

Aristotle, Plato, and the Genesis of Number

(Chapter 8 of Draft MS: *The Logic of Being: Heidegger, Truth, and Time*)

If time is understood as the most universal condition for the *presentation* of entities, in general, *to or for* a being constituted as finite, the problem of its form as given already involves the problem of the relationship of the finite and the infinite as such. For the finitude of the finite being is then already understood as the condition under which, within the infinitude of beings, a place arises for their appearance in presence, the place whose structure is therefore the form of (spatial as well as temporal) presence itself and in general. The question of this structure is then not distinct from the question of the forms in which the infinite propounds itself to thought. This is the question of the formalisms of its finite schematization, whereby it nevertheless indicates, in the posed problems or excessive truths it indicates, its own inherent outstripping of the finite condition of its positive representation there. The indication and discernment of these forms is then sufficient to raise the question of the temporal constitution of presence, or the temporal condition of the being and subsistence of whatever is. Thereby, it radicalizes the question of the mode in which being manifests itself as time. Here, in particular, there arises in a renewed fashion the question of the temporal condition of what has traditionally been thought as the *eternal* presence of the ideal: that which, removed from the condition of sensible, is thought as underlying the it as the thinkable substrate of its being. With the distinction it thereby introduces between the finite structure of sensation and the temporal infinity of the intelligible, this thought of removal frames the “metaphysics of presence” as its *sine qua non* condition and positive structure. But there must be a thinkable reality of change, becoming and motion as real in themselves. And if time is indeed thought as the universal condition of all presence, it must be possible to conceive, in their own temporal condition, *even* the forms in which the universal – the “for everyone”, the “in general” and the “at all times” -- gives itself to be thought.

It is thus significant for the “ontological” problematic that there is, embedded within the Platonic text and legible there a thought of the *genesis of ideality* or of the ultimately genetic-temporal condition for the existence of the formal-universal itself. As the thought of the paradoxical genesis or institution of the ontic referent which subsequently serves as the intelligible measure for sensible beings, the paradigm of their being itself, this thought surrounds the “Platonism” of the generality of the idea, the universal, and the (logical, psychological, and ontological) *koinonia* of the *logos* as its determining problematic condition. In particular, the residual indications of Plato’s development of this problem of the genesis of the ideal, under the dual condition of the challenge of Eleatic monism and the mathematics of the multiple developed in Plato’s own time, point there, as we shall see, to a prior problematic of the availability of the infinite. This is the problem Plato thinks as that of the relation of the *apeiron* or the *aoristos duas* (or ‘unlimited dyad’) to the one or the limit, whereby the tendency of all becoming to outstrip fixed boundaries is able to be modulated and contained within a unitary form of presence. But whereas the original structure of the problem of the infinite and the finite here points toward Plato’s own thought of a deeper constituting origin of both the sensible and the supersensible in the prior dynamics of the limit and the unlimited, the insistence of the infinite there in forms of essential temporal *aporia* and paradox simultaneously points to the deeper problematic structures which

condition the regime of “metaphysical” thought and practice as its virtual structure and historical provenance. With the development of this problematic and its further radicalization under the twofold condition of contemporary mathematical knowledge and the Heideggerian ontological reflection itself, it is then possible to clarify how this problematic structure again insists at its end, and thereby indicates the development of the problematic of presence to the contemporary point of its closure and possible overcoming.

Over the last several chapters, we have seen how the development of theaporeatic formalism of given time itself points to the inherent paradoxes of the presentation of time under the condition of any figure of simply ontic presence. The most decisive of these figures is Kant’s schematism, whereby the transcendental subject both constitutes and is constituted by time in giving it to itself. Behind this structure, as we saw in chapter 6, lies another, ontologically deeper one: that of the reflexive self-giveness of time whereby it conditions change and becoming in a twofold way, both as the presentation of the present moment, which is nevertheless always changing and destroying itself in another, and (as “world time”) as the universal and indifferent condition for the presentation of all “innerworldly” entities, as such and in general.

The possibility of this universal condition is to be grasped, for Kant as well as for the “metaphysics of presence” in general, as the outcome of the *institution of a measure*. If the time of the world is to be accessible, universally and in general, there must be a regular standard of measurement that is itself universally accessible in its regularity, itself bearing the character of the infinite as its own infinite repeatability as the same. The metaphysics of presence thus thinks the accessibility of time in relation to an ontic being whose form is the infinite repeatability of the instituted standard. But this possibility of institution remains obscure as long as it is not clarified in its own temporal condition, the temporal condition of the origin of the standard or ideal which is thereby capable of repeating itself as the same *ad infinitum*. The question of the possible measure of beings thus becomes the question of the institution of the standard that measures time in general. And if time can be defined by Aristotle, in a summary statement, as the “number of motion with respect to before and after,” then this question is also not distinct from the general question of the genesis and temporality of *number* as standard and measure, as the formal/structural basis for any possible measurement and calculation of beings. This question is in fact decisive for the question of being and time in its formally radicalized version. This is not only because the “realm” of mathematical existence is thought, within the “metaphysical tradition”, as the *paradigmatic* realm of the atemporal and changeless, and thereby represents the most difficult but also the most revealing “case” for a radicalized ontological thought of the actual temporal conditioning of all presence. It is also, and just as significantly, because here the atemporal accessibility of the mathematical yields the terms in which the (measurable) temporal being of entities is itself ultimately evaluated and thought. Behind the Aristotelian definition, there is therefore indicated a deeper and underlying problematic, suppressed there, of the relationship of number and time, and of the paradoxical inherence of the infinite in both at the point where they are given, together, to be thought. This problematic, in the radicalized form whereby it is indicated by contemporary ontological and metaformal reflection, is sufficient to indicate the possible thought of a different condition, beyond that of ontic presence, of the radically temporal unfolding of being as such.

I

In the summer 1927 lecture course, *The Basic Problems of Phenomenology*, in an extended discussion of Aristotle's conception of time, Heidegger reads him as drawing out the determinate consequences of a specific interpretation of what it is to be *in* time. On Heidegger's reading, Aristotle understands intertemporality or being-in-time in terms of what it is to be an object of nature, of the sort that is shown by our "natural" experience of things and of time itself. This is why, according to Heidegger, Aristotle will privilege the character of local motion as the basis for his analysis of the structure of time in itself; for it is in such motion that time is indeed most naturally and basically measured and experienced. This privileging of local motion, and the resulting privileging of the kind of standard of measurement that it represents, is what ultimately produces the most "official" definition of time that Aristotle gives in *Physics* IV, according to which it is "...just this: number of motion in respect of 'before' and 'after' [*arithmos kineseos kata to proteron kai husteron*]." ¹ In arguing for the definition, Aristotle relies on the consideration that, although time cannot simply be identified with motion, it nevertheless is not "independent of it". ² For we "perceive movement and time together," [*hama gar kinesis aisthanometha kai chronon*]. In particular, when the mind does not change in an interval, we do not perceive any time as having elapsed. ³ On the other hand, "we apprehend time only when we have marked motion," either in the external world or (as when it is "dark and we are not being affected through the body") in the mind itself. ⁴ In either case, we do so, on Aristotle's account, by judging a difference in it between what is "before" and what is "after" and thereby discerning the interval between the two. When, therefore, the mind perceives a "now" as "one" and without motion, it judges that no time has elapsed; but when it discerns a difference between two "nows" and relates them as before and after, we thereby speak of time as what is measured in the discernment. ⁵ In this dependence on the judgment of the "before and after," time is itself, Aristotle concludes, a kind of number, the "counted" number of the discrimination of the "more or less" in movement. ⁶

On Heidegger's reading, Aristotle thus indicates a prior basis for the givenness of time in the ontic existence of the *psyche* or soul which counts it. At the same time, this raises the *question* of how time can indeed *also* be everywhere and in all things. The question is particularly insistent, Heidegger notes, at the point at which, in concluding the whole discussion, Aristotle poses the "aporeatic" question whether time, as the counting number of motion, would or could still exist without the counter. ⁷ According to Heidegger, Aristotle does not resolve this question but merely "touches on it"; nevertheless it points, in the ontological context of Heidegger's own inquiry, to the further question of

¹ *Physics* 219b1.

² *Physics* 219a1-2.

³ *Physics* 218b22-219a4.

⁴ *Physics* 219a4-5; 219a23-24.

⁵ *Physics* 219a30-219b1.

⁶ *Physics* 219b2-9.

⁷ *Physics* 223a21-28; GA 24, p. 358.

“how time itself exists.”⁸ And this question, Heidegger argues, is not to be settled on the basis of any determination of time as “subjective” in belonging to the *psuche* or as “objective” in being basically determined by number. However, Aristotle’s indication of the numerical character of time is here decisive in characterizing the basic sense of the intratemporality of beings, their basic way of being in time:

The numerical character of the now [Der Zahlcharakter des Jetzt] and of time in general is essential for the fundamental understanding of time because only from this does what we call intratemporality become intelligible. This means that every being [jedes Seiende] is in time. Aristotle interprets “being in time” as being measured by time [Gemessenwerden durch die Zeit]. Time itself can be measured [Gemessen werden kann die Zeit selbst] only because on its part it is something counted [ein Gezähltes ist] and, as this counted thing [als dieses Gezählte], it can count itself again [selbst wieder zählen kann], count in the sense of measuring, of the gathering together [Zusammennehmens] of a specific so-many.

At the same time there is given from out of the numerical character of time [ergibt sich aus dem Zahlcharakter der Zeit] the peculiarity that it embraces or contains the beings that are in it [daß sie das Seiende, das in ihr ist, umgreift oder umhält], that with reference to objects it is in a certain way more objective than they are themselves. From this there arose the question about the being of time and its connection with the soul. The assignment of time to the soul, which occurs in Aristotle and then in a much more emphatic sense in Augustine, so as always thereafter to make itself conspicuous over and over again in the discussion of the traditional concept of time, led to the problem how far time is objective and how far subjective. We have seen that the question not only cannot be decided but cannot even be posed [nicht einmal stellen läßt], since both these concepts “object” and “subject” are questionable...It will turn out that this manner of putting the question is impossible but that both answers – time is objective and time is subjective – get their own right in a certain way from the original concept of temporality [in gewisser Weise aus dem ursprünglichen Begriff der Zeitlichkeit selbst ihr Recht bekommen].⁹

In particular, according to Heidegger, it is this conception of time as “counted number” with respect to motion that allows Aristotle to see in time as this form of measurement a unitary and enframing *condition* for the intratemporality of beings, the basic character of their “being in time.”¹⁰ This characterization of the intertemporality of beings determines as well, on Heidegger’s analysis, Aristotle’s conception of the successive “nows” as having the character of “number” and measure and thereby “embracing” [umgreifen], in their succession, all the beings and movements whose time can be counted by means of them. Here, the “now” is itself, in the unfolding of time, again and again “in one sense...the same” and “in another...not the same.”¹¹ In the succession, the “now” as a substrate is

⁸ GA 24, p. 358.

⁹ GA 24, p. 361.

¹⁰ GA 24, p. 355.

¹¹ *Physics* 219b13.

“carried along” in such a way as to make the awareness of “before and after” possible by the marking of it. In this it is analogous, according to Aristotle, to that which moves in a motion.¹²

With this, Heidegger suggests, Aristotle understands time essentially as a countable sequence of successive “nows”, albeit not one in which the successive “nows” “are ...parts from which time is pieced together as a whole” but rather one in which their identification provides the basis for the temporal measure of phenomena in their “transitional” character.¹³ This picture of time as the succession of “nows” is the “vulgar” conception of time that will, on Heidegger’s account in *Being and Time*, determine the whole subsequent development of the interpretation of beings in the history of metaphysics. Nevertheless Heidegger here emphasizes here that Aristotle’s definition is not arbitrary, but is instead appropriately drawn from the most “natural” mode in which time appears to allow our access to it:

...the Aristotelian definition of time does not contain a tautology within itself, but instead Aristotle speaks from the very constraint of the matter itself [aus dem Zwang der Sachen]. Aristotle’s definition of time is not in any respect a definition in the academic sense. It characterizes time by defining how [daduch, daß sie umgrenzt, wie] what we call time becomes *accessible* [z^ugänglich wird]. It is an *access definition* or *access characterization*. The type of definiendum is determined by the manner of the sole possible access to it: the counting perception of motion as motion is at the same time the perception of what is counted in time [Die zählende Wahrnehmung der Bewegung als Bewegung ist zugleich die Wahrnehmung des Gezählten als Zeit].¹⁴

If, in particular, Aristotle here proposes, on Heidegger’s analysis, a basic priority of measurement and the measurable as giving the ultimate criterion for the temporality of intratemporal beings by yielding the form of given time, this “access characterization” of time in terms of the conditions for its measurement is not to be rejected but only ontologically deepened and thereby separated from what remains, in Aristotle, its apparently ontic ground. For if Aristotle’s analysis invokes the ultimate being of the psuche or its circular movement as the ontic substrate and standard for any reality of time as given, Heidegger himself will suggest, as we have seen, a deeper ontological and temporal condition for the being of the psuche itself in the reflexive structure of Dasein’s own “authentic” temporality. In *Basic Problems* itself, Heidegger accordingly next gives an analysis of the derivation of the “natural” and “common” understanding of time that is the basis of Aristotle’s account, as it is evident in the use of a clock to measure time, from the more “original” and underlying structure the ecstases, wherein Dasein gives itself time by means of an original reflexivity.¹⁵ This is essentially an extended version of the analysis of the derivation of “world time,” under the constraints of Dasein’s fall into “publicity” and the correlative availability of “general” standards, from the original ecstatic-horizonal temporality of Dasein that is given in *Being and Time*.

¹² *Physics* 219b24-25.

¹³ GA 24, p. 362.

¹⁴ GA 24, p. 362.

¹⁵ GA 24, pp. 363-388.

