive ordinances or statutes of Allah.

> Before assuming its philosophical meanings, the word *hadd* follows a semantic evolution comparable to that of the Greek words that it translates, ὁρισμός and ὅρος. From its meaning of "limit" it passes to that of "delimitation" or "definition", and from that of "furthest limit" or "extremity" to that of "extreme" or "term" in logic. In order to avoid any ambiguity between the two meanings, modern Arab authors who study mediaeval philosophy often follow *hadd*, in the sense "definition", with the word *ta'rif* parenthesis, since one of the uses of *ta'rif* is in fact "definition", although its meaning includes both description and name.[40]

In the term *hadd*, this implicitly deontological sense of the *horos* is made explicit, 'in theology, *hadd* in the meaning of limit, limitation, is an indication of the finiteness which is a necessary attribute of all created beings but incompatible with Allah.'

> Ibn al-'Arabî says that differentiation (*tafriqa*) is the root of all things. This is because through the process of differentiation limits (*huddud*) are set between things, and except for the limits knowledge would be impossible.[41]

In Ibn Sina, the difference between definition and the definition of definition concerns the essential being of a thing. *Horos* differs from *horismos* by antinomy; where the *horos* is *hadd*, the definition *horismos* cannot be separated from its essence, it is the thing itself. But does this mean that it is identical to the thing or a representation of the thing in

39 Kennedy-Day (2004) 51, 102.
40 Gibb (1979–2005) 'Hadd.'
41 Bashier (2004) 87.

speech? Al-Farabi provided a definition of definition as 'a signification (*dalla*) of the essence of a thing,' saying of definition that it is used 'in signifying (*dalala*) how to distinguish a thing,' but also that 'it is considered that there is no difference between a thing and its definition.'[42] This is what Aristotle meant by stating that the *horos* is the word that as *logos* means the essence, τὸ τί ἦν εἶναι, of a thing: *horos* is the divisive signification that unites the explanation, *logos*, with its essence, *ousia*. The *horismos* is this as activity. Essence enters as the divisive factor between *horos* and *horismos*, and yet, as Aristotle put it, *ousia* is the only definition or main term (*horos*). This ambiguity or ambivalence of the *horos* is exactly what joins it (συνάπτει) to the essence or being of a thing (οὐσία).

The big difference in translation is, however, the absence of the lithic in the Arabic *hadd*. Here definition is abstracted from the material, it might be materialised in a barrier, but it is not essentially identified with stone. Nonetheless, the lithic is never far away. In Arabic, *ousia* is translated as *jawhar*, and by Gibb *jawhar* is translated into English as 'substance.'

> *Jawhar* [...] (the Arabic word is derived from Persian *gawhar*, Pahlawi *gor*, which has already the meaning of substance, although both in Pahlawi and in Arabic, it can mean also jewel) is the common translation of οὐσία, one of the fundamental terms of Aristotelian philosophy. "Substance" in a general sense may be said to signify the real, that which exists in reality, *al-mawdjud bi 'l-hakika*.[43]

The idea of 'reality' is basically foreign to the Greek language, though if it is to be found anywhere, it is most certainly not in the word *ousia*. Even translating the word *hypostasis* as 'reality' is more than a stretch. Reality for the Ancient Greeks does not seem to be related either to being or to 'things' (the πραγματικότητα of modern Greek is a loan word coined in 1787, and inspired by the French *realité*.[44])

According to the entry on *jawhar*, we learn that there is one point upon which the Arabic philosophers 'go beyond their master' Aristotle, for whom being is predicated analogically, that is by degrees.[45] For the

42 Kennedy-Day (2004) 50–51.
43 Gibb (1979–2005) Djawhar.
44 Babiniotis (2010) 1148.
45 Lane (1968) 475.

Arabic philosophers, however, there is a supreme being and intellect, that is, Allah, the principle of otherness; he is the Real, Justice, Truth (*Haqq*).[46] In order to be translated into this context, the essence of being (τὸ τί ἦν εἶναι) is itself divided, between what is here in the material world, and this essence as the *Real*, that is to say, Allah. In Arabic, then, we cannot help but recognise that what is substantial in definition and what is defined as substance consistently points to what it is to be (τὸ τί ἦν εἶναι), the definition as signifying the Real which is God, Justice, Truth, *Haqq*.

This 'reality' is, however, also coindicative of *Jawhar*, 'any kind of jewel, precious stone, or gem [...] any stone from which is extracted, or elicited, anything by which one may profit.'[47] This is what I mean when I say that the lithic is never far away. The rock is more significant for Ibn Sina than it may immediately seem, and Ibn Sina's absorption with rocks affects the very definition of the future and the past. Alchemy, obviously, is derivative of a fascination with rocks or minerals and their potentially combinative and explosive relation with one another. And while Ibn Sina does expound the different healing properties of rocks, it is another aspect of his work that has come to play a significant part in the lithic drama of the earth, or at least the human interpretation of this drama.

Ibn Sina is known as the first to read into the rocks a story of earthly history, now known as stratigraphy, the writing of the rock strata. The idea is that we can read time into rocks by taking the deeper rock layers (strata) to represent time periods far in the past and the strata closer to the earth's surface to represent periods of time closer to the present. In geology, this is known as the Law of the Superposition of Strata, and it is a principle fundamental to the measurements that comprise the geologic timescale. The following is Ibn Sina's account of the principle of superposition.