But without disputing the analysis, it is possible to extend it by considering the ontological problem that is at any rate co-implicit with it, and equally implicit in the Aristotelian structure itself. This is the problem of the *givenness of number* as measure, or of the ontological and temporal character of the *arithmos*, such that in it can found both the unlimited applicability of number to beings in the measure of time and the structural condition for its being able to be thought as quantified in general. This deeper problematic has a basic significance with respect to the relationship of time to thinkable being as it is conceived in the “metaphysical” tradition as a whole. As we have seen (chapter 1 above), when Plato’s Eleatic Visitor, in the *Sophist*, introduces, against the Eleatic strictures, the necessity to think the inherence of motion and becoming in being itself, the suggestion itself poses the problem to which the Visitor’s solution in terms of the logical and psychological *koinonia* of the categories of thought and the possibilities of beings will answer. With the solution, therefore, the dynamic correspondence of the forms of temporal being with their representational thought in the soul is assured, and the thought of temporal being itself is simultaneously guaranteed on the basis of the availability of the *dunamis* of *koinonia* through which the logical measurability of beings itself is assured. As we shall see, though, if Aristotle’s analysis presupposes this availability, and thereby mobilizes it to verify what he sees as an ultimate basis of a givenness of time in the counting activity of the *psuche*, he does so only by means of his repression or exclusion of a more fundamental and problematic structure of the ontological and temporal basis of number itself which is *also* still marked in Plato’s own text. This problem is none other than that of the availability of the actual *infinite* and its consequences for the regular and regulated thought that counts and measures beings. Within the ambit of the assurance of the regularity of standards of temporal measure, this problem must be excluded or dissimulated in order for the regular temporal measurability of intratemporal beings in general to be guaranteed and maintained. It is only by means of this exclusion, in particular, that Aristotle can present the repetition of the same in the regularity of circular motion as amounting to the most fundamental structure of given time, since it is, as Aristotle argues, “above all else” its “measure.”¹⁶ This thought of time as founded in the infinite potential repetition of the same that gives the possibility of measure by introducing the limit, however, dissimulates a series of aporias of the “now”, the measure, and time’s constitution itself which, although they appear in Aristotle’s text only to be put out of play there, nevertheless thereby point back to the more original problematic of the limit and the unlimited as such.

II

In the 1968 article “Ousia and Gramme: Note on a Note From *Being and Time*”, Jacques Derrida carries out a rigorous deconstructive reading of a footnote in the last chapter of division II of *Being and Time*.¹⁷ In the note, Heidegger asserts the direct connection of Hegel’s conception of time to Aristotle’s and the determination of both by the “ordinary” or “vulgar” conception of time as a “leveled off” series of present “now” moments, the concept of time which is, for Heidegger, characteristic of metaphysics in its privileging of presence in general. The reading yields terms in which Heidegger’s assertion of this

¹⁶ *Physics* 223b19.

¹⁷ For the footnote, see GA 2, p. 432.

connection, and along with it his entire opposition of an “ordinary” or “vulgar” temporality linked to metaphysics and to presence from the underlying “authentic” temporality of Dasein’s ecstases, are put into question. In particular, by developing the implications of the originallyaporeatic structure of Aristotle’s discussion of time, Derrida argues that the constitutive problems in terms of which time is thought by Aristotle remain characteristic of every subsequent discussion that recognizes time “as the condition for the possibility of the appearance of beings in (finite) experience” and thus, and even in exemplary fashion, for Heidegger’s *own* discourse on time as well.¹⁸ Through the connection that links every discourse on time to the question of the conditions for the possibility of *finite* appearance, Derrida suggests, every such discourse remains characterized by a “profound metaphysical fidelity” to the thought of presence.¹⁹ This fidelity is marked most of all in those moments where time is subtracted from the realm of positive beings in order to appear as an underlying form of their appearance, of presentation or of presencing in general. Such a moment, according to Derrida, is as much characteristic of Kant’s conception of time as it is of Hegel’s and Aristotle’s; and it is once more characteristic of the determinative moment of *Being and Time* in which Heidegger *repeats* the critique of the “silent” determination of the nature of time by the assumed presence of some present being that already in fact characterizes the discussions of all three earlier philosophers.²⁰ In particular, if Aristotle’s discourse on time is irreducibly situated, Derrida suggests, within an interrelated series of aporias about time and the “now,” aporias that are never resolved within Aristotle’s text or indeed anywhere else in the history of metaphysics, the necessity of their repetition will have determined a certain necessary submission of the critical destruction of metaphysics on the basis of time to metaphysics itself.

Aristotle’s explicit discussion of time in the *Physics* begins, specifically, by proposing to work out (*diaporesai*) two questions which, as Derrida points out, both gesture, by way of what Aristotle characterizes as an “exoteric” argument, to basic aporias of the constitution and nature of time.²¹ The first is the question whether time is a being or not (*ton onton estein e ton me onton*), and the second is the question of its *phusis*.²² The difficulties involved in both problems can lead, Aristotle says, to the opinion that time “either does not exist at all or barely, and in the obscure way.”²³ Most immediately, there is a problem about how time can exist at all, given that one part of it is no longer, and the other part is not yet. But both “infinite [apeiros] time” and “any time you like to take” are made up of these parts, each of which thus seems not to exist, and it is natural to conclude that something whose parts do not exist cannot take part in being (*metexein ousias*) at all.²⁴

The discussion proceeds as a consideration of the nature of the “now” (nun), which appears to be the limit or boundary between past and future, and its possibility. Is the “now” always the same, or is it

¹⁸ Derrida (1968), p. 48.

¹⁹ Derrida (1968), p. 48.

²⁰ Derrida (1968), pp. 47-48.

²¹ *Physics* 217b31; Derrida (1968), p. 39.

²² *Physics* 217b31-32.

²³ *Physics* 217b34-35.

²⁴ *Physics* 217b36-218a3.

continually or continuously “different and different”?²⁵ The second hypothesis is untenable. For on it, if the moments succeed one another without interval, each new “now” moment will replace the last and the last will not, then, exist; or if there are moments between one “now” and the one that succeeds it then these intervallic moments, of which there are innumerable (*apeioros*) many, will be simultaneous, which is impossible.²⁶ But the first hypothesis is equally so; for if the “now” is always the same, then both what is “before” and “after” would always be in this same “now” and “things which happened ten thousand years ago would be simultaneous [*hama*] with what has happened to-day, and nothing would be before or after anything else.”²⁷ These are the problems that will allow Aristotle to say that the “now” both that it is the “same”, in one sense, and that it is not, in another, and that time is both a continuity with respect to the “now” and divided by it.²⁸ For this reason, he will apparently reject the claim that time is to be seen as composed of “nows” as a line may be thought to be composed of points; but this does not mean that he simply or univocally rejects the idea of the “now” as a limit.²⁹ Nevertheless, the sense in which the “now” is a limit between past and future is itself aporetic: for a point to be a limit between two spans, it will have to be the end of one and the beginning of the other. For this to happen, the “now” will have to involve an “arrest or pause”, but there is no such pause among the constantly flowing nows.³⁰

As Derrida suggests, the problems here posed are, in one sense, not distinct from the problems posed in general by the mathematical question of the relationship of the point to the line, or of continuity to discontinuity.³¹ But by the same structure, they are none other than the problems of what allows space and time to be thought *in their relation* at all.³² If the aporias of its constitution from “now” moments shows that time is not to be thought as composed of points at all and is in some sense irreducibly continuous, still it cannot be identified with the *gramme* as the linear inscription in space. For the spatially inscribed line is such as to have all of its parts co-existent *at once*; but it is of the essence of time, however it is composed, that its parts do not exist simultaneously.³³ More generally, in thinking the difference between space and time in as a constituted and given difference, we think it exactly as the difference between the order of coexistence in the same time and the order of succession in which there is no possible coexistence in this sense. As Derrida points out, it is not even possible to say meaningfully that the coexistence of two “nows” is impossible, for the very sense of coexistence is constituted by this impossibility. Thus, “Not to be able to coexist with another (the same as itself), with another now, is not a predicate of the now, but its essence as presence.”³⁴ The very *meaning* of the

²⁵ *Physics* 218a9-11.

²⁶ *Physics* 218a11-21.

²⁷ *Physics* 218a27-29.

²⁸ *Physics* 219b14; 220a5; Derrida (1968), p. 54.

²⁹ Derrida (1968), p. 54, pp. 59-60.

³⁰ *Physics* 220a11-14.

³¹ Derrida (1968), pp. 57-58.

³² Derrida (1968), pp. 53-54.

³³ Derrida (1968), p. 54.

³⁴ Derrida (1968), p. 55.

present is constituted by this “impossibility”, and thereby, Derrida suggests, so is “sense itself,” insofar as it is linked to presence and *its* possibility.³⁵

According to an aporia which is already implicit in Aristotle and is repeated in Hegel’s discussion of time as the dialectical “solution” of the contradiction between the (spatial) point and the (spatial) line, the “with” of time (simultaneity) will thus presuppose the “with” of space that it also constitutes. If Aristotle is able to presuppose the difference between space and time as the difference between the order of coexistence and the order of succession, the supposition will be maintained only on the ground of a more basic structure of paradox which is at the same time evaded or dissimulated. To assume the difference between space and time in this way is, Derrida suggests, to assume that it is already possible to know what it is to ask what time and space *are* in general; and thus to assume that one already knows that the question of essence can be “the formal horizon” of the question about both. But this is to assume that what essence *itself* “is” has not been “predetermined secretly – as presence, precisely – on the basis of a ‘decision’ concerning time *and* space.”³⁶

The question is evaded in Aristotle by means, Derrida suggests, of his reliance on the resource of a single word which is according to its sense undecidable between a spatial and temporal significance, or rather whose sense in Aristotle’s text is constituted by an undecidability between time and space which the argument crucially exploits. On Derrida’s reading, Aristotle can “give himself” the difference between time and space only on the basis of both *presupposing* and *foreclosing* the specific undecidability of the word “hama,” which means indifferently “together,” “all at once,” or “at the same time,” and which Aristotle uses, as Derrida notes, no less than 5 times in the 30 lines of the opening discussion of the problems raised by considering the structure of time in 218a.³⁷ In particular, since the term “hama” is itself ambiguous between spatial and temporal co-presence, it provides an essential resource for Aristotle’s development of the purported consequences of the fact that motion and time are perceived *together* (*hama*). By taking advantage here of the resource of the undecidable meaning of “hama” to argue for the analogy or actual correspondence of motion to time, Derrida suggests, Aristotle can suspend his entire discourse, and with it the whole tradition of discussion of time and being that follows it, upon the original structure of aporia which has already been announced. If this is correct, the original undecidability of *hama* points not only to, as Derrida says, the “small key that both opens and closes the history of metaphysics,” but also back to the originally paradoxical structure of time, a structure that also underlies the specific possibility of the critique of presence in general on the basis of time and which therefore *cannot* be closed or resolved by its means, but only (more or less explicitly) repeated.³⁸

How, then, does the resource of the undecidable *hama* allow Aristotle to foreclose the original paradoxes of the now as limit, which have already been announced? He can do so only by taking advantage of a further distinction, that between the *potential* and the *actual* (or *dunamis* and *energeia*).

³⁵ Derrida (1968), p. 55.

³⁶ Derrida (1968), p. 56.

³⁷ Derrida (1968), p. 56.

³⁸ Derrida (1968), p. 56.

In particular, given that the “now” is marked as a limit *only* in the simultaneity or co-presence of its measurement or marking, Aristotle can argue that the “now” does not exist, actually or in general, in such a way as essentially to compose constantly flowing time. Rather, it is instead the merely *potential* outcome of a *potential* act of measurement, an accident with respect to time in itself, instead of its actually constituting element.³⁹ This allows Aristotle to argue, in the present context, that there is no aporia involved in the now as limit; for motion is as such continuous, and has a limit only in its possibly being completed or broken off. Analogously or for the same reason, the “now” which distinguishes before and after with respect to time is not its real constituent, but only a product of the potential distinction, which *may be*, but *need not be*, drawn at *any* point. The “now” or instant, as limit, is itself not to be thought as real or actual in general, but only as inhering in the *potentiality* of its possible marking or discernment in the spatiotemporal simultaneity and co-presence of measurement. In this way, Aristotle links the *actuality* of the “now” as limit to the activity of the mind’s perceiving or distinguishing, an activity whose structure itself also verifies that time is something “belonging to” motion in the “simultaneity” or “togetherness” (hama) of the way both are given.

Aristotle’s foreclosure of the originally aporetic structure of the “now” as limit is therefore possible only on the basis of a specific development of the meaning of *dunamis*, one which makes it the standing form of the capacity of a self, soul, or subject to measure time in the simultaneity and co-presence of itself to itself. As Derrida notes, to understand the basis of time in this way is already to make it something like the form of inner sense.⁴⁰ This is the form of a capacity to be affected in general, whose ultimate basis is the thought of the mind’s self-affection in the interiority of its own self-presence. Aristotle has thus anticipated, even in detail, the structure of Kant’s conception of time and indeed, just as much and with the same structure, the terms in which Heidegger will both repeat and criticize it in *Kant and the Problem of Metaphysics*. In particular, the analogy or correspondence that Aristotle already draws between motion and time thus both includes and dissimulates the original form of given time as a paradoxical auto-affection that is equally, and primordially, active in the giving and passive in the taking and in which the mind is both receptive in perception and active in creating its very possibility. If Aristotle can already pretend to resolve the aporia of the presence of the now by appealing to the distinction between the *actuality* of the continuous and the mere *possibility* of its discontinuous limit as drawn, he can therefore do so only by suppressing or evading the terms of this originally paradoxical structure of the givenness of presence, which will thus itself determine its own more or less critical repetition, in Kant, Hegel, and Heidegger himself. The form of this givenness can then only be determined, as Derrida suggests, as the finitude of a circle that “regenerates itself *indefinitely*”, that constantly gives the possibility of the present without ever giving it as actual end.⁴¹ The very structure of the present is thought in terms of this auto-affective circle in each of the figures that interpret the possibility of time in terms of the possibility of a giving of presence to an intellect determined as finite.

³⁹ Derrida (1968), pp. 59-60.

⁴⁰ Derrida (1968), p. 48.

⁴¹ Derrida (1968), p. 60.

Specifically, Aristotle argues for a standardization of time in terms of circular motion as a uniform standard. If two spans that are simultaneous (*hama*) can also be “equal” in that they begin and end at the same moments, they are not two simultaneous times but the same one. But even if two times are not simultaneous and are thus different they can be equal by being the same “length” of time. The identity is akin to the identity of the number 7 in the groups of 7 dogs and 7 horses; the groupings are of different things, but there is nevertheless something in common in their measure.⁴² In both cases (extending the metaphor) the measure depends on the particular unit; thus, as groupings of horses must be “measured” by the single horse, so time must be measured by something “homogenous” with it. This something is the regularity of a circular motion, which functions as a standard for the counting of time that is everywhere and to everyone accessible (not accidentally, it is the “best known” of motions).⁴³

Aristotle thus limits or modifies the consequences of the dependence of time on the soul’s activity of measurement by submitting it to another condition that is also implicit in the activity of measurement in general, that of the general availability of the *standard* and its repeatability *ad libetum*. Like the availability of number for counting, to which Aristotle compares it, this availability is *in principle* unlimited: it is only if one can assume that the standard is always available, and everywhere, that it will be usable at all; only in this way will it be possible to vindicate the claim that time is thought to be not *only or just* “in the soul” but *also* “in everything, both in earth and sea and in heaven”.⁴⁴ In appealing to the standard or using it, one applies in a particular case a structure that is in itself self-similar across *all* the cases of its particular application and is always and in general applicable. As such, if Aristotle can avoid the further consequences of saying that time is simply motion or what is measured in the measuring of it, it is because he can appeal to the relationship, both identical and metaphorical, of this application of the standard to the use of number in counting, and thereby to the (metaphorical or actual) identity of this availability with that of number. In terms of this analogy or identity, it is crucial that number is, as such and in itself, iterable in two senses: both in the indifferent availability of one and the same number, say 7, to serve for the measure of distinct groups of different kinds of things, and in the indefinite possibility of generating numbers themselves by iterating the “plus one”. In both senses, the standard itself is determined as indefinitely iterable, everywhere and in general, and this indefinite iterability is essential to the very structure of counting as such that is not only criterial for time, according to Aristotle, but generally definitive of it.

Both the (unlimited) *dunamis* of this possibility of application and its *unlimitedness* in principle determine equally its structure: even if the standard is not actually applied everywhere and all times, it must be possible to do so, and this possibility must never give out. Here, Aristotle’s argument is once more dependent upon an appeal to the specific structure of the *dunamis*, and in particular (this time) to the link he here presupposes between it and the infinite itself. If time is indeed to be applicable to “all things” and its measurement generally possible, the standard by which it is measured must itself be

⁴² *Physics* 223b1-5.

⁴³ *Physics* 223b17-20.

⁴⁴ *Physics* 223a17.

infinitely and indefinitely repeatable: it must itself have the structure of that which *can* be repeated infinitely as the same. It is this assumption of indefinite repeatability that alone licenses, in Aristotle's picture, the assumption that time, though in itself continuous and applying to "all things", nevertheless always *can* be measured in a univocal way, and on which the whole possibility of time's non-paradoxical givenness – as measurable – to a finite being ultimately turns. And this conception of the specific form of the availability of time in measurement itself depends upon a specific figure of the relationship of the infinite to the finite as such: namely, the one on which the infinite has the meaning of the unlimited *potential* repetition of the (finite) same. The assumption of this figure is the assumption of the unlimited repeatability of the given standard of the self-presence of the self or the regularity of circular movement, and thus the interpretation of the givenness of time in the ultimately ontic terms of the repetition of a present being in general.

But if this conception of the relationship of the finite and the infinite is the one that Aristotle presupposes both in his account of the givenness of time and in developing the very sense of the relationship between the finite and the infinite itself, it is not (as we have seen in chapters 5 and 6, above), the only possible one. Viewed from a metaformal perspective that takes account of the relations of the finite and the infinite in terms of the dynamics of the constitutive ideas of reflexivity, totality, and infinity themselves, moreover, it effectively forecloses the very structure of ontological or metalogical difference, thus repressing the problematic and paradoxical structure which is indeed at the ("ontological" or "metalogical") foundation of given time itself. From this perspective, it would be misleading to suppose that Aristotle, in developing the implications of the *dunamis* of counting or measuring for the givenness of time, has thereby simply drawn out the implications of the given or natural distinction between the potential and the actual as such. It is, rather, much more the case that Aristotle's specific conception of the form of the finite accessibility of time, *along with* the whole sense of the *dunamis* and in particular the conception of the (always only) *potential* infinite itself, is here as a whole a consequence of this more fundamental repression of the originally aporetic temporal structure.

To begin with, the account of time given in *Physics*, book 4, is both preceded by and visibly prepared by the discussion of the infinite in book 3. Over the course of this discussion, Aristotle argues that it is not possible for any actually completed infinite magnitude to exist and hence, as a consequence, that no actual material object can be infinite in size.⁴⁵ This is because the infinite *by increase or addition* exists always only potentially and never actually. What is infinite in this sense has the character of "always" being able to be added to but is never an actually existing infinite in the sense in which a sculpture exists as complete and actual.⁴⁶ This does not preclude, however, that continuous magnitudes are divisible *in infinitum*; indeed, Aristotle suggests in introducing the topic of the infinite, the specific character of the infinite is first and most directly shown in connection with the continuous.⁴⁷ Nor is it to say, however, that there is not the infinite at all and in some sense. Indeed, Aristotle lists five considerations that

⁴⁵ *Physics* 204b2-206a7.

⁴⁶ *Physics* 206a19-21.

⁴⁷ *Physics* 200b17-18.

point to its existence, and to the “many impossible consequences” – among them that there would be “a beginning and end of time” -- that would result if it did not.⁴⁸ The fifth and most telling of these is the consideration that “not only number but also mathematical magnitudes and what is outside the heaven are supposed to be infinite because they never give out in our thought.”⁴⁹

This is related to the other considerations in favor of the infinite that Aristotle introduces: that the limited always finds its limit in something else, that “coming to be and passing away do not give out,” that magnitudes are infinitely divisible in a mathematical sense, and indeed to the consideration that he places first, that time itself is infinite.⁵⁰ Aristotle never disputes this claim, either in book 3 or in book 4; nor does he challenge the structurally determining relationship he points to here between this infinitude of time and the character of numbers such that they too “never give out” in thought. Rather, his strategy is to *reinterpret* this character of “never giving out,” which basically characterizes *both* number *and* time, in terms of the distinction between potentiality and actuality:

The infinite exhibits itself in different ways—in time, in the generations of man, and in the division of magnitudes. For generally the infinite has this mode of existence [outos esti to apeiron]: one thing is always being taken after another [to aei allo kai allo lambanesthai], and each thing that is taken is always finite [kai to lambanomenon men aei einai peperasmenon], but always different [all aei ge heteron kai heteron] ...

But in spatial magnitudes, what is taken persists, while in the succession of time and of men it takes place by the passing away of these in such a way that the source of supply never gives out [phtheiromenon outos oste me epileipein].⁵¹

The characteristic of “never” giving out that is characteristic of both number as thought and time as counted is thus interpreted, not as pointing to the source of both in some principle or basis of plenitude which underlies it, but rather as the boundlessness of a potentiality that is never fully exhausted in the completeness of its actualization. This is the potentiality of what, in its taking, “always” involves taking something “outside” itself. In the taking, what is taken is, as such, finite. But it can *always* again be taken, and the taking is in each case of something “*always* different”. The “always” that is applicable here to magnitude as such is not applicable in the same way to things that may exist fully and actually, such as bodies, whose being comes to them “like that of a substance.” Nevertheless, it is in a certain way the specific formal basis of potentiality as such, for bodies and substances that can exist in full actuality just as much as for *taken* processes and magnitudes for which, as Aristotle says, the “source of supply” of the possibility of taking “never gives out.” For even in the case of fully actual beings, their potentiality precedes their actuality as the principle of *its* coming-to-be; the transition from potentiality to actuality is the form of the coming-to-be and, in this way, the procedural or temporal *basis* of determinate being. Here, as Aristotle elsewhere suggests, potentiality is opposed to actuality as matter

⁴⁸ *Physics* 203b16-27; 206a10-12.

⁴⁹ “dia gar to en te noemsei me hupoleipein, kai o arithmos dokei apeiros einai kai ta mathematika megethe kai to exo tou ouranou.” (*Physics* 203b25-27).

⁵⁰ *Physics* 203b16-22.

⁵¹ *Physics* 206a27-206b3.

is opposed to form. The subsistence of matter in form amounts, on the one hand, to the determining possibility of its coming to be actual and, on the other, to the substrate of its *actual* being, its determinate being thus-and-so and thereby its being measurable, as finitely determined and within always finite limits.

Aristotle thus here thinks the specific character of the potential as such, whether with respect to the counting of number or time, on the basis of the constant and standing possibility of the “taking” which is “always” again possible in each new case. This “always,” [*aei*] however, along with the “never giving out” of the unlimited possibility of repetition in the counting or measuring itself, is itself, however, ultimately a *temporal* determination. The being of the potential, in terms of which Aristotle appears at first to determine the limited form in which the infinite can appear in human thought, is thus in fact rather itself here determined on the ultimately temporal basis of the *aei* or the “always,” that which subsists constantly, in general or at *all* times and thereby provides for the possibility of unlimited repetition. This then provides the ultimate structural basis for Aristotle’s specific conception of the nature and accessibility of the infinite itself. In particular, Aristotle inaugurates a conception of the infinite which will remain in force up to Cantor and thereby basically determine the forms in which the character of finitude in relation to the infinite is “metaphysically” thought. On this conception, the infinite, such as it can appear within finite experience or in physical reality, is only ever potential and never to be “realized” there as a whole, whereas the only fully actualized infinite is itself, as absolute, in principle inaccessible to “finite” thought.

Within this configuration, specifically, the limitation which determines physical objects and experience as only ever finite, and thus as unfolding what can only be a (merely) *potential* infinity is set over against the figure of the absolute as an actual-infinite which is, however, understood not mathematically but rather theologically, as an absolute transcendence. In Aristotle’s own conception, this is the “prime mover” that is thought as pure act and as the ultimate actuality of *nous* or thought thinking itself. Within this configuration, human or finite thought is such that its own powers of determination or distinction only ever go so far as to measure to some finite extent, even if the *possibility* of determination itself always goes further than any finite limit. This is what allows Aristotle to argue that the potentiality divisibility of magnitudes and times in *infinitum* does not imply the actual existence, as underlying stratum, of any infinitely determined point, and in this way to resolve or foreclose the aporias of the actual constitution of the continuous from the discontinuous, or of the actual composition of time from the series of “nows”. But if the idea of potentiality can serve Aristotle, in this doubled fashion, as both the principle of coming-to-be of limited things and the basis of the *unlimited* possibility of their measurement as being thus-and-so, it is nevertheless possible, on the basis of the reconfigured thought of the (mathematical) actual infinite that becomes available after Cantor, to pose once more the underlying question of the structure of this very *possibility* itself.

What consequences follow, then, if the original temporal basis of the thought of *dunamis* in Aristotle, and along with it the temporal aporias that are foreclosed in Aristotle’s text on the basis of this specific conception of potentiality, are instead brought to light and formalized in light of a reconfigured formal thought of the infinite itself? One consequence is in fact already suggested by Derrida in his analysis of Aristotle: number or the mathematical in general can no longer be presupposed as simply exterior to the

being of time, or opposed to it in the way that Aristotle does, as the counting number to the counted number, or as the *determining* is opposed to what is *thereby* determined. Rather, since the general possibility of the “unlimited” application of number to the determining or thinking of time itself here becomes a topic for mathematical reflection on the finite and the infinite as such, the topic of the *being* of time can no longer be excluded from the proper scope of this reflection as accident is excluded from essence or as matter is opposed to form.

Henceforth, it will be of the *essence* of time that it be counted, or at least that it be determinately and originally related to number in *its* original givenness, and not simply as what is to be determined is related to what determines it. But the basis of this countability is no longer thought as resting in the finite activity of a finite being, but in the determinate forms in which the actual infinite is actually *thinkable* as such. Without reducing it to “being” simply a mathematical “object,” it will then be possible to affirm that time is, at any rate, not *simply* extra-mathematical; at any rate it is not extra-mathematical in the sense in which horses or dogs, for instance, are extra-mathematical, even though, as Aristotle points out, the numbers of their groupings may be counted and compared.⁵² But by the same token and for the same reason, it will no longer be possible to exclude the mathematical in *general* from the “topic” of time. If this exclusion, whereby the mathematical as such has been maintained as separated from all possibilities of becoming and as the extra-temporal in itself, remains determinative for metaphysics as such, it is here thus possible to see the possibility of an overturning or reversal of it within the ambit of a retrospectively more basic thinking of the being of finitude and the infinite themselves. With this reversal, the constitutive figure of the infinite in its relation to finite time is no longer to be thought, in the characteristic mode of ontotheology, as an infinite-absolute, austere removed from becoming and change. Rather, it is to be unfolded in the specific logical and metalogical structures that are indicated in the inherent paradoxes of mathematical being and its specific relation to finitude.

With this, the characteristic discourse of the *phusis* or metaphysics of time, which Derrida suggests is structurally continuous from Aristotle to Heidegger, is made to communicate integrally with another kind of text, the text of mathematical reflection, or of a mathematical dialectic which is presupposed in every concrete application of the concept of number in counting time but is not itself simply “metaphysical” in this sense. The implications of this mathematical or formal text thereby also become relevant, in a direct way, to the “ontological” problematic of the original relationship of being and time, and the internal or external possibilities it structurally poses for the specification, and thereby overcoming, of the “metaphysical” determination of this relationship are thereby more originally shown. But it is then here that the question of the nature of mathematical truth and *existence* becomes urgent, in relation to an ontological problematic which must then pose the question of the basis and ontological sense of the finite and the infinite in a suitably renewed way.

⁵² Cf. Derrida: “[For Aristotle] time is a numbered number...This means, paradoxically, that even if time comes under the rubric of mathematics or arithmetic, it is not in itself, in its nature, a mathematical being. It is as foreign to number itself, to the numbering number, as horses and men are different from the numbers that count them, and different from each other. *And different from each other*, which leaves us free to think that time is not a being among others, among men and horses.” (pp. 58-59).

III

The investigations of Oskar Becker and Albert Lautman into the sense and structure of mathematical truth and existence are still little-known in contemporary scholarship.⁵³ However, since both develop these questions under the dual condition of the most decisive formal results of the twentieth century and the extension of Heidegger's own ontological problematic, these investigations bear, in both cases, importantly and even decisively on the further development of this problematic in our time.