> It is also possible that the sea may have happened to flow little by little over the land consisting of both plain and mountain and then have ebbed away from it. It is possible that each time the land was exposed by the ebbing of the sea a layer was left, since we see that some mountains appear to have been piled up layer by layer, and it is therefore likely that

46 Cf. Gutas (1998).
47 Lane (1968) 475.

> the clay from which they were formed was itself at one time arranged in layers. One layer was formed first; then, at a different period, a further layer was formed and piled (upon the first, and so on). Over each layer there spread a substance of different material, which formed a partition between it and the next layer (perhaps implying unconformity); but when petrification took place something occurred to the partition which caused it to break up and disintegrate from between the layers [...] As to the beginning of the sea, its clay is either sedimentary or primeval, the latter not being sedimentary. It is probable that the sedimentary clay was formed by the disintegration of the strata of mountains. Such is the formation of mountains.[48]

This theory was adopted later and generated what we now call the geologic timescale. George Sarton in his *History of Science* stated that the translation of Ibn Sina's *Mineralia* (elaborated upon by Alfred Sareshal) 'was an important source of geological knowledge,' especially concerning the formation of mountains and rock strata.[49] Toulmin and Goodfield add that our understanding of the past is 'no longer restricted within the time-barrier of earlier ages, this is due above all to the patience, industry and originality of those men who, between 1750 and 1850, created a new and vastly extended timescale, anchored in the rock strata and fossils of the Earth's crust.'[50]

How time is measured in the geosciences provides the framework for multiple fields of study, from a cosmological reconstruction of the history of the earth to understanding extinction events and predicting climatic rates and processes. Although there are different conceptualisations of time in the geosciences, the stratigraphic record continues to be the most important method of measurement, or 'clock.' Here, information is contained within the layers, or strata, and can be used to reconstruct the history of the earth. The underlying principle to this method is that of superposition. This method of dating is often accompanied by biostratigraphy, the use of paleontological, fossil, content found within the stratigraphic record, correlating spatially separate and potentially very distant strata and providing something of a cross-reference between strata in order to come up with a relative age for each stratigraphic

48 Ibn Sina (translation and source unattributed) quoted by Munim al-Rawi in Al-Hassan (2001) 414. However, Alfred of Sareshal's *De Mineralibus* also comprises some of Ibn Sina's earlier tractate, see Sarton (1931) 515.

49 Sarton (1931) 515.

50 Toulmin (1982) 141.

unit. A biozone, delimited by biohorizons, where divisions are made according to the first and last appearance of a fossil taxon, is described both spatially and temporally, where the occurrence that is the deepest down coincides with the occurrence that is furthest in the past. Even in the geosciences, space and time work together as a temporal duality.

It is interesting to note that we see something that quite closely resembles Aristotle's conceptualisation of the 'now,' a temporally specific point that is bound on either side but that contributes as an inseparable part to a continuum. Here, we have the biozone, bounded by biohorizons and contributing to the idea of continuous sedimentation, and when added up these layers of sedimentation become the spatial representation of the temporal continuum. 'A boundary horizon corresponds to a geological moment—the moment when the horizon was deposited. The interval between two successive physical boundaries is thus the embodiment of an inferred interval of time, or "age".'[51] The word choice here, of the 'horizon,' cognate of *horos* (verbal *horizo*, and neuter participle of the verb to be *-on*) suggests to me that accidents are rarely devoid of meaning and that the history of a word remains embedded even after it has long been forgotten. The horizon in stratigraphy can be constituted of stone (lithohorizon) of fossils (biohorizons), there are (in this context seemingly synonymous) marker horizons, there are also event horizons. The word 'horizon' here functions simply to draw attention to an alteration in rock layers whose uniformity allows the geologist to abstract a determinate interpretation. This is the *horos* in its primaeval form, natural mark and marker of nature, but still read by us.

However, to bring us back to earth (or perhaps the opposite), in the words of Aubrey, 'should boundary definitions take full precedence in chronostratigraphy?'[52] How can boundaries (and this is a direct echo of Aristotle) be defined? Must a time boundary be instantaneous, or can it last for several centuries or millennia? For most geological boundaries the transforming event can last a long time, which makes giving a particular date of change very difficult, and it is always possible that not everything changed so that the boundary is not an absolute but a relative boundary, perhaps including some species while excluding others. Ager addresses this problem, in discussing the relation between

51 Aubrey (2009) 94.
52 Ibid.

sedimentation and 'breaks' in sedimentation. For example, if a column of earth is taken, not only can different layers be observed but breaks within those layers, and if another column of earth is taken from the other side of the globe, one might expect to find a vaguely similar column given that significant change tends to happen on an earth-wide scale. However, this is not necessarily the case. What was merely a thin layer in the one column might appear as several feet in the other. Continuous sedimentation is interpreted as meaning continuous without significant breaks. 'But what is significant?,' asks Ager, 'Obviously there are plenty of unconformities where the break is obvious, such as the splendid unconformity between the Upper Cretaceous and the Precambrian of the Bohemian Massif.'[53] As studies continue to be buried in ever more detail, more breaks become apparent. It would appear that the geologic record has as much difficulty in designating and verifying 'continuous sedimentation' as Aristotle had in proving the continuity of time.

These discrepancies pose a problem in the definition of a particular period of geological time because time appears to be relative to place but also relative temporally. Ager's response is to reformulate the stratigraphic record not in terms of layers of sedimentation but in terms of gaps interspersed with layers of sedimentation, where 'gaps predominate,' 'lithologies are all diachronous' and 'fossils migrate into the area from elsewhere' and then out again. In the words of Deleuze and Guattari, 'stratification in general is the entire system of the judgement of God (but the earth, or the body without organs, constantly eludes that judgement, flees and becomes destratified, decoded, deterritorialized).'[54] Ager uses slightly more mundane language to describe the relation between breaks and sediment.

> Perhaps the best way to convey this attitude is to remember a child's definition of a net as a lot of holes tied together with string. The stratigraphical record is a lot of holes tied together with sediment.[55]

Diachronous, rather than synchronous, measurement allows for flows, reiterations and intra-actions in the fossil record. So that evolution is no longer visualised as an arrow, or a climb upwards on the pyramid of being. Instead, we have infiltration and movement and flux, as

53 Ager (1973) 28.
54 Deleuze and Guattari (2014) 46.
55 Ager (1973) 34.

well as interruptions and one-way streets. As Ager puts it, 'this may be called the Phenomenon of the Gap Being More Important than the Record.'[56] On the one hand, the problem of the inconsistency between the gap and the continuum, outlined by Ager, has since resolved into relative time, with biostratigraphy and stratigraphy working together.[57] On the other hand, the concept of geological time is being increasingly funnelled into attempts to delineate absolute time through technological advances providing continuous and anchored methods of measuring time (radiometric, astrochronology, dendrochronology). The first is measured according to rocks that provide both the material basis for the continuum and for the gap. The second is measured as measurement abstracted from the material (or the attempt to do so): that is numerically.

> Chronostratigraphic ages and numerical ages thus differ in a fundamental way. One refers to a duration, the other to a discrete stratigraphic horizon. They also differ in their stability. Once a chronostratigraphic unit has been defined by physically fixed boundaries, its true duration remains unchanged. In contrast, numerical ages may vary considerably, even in measurements on the same material, let alone in different samples measured in different laboratories with different tools [...] For this reason numerical ages are often explicitly characterized by method, whether radio-isotopic, astronomical, or estimated.[58]

These methods of measuring absolute time are integrated, or synchronised, in order to construct a geologic timescale unfettered to the inconsistences of the material. However, where the stratigraphic record is bordered, bounded or limited by the origin of the earth and the present—that is, it covers the last 4.54 million years—the astrochronological record goes back 50 million years (and no further because of chaos). How on earth can any kind of isochroneity be established between things (beings, organisms, objects) that are simultaneously spatially and temporally distant? When they are literally worlds away, how can different strata share isochronous biohorizons?

> To restate the obvious, duration is an interval of time between two moments, i.e., two points in time. It follows that any consideration of time involves three parameters, a proximal point, an interval, and a

56 Ibid.
57 see *Stratigraphy and Timescales* Montenari (2016).
58 Aubrey (2009) 96.

> distal point. The greatest duration for Earth sciences is 4.54 billion years, from the time of the formation of the solar system to the time of today. Intermediate points in this 4.54 billion years temporal continuum are necessary to comprehensively describe Earth history.[59]

There is something reassuringly banal about the fact that something posed as one of the great *aporias* of ancient philosophy is here treated as something that can be taken for granted. The assumption here that Aristotle's definition of time is not only correct but self-evident evades the interruption into the continuum of time of gaps, hiatuses, *stasis* or quantum discontinuity. All those gaps in the stratigraphic record that confounded Ager, what are they made of? Did nothing happen? Are they marks of an absence of change? Were they felt or sensed as a lapse in time at that time? It might be possible to say what this missing time in the stratigraphic record is composed of though that is not the same as knowing what it was when it went wherever, whenever that was. Does it not seem peculiar that a theory of geologic time is so dependent upon lapses or indeterminate breaks in time? On this at least it appears that the geologic timescale is, perhaps not based upon, but at least metaphorically and terminologically indebted to Aristotle's description of time as continuum interrupted by the sensation of movement or lapse thereof, forming a line marked by a series of points.

Although the tendency to resist metaphor in the sciences is strong, Gould states the difficulty of conceptualising time as so extreme that it can only be grasped metaphorically.

> An abstract, intellectual understanding of deep time comes easily enough—I know how many zeroes to place after the 10 when I mean billions. Getting it into the gut is quite another matter. Deep time is so alien that we can only comprehend it as a metaphor.[60]

Perhaps this is why descriptions of space, linear and circular, always arise whenever a new definition of time is attempted. Or what if time itself can only ever be taken as a metaphor, matter carried over spatial temporality, as Aristotle would seem to suggest when he says that it is 'of change'? Metaphor functions by drawing out similarities that might not otherwise be apparent. My suggestion is therefore that there is a

59 Ibid.
60 Gould (1987) 3.

deep conceptual relationship between our 'feeling' of time and our experience of solidity. The metaphor might be described by a phrase, such as 'all that is solid melts into air.' What if there is only floating time, and any attempt to bring time down to earth, to fix it to a particular point in time must of necessity employ metaphor? Given that stratigraphy is the act of reading what was never written, geologic time reads as poetry. For example, as Aubrey states, a 'chronostratigraphic boundary itself is comparable to a datum: a point in the rock (no thickness) that represents a point in time (no duration).'[61]

In response to the common belief that contemporary science is divorced from ancient mythical belief systems, Gould elaborates a series of metaphors used to envision time both within the biblical tradition and in antiquity, of the arrow, the cycle and the line, that have supported subsequent forays, scientific and literary, into conceptualising the passage of time. He argues that these metaphors are so deeply instilled in the psyche of researchers that they are fundamental even to the geological formulations of deep time. The result is that the founding theories of the geologic timescale (Hutton, Lyell) were primarily based upon these metaphors, and only secondarily based upon a familiarity with rocks. These scientific elaborations upon geologic time, 'deep time' as Gould says, might be called philosophy, metaphor, or organising principle, 'but one thing they are surely not—they are not simple inductions from observed facts of the natural world.'[62]

Concerning these metaphors that remain latent in the interstices of the project of modern science, Eliade argues that the linear version of history, with its overtones of progress and linear evolution, has more recently been invested with a rehabilitation of earlier, prehistoric cyclical versions of time, marked by periodic oscillations and fluctuations. While the theory of the linear progress of history may be attributed to the Middle Ages, the linear theory of time is as we saw much older and is also intricately linked with the notion of cyclical time.[63] Eliade highly valued the reappearance of cyclical theories in contemporary thought, obviously derived from archaic fertility myths (such as the Orphic myths, the reversion of the Dao, the repeated creation of the Enuma Elish, and

61 Aubrey (2009) 93.
62 Gould (1987) 9.
63 Eliade (1959) 145.

many more), since 'the formulation, in modern terms, of an archaic myth betrays at least the desire to find a meaning and a transhistorical justification for historical events.'[64] I agree with Gould when he says that deep time 'imposed a vision of reality rooted in ancient traditions of Western thought, as much as it reflected a new understanding of rocks, fossils, and strata.'[65] That said, I would rephrase the statement to include other traditions, in particular the Arabic philosophical tradition, as well as stressing that the vision of reality was firmly based upon a much older understanding of rocks, without which the notion of reality itself would not have been definable.