Oskar Becker's work *Mathematische Existenz* was published in 1927 in the same issue of the *Jahrbuch fur Phenomenologische Forschung* that contained the first edition of Heidegger's *Being and Time*. Here, Becker undertakes to investigate the "being-sense" [*Seinsinn*] of mathematical phenomena through the research methodology of "hermeneutic phenomenology," here understood as "ontology" in Heidegger's sense of a "hermeneutics of facticity."⁵⁴ In particular, according to Becker, it is essential that the question of the meaning of mathematical existence be posed in relation to the structural basis of factually existing "human Dasein," which, Becker follows Heidegger in suggesting, provides the foundation for the unity of all possible interpretation of meaning.⁵⁵ Thus, the interpretation of mathematical existence must always refer back to the phenomenological interpretation of the mode of life in which the activity of "mathematizing" (*mathemaitikeusthai*, analogously to philosophizing or making music) takes place and it is the structure of this life that must provide the ultimate guideline for understanding its deliverances or productions.⁵⁶

Becker takes the basic directive for his interpretation of the sense of mathematical existence from the (then-contemporary) debate in the foundations of mathematics between the formalism of Hilbert and Bernays and the intuitionism of Brouwer and Weyl. Because of the decisive way in which the structure of the infinite enters into foundational research through Cantor's set theory and other advances of nineteenth and early-twentieth century mathematics, the question of the nature and accessibility of the infinite is crucial to this debate and its possible resolution. For the formalist, access to infinite structures is possible only on the basis of a "proof theory" that sees mathematical proofs as, themselves, combinatorial mathematical structures that are necessarily finite.⁵⁷ This gives rise to the problem of demonstrating the noncontradictoriness of particular axiom systems and of providing axioms which allow the noncontradictory specification of infinite sets and totalities. For the intuitionist, by contrast, no mathematical object or set is demonstrated to exist unless, and until, it is concretely provided to the actual intuition of the mathematician. Moreover, for the intuitionist, "only finite discrete wholes" can be so given.⁵⁸ On this conception, the infinite, for instance the infinite series of whole numbers, can be

⁵³ For instance, Becker's major work *Mathematische Existenz* (Becker 1927) has still never been translated into English, and Lautman's major works collected as *Mathematics, Ideas, and the Physical Real* (Lautman 2006) was translated only in 2011.

⁵⁴ Becker (1927), p. 1.

⁵⁵ Becker (1927), p. 1.

⁵⁶ Becker (1927), p. 1.

⁵⁷ Cf. chapter 7, above.

⁵⁸ Becker (1927), p. 7.

given only through what Weyl calls a “basic arithmetic intuition” of the unlimited *possible* progression of the series 1, 2, 3, 4... More generally, according to intuitionism it is possible to give an unlimited series of natural numbers only insofar as it can be specified through a finitely intuitible *formula* (for instance, the series 1, 4, 9, 16... through the formula: n^2), and such a series is to be considered existent only insofar as it has *actually* been developed at any time.⁵⁹

As Becker notes, the intuitionist conception suggests cases in which the law of excluded middle must be suspended, in particular in the case of the progressive development of infinite series or decimal extensions.⁶⁰ For in these cases, with respect to the question whether there is or is not, in the future development of the series, a number with a specific property, the disjunction between a positive and a negative answer is not to be considered as exclusive until one or the other answer is actually obtained.⁶¹ This constraint is basically, as Becker points out, a consequence of the intuitionist insistence that all mathematical knowledge must be seen as an intra-temporal phenomenon: that is, one that is essentially attained by means of a temporal process of discovery or construction that is continued, in each case, only finitely far. Admittedly, this leads to what are from the alternative, formalist standpoint, severe limitations on the availability of infinite totalities. For instance, there is no sense in speaking of the totality of all number-series or indeed of most non-denumerable infinite sets, and proof by *reductio* is not generally available.⁶² However, Becker sees the formalist standpoint itself as problematic in that, with its countenancing of infinite totalities on the slender basis of their formal non-contradictoriness (rather than their actual demonstration in intuition) it creates a kind of “strange” and mysterious “third realm” of objectivities, situated between existence and non-existence (in the concrete, intuitive sense).⁶³ Since the formalist demonstration does not actually consist in concretely exhibiting the relevant entities in present intuition, but merely showing their logical non-contradictoriness, Becker concludes that the formalist can provide, at most, a “logic of consequence” that in fact falls short of an actual “logic of truth” that would provide the entities themselves in their comprehensible givenness.

This posing of the terms of the dispute raises in a sharpened fashion the question of how the infinite and transfinite are themselves *intuitively* and temporally presentable (if, indeed, they are at all). To address it, Becker develops the implications of Cantor’s own conception of the hierarchy of transfinite sets. As early as 1883, Cantor had conceived of the sets beyond the finite as forming an ordered series of actually existing infinite wholes, while at the same time categorically denying the possibility of any determination of the “absolute” or unincreasable infinity, which he identified with God. In particular, Cantor initially thought of the transfinite hierarchy as generated by means of two “generation principles,” which Becker interrogates as to their ontological significance, in close connection with the phenomenological/ontological idea of the infinite “horizon”, as it had already been developed by Husserl, which makes available the “mastery of the infinite by means of a finite ‘thought’” .⁶⁴ In the

⁵⁹ Becker (1927), pp. 8-9.

⁶⁰ Becker (1927), p. 9.

⁶¹ Becker (1927), pp. 8-12.

⁶² Becker (1927), p. 13.

⁶³ Becker (1927), p. 41.

⁶⁴ Becker (1927), pp. 107-109.

horizon as thought by Husserl, specifically, the “and so on...” of an unlimited possible continuation is nevertheless surveyable in a single, finite “look”, thereby making possible a certain “mastery of the infinite by means of a finite ‘thought’”.⁶⁵ The first principle is that, to a present, already formed number, it is always possible to produce a new number by adding one; this is the familiar basis for counting with finite whole numbers, which Cantor extends as well beyond the domain of the finite. It is the second principle, however, which is decisive in producing the transfinite cardinals. According to this second principle, it is possible in general to pass from one’s grasp of the law governing the creation of a particular unlimited series to the formation of a new number which is thought of as succeeding *all* of the numbers in the series; thus, for instance, the regularity of the sequence of natural numbers 1,2,3,4... engenders the first infinite number, ω .⁶⁶

Cantor’s own development of the implications of the two principles already suffices to raise two significant questions about the existence and givenness of the transfinite realm of ordinals thereby demonstrated. First, it becomes possible to ask whether there is any possible presentation of the *totality* of the ordinals: that is, whether the whole realm of the transfinite ordinals can be captured in a *single*, ‘maximal’ ordinal, W . Second, there is the broader question of whether and how the unlimited progression through the transfinite can actually be motivated or given in concrete experience itself. As Becker notes, the first question is apparently resolved negatively by the antinomy demonstrated by Burali-Forti in 1897 (and closely related to Russell’s paradox of the set of all non-self-membered sets). Because of this antinomy, which shows that such a “maximal” ordinal, if it were to exist, would be both smaller and larger than itself, it must be impossible to suppose the “absolute” infinite W to exist as the limit of *all* (finite as well as transfinite) counting and limit-processes.⁶⁷ Becker sees in this circumstance an inherent complication in the transfinite process of generation itself, which in turn provides the occasion for the re-introduction of a certain element of “freedom” and temporal futurity into the concrete generation of the transfinite and the dynamic structure that supports it. For whereas the procedure to ever-higher levels within the transfinite hierarchy is governed, in accordance with Cantor’s second generation principle, by the recurrent passage to the limit that is permitted, in each case, by the specification of a series-law, in the case of the (paradoxical) ordinal W , there is *no particular series-law* which can support such a passage. In the ordered series of transfinite cardinals, each successive series-law builds on earlier ones, but the process *as a whole* is therefore “in no sense ever given in its completeness;” rather it must be “always grasped in becoming (*dunamei on*).”⁶⁸ This ongoing and essentially open temporal becoming at successive levels is such, Becker argues, as to always again demand what is genuinely a new and creative formation, one that is not mechanically determined at the level below.

To address the second question, Becker draws on the phenomenology of presentation developed by Husserl as well as Heidegger’s radicalization of it on the ground of its ultimate basis in Dasein’s factual life. What is decisive in each case, according to Becker, is the structure of actual concrete *reflection*

⁶⁵ Becker (1927), p. 107.

⁶⁶ Becker (1927), p. 109.

⁶⁷ Becker (1927), pp. 112-19.

⁶⁸ Becker (1927), p. 112.

through which particular contents or meanings, once attained, can be reflectively modified and transformed into others at “higher” levels: here, the possibility of such iterated reflection is seen as corresponding to the two Cantorian generation principles in allowing for the actual motivation and concrete presentation of ever-higher indices and types. As Becker notes, Husserl, in *Ideas I*, had already discussed what he called the “step-characteristic” arising from iterated reflection on experience. This is, in particular, a kind of “index” that phenomenologically marks the levels of reflection, reflection on reflection, etc.⁶⁹ Though Husserl himself develops this possibility of iteration only up to indefinitely high *finite* levels and situates the whole process of reflective iteration within consciousness rather than concrete, factual life, it is nevertheless in fact possible, Becker argues, to develop from it an “actually living motivation” for a particular type of iteration of reflection which can be conceived as continuing up to the transfinite level.⁷⁰

Becker considers Karl Löwith’s development of an existentially motivated kind of reflection, which Löwith finds exemplified in Dostoevsky’s “Notes from the Underground” and calls the “parentheses reflection” [*Parenthesen-Reflexion*].⁷¹ Dostoevsky’s work presents the self-dialogue of a fallen man who considers himself and his life as he has factually lived it. This reflection is fruitless and self-defeating; at a certain point, however, “just this fact,” i.e. the fact that he can and does reflect on his life (even in this unfruitful and self-defeating way) itself becomes a theme for reflection. And even *this* fact can itself become a theme for further reflection, and so on. In this whole process, the infinitely extensible reflection is thus motivated concretely by the impulse to “flee the groundlessness and nullity of one’s own Dasein and to find an inner stability by means of sincere, unsparing self-examination.”⁷² Moreover, one can in fact recognize in the very course of the reflection that this impulse to take “flight” before facticity has no end. In and by this recognition, according to Becker, the impulse to flight itself, which motivates the whole process, attains an appreciation of its own capability of being continued in infinitum and thereby drives “out over the infinite” [*über das Unendliche hinaus*] altogether. Thus, if the initial iterative reflection corresponds to the simple iteration of levels that is captured in Cantor’s first generation principle, the second step, wherein the infinite iterability of the initial reflection and its entire containment within one’s own facticity itself is recognized, corresponds to the “passage” to the infinite limit, which is formulated in the second. This consciousness of the possibility of unlimited, univocal iteration through *all* finite steps is thus, according to Becker, itself the *with* step, and it is now possible to continue to the $\omega+1^{\text{st}}$, etc. In this way the givenness of the infinite receives structural motivation from the concrete possibilities of factually experienced life, and “one actually finds...a way from concrete, ‘historical’ life-motivations to a *transfinite* iteration of reflection.”⁷³

⁶⁹ Becker (1927), p. 101; Becker references, in particular, sections 38, 77, 78, 100, 101, 107, and 112 of *Ideas I*.

⁷⁰ Becker (1927), p. 102.

⁷¹ Becker (1927), pp. 102-103.

⁷² Becker (1927), p. 103.

⁷³ Becker (1927), p. 106. Becker here considers a possible objection: as a matter of what factually occurs, we continue the process only up to a *finite* step, say n , and then *realize* that the steps can be continued indefinitely. This realization (so the objection goes) is then only the $n+1^{\text{st}}$ act; thus only $n+1$ (a finite number of) acts have actually taken place. However, (Becker answers), we need to distinguish the *contemplation* of the iterated inscription from the iterated inscription itself. The former is indeed finite, but the latter is *structurally* infinite. It is

This description of the phenomenon gains further support from Emil Lask's phenomenological description of the distinction between particular contents and the categorial forms that "encompass" them.⁷⁴ For Lask, the relationship of form to content, which allows all determinations of "validity," is analogous to a "clothing" of material with form. This process of clothing can be iterated in reflection or in iterated validity-judgments, and it thus becomes possible that, in this iterated process, the *univocity* of the concrete steps of iteration is recognized.⁷⁵ The possibility of this kind of awareness is in fact already implicit, Becker suggests, in the ideas of the horizon and the step-characteristic developed by Husserl in his description of phenomenological reflection. But with Lowith's parentheses-reflection, Lask's iteration of validity judgments, and the general possibility of grasping the standing possibility of iterating reflection on one's concrete life-situation, one gains, according to Becker, a structural motivation for the actual availability of the transfinite that is not merely "epistemological" but actually concretely rooted in the ontological structure of factual life itself.

Becker sees the transfinite structure of reflection, as thereby developed on the basis of the concrete structure of Dasein, as intimately linked to the connected issues of time, decision, and finitude. Given the structure thus illuminated, for instance, it is possible to consider the implications for Hilbert's decision question, which had been posed some years before, but was still unresolved at the time of Becker's writing: that is, the question of the existence of problems that are not capable of solution by means of any finite procedure. On Becker's interpretation, the problem is a "specifically human" one, or is at any rate *only* "a problem for a 'finite' nature (a 'creature')." ⁷⁶ In particular, the problem arises only for a being which is essentially *bounded* in time and would not, therefore, arise for a being capable of "intellectual intuition" or God, who (according to Becker) "does not need to count."⁷⁷ This verifies, according to Becker, that both number and the problem of mathematical objectivity, if treated in terms of its concrete factual condition, more generally must be "referred back to time," and thereby to what can be treated as a "specific human form of intuition," as it is in Kant.⁷⁸

Becker sees in the concretely motivated structure of transfinite reflection and its relation to finite temporality grounds for an actual resolution of the intuitionism/formalism dispute in favor of (a non-finitist form of) intuitionism. For according to Becker, given this thoroughgoing temporal conditioning of mathematical existence, the actual demonstration of mathematical objectivity must be accomplished, in each case, by means of an actual carrying-out of the relevant construction or synthesis which displays the object itself. By contrast with the formalist "demonstration" by means of a proof of noncontradictoriness, this carrying-out of actual processes of construction or synthesis guarantees that the specific "being-sense" (i.e. the meaning of the being) of the relevant mathematical objects, including the transfinite ordinals, remains in view and that they thereby maintain their foundation in

in this way that the finite and factual process of reflection indicates, in itself and *as* a process, the specifically infinite structure.

⁷⁴ Becker (1927), p. 104; Becker refers in particular to Lask's (1911) *The Logic of Philosophy and the Doctrine of Categories*.

⁷⁵ Becker (1927), pp. 104-106.

⁷⁶ Becker (1927), p. 197.

⁷⁷ Becker (1927), p. 197.

⁷⁸ Becker (1927), p. 197.

factual, concrete life. More broadly, Becker sees this outcome as deciding in favor of an “anthropological” conception of mathematical knowledge in general, which he contrasts with the “absolute” one according to which the mathematical domain is a “measuredly structured *universum*” existing in itself.⁷⁹ Instead of having such an extra-human and atemporal mode of existence, in particular, mathematics is here to be seen as having an “anthropological” foundation in the “factual life of humans, the “the in-each-case-one’s-own [*jeweils eigene*] life of the individual (or at least the occurrent [*jeweiligen*] “generation”).”⁸⁰ In particular, the concrete motivation of the transfinite progression on the basis of Dasein’s factual life and temporality motivates the idea of a “progress” into the future which is no longer understandable on the basis of an eternally existing substrate of present moments, each one in principle the same as the last, but rather as an irreducibly dynamic process of open, reflexive becoming, which Becker designates, adopting Heidegger’s terminology, as “historical temporality.”⁸¹ This temporality is further, according to Becker, to be seen as connected or identical to the “authentic” or primordial time that had already been described by Heidegger as the reflexive structure of Dasein through which Dasein “gives itself its time” and is in a certain way “time itself.”⁸²

This provides a basis on which Becker can clarify the contrasting sense in which an interpretation of time figures in classical analysis and in the foundations of the traditional conception of the realm of the mathematical as the eternal or extra-temporal. In particular, Becker here suggests that the traditional determination of the infinite or *apeiron* in terms of the character of an *unlimited temporal repetition of the same* provides a basic structure that underlies or produces the overall conception of time as such.⁸³ As Becker argues, the basic character in the conception of the infinite as potential which ultimately yields Aristotle’s understanding of time as the number of motion may be seen as having even deeper roots, before Plato, in the thinking of the Pythagorean Archytas, as well as the pre-socratics Anaxagoras, Zeno, and finally Anaximander.⁸⁴ In each of these thinkers, according to Becker, the question of time indeed already played “a decisive role in the definition of the *apeiron*.”⁸⁵ For Archytas and, before him,

⁷⁹ Becker (1927), p. 196.

⁸⁰ Becker (1927), p. 196.

⁸¹ Becker (1927), pp. 220-28.

⁸² Becker (1927), pp. 220-221. Becker here relies primarily on the conception of time that Heidegger had expounded in his lecture on “Time” given to the Marburg theological faculty on July 25, 1924 (GA 64). As Heidegger suggests there and Becker emphasizes, authentic time cannot be conceived as primarily the outcome of a measuring or numbering, but must instead be grasped as a “coming-back” to “what is constantly the same unique instance,” namely the “how of care” in which I “linger.” In this way, time’s running-forward into the future is not to be understood as an indifferent stretching-out or becoming longer; in fact, time originally has “no length in general” but is rather to be understood as containing “all time” within itself, including the very structure of its running-ahead, in the form of “momentariness” [*Jeweiligkeit*]. This authentic temporality, grounded in the original structure of Dasein’s reflexivity, is to be sharply distinguished from the “non-historical” temporality typical of Dasein in its inauthentic everydayness; this inauthentic temporality, by contrast, is determined by measurement and by the clock. Its basic pattern, by contrast with the authentic temporality of Dasein, is set by the cycles of nature and the interpretation of processes in what is conceived as the natural world; thus, by contrast with the determination of authentic, “historical” time, determined by a momentariness that is in each case unique, the basic characteristic of this “natural” time is the possibility of the recurrence of the same.

⁸³ Becker (1927), pp. 208-9.

⁸⁴ Becker (1927), pp. 206-9.

⁸⁵ Becker (1927), p. 208.

Anaxagoras, the existence of space and entities already had, in itself, the character of the *aei*, or “always”, of eternity.⁸⁶ We can, according to Becker, apparently trace to Zeno the first clear understanding of this *aei* as implying the infinite repeatability, in principle, of the individual instance, as well as the idea of the infinite divisibility of continua of motion and space which yields his notorious paradoxes of motion.⁸⁷ And before all of these, Anaximander understood the principle (or *arche*) of things as the *apeiron*, or the unlimited, holding (in what may be the first direct quotation that reaches us from the pre-Socratics) that:

Where their arising is from, therein arises also their strife, according to necessity. For they count against one another strife and compensation according to the ordinance of time.⁸⁸

According to Becker, we can already see in this the origin of the conception of time which dominates Greek thought, a conception of time as the eternal and infinite rhythmic alteration or repetition. Here, “*apeiron* is the original power ... that becoming never allows to cease.” In this respect, according to Becker, the Anaximander fragment already yields the prototype for the interlinked conception of the infinite and time that comes to the fore in Aristotle’s developed conception of time as the number of motion.

But if there is a basic sense in which the thought of time is always determined for the Greeks, including Plato, on the basis of the thought of the *aei* as eternal repetition in presence of the same, this thought is nevertheless undermined in a decisive and internal way by certain problematic discoveries of Greek mathematics, already well known to Plato himself, which arise again in a different form in the contemporary (20th century) context of the intuitionist-formalist debate itself. In particular, as Becker notes, the contemporary problem of the continuum, as it has been developed by Cantor in terms of his method of diagonalization and his conception of continua as point sets, is itself closely related to the problem that appeared already in the problem of the nature and definition of irrational magnitudes for the Greeks, where it already played a crucial methodological and philosophical role in their thinking about number, magnitude, and the infinite. On Becker’s reading, the critical problem posed by the discovery of irrational magnitudes such as that of the diagonal of a unit square, in particular, seemed to Plato and others of his time to pose a deep threat to “the thoroughgoing rule of form, of ordering principles [des ordnenden Prinzips], and indeed not only in the realm of sensory, fluctuating becoming [des sinnlichen, fließenden Werdens], but even in that of precisely construable beings (those that can be ascertained by *dianoia*) [in dem des exakt konstruierbaren (mittels den *dianoia* erfaßbaren) Seienden].”⁸⁹ This prompted mathematicians such as Euclid and, before him, (the historical) Theaetetus to undertake a rigorous and exhaustive construction and classification of the forms of irrational magnitudes themselves.⁹⁰ The attempt sufficed partially to overcome the crisis posed by the initial

⁸⁶ Becker (1927), pp. 206-7.

⁸⁷ Becker (1927), p. 207.

⁸⁸ Becker (1927), p. 208.

⁸⁹ Becker (1927), p. 136.

⁹⁰ Becker here references the discussion, in *Philebus* 16c-18c, of a “god-given method” for knowing “the exact number of any plurality that lies between the unlimited and the one” (16d-e).

discovery of the irrational, but only by means of a piecemeal and essentially partial re-incorporation of its structure back into the realm of classifiable and surveyable relations. Nevertheless, as Becker argues, they remained in Plato's own thought the decisive sense of a primary *apeiron* which structurally insists in the actual genesis of number and indicates therein the inherent moment of an unlimited becoming that threatens to outstrip determinate limits, boundaries and order. This is, specifically, the late-Platonic conception of the *aoristos duas* or 'unlimited dyad,' which was, according to the suggestion of Aristotle's own polemics against the Platonic conception, at the origin and root of the generation of number in its combination with the contrastive principle of the one or the limit.

Becker discusses the progression from Plato's conception of number to Aristotle's in terms of what he sees as the development from an anciently rooted and mystical conception of number as figure to the conception decisive in Aristotle's thinking and indeed in all subsequent mathematical investigations into number and the continuum, that of number as seriality and order.⁹¹ On the initial, "mystical" conception, still present in Plato, number is a kind of figure that gives the possibility of *measure* (p. 201).⁹² Here, according to Becker, infinite number is basically unthinkable; for the figural character of numbers is basically understood as its being limited.⁹³ On the other hand, as Aristotle, at any rate, certainly grasped, the conception of number as a position in a series immediately demands the thought of the possibility of an endless procession, one that can be continued indefinitely without running to an end. Becker suggests that Aristotle in fact sees in this endlessness a basic link not only to number and the mathematical, but also, decisively, to the "basic phenomenon of time."⁹⁴

Nevertheless, although the "series" character of number and the specific phenomenon of the potential infinite involved in it only becomes fully explicit with Aristotle, Becker already sees in the late Plato's conception of the *aoristos duas* a significant development of it, whereby it is methodologically linked, according to Becker, with the distinctive methodology of synthesis and *diaeresis* suggested in dialogues such as the *Sophist*, the *Statesman*, and the *Philebus*. In particular, Becker, following Stenzel, suggests that Plato here contemplates a synthetic/diaeretic development of numbers, whereby they are generated through a repeated process of "something like doubling and halving."⁹⁵ Through this process, in particular, "whole numbers as well as fractions originate through the genetic possibility of the *aoristos duas* (the unlimited dyad)."⁹⁶ The dyad, developing the implications of the *apeiron* itself as irreducibly "something becoming [eines Werdenden]" thereby amounts to the ultimate "potency *generative* of number [die zahlen *erzeugende* Potenz] (duopoios) ."⁹⁷ In the repeated possibility of division that it introduces, it thus, when balanced with the equally basic principle of the unifying, synthetic one or limit, provides an essentially unlimited *arche* or *dunamis* capable not only of structuring the whole unlimited domain of (whole and fractional) numbers but also explaining their ultimate structural genesis.

⁹¹ Becker (1927), p. 200.

⁹² Becker (1927), p. 201.

⁹³ Becker (1927), pp. 201-202.

⁹⁴ Becker (1927), p. 202.

⁹⁵ Becker (1927), p. 205.

⁹⁶ Becker (1927), p. 205.

⁹⁷ Becker (1927), p. 206.

In a later (1931) article “The Diairetic Generation of Platonic Ideal Numbers,” Becker further develops the suggestion that the generation of numbers can be considered to be an outcome of the late-Platonic structure of diaeresis, and indeed actually identical to that of the diairetic definition of a concept by division. Here, Becker suggests in particular that ideal numbers can be seen as generated by a repeated process whereby one divides into two, but in the division the original one is “sublated” or overcome in the division.⁹⁸ The seriality of number can thus be seen as generated in a way that is “formally identical” to the structure of the diaeresis of concepts that Plato suggests in the *Sophist* and the *Statesman*. According to the solution, what corresponds to the diairetically disclosed “parts” of a defined concept in the ideal number is not the number itself but its “units.”⁹⁹ In this way the formal structure of the decomposition of the idea in the definition is exactly formally analogous to the generation of the number. Becker also notes the possibility of connecting this to the structure of the division of a continuous quantity by iterated fractional decomposition to produce an exact (rational) point.¹⁰⁰ In this way, he suggests, the process of diaeresis which results in the identification of the constituents of an idea as “monads” or “ones” may be thought to produce examples of the sort that Plato appeals to in the *Sophist*, the *Philebus*, and other late texts, e.g. the identification of the fixed letters or discrete musical notes from the fluid continuum of possible sounds.¹⁰¹

Becker’s analysis thus suggests the suppressed presence in Plato’s late texts of an actually temporal or chronological process of the genesis of numbers as well as idealities more generally, one that is thereby decisively linked to the analytic methodology of diaeresis which yields some of the late Plato’s most important suggestions about the constitution of the ideal realm as well as the practice of dialectic which is capable of disclosing it. This specific suggestion of the ontological grounding of a temporal phenomenon of “ideal” genesis which is also methodologically and structurally linked to a superior “dialectic” underlying the development of mathematical inquiry as well as philosophical reflection on it is further developed in the work of the French mathematician, philosopher, and resistance fighter, Albert Lautman. In his essay “New Research on the Dialectical Structure of Mathematics,” first published in 1939, Lautman develops the problem of the *structure* and *genesis* of mathematical objectivities, employing “certain essential distinctions in the philosophy of Heidegger” to demonstrate a specific kind of genesis of mathematical theories in what Lautman calls a “dialectic” that governs their constitutive structures as well as its concrete realization in practice. Here, Lautman (like Becker) refuses to locate the origin of mathematical objectivities and effective theories in a timeless realm of pure being, instead conceiving of the problem of the genesis of mathematical objects as intimately connected with the question of the givenness and structure of time itself. He reaches the conclusion that the

⁹⁸ Becker (1931), p. 265. In particular, the powers of 2 (2, 4, 8, 16, etc.) can be thought of as generated by the symmetrical iteration of binary division itself, while all other numbers are seen as arising from an asymmetrical development of a diairetic tree structure (e.g. 3 is generated by the division of an initial unit, a, into two, (b and c) and the subsequent division of c into d and e, while b remains unaffected; the remaining (unsublated) elements are then three (b, d, and e).)

⁹⁹ e.g., b, d, and e in the example above.

¹⁰⁰ Becker (1931), pp. 271-73.

¹⁰¹ Becker (1931), pp. 286-87.

capability of mathematics in understanding and influencing the physical world, and hence its application to the temporality determined by the phenomena of physical nature, must be understood on the basis of a more primary and original order of genesis, one which also yields an original, pre-natural structure of time. This original time, for Lautman (as for Becker), is grounded in the reflexive and ec-static structure of Dasein, according to which Dasein is originally “transcendent” in that it exceeds itself and in a certain sense “surpasses” beings in the direction of its always presupposed, if typically inexplicit, fore-understanding of Being itself.

Lautman’s 1939 work develops the thesis of his 1938 dissertation, according to which concrete mathematical theories develop a series of “ideal relations” of a “dialectic abstract and superior to mathematics.”¹⁰² In particular, Lautman understands abstract “dialectical” ideas as the development of the possibility of relations between what he calls (by contrast) pairs of *notions*: these are pairs such as those of “whole and part, situational properties and intrinsic properties, basic domains and the entities defined on these domains, formal systems and their realization, etc.”¹⁰³ The dialectical ideas that pose these relations do not presuppose the existence of specific mathematical domains or objects. Rather, they operate, in the course of mathematical research, essentially as “problems” or “posed questions” that provide the *occasion* for inquiry into specific mathematical existents.¹⁰⁴ In reference to differing specific mathematical theories such as, for instance, the theory of sets or (in a different way) real analysis, the dialectical relationship of whole and part may be seen as posing a general *problem* which is to be resolved differently in each domain, on the basis of concrete mathematical research, and thereby partially determines the kind and structure of entities which may be seen as existing in that particular domain.