Horos, even in its stony presence, comprises a notion of the cyclical. The *horos*, as the definition of a thing, is also in a sense the reality or essence of a thing; it draws up the boundaries of a thing, defining it from and in reference to other things that are close but are not it. The limit of a thing is therefore its beginning, but it is also its end; *Horos* might also be translated as the limit in the sense of an 'end' or 'aim' towards which something drives. And that is a problem, because once things become metaphorical there is always the risk of determinism intervening in the guise of the supernatural or the divine, which is not necessarily the opposite of what is real.

Another boundary that dissembles the metaphorical presence of the *horos* on a universal scale can be found in Ibn 'Arabî's conception of the *barzakh*. As with *horos*, so here, *barzakh* is expressed in a relation of similarity with the 'now,' 'the now (*al-an*) is like a partition (*barzakh*).'[66] This *al-an*, 'now,' is a 'moment' or 'presence' that is given as the only real part of imaginary time, a moment that can also be expressed in the phrase 'Day of Event' or 'Day of Breath,' or in the single letter, *alif*, the initial vowel of the name of Allah. All letters (and this also holds for the world at large) can be broken down into this single letter and built up from it, though it does not break down into them.

> Time is a circumstance for an event just like meanings for letters, and space is not like a circumstance, so it is not like a letter. Time is confined through division by "now" and does not necessarily require the existence of objects, but space can not be comprehended without objects (that

64 Ibid. 147.
65 Gould (1987) 10.
66 Yousef (2008) 68.

> occupy it), so it is a kind of (ontological) "home" (for what is created in it).[67]

Barzakh is a 'boundary' that is inclusive 'in the sense that things participate in the limit not that the limit constitutes the final part of a thing.'[68] As the very possibility of defining, the *barzakh*, like *horos*, resists further definition in so far as it presents a common limit to all things. It is the separation between two things (definition) as well as the separating factor (that which defines) 'become manifest as one in entity.'[69]

> So the reality about the *barzakh* is that within it there can be no *barzakh*. It is that which meets what is between the two by its very essence. If it were to meet one of the two with a face that is other than the face with which it meets the other, then there would have to be within itself, between its two faces, a *barzakh* that differentiates between the two faces so that the two do not meet together. If there is no such *barzakh*, then the face with which it meets one of the two affairs between which it stands is identical with the face with which it meets the other.[70]

In an echo of the boundaries of stratigraphy, the *barzakh* is 'between-between, a station between this and that, not one of them, but the totality of the two.'[71] Ibn 'Arabî puts it simply, 'the true barzakh is that which meets one of the things between which it separates with the very face with which it meets the other[...] It is in its essence identical to everything it meets.'[72] This reflective otherness is essential to any notion of a boundary; no boundary can be double, and yet it remains the essence of duplicity. It is division, but undivided, and as such it remains as the common term or boundary of either side, even when either side have nothing in common beyond this boundary. The *barzakh* defines by relating what falls to either side of it to what is other to it, it is not a limit that draws something to an end, but a limit that defines by unifying relations between Other and its other. As Bashier states, the closest, as well as affectionate and unifying of all 'relations is one between Other (khilåf) and its other, from which it is differentiated. [...] Affection (mawadda) between differentiated things prevents each of them from

67 Ibid. 181.
68 Bashier (2004) 86. Ar.*Met*.1022a. tr. Ross.
69 Bashier (2004) 87.
70 Chittick (1998) 334–335.
71 Ibid. 333.
72 Bashier (2004) 87.

wanting the disappearance of its other from existence.'[73] The *barzakh* cannot be differentiated in thought; it is not entirely logical. Thinking about it is said to be comparable to threading a camel through the eye of a needle. In the canonical tradition of the Qu'ran *barzakh* is also the intermediate state between death and resurrection. It is the grave, in a temporal and spatial sense, where the dead linger for the time between death and judgement.[74] The experience of arriving at the boundary, *barzakh*, is described by Ibn 'Arabî in two comparable states, that of the 'greater death' which occurs to a person after death, and that of the 'lesser death' occurring to someone during sleep.

> Do you not see that, when he is transferred to the barzakh through the greater death or the lesser death, he sees in the lesser death affairs that he was considering rationally impossible in the state of wakefulness? Yet, in the barzakh, he perceives them as sensory things, just as, in the state of wakefulness, he perceives that to which his sensation is connected, so he does not deny it. Despite the fact that his rational faculty proves to him that a certain affair cannot have being [*wujud*], he sees it existent in the *barzakh*. There is no doubt that it is an affair of being [*wujud*] to which sensation becomes connected in the *barzakh*.[75]

The sensation that is located here realises the possibility of a presence, which Ibn 'Arabî calls the 'presence of the imagination,' this presence is other than that of perception. But that does not mean the *barzakh* cannot be conceived, imagined or real. It is no doubt the confrontation itself where what is logical meets what is imagined, and the boundary between the two is expressed by the *barzakh*, a boundary that exactly bounds upon the 'Real,' *Jawhar*. *Jawhar* is the stone, but it is also *Allah*.

Indefinite Human Time

Are we forced time and again to return to Aristotle as the originator of the myth of the returning circle of time? If the 'now' is, according to Aristotle, the determination or definition of time, but time is not without movement—that is, it is nothing other than indeterminateness—the 'now' is either not a part of time or time is both indeterminate and

73 Ibid. 88.
74 Ibid. 88. (Qu'ran 23:100)
75 Chittick (1998) 337.

determinate, with and without definition. This is the problem of the limits of time inherited from Aristotle's conception of movement as something indefinite (*aoriston ti*).[76] Here, Aristotle is responding to the theories of the pre-Socratics that nothing can come into or pass out of existence.