The problem, here, thus has a priority over its particular solutions, and cannot be reduced to them. According to Lautman, this priority is not that of an ideality existent in itself prior to its incarnation in a specific domain, but rather that of a problematic “advent of notions relative to the concrete within an analysis of the Idea.”¹⁰⁵ In particular, it is only in developing the actual structure and configuration of particular concrete domains, that the actual meaning of the governing Ideas is worked out. Here the concrete development of particular domains does not, moreover, exhaust the general problem but rather, typically, suggests new questions and problems in other concrete domains which are also to be related to the same general dialectical structure. Lautman sees this dynamic as structurally comparable to the analysis of the concrete structure of the factual disclosure of being undertaken by Heidegger.¹⁰⁶ In particular, here, as for Heidegger, the method of analysis depends, upon the possibility of the prior posing of a *question* and on the “prior delimitation” that this involves.¹⁰⁷ This need not, as Lautman emphasizes, involve knowledge of the essence of the thing asked about but is rather based in what Heidegger calls a “pre-ontological” understanding. Like the posing of ontological questions on the basis

¹⁰² Lautman (1939), p. 199.

¹⁰³ Lautman (1939), p. 204.

¹⁰⁴ Lautman (1939), p. 204.

¹⁰⁵ Lautman (1939), p. 200.

¹⁰⁶ Lautman (1939), p. 200.

¹⁰⁷ Lautman (1939), p. 200.

of this “pre-ontological” understanding which first makes it possible, according to Heidegger, to interrogate specific beings as to their being, the posing of the dialectical questions is not separable from the questioning of the specific, concrete, ontic beings that are involved in each case¹⁰⁸. Rather, as for Heidegger, with disclosure of the superior, “dialectical” (or “ontological”) truth, the concrete structure of (ontic) beings is inherently *co*-disclosed, in particular with respect to the determination of the factual existence of the domains or regions in which they are categorically structured. In the analysis of the structure of mathematical theory, there is thus an anteriority of the global dialectical relationships “incarnated” in it to the specific theory; the priority of the dialectic is specifically “that of ‘concern’ [what Heidegger calls “care” or *Sorge*] or the ‘question’ with respect to the response.”¹⁰⁹

Dialectical Idea, in this sense, “govern” the “intrinsic reality” of mathematical objects and it can even be said, using the Platonic terminology, that the reality of the mathematical objects, as concretely demonstrated in mathematical research, thus resides in their “participation” in the dialectical ideas.¹¹⁰ But as Lautman emphasizes, this sense of “participation” is quite at odds with the way Plato’s conception of participation is typically understood; in particular, whereas participation is often understood as that of an ideal model to objects which in some respect copy them, here the Ideas are understood “in the true Platonic sense of the term” as the “structural schemas according to which the effective theories are organized.”¹¹¹ What is at issue here is not a “cosmological sense” of the relationship between ideas and their concrete realization such as is developed, for instance, in the *Timaeus*. According to such a sense, which is fundamentally understood by reference to the concept of creation as forming or shaping, the realization of the ideas in concrete reality depends on their capacity to impose law and structure on an otherwise undifferentiated matter, itself knowable only (as Plato in fact suggests) by a kind of “bastard reasoning” or “natural revelation.”¹¹² By contrast with this “cosmological sense” of the relationship between ideas and particulars, it is essential in the case of mathematical objectivity to understand the relationship between the dialectical ideas and the particular mathematical objects as a “cut [which] cannot in fact be envisaged,” a kind of “mode of emanation” from dialectics to mathematics that does not in any way presuppose the “contingent imposition of a Matter heterogeneous to the Ideas.”¹¹³

In the relationship between the dialectical ideas and the particular mathematical objects, there is thus a twofold relation of priority. While problems precede their concrete solutions as questions more generally precede their answers, it is essential to the articulation of the concrete domains of existence that it be possible only on the basis of a prior possibility of posing the questions which receive (partial) solutions therein. The question of the determinate ontic structure of a particular entity thus always refers back to the level of an ontological determination on which the question of its being can be posed. A determinate and essential moment of this process is the determinate “projection of the ontological

¹⁰⁸ Lautman (1939), p. 200.

¹⁰⁹ Lautman (1939), p. 204.

¹¹⁰ Lautman (1939), p. 199.

¹¹¹ Lautman (1939), p. 199.

¹¹² Lautman (1939), p. 199. Cf. *Timaeus* 52b.

¹¹³ Lautman (1939), pp. 199-200.

constitution of beings” whereby a specific domain or field of beings (such as, Heidegger says nature or history) is marked off by means of specifying “fundamental concepts” that subsequently make possible the “objectification” of beings in this domain and their treatment by scientific means. In this determination of regions by means of the fixation of problems:

...a same activity is therefore seen to divide in two, or rather act on two different planes: the constitution of the being of the entity, on the ontological plane, is inseparable from the determination, on the ontic plane, of the factual existence of a domain in which the objects of a scientific knowledge receive life and matter. The concern to know the meaning of the essence of certain concepts is perhaps not primarily oriented toward the realizations of these concepts, but it turns out that the conceptual analysis necessarily succeeds in projecting, as an anticipation of the concept, the concrete notions in which it is realized or historicized.¹¹⁴

It is in the analysis of this “projection” of being onto specific domains of beings by means of the fixation of determinate problems and questions that Lautman identifies the possibility of a “general theory of [the] acts...which, for us, are geneses” and hence provides the essential ontological structure at the basis of the existence of mathematical (as well as other) entities in their specific conceptual determinacy.¹¹⁵

As Lautman points out, this structure can be understood as the specific structure of Dasein’s transcendence, at the structural root of the phenomenon of “world” in general, that Heidegger develops in the 1929 essay “On the Essence of Ground,” on which Lautman here relies.¹¹⁶ On the level of properly ontological genesis, this structure points, according to Lautman, to the specific relationship between logical and creative determination at the root of every possibility of the grounding of entities by means of their rational explanation or their creative foundation, which can both be understood as a structurally original freedom. According to Lautman, this freedom is not ontic or empirical freedom but rather a freedom of Dasein that is structural, and thereby points back to underlying temporality itself.¹¹⁷ The structural configuration that here indicates a deeper structure of ontico-ontological genesis at the root of both the specific constitution of particular material domains and the possibility of Dasein’s possible disclosure of them is quite general, and indeed can be seen as a structural-genetic precondition for the determinate being of beings in any number of domains. According to Lautman, this account of ideal genesis can, moreover, be separated at least to some extent from Heidegger’s own preconceptions linking it to the specific projects of a “human” Dasein. Thus, although Heidegger himself assuredly thinks of the genesis of the “project of the World” as founded specifically in the idea of “human” reality, it is nevertheless, Lautman suggests, possible to read his genetic conception as having the more general significance of “a genesis of notions relating to the entity, within the analysis of Ideas relating to Being”

¹¹⁴ Lautman (1939), p. 201.

¹¹⁵ Lautman (1939), p. 200.

¹¹⁶ Cf. the discussion in chapter 7, above.

¹¹⁷ Latuman (1939), p. 203.

that is characteristic of the determinate ontico-ontological ideal constitution of entities *in general* and bears no necessary reference to “human” being or anything specifically characteristic of it.¹¹⁸

According to Lautman, the specific kind of relationship, characteristic of mathematical philosophy, that exists between the dialectical ideas and particular domains of existence is, in particular, illustrated in an exemplary fashion by the metamathematical results of Gödel and those who immediately followed him, which put an end to the debate of the 1920s between intuitionists and formalists, or at least situated it on very different ground. Near the conclusion of his principal thesis of 1938, “Essay on the Notions of Structure and Existence in Mathematics,” Lautman makes reference both to Gödel’s 1931 incompleteness results and to the proof of the consistency of Peano Arithmetic, by means of transfinite induction on the length of formulas, achieved by Gentzen in 1936. Lautman here suggests that the particular situation of philosophical analysis with respect to mathematical problems is illuminated by both results. In particular, both Gödel’s limitative result, which shows that there can be no proof of the consistency of a theory by means of that theory itself, and Gentzen’s positive one, which proves the consistency of arithmetic but only, as Gentzen himself says, by means that no longer belong to arithmetic itself, bear witness to the “exigency” of the logical problem of consistency with respect to any particular theory. This marks the distinctive status of a “metamathematical” inquiry into the nature of mathematical knowledge which essentially depends on, and accommodates itself to, logical results without being simply reducible to them. It is possible, in particular, to see “how the problem of consistency makes sense” without yet being able to resolve it by mathematical means. It is within such an “extra-mathematical intuition of the exigency of a logical problem” that the whole foundationalist debate of the 1920s has essentially taken place, and it is only by drawing on it that Gödel’s results were able to transform the problematic situation and place it on new grounds.¹¹⁹

More generally, with respect to problems such as that of “the relation between the whole and the part, of the reduction of extrinsic properties to intrinsic properties,” or “of the ascent towards completion,” progress in general depends not simply on the application of pre-existing logical schemas or regulative logical conceptions (such as the ones governing the competing approaches of formalism and intuitionism in the 1920s) to already-defined domains but rather on the constitution of “new schemas of genesis” within the concrete progress of mathematics itself. The task here is thus not to demonstrate the applicability of classical logical or metaphysical problems *within* mathematical theories, but rather, in each case, to grasp the structure of such a theory “globally in order to identify the logical problem that happens to be both defined and resolved” by its existence. (p. 189). This is a peculiar experience of thought, according to Lautman, equally characteristic of the capacity of the intelligence to create as of its capacity to understand. In it,

Beyond the temporal conditions of mathematical activity, but within the very bosom of this activity, appear the contours of an ideal reality that is governing with respect to a mathematical

¹¹⁸ Lautman (1939), p. 202.

¹¹⁹ Lautman (1939), pp. 188-89.

matter which it animates, and which however, without that matter, could not reveal all the richness of its formative power. (p. 190)

As a concluding illustration of the concrete significance of this “ideal reality” and the dialectic that witnesses its structure, Lautman finally turns to its integration into the “most authoritative interpretations of Platonism.”¹²⁰ It is essential to the interpretation of Plato posed by “all modern Plato commentators,” according to Lautman, that the “Ideas are not immobile and irreducible essences of an intelligible world, but that they are related to each other according to the schemas of a superior dialectic that presides over their arrival.”¹²¹ In particular, referring to the work of Robin, Stenzel, and Becker himself, Lautman here refers to late Plato’s understanding of the dynamical genesis of Ideas and numbers. On this understanding as Lautman describes it,

The One and the Dyad generate Ideas-numbers by a successively repeated process of division of the Unit into two new units. The Ideas-numbers are thus presented as geometric schemas of the combinations of units, amenable to constituting arithmetic numbers as well as Ideas in the ordinary sense.¹²²

Lautman further suggests that the diaeretic “schemas of division” of Ideas in the *Sophist* can themselves be traced, in their logical structure, to the schemas of the “combination of units” that are also responsible for the generation of the ideal numbers.¹²³ Both are then genetically dependent upon a kind of “metamathematics” which unfolds a time of generation that, though it is not “in the time of the created world” is nevertheless, just as much, ordered according to anteriority and posteriority. This ordering according to anteriority and posteriority is equally determinative, and even in the same sense, with respect to ideas quite generally as with respect to numbers themselves, and its significance is nothing less than that of the “introduction of becoming within Ideas.”¹²⁴ Indeed, following a suggestion by Stenzel, Lautman suggests that this is the significance of Aristotle’s claim that the Platonists, while treating ideas *as* numbers, nevertheless did not admit the ideas *of* numbers: since the ideal-numbers are *already* the principle of the determination of essences as anterior and posterior (i.e. as before and after), there is not (nor can there be) a *further* principle of the division of essences that is prior to or superior to this numerical division itself.¹²⁵ In this impossibility of equipping the metamathematics of the ideal-numerical principles of anteriority and posteriority with *another* determination (a “metametamathematics”, so to speak), we witness once again, according to Lautman, the necessity of pursuing the dialectic in which the mathematical problems and the ideal relations communicate with and articulate one another. In particular, in such a dialectic, and only in it, are to be found the problematic conditions and the possibility of mutual illumination in which the more original structures

¹²⁰ Lautman (1938), pp. 189-90.

¹²¹ Lautman (1938), p. 190.

¹²² Lautman (1938), p. 190.

¹²³ Lautman (1938), p. 190.

¹²⁴ Lautman (1938), p. 190.

¹²⁵ Lautman (1938), pp. 190-191; *Nicomachean Ethics* 1.4.

constitutive of anteriority and posteriority *as such* – and hence of temporal genesis, in an original sense – can be brought to light.

With this suggestion of such an illumination of the conditions of the genesis of numbers and idea that is at once interpretable in terms of the Platonic dialectic as well as the ontico-ontological structure characteristic of Dasein, it is possible to return to the question of the significance of the leading metamathematical (or metalogical) results of the twentieth century, and in particular Gödel's incompleteness theorems, for the ontological problematic of given time itself. In particular, given Lautman's suggestion of the way the metalogical results illuminate the "superior" dialectic of ideal genesis, and Becker's suggestion of the ontic-ontological structure underlying the availability and constitution of the infinite and transfinite themselves, it is possible to interpret the metalogical and ontological structure of given time in terms of the specific phenomenon of the "inexhaustibility" of mathematical truth, which Gödel himself saw the demonstrated outcome of his own incompleteness results (see chapter 5, above). From this perspective, given time in its metalogically indicated structure is always interpretable in a twofold way: *both* as incomplete in its continuous unfolding of a "superior" progression in *infinitum* that insists in it, but cannot essentially be reduced to the unity of a simple *dunamis* thought in terms of the infinite repetition of the same, *and* as inconsistent in the punctual condition of its presence, the paradoxical structure of the "now" which is always becoming other and being destroyed.

As we saw in chapter 5, Gödel's second theorem, which shows the incapability of any finite system to prove its own consistency (unless it is in fact inconsistent), here bears a particular significance for the question of contradiction and thinkable time. For given it, the question of total consistency is henceforth either one that inheres irreducibly and without final resolution with respect to the totality of truths, or one that can be resolved only locally, with respect to a thereby constituted ontic domain, and from a perspective exterior to that domain itself. More generally, what is witnessed here with respect to both the temporal constitution of individual ontic domains and the ontic totality as such is the irreducibly dual structure which Gödel himself, in the 1953 Gibbs lecture, sees as implied by his own incompleteness results. This is the structure of, on the one hand, an irreducible primacy of problems without finite or final solution at the basis of the possible "projection" of the domain and its constituent entities – this is just the primacy of posed problems over their solutions of which Lautman speaks – or, on the other, the realized truths that successively demonstrate themselves as their determined solutions in those domains, while nevertheless always leading to the posing of further problems with respect to which they show their essential incompleteness. With the conception of this dual structure as an original structure of genesis, the structure of "given" time is also clarified in terms of the underlying phenomenon of essential undecidability which underlies both horns of the disjunctive conclusion. It is thereby illuminated, as well, in its essential relation to the ontological difference between being and beings itself, which the metaphysical duality of consistent incompleteness and inconsistent completeness both witnesses and explicates.

As Becker himself suggests, the original temporality of Dasein, or "authentic" or original temporality itself, can therefore be metalogically illuminated by the results that demonstrate the specific mode of

the inherence of the infinite in the finite according to which the *apeiron* structures time as given. But it is also possible, on the basis of the structure indicated here, to reject Becker's own specific conclusion in favor of intuitionism and (more broadly) an "anthropological" conception of the basis of given time. Writing in 1927, of course, Becker did not have the benefit of Gödel's incompleteness theorems themselves. Nevertheless, *one* part of his conclusion is indeed apparently confirmed by them: that of an iterative development of reflection that can be continued, in principle, indefinitely through the transfinite hierarchy, and furthermore one in which the phenomenon of undecidability never completely subsides.¹²⁶ This persistence of undecidability with respect to particular formal systems even given their iterated supplementation by means of consistency or "reflection" principles, which is verified by means of Gödel's results, in particular appears to parallel or confirm the link that Becker already draws between this "free" character of transfinite development and the actual structure of the stages of Dasein's concrete reflection on itself, which for Becker is grounded in the essential freedom of Dasein's "historical" temporality. On the other hand, however, as we have already seen in chapter 5, to interpret the temporal givenness of truths as ontologically structured in terms of the metalogical results is already to reject intuitionism or any other "anti-realist" attitude toward them, in Dummett's sense. Here, in particular, what is carried out is not the characteristic intuitionist *submission* of the structure of truths to the condition of a given, "always finite" unfolding in time, but rather the illumination of the underlying structure of time itself as given by means of the indication of its metalogical and ontological basis. With this illumination, as we have seen, what is at issue is not therefore the idea of mathematical truth or objectivity as subject to a condition of "human" time-boundedness in finitude, but rather the metalogical or metamathematical problematic schematization of the relationship between "infinite" time and its finite givenness as such, and any suggestion of an "anthropological" or subjectivist basis for given time can accordingly be allowed to lapse. Just, then, as Gödel's own results provide a sufficient basis for the overcoming of the whole dispute between intuitionism and formalism without resolving it in favor of either, so does the suggestion thereby made about the structure of given time suffice to overcome the much longer-standing 'dispute' between an onto-theological (or "absolute-objective") and a constructivist (or "subjectivist") conception of its basis. What is witnessed here instead is the actual formal basis for a realist thought of given time on which it is neither absolute nor constructed, but rather formally inherent in the problematic structure of its givenness itself, as determined by and determining the ideas and paradoxes of the infinite, the punctual, and the continuous which are clarified within it by the metaformal reflection.

V

In the foregoing sections, we have considered the question of the specific forms in which number and time are linked in the formal relationships by which the infinite is presentable in the form of a finite

¹²⁶ Cf. Gödel's footnote to his own 1931 paper: "The true source of the incompleteness attaching to all formal systems of mathematics, is to be found—as will be shown in Part II of this essay—in the fact that the formation of ever higher types can be continued into the transfinite ... whereas in every formal system at most denumerably many types occur. ... Namely, one can show that the undecidable sentences which have been constructed here always become decidable through adjunction of sufficiently high types (e.g. of the type ω to the system **P**). A similar result holds for the axiom systems of set theory." (Gödel (1931), footnote 48a, pp. 28-29.)

thought or condition of experience. The further development of this question, in light of historical and contemporary developments of mathematical and ideal reflection, provides, as I have argued, the basis for a critical deconstruction or actual alternative to both the “ontotheological” conception of infinite *countable* or *measurable* time as given from the eternity of the *aei* and the interlinked “constructivist” conception of finite *counted* or *measured* time as given in the (always finite) activity of the counting or measuring. The alternative is posed, in part, by developing the implications of the original structural paradoxes of becoming and its availability to thought that are foreclosed (as Derrida suggests) or avoided in the Aristotelian conception of the infinite as the *dunemei on* and in the structure of essence and accident that he draws from it. The problem of the being of the infinite and its link to the temporal structure of becoming in itself can then be retrieved both by means of the interpretation of the internal development of metamathematical or metalogical problematics, and also discerned at the historical foundation of the “metaphysical” interpretation of being as presence and of the mathematical/ideal as the *aei on*. In particular, as we have already seen reason to suspect, it can be discerned in thought of the late Plato, where the original problem of the paradoxical structural configuration time, becoming and the *apeiron* is (prior to and by contrast to its Aristotelian foreclosure) still alive as an actual and decisively determining problem of ontological research.

The paradoxes of the actual inherence of the *apeiron* appear in Plato’s middle and later dialogues in two characteristic forms: one cosmological, and one kinematic. The first kind of paradox, investigated for example in the *Parmenides*, the *Timeaus*, and the *Sophist*, relates the inherence of the infinite to the topic of the unity of the cosmological All, whereby the very structure of its *logos* always ensures “at least one more” and thereby tends toward the ultimate destitution of the One-All in a logically/structurally implicit unlimited many. The second kind of paradox, investigated in the *Cratylus*, the *Philebus*, the *Sophist*, the *Theaetetus*, and again the *Parmenides*, is that of the thinkability of becoming and change, and more generally of the possibility of any thought at all of what is subject to the condition of temporal flux.¹²⁷ Both types of paradoxes, in introducing a basic structure of contradiction into the thought of the One as such, underpin late Plato’s two-pronged attack on the Eleatic monism which treats being as the cosmological One-All and time and change as illusory and impossible. The development of this critique and the positive demonstration of the phenomena underlying its possibility allows Plato to rehabilitate and develop certain suggestions of Pythagorean ontology and by expounding the underlying problematic of the structural givenness of number to which it responds.

There is evidence that the development of the problem of number may be closely connected with the content of what have been called Plato’s “unwritten” teachings.¹²⁸ The sixth-century neoplatonist Simplicius notoriously reports descriptions by Aristotle and others (now lost) of a lecture given by Plato on the Good: in the lecture, Plato is said to have taught that the principles of all things, including the Ideas, are the “Indefinite Dyad, which is called Great and Small” and Unity.¹²⁹ There is a suggestion in

¹²⁷ These latter are what Deleuze has treated as the paradoxes of an “unlimited becoming” which threatens to show that it is impossible for anything to have any determinate identity, insofar as all such identities are situated within continua that structurally allow of indefinite increase or decrease.

¹²⁸ Aristotle refers to Plato’s “so-called unwritten teachings” at *Physics* 209b14-15

¹²⁹ Sayre (1983), p. 76

Simplicius's quotations of Poryphry and Alexander that Plato had held that Unity and the Indefinite Dyad are also the elements of numbers and that each of the numbers participates in these two principles.¹³⁰ The lecture on the Good is said by Aristoxenus to have confounded Plato's listeners, who expected a lecture on ethics but were instead treated to a discussion of numbers and geometry, leading up to the claim that the Good is to be identified with Unity.¹³¹ Beyond these second-, third-, or fourth-hand reports, there are many suggestions in Aristotle's *corpus* of the late Plato's views about the connection of forms, numbers, and the principles of unity and the "indefinite dyad" or the "great or small". Aristotle says in several places that Plato identified forms with numbers.¹³² He also makes the suggestions that Plato identifies Unity with the Good (and perhaps that he identifies the Great and the Small, by contrast, with evil), and that Plato treats the "Great and Small" as matter with respect to which the One is form.¹³³

In a helpful analysis, Sayre has argued that the content of the so-called "unwritten teachings" can be largely recovered from Plato's middle and late dialogues themselves, thereby illuminating Plato's final conception of the method of the dialectic and of the nature of forms and participation.¹³⁴ It is thus not necessary, Sayre argues, to speculate about the esoteric content of the Platonic teachings alluded to by Aristotle, since they can be shown to be actually present in the late dialogues themselves. In particular, Sayre reconstructs Aristotle's statements as clearly attributing five distinct claims about forms, sensible objects, numbers, and the Great and the Small. Among these are the claims that sensible objects are constituted of forms *and* the Great and the Small, and that forms are *themselves* composed of the Great and the Small and Unity.¹³⁵ As Sayre notes, while the claim that the forms are the principles or causes of sensible things is familiar from many of Plato's dialogues and is present as early as the *Phaedo*, the suggestion of a composition of the forms themselves by more basic principles would be, if it can be attributed to him, a significantly novel element of the late Plato's final thinking about them. Sayre sees this late conception as developed both thematically and methodologically in Plato's descriptions of the method of dialectic in the *Sophist*, the *Statesman*, and especially the *Philebus*, where at 16c-e, where Socrates describes a "god-given" method for pursuing problems of the one and the many generally, including (it appears) with respect to the distinctive unity exhibited by forms:

Socrates: It is a gift of the gods to men, or so it seems to me, hurled down from heaven by some Prometheus along with a most dazzling fire. And the people of old, superior to us and living in closer proximity to the gods, have bequeathed to us this tale, that whatever is said to be [*ton aei legomenon einai*]¹³⁶ consists of one and many, having in its nature limit and unlimitedness

¹³⁰ Sayre (1983), p. 77.

¹³¹ Sayre (1983), p. 77.

¹³² E.g. *Metaphysics* 991b9; *De Anima* 404b24.

¹³³ *Metaphysics* 988a7-17; *Metaphysics* 1091b13-14; *Physics* 187a17.

¹³⁴ Sayre (1983), p. 13. I would like to thank John Bova for initially pointing out to me the relevance of Sayre's work to the problems considered here, as well as being one of those who first suggested Lautman and Becker, as well, as potential resources.

¹³⁵ Sayre (1983), p. 161.

¹³⁶ As Sayre notes (1983, p. 292) the sense of "aei" here is ambiguous, involving the possibilities i) that Socrates may be speaking of forms, conceived as eternal existents, exclusively of sensible objects; that ii) that he may be

[*peras de kai apeirian en autois zumphuton echonton*]. Since this is the structure of things, we have to assume that there is in each case always one form for every one of them, and we must search for it, as we will indeed find it there. And once we have grasped it, we must look for two, as the case would have it, or if not, for three or some other number. For we must not grant the form of the unlimited to the plurality before we know the exact number of every plurality that lies between the unlimited and the one. Only then is it permitted to release each kind of unity into the unlimited and let it go.¹³⁷

On Sayre's reading, the passage is meant to formulate a methodological response to the question of how the kind of unity (*monadas*) that a form is can characterize indefinitely many changing particulars, without thereby becoming dispersed among them and losing its unity. The problem is a specification of the more general question of how the properties and characteristics of individuals are thinkable at all, given that they are subject to ceaseless change in time. Thus specified, the problem does not simply involve the unity of forms as such, over against sensible beings thought as completely undifferentiated or irreducibly multiple; rather, since it is also the question of how sensible things are themselves thinkable as enduring unities despite the unlimitedness of their possible change, its solution involves a unified accounting for the unity of both. Since sensory objects would, if (somehow) deprived of the relationship to Forms that allow them to be thought as distinct individuals having definite characteristics, also have no definite character and in this sense be indistinguishable from the *apeiron*, the problem is that of characterizing how determinate forms are themselves defined and gain application to the changing particulars.¹³⁸ The elements of a solution to this are to be found, Sayre suggests, in the *Philebus*' development of cases in which a number of specific characteristics are distinguished out of a continuum of possible variation, such as the identification of particular letters from the continuum of vocables, or the identification of discrete musical notes from the continuum of sound.¹³⁹ In this way, a particular discrete number of intermediate forms are introduced between the general and continuous form (for instance sound itself) and the specific instances, for which the intermediate forms then serve as measures.¹⁴⁰

As Sayre suggests, essentially here following Becker and Lautman, the methodology may be considered a further development of the method of the collection or division (or synthesis and diaeresis) proposed in the *Statesman* and the *Sophist*. As is suggested there, the key methodological idea is that the definition of a thing begins by collecting a number of instances of the kind to be defined with a view to discerning the general form they have in common, and then that form, once found, is further articulated or qualified by a repeated *diaeresis* or division of its several components, until a unique set of specific

speaking of what are said to exist "from time to time", and thus of sensible objects exclusively of forms; or iii) that both are intended. Sayre prefers the third alternative, since Plato often uses the formulation "there is such a thing as..." even in cases not specifically relating to forms, although there are also many precedents in Plato for the discussion of forms as causes.

¹³⁷ *Philebus*, 16c-e.

¹³⁸ Sayre (1983), p. 124.

¹³⁹ Sayre (1983), p. 126; *Philebus* 17a-e.