> οὔτε γὰρ τὸ ὂν γίνεσθαι (εἶναι γὰρ ἤδη), ἔκ τε μὴ ὄντος οὐδὲν ἂν γενέσθαι· ὑποκεῖσθαι γάρ τι δεῖ.
>
> [F]or what is could not come to be, since it is already, and from what is not nothing could come into being, since something must form a substrate.[77]

What remains in time is movement, as what is both same and other to time. If time is sense and consciousness according to determination, movement is necessary as the indeterminate continuity of time that is not sensed, that is not felt. In Book II of the *Physics* Aristotle had thus defined movement as *aorist*—'indeterminate,' literally 'unbounded,' *aoriston*, 'without *horos*' since 'when movement is determined, it ceases' (ὅταν γὰρ ὁρισθῇ, παύεται). Or, as Heidegger explains, 'Being-there is being-there-completed in its place, limit. If it is moved, it is something that changes its site; it is such a thing that is no determinate place.'[78]

What is the significance, in light of this, of the verb-form in Ancient Greek that poses a challenge to the Latinate tense system, the *aorist*? Because of the 'primitive' nature of its stem the aorist is believed to be the oldest Greek tense, and indeed requests to the deity are usually phrased in the aorist. Does this mean undefinability precedes definition, temporally speaking, that is verbally? The fact that its name is the *a*-privative-*horos* tends to lead toward definitions of this supposed tense via negative determination, 'without limit,' 'without time,' in variations on the theme of the occurrence as simple and undivided. However, that is not to say that it never happened or happened 'once for all,' 'final,' or 'completed.'

In fact, the aorist can imply that an event is in the past, without actually belonging to the past itself. The verb form can be used in association with other tenses to denote present or future events (hence its use in

76 Ar.*Phys*.201b23.
77 Ar.*Phys*.191a27–33.
78 Heidegger (2009) 215.

proverbs or gnomic sayings). As one study suggested, the aorist is punctiliar because it 'simply refers to the action itself without specifying whether the action is unique, repeated, ingressive, instantaneous, past, or accomplished.'[79] Therefore the aorist has been defined not as a tense but an *aspect*, rendering it a matter of perception, or a sense for the moment. It is, in short the tense of the verb that most lends itself to sensing time beyond movement.

One article on the 'abused' aorist's exegetical function decries the semantic interpretation that would take the aorist's punctiliar aspect to imply that the action of the verb is a point. Insisting instead on taking the name of this supposed tense literally, Stagg states 'the aorist draws no boundaries.'[80] The 'punctiliar,' or 'snap-shot action' of the aorist belongs to the writer's presentation, not to the action of the verb itself. In *Revelations*, creation is described in the aorist, which is certainly not to say that it is a single act, nor a completed one; 'that the aorist here covers a semantic situation which in itself is not punctiliar but clearly linear is as normal an aoristic usage as can be found. The aorist is simply a-oristic.'[81] Creation is indeterminate, neither a point nor a line. It is definitely a matter of interpretation, whether creation was something that happened or continues to happen. Whatever it is, it is neither momentary, nor a simple action, nor limited to the past. 'The main point [!] is that it cannot represent action as progressive,' or completed, thus the 'life eternal' is manifested every hour, in 'every word' and 'every deed.'[82] Mirroring creation in speech, the aorist is not a historical singularity, or definite occasion, but nor is it just one step in the linear march toward organised systems (*cosmos*).

The aorist 'represents the action denoted by it indefinitely.'[83] The distinction that must be drawn up is that between the form of the verb and the action it describes. This is more than a simple difference of syntax and semantics—it is not the act that is punctiliar, it is the verb, 'the tense stems indicate the point of view from which the action or state is regarded.'[84] But where is this spectral point if we are talking about

79 Carson (1984) 70.
80 Stagg (1972) 222–231.
81 Ibid. 228. *Rev*. 4.11.
82 καὶ ἡ ζωὴ ἐφανερώθη, John 1:2, ζωὴν αἰώνιον ἔδωκεν ὁ θεὸς ἡμῖν, 5:11. Stagg (1972) 225.
83 Stagg (1972) 229–231.
84 Ibid. 230.

indeterminateness? If movement is defined as 'indeterminateness,' the question remains how we are able to define something in the absence of determination itself.

Obviously, the problem is the 'point of view' or perception. When it comes to the aorist, it all depends on one's point of view, as Aristotle himself suggested when he stated that we feel the movement of time, we sense it. In the other tenses, one's point of view is defined by temporal relation to the verb at hand, whether one is involved in the action of the verb (present continuous), placed after the action of the verb (past perfect), before it (future/conditional) and so forth. But with the aorist, one's temporal relation is not at stake, that is, one's position is as actor or acted upon without further elaboration as to this temporal position (the determining factor for translation is therefore the context itself). If there is any verb that represents floating time, it is the aorist. The aorist is punctiliar, but it is not instantaneous; as Stagg says, the aorist 'presents' an action, 'of whatever nature, without respect to its nature' and the action itself is thus represented in the negative (*a-oriston*).[85] The aorist is change itself, only partly abstracted from nature, and undetermined because when it is determined, it stops.

What really matters is the position of making this indetermination present: *horos*. Movement, like the aorist, requires something else to transform it into time. According to Aristotle, nature is movement ἐν δυνάμει, in potentiality. And we should have sensed this contradiction, between nature and (human) time, with the first *horos*, the boundary or term from which the human marker has been obviated. The *horos* names itself so that determinateness, boundaries, definitions and so forth might be 'natural,' inscribed in nature, an already prescribed limit that leaves us free to go about the task of (re)definition.

We require the potentiality of the *horos* to determine even its negation; in which case the *horos* becomes exactly this, our 'point of view.' So, the *horos*, in the absence of the negating *a-* is what? Non-movement? A point, *stigmē*? Our bondage to our brief moment in time or the stigmata of mortal beings? *Horos* would appear to put in question the exclusivity of a linear boundary and the point of transgression. The opposition is not limited to that between *horos* and *aorist* but between the whole order of organic and nonorganic movement and this singular stone's immovability. But

85 Stagg (1972) 231.

the opposition is also there between our determination of ourselves in contrast to nature, inorganic and organic. Or is it the matter that marks our lapse of consciousness and the indeterminate 'continuity' of time? Levinas expresses the position as existential: 'the value of images for philosophy lies in their position between two times and their ambiguity. Philosophy discovers, beyond the enchanted rock on which it stands, all its possibles swarming about it.' [86]

Prometheus Unbound

Do the structures of language reflect a preconceived conceptual chronology or do the words we use modify our ability to recognise limits and agencies within or outside of time? The demiurge might be timeless or beyond time but does that mean that any consciousness of divinity also becomes extraneous to time? To reframe the problem from a secular position, is human reason capable of structuring a conception of time from any perspective but that of the human? Are we trapped within thought processes that constantly reenvisage time as an object of human thought despite epistemological advances or is there some way to escape the narcissism of human subjectivity when it comes to observing the sublimity of creation and the motion of the spheres?

There is a very similar structure of oppositions and play of metaphor undergirding the conceptual diagnosis of our age as the 'Anthropocene.' As DeLoughrey states, in 'recognising the history, present, and future of apocalypse, universalized temporality becomes parochialized and characterized by ruptures and an experience of "now-time," a marked shift from chronology to simultaneity.'[87] We have attributed the age with our name, and it is thus the name of the *anthropos* that presents the boundary of time. We are the 'now.' At once divisive and nominative, the Anthropocene reinstates humans as the determiners of time, this time not simply as subjects who sense time but rather as a major geomorphic force. As both dominators and denominators we are now masters of time, we make our own time. This hubristic denomination of an age should alert us to the true nature of the problem. The problem is only inadvertently given as the human use of natural resources, excavating

86 Levinas (1987) 13.
87 DeLoughrey (2019) 133.

and burning fossil fuels, mass deforestation, the enormous scale of chemical detritus we leave in our wake. The Anthropocene obviously points to all this and critiques it. But the deeper significance of the Anthropocene is the reinforcement of the egoism of humanity. The Anthropocene might be treated as a symptom of a more than material presence upon earth, where the 'diagnostic of the Anthropocene proposes a new geological epoch that designates humans as a collective being capable of geomorphic force, shaping Earth systems on a par with inhuman forces.'[88] The problem will be whether the attribution of the name, or rather our name, to an epoch serves to vindicate rather than hinder such egoism.

The scientific designation that poses the Anthropocene as the name of an entire age obfuscates the fact that we are not actually in control of the forces of nature; we are not in control of geomorphic forces nor should we be, and our continuing egoism in placing ourselves above 'nature' can only lead to our own destruction (in soul if not in body). More than anything the title 'Anthropocene' assumes a 'we,' a general humanity of actors who are in no way the 'we' who are in effective control of the detritus we leave in our wake. We might name names, but they should know already and that hasn't stopped them so far, on the contrary it has only spurred them on to greater acts of hubris.

But perhaps we can look at it from a different perspective. Rather than taking the human as a force that changes time, that insinuates itself as the lord and master of the nonhuman, we could think of this determination of the Anthropocene as a remineralisation of the human, putting us on a par with rocks. However, studies show that human activity is 'the most important geomorphic agent acting on the surface of the modern Earth, a conclusion that evokes several nontrivial consequences. It should be made clear, however, that anthropogenic and natural rates of erosion embody somewhat dissimilar measures of continental denudation.'[89] We might be a geomorphic agent, but we are not acting in any way similar or equivalent to the nonhuman forces that preceded us. If anything, the name of the Anthropocene is a pretence that permits us to reconfigure ourselves petromorphically, the scientific version of Adam and Eve's earthly and ostic origins. As Yusuff states, this 'immersion

88 Yusuff (2013) 779.
89 Wilkinson (2005) 163.

of humanity into geologic time suggests both a remineralisation of the origins of the human and a shift in the human timescale from biological life course to that of epoch and species–life.'[90] So which is it to be? Does the designation of the Anthropocene iterate human mastery over nature or does it reinvest us as mineral beings?

This passage back into mineralisation echoes the earlier mineralisation from the previous domination of soft tissue, 500 million years ago when bones emerged in organic bodies. De Landa describes it as 'if the mineral world that had served as a substratum for the emergence of biological creatures was reasserting itself, confirming that geology, far from having been left behind as a primitive stage of the earth's evolution, fully coexisted with the soft, gelatinous newcomers.'[91] In her *Allegories of the Anthropocene*, DeLoughrey describes the discourse of the Anthropocene as invigorating a 'geological turn whereby anthropogenic sediment becomes a sign of deep history, evidence of human minerality where the excavation of the "geos" reveals the "bios" and a merger between the human and the nonhuman nature.'[92] For DeLoughrey the Anthropocene also serves to restructure the belief systems of the past, such as that in developmental, technological progress. Given the fact that the new age is marked by a destabilisation of the elements, that essentially poses an existential threat to the previous pleasantly beneficial age of climatic stability of the Holocene, she suggests that this engenders a reinterpretation and revelation 'the enlightenment narrative of progress' as myth. She is probably using the word 'myth' in much the same way that Adorno and Horkheimer used the word in the *Dialectic of Enlightenment* to argue that a return of barbarism within advanced civilisation was possible.[93] Myth, of course, need not have this overtone of the barbaric/civilisation divide. Or, if it does, that divide itself should be the first item of study when investigating myths of civilisation. I would argue that the Anthropocene itself, as a concept, could be equally subjected to this critique, as myth.

Frodeman raises the possibility that a restructuring of thought might alleviate us of the burden of traditional methods of consumption.

90 Yusuff (2013) 779.
91 Delanda 26.
92 DeLoughrey (2019) 133.
93 Adorno and Horkheimer (1997) 44.

> The problems facing society today require us to question the intellectual taxonomy that has trained us to think ever more deeply within the same old ruts. Reordering the categories of our thinking and our institutions—even more, learning to think across categories—will help us create new conceptual and social spaces for addressing our environmental challenges.[94]

The call to break down the categories, to reconfigure the system, to spread out and dissolve all boundaries uses exactly the same language that got us here in the first place. The drive to transgress, break free, to exceed present limits, and to extend the limits of human thought and technology is the same as that which framed the scientific revolution. In the words of Bacon, what was desirable was 'the enlarging of the bounds of human empire, to the effecting of all things possible.'[95] In a similar vein, Latour claims that the time has come to 'develop *more*, not *less*' and in order to do so we must do away with 'the limits of the notion of limits.'[96] Not only are we forced to face our existence in a timescale that explodes our minds but Latour also tells us that accepting the paradigm of the Anthropocene is to accept that we are exiting the human drama and entering one on a planetary scale. Hence, all attempts at revolution are behind us since 'we have already crossed a few of the nine "planetary boundaries" considered by some scientists as the ultimate barrier not to overstep!'[97] Latour implies with irony that the Anthropocene brings in a new era of self-satisfied scientism, in which multiple disciplines collude in order to coerce us into obedience. The drama that science maintains is that of humankind's emancipation from Nature and 'the thrusting-forward arrow of time—Progress—characterized by its juvenile enthusiasm, risk taking, frontier spirit, optimism, and indifference to the past.'[98] While I agree with his critique of the Anthropocene as scientific megalomania, I think his resultant faith in technologies and political ecology as a force of intervention is not only theoretically dubious but also maintaining and giving power to exactly the same megalomania that characterises the Anthropocene. We might be able to observe the 'molecular machinery of soil bacteria,'

94 Frodeman (2003) 3.
95 Quoted in Neyrat (2019) 98.
96 Ibid. 95.
97 Latour (2014) 1.
98 Latour (2011) 21.

but that has not stopped us from doing our utmost to kill as much of it as possible with the use of agrochemicals.[99]

We live in an age where new technologies are created to confront new threats. The problem is that the new technologies and their demand on natural resources are so often the cause themselves of threats, such as deforestation, mineral depletion and contamination through mining, not to mention horrendously abusive labour conditions. It would appear that the solution is as much a problem as the cause. Perhaps this novelty that seems to be so desirable, in both thought, technologies and institutions, is itself the rut that we are trained to think with as well as believe in. It would appear that the designation of the massive boundary of the Anthropocene, separating us off from the Holocene that most of my friends were born in coincides or even permits the dissolution of boundaries elsewhere. Frodeman argues that this new age dissolves hard borders, so that 'processes flow across disciplinary boundaries. Life becomes lithic (e.g. limestone), while tectonics influences patterns of evolution. To put it differently, the terms "Earth sciences" and "environmental sciences" today represent a distinction without a difference.'[100]

It would appear that we live in an age where distinctions are breaking down, where flows and assemblages are transforming our world from one formed of categorical differences to one where technological interconnectedness and the rhizomatics of domination interrupt such autarchic desires as self-control and self-limitation.[101] That's not to say that life on earth is composed of entirely distinct, separate organisms, rather 'a sum of relatively independent species of flora and fauna with sometimes shifting or porous boundaries between them.'

Geology appears to be the core, even the substrate or bedrock, providing the junction for what was formerly thought distinct and separate. Frodeman continues his diagnostic with a prescription for the academy: 'To effectively grapple with our environmental challenges we must cross the boundaries that have separated the humanistic and scientific part of geology.'[102] Scientific facts cannot in isolation address the dead-end street that science has created, he says, so we must

99 Ibid. 21.
100 Frodeman (2003) 4
101 Deleuze and Guattari (2014) 55. 'Rhizomatics of Domination', see Mikulak (2007).
102 Frodeman (2003) 4.

'redefine the conceptual space of the Earth sciences.' The crux of the problem is 'philosophical and spiritual in nature.' While he surely does not mean it in this sense, I think it is not incorrect to interpolate into this diagnosis that natural spirit or the spirit of nature is lacking from scientific discourse. That the spirit of nature is to be found, as Frodeman suggests, in a nexus of scientific debate, democratic institutions, and humanitarian virtues, seems to me to reinstate power in the mire of the same old ruts.[103] As was the case with Latour, we see an advocation for change acting in the name of restoring the current systems and holders of power, albeit in a slightly different guise.

And yet, a limit is seen, floating around the edges, determinable within the bounds of the sciences, perhaps as the bounds of science: 'The Earth sciences are becoming the sciences of limit,' states Frodeman.[104] 'The scarcity we are facing will not be a matter of running up against purely physical boundaries. Scarcity in the twenty-first century will combine physical limits with a complex range of cultural factors,' these include everything from economics to theology.[105] The Earth sciences pose an 'ontological disruption,' the limit breaking into our everyday excursions from the pub to the supermarket, something like an earthquake opening up great chasms in the road and drawing up distinctions between the various exorbitant, consumptive activities we engage in on a daily basis and the enormity of geologic life. The Earth sciences are once again rising up as a soothsayer of catastrophism, as the old gods of the earth rumble in discontent below while the sea god creeps formidably closer and the god of fire wreaks havoc upon the land. However the Earth sciences do not call them 'gods,' they call them 'natural processes' disturbed and unbalanced by human activity, though that does not seem to explain the way these forces rage. But no, the absence of gods in the sciences is what has allowed science to progress in its mechanistic interpretations. At base I agree with Frodeman; we are confronted with a problem of limits, rather an absence of limits in contemporary scientific, technological and governmental development, in social and behavioural determinism too. It is this problem that the diagnostic of the Anthropocene should draw our attention to.

103 Frodeman (2003) 8.
104 Ibid. 16.
105 Ibid.

Neyrat, in *The Unconstructable Earth*, also brings our attention to the presence of limits in the discourse of the Anthropocene. Modern belief still has its consequences, he says, by 'believing that science had emancipated us from nature, we have believed in the existence of the Great Divide between us and the rest of the world.'[106] Neyrat quotes Hans Jonas's characterisation of the contemporary human as the 'definitively unbound Prometheus,' where he also calls for 'concerning ourselves with limits.'[107] Neyrat also criticises Latour for arguing against the existence of these limits or essentially the limit that divides humans from their environment. For Latour, the absence of limits does not mean only that we are one with nature but rather that all of nature has been anthropomorphised such that we have the ability, perhaps according to Latour the necessity, to totally remaster the environment in such a way as it suits us; 'more attachments, more mastery, more interventions.'[108] He gives the example of terraforming, which would be the opposite of recognising these limits.

Neyrat uses the word 'myth' to discuss the Anthropocene, but he does so with caution.[109] As the former section suggested, the word 'myth' in addressing geological timescales would not be inappropriate, based as they are upon archaic structures of belief that indeed required systems of mythical belief to support them. The Anthropocene is the 'myth,' the story that elaborates the mythology of human mastery and human dominance over nature, where the role played by today's humans is not unlike the role human beings play in the Promethean myth. And just like the Promethean myth, the intercedence of Zeus, father of gods and men is required as a heteronomous source of permission and legitimation for subsequent human activity. As Neyrat puts it, 'with the anthropocene, our winded postmodernity seems to have acquired a new breath and a means for resuscitating a grand narrative that [...] plunges us into the most distant past.'[110]

The grand narrative of the Anthropocene seems to justify an overwhelming dissolution of boundaries. More often than not these

106 Neyrat (2019) 92.
107 Ibid. 93.
108 Ibid.
109 Ibid. 34–35.
110 Ibid. 35.

boundaries pertain to the individual rather than states and corporations, as movement between corporations, banks and state systems of power is definitely becoming more fluid. Biotechnological control and surveillance of individuals is already being justified by necessities claimed to have been instigated by climate change. Similarly most environmental concessions are forced upon individuals rather than the corporations largely responsible for aggressively rapacious forms of resource extraction and use or the large stakeholders in such firms. With the Anthropocene, boundaries dissolve, and nature becomes subsumed into aggressively despotic human nature, or a few limited examples thereof.

Nonetheless, limits arise again and again in human discourse, and here specifically the consideration of the human relation to the nonhuman should recall us to our own limits and boundaries. While many boundaries are internal, or at least linguistic, they are also substantially present in our relations with the world around us, framing those relations, whether in transgression or symbiosis. Perhaps there are only absolute limits in nature, the limits that are even today becoming evident because once transgressed they produce unpredictable and perilous disequilibrium in the natural systems that support not only human but all organic and nonorganic life. Mining, an attack upon the deep sedimentary deposits of the earth is as destructive as deforestation, and personal technologies, such as phones and computers, are based upon the ongoing extraction of increasingly rare metals. Biotechnologies, along with genetic modification of plants, animals and humans, consistently cross the boundaries of what it means to be a plant, animal or human. And as these technologies show, there is always a price to pay, even if that is simply the ensuing dependence upon the industry that created you, or made you as you are. The resulting catastrophes of wildfires, pesticide poisoning, the disappearance of heirloom plant varieties, the human epidemic of allergies and pharmaceutical dependence are all as a result from human intervention claimed in the name of science, to improve upon natural processes and what we cannot help but recognise as natural limits, from the earth's crust to human skin.

Walter Benjamin's notion of similitude arrives via a redemptive theory of language where the principle has long been lost to the past (whether it ever *was* remains an issue in Benjamin's evolutionary messianism). Any similarity in word or letter can only act as a reminder/remainder

or a brief moment of recognition of what language as such could have been or was. It is thus exactly what is lost that can be a subject not of knowledge but of recognition, something that 'flashes up' in the instant of similitude: 'The past can be seized only as an image that flashes up at the moment of its recognizability, and is never seen again.'[111] This illuminated image draws Benjamin's gaze beyond the horizon whereby 'allusion to the astrological sphere may supply a first reference point for an understanding of the concept of nonsensuous similarity.'[112] Not just because the form that similarity takes in recognition is that of a flash but because there is a very real possibility that the star you happen to admire tonight has ceased to exist many thousands of years before. In which case, how can we ever solidify our relation with the whole as anything but in loss, of the lost returning as a memory, an instance of eternity in the midst of life's brevity? What are stars but rocks reflecting light at a distance, exceeding extension and measurable by time? Is there a correspondence between human beings' tendency to place stones upon the land as marks of memory and the overwhelming eternity of rocks in the sky?

Since we are now standing in the place of the third term of astrological measurements, οἱ τρεῖς ὅροι, we must be forgiven for extrapolating without the hindrance of atmospheric pressure.[113] The definition of the 'now' has a 'non-sensuous similarity' with *horos*, in all its determinations, boundary and mark, letter and word, definition and stone. Or to put it otherwise, the 'now' is *horos* exactly because the singularity of identification is impossible. There is no opposite of the 'now'; it is not opposed to continuity even though in the vulgar concept of time it is the single moment, the exception that proves the rule. Just as there is no opposite of *horos* since once we start determining what is *a-horos*, we must have placed a limit from which to begin. It is a point that takes place at a certain distance from time. The point is that with the *horos*, this limit is none other than the raising of the question of definition. In conclusion, we can begin again with Aristotle's definition that time begins as a sense or, to rid this sense of its intentionality (*dianoia*), as a feeling for what is other than time, that is for something else that falls in between the 'now' that is past and the 'now' that is to come.

111 Benjamin in Löwy (2005) 390–391.
112 Benjamin (2005) 721.
113 LS: 1256 (IV.4).