¹⁴⁰ Sayre (1983), pp. 125-26.

characteristics is identified that distinguish the particular kind of thing in question from others similar to it. As Sayre notes, however, the major and glaring difference between the description of the “god-given” method in the *Philebus* and the descriptions of the dialectician’s art in the *Sophist* and the *Statesman* is that the latter two involve no mention of the *apeiron* or of the need to distinguish among indefinitely many single things or to articulate what is in itself a continuum having the character of the “unlimited” in the sense of indefiniteness. Sayre sees the account given in the *Philebus* as responding to a problem about unity and the *apeiron* – both in the sense of the “indefinitely many” and that of the indefinitely continuous – that is already posed in the *Parmenides* (157b-158b). The idea of a unified collection of individual members, or a whole composed of parts, involves both that there is a sense of unity characteristic of the collection as a whole and that there is a sense of unity characteristic of each member as a unique individual; unity in both senses must be imposed on what is in itself non-unified in order to produce the determinate structure of whole and part.¹⁴¹ The possibility of identifying an individual as part of such a collection must thus result from the combination of a principle of Unity, in both senses, with a contrasting principle of the indefinitely many or multitudinous, what Plato calls in the *Parmenides* the *apeiron plethos* and which, Sayre suggests, may also be identifiable with the (later) mentions of the “indefinite dyad” (*aoristos duas*) or the “Great and the Small” of which Aristotle speaks.¹⁴²

The idea of a structural basis of the unity and determinacy of individuals in the combination of the unlimited dyad with unity is also underwritten by mathematical developments of Plato’s own time, of which he may well have been aware. In particular, Sayre suggests that in developing the idea of a generation of determinate measures from the principles of the unlimited and unity (or limit) in the *Parmenides* and the *Philebus*, Plato may have in mind also a general method of identifying arbitrarily rational or irrational magnitudes which is analogous to or actually derived from a method developed by Eudoxos and later applied in book V of Euclid’s *Elements*, where Eudoxos is said to have been “Plato’s teacher.”¹⁴³ The method is essentially one of approximating an (indifferently) rational or irrational magnitude by the continued development of series of fractions. Though it is likely that the original presentation of the method was in a geometric rather than arithmetic form, it is also quite possible, Sayre argues, that some version of its arithmetic development was also known to the mathematicians of Plato’s time. At that time, it would have been seen as a powerful tool of classification and comprehension in the face of the problematic discovery of irrational magnitudes; and it is clearly significant in connection with this that the main interlocutor of the *Sophist* and the *Theaetetus* is the mathematician Theaetetus, who historically contributed to the initial project of classifying irrational magnitudes and thus to the background of Euclid’s book V. Sayre further notes that Dedekind himself, in discussing his own method for defining arbitrary real numbers as “cuts” in the rationals, cites Eudoxos’s method as a direct anticipation of it.¹⁴⁴ If this mathematical methodology is indeed something that Plato has, more or less explicitly, in mind with his account of the production of determinate number as well as the “measure” of fixed quantities along continua, then it yields a direct

¹⁴¹ Sayre (1983), p. 64.

¹⁴² Sayre (1983), pp. 66-68.

¹⁴³ Sayre (1983), p. 69.

¹⁴⁴ Sayre (1983), p. 74.

mathematical basis for the suggestion of the primacy of the principles of the limit and the unlimited in producing both forms and sensory individuals with determinately thinkable properties. And – as was undoubtedly important to Plato – if the account is indeed mathematically based in Eudoxos’s method, it holds up generally even in the face of the challenge to rational thought that is *prima facie* involved in the existence of the incommensurable.

As Sayre notes, there is good evidence that these ideas about measure and number are intimately linked in Plato’s thought with questions about time and becoming.¹⁴⁵ The general problem of the determination of fixed points or measures within open continua gains its relevance from the consideration (which Plato may have developed, according to Aristotle’s testimony, from Heraclitus) that sensory objects are generally subject to flux and change, and it is thus not evident how they can be thought as having determinate properties at all. Within the general problem thereby posed of the relationship of generation and becoming to being in itself as thinkable, the problem of the structure of time itself takes on a particular significance, and (as we have already seen in relation to Aristotle) the question of the relation of continuity and discontinuity involved in the possibility of its being measured at determinate instants becomes particularly urgent. At *Parmenides* 156c-157b, after discussing the apparent paradox that the One, if it partakes of time, must be simultaneously becoming older and younger than itself at all times, Parmenides introduces the problem that the One, in going from being in motion to being at rest, must apparently pass through an instant at which it is neither in motion nor in rest; but there can be no such time. Thus, the “queer thing” that the instant [*to exaiphnes*] is seems to “lurk between motion and rest” and exist in paradoxical fashion between the two opposed states which something is in before and after it.¹⁴⁶ By the same argument:

“...Whenever the one changes from being to ceasing-to-be or from not-being to coming-to-be [*ek tou me einai eis to gignesthai*], isn’t it then between certain states of motion and rest [*metaxu tinon tote gignetai kineseon te kai staseon*]? And then it neither is nor is not, and neither comes to be nor ceases to be?” -- “It seems so, at any rate.” -- “Indeed, according to the same argument, when it goes from one to many and from many to one, it is neither one nor many, and neither separates nor combines. And when it goes from like to unlike and from unlike to like, it is neither like nor unlike, nor is it being made like or unlike. And when it goes from small to large and to equal and vice versa, it is neither small nor large nor equal; nor would it be increasing or decreasing or being made equal.” -- It seems not.¹⁴⁷

The argument is, as Sayre notes, general, applying not only to “the one” but to *any* particular thing, considered as a unity, as well as to any change that involves going from being in a determinate state to not being in that state.¹⁴⁸ If any such change is considered as continuous, there will necessarily be a temporal moment at which the thing is neither in the state nor not in it. Thus considered, the instant is

¹⁴⁵ Sayre (1983), p. 73.

¹⁴⁶ *Parmenides* 156d.

¹⁴⁷ *Parmenides* 157a-b.

¹⁴⁸ Sayre (1983), p. 72.

something with a paradoxical nature (*phusis atopos*) which seems itself to occupy “no time at all”. (*en chrono oudeni ousa*).¹⁴⁹

The paradox of the instant that is here demonstrated is none other than one of the several aspects of the paradoxical nature of the “now” as a *part* of time that, as we have seen above, Aristotle points out in the *Physics*. As we saw in section 1, above, Aristotle is able to resolve or foreclose these paradoxes only insofar as he can treat the “now” not as an actual part of time but only as a *marked* limit, to be defined in the actual measurement of a span but not as a really existing part of the continuity of a continuous motion (or temporal span) prior to the measurement.

However, with this, we are now in a position to see in Plato’s late view of the dialectic the basis for a conception of the relationship of the infinite to time that is quite opposed to Aristotle’s own. Here, in particular, and as we have seen, as well, in relation to Lautman’s reconstruction of the “dialectical” conception of ideal genesis, the kind of determinacy that number in itself has is not conceived as prior to the measurement of continuous time, but rather as determined *in the same way and by the same principles* that make possible the measurement of sensory objects themselves – namely, that is, ultimately by the combination of the principles of the *apeiron* (or indefinite dyad) and unity or the one. Thus, as Sayre underscores, on the solution suggested ultimately by the *Philebus*, “...whereas sensible objects are composed of Forms and the Unlimited, Forms themselves are composed from the same Unlimited in combination with the principle of Limit,” and thus “Forms and objects are ... ontologically homogenous” in standing (along with numbers as well) under the unified *temporal* condition of being jointly *secondary* to the overarching principles of the unlimited and the limit themselves.¹⁵⁰ Measured time is thus, here, not the *numbered* number (or the counted number), but is rather (in terms of the generative structure of its constitution) simply number, and is thereby in an original relationship with the *apeiron* and the *peras* as such. The problems of the determination (and hence the possible givenness) of time are thus not conceived as distinct from the general problems of the generation of numbers and forms, and both maintain, in the theory of their ideal genesis, an irreducible and necessarily paradoxical temporal referent. As a result, the originally paradoxical character of the *apeiron*, both in relation to the cosmological totality of time as the *aei* and to its locally continuous character, is here allowed to maintain itself to a certain extent and is preserved in the dialectical relationships that connect it to the other organizing principle of the One or unity, rather than being foreclosed or deferred, as in Aristotle’s account.

In the context of the broader question of the implications of the late Plato’s thinking about time, number and the infinite for the deconstructive interpretation of the history of metaphysics, what is most significant in this account – as, also, in the suggestion of a Platonic “ideal genesis” that Becker and Lautman both develop -- is thus the implication of a *unified* mathematical/temporal condition for *both* the genesis of the ideal *and* the ascertainable properties and identities of sensory particulars. With this, there is actually suggested in Plato’s text, or at any rate legible there, the underlying structure of a

¹⁴⁹ Sayre (1983), p. 72; *Parmenides* 156e1.

¹⁵⁰ Sayre (1983), pp. 14-15.

temporality that applies equally and indifferently to the ideal *and* the sensible, to the thinkable *and* to the sensory as such. If brought out and made explicit, this suggestion suffices to overcome the duality in the thinking of time which defines the temporality of the “metaphysics of presence” itself: that is, the duality of the time of thought as the eternal and unchanging, and the time of experience as that of change and constant flux. This is the duality of the sensory and the intelligible that, as we have seen, repeatedly conditions the thinking of time and finitude in the tradition after Plato, and reaches a kind of culmination in Kant’s picture of the distinction between the faculties of the sensibility and the understanding. However, if this duality is characteristic of the metaphysical tradition inaugurated by Plato as such, grounds for its overcoming are already thus given, even in explicit terms, by the late Plato himself when he repeatedly inscribes the suggestion of the necessary conceivability of temporal becoming, the irreducibility of temporal paradox, and the inherence of the *apeiron* in the sensible *as well as* the intelligible as such.

But if the conditions for this overcoming can indeed be found in a more rigorous and uncompromising development of the demand already made by the Eleatic Visitor of the *Sophist* in re-introducing the problematic of time and being as such -- namely that motion, change and becoming must be included at a basic level in the thought of “what is” -- this is nevertheless not the way the suggestion is in fact developed in the argument of the *Sophist* itself. Here, even if the “official” account given by the Visitor involves a logical/dynamic capability of forms to “mix” with one another that may perhaps be read in temporal terms, the ultimate distinction of the temporality of the ideal from that of the sensible is nevertheless maintained in the threefold separation of the properties and relations of things, the logical or psychological structure of the judgment or proposition, and the internal relations of the forms themselves. In particular, as we have seen (chapter 1 above), the solution in terms of the *koinonia* of limited mixing between types presupposes the *simultaneously* logical, ontological, and psychological parallel givenness of a structure that it itself cannot ultimately explain. The *simultaneity* of the orders in which the properties of beings *and* their possible thinking -- *including* the thought of their non-being -- take place is here crucial, and its assumption (as we have seen in connection, also, with Aristotle), amounts to the assumption of a logical-ontic construal of thinkable being as correspondence in the temporal form of the present as such. It is also to be noted here that nothing in the Visitor’s official solution even so much as responds to the problems of the relationship of continuity and discontinuity, such as they are involved in the form of the moment or “now”, as Plato’s later development of the method in terms of the *apeiron* as the indistinct at least attempts to do. The Visitor’s account of the co-existence of change and being, as well as his account of non-being and falsehood, must then be seen as essentially presupposing this ambiguously simultaneous logical, ontological, and psychological *koinonia* as a simply given ontic structure of co-presence, without actually penetrating to the deeper ontological ground of *its* possible givenness. This deeper ground must be the underlying structure of given time, as it is articulated and undermined in the constitutive dynamics linking the ideas of unity, number, and the infinite.¹⁵¹

¹⁵¹ In his remarkable study *Greek Mathematical Thought and the Origin of Algebra*, (Klein 1936), Jacob Klein places Plato’s conception of number in the context of the broader Greek *arithmos* concept as developed in different but related ways by the Pythagoreans prior to Plato and Aristotle and certain neo-Platonists after him. On the basis of

As we have seen (chapter 4), it is only this failure to pose and pursue the ultimately ontological (or, metalogical) questions here that allows the Visitor to portray non-being and the possibility of illusion in general as the result of the limited “mixing” of difference with other *eide* or *gene*, thus grounding it in what must then seem to be a logically *regulated* structure of combination. From the perspective of the later development of the specific problematic structure of the *apeiron* (which is, however, already fully visible in relation to the paradoxes of the one and the others in the *Parmenides*), this is visibly an attempt to limit or modify the capacity of difference to subvert and transform fixed identities, a capacity which is only fully brought out in the specifically “unlimited” structure of the *aoristos duas* itself. In chapter 4, above, we saw reason to suspect, on the basis of the development of the problems of the original structure of negation, non-being, and contradiction, that the specific structure of non-being is ultimately not to be referred to difference as a form or type, but rather to a prior differentiation that is anterior to all given beings and insists on the level of the possible givenness of the whole. Insisting in this way, it communicates irreducibly with the constitutive ideas of finitude and the infinite as well. From this perspective, that neither the *aoristos duas* nor unity are, in Plato’s most developed thought, ideas, but rather superior principles of the genesis of ideas *and* sensory objects, both in their being *and* their becoming, means that the dialectic of the determination of the being of beings is here referred, finally, not to beings but to the superior principles that are, in governing their possible disclosure, also governing with respect to the givenness of numbers as such. But they do not do so without *also* witnessing the insistence of an original structure of paradox at the metalogical/ontological basis of this co-givenness itself, which is clarified and confirmed in our time by the train of implications following from Cantor’s radical development of the constitutive ideas of the one, many, limit and unlimited.

this structure, Klein argues, Plato is able, according to Klein, to perform a kind of repetition of the Pythagorean attempt at ordering all beings according to number, this time “within the realm of the ideas themselves.” (p. 8). This conception of numbers, which finally renders them basically “separate” from the objects of sense perception, is then attacked by Aristotle (in articulating a series of criticisms which Klein finds basically convincing) as actually possible only on the basis of a prior abstractive separation in thought. As Klein presents it, the Platonic development of the concept of number in the late dialogues thus responds to the deep problems of the *methexis* or “participation,” whereby it leads to the logical/ontological *koinon* of the *Sophist* which attempts, according to Klein, to solve “the problem of relation of an idea of a higher order to the ideas under it, of a ‘genus’ to its ‘species’,” by means of the discovery of a *different* kind of *koinon* characteristic of the *arithmos* as such. (p. 80)

While it is certainly possible to see the structure of the “great types” and the methodology of synthesis and diaeresis on which their discernment is based, in the *Sophist*, as “on the way” to a taxonomy of species and genera of roughly an Aristotelian kind, it is in fact questionable both whether the late Plato sees in the *arithmos* concept, as Klein maintains, a “different” kind of *koinonia* suitable for the relation and combination of ideas rather than simply the “many over one” structure of ideas themselves, and, more basically, whether the structure of number itself, in view of its inherent relation to the structure of the *apeiron*, ultimately can be seen as such a (simple and unified) *koinonia* at all. In particular, in view of the deeper underlying structure that appears to be at the basis of number itself for Plato, it is worth asking whether a general and total structure of categories can indeed be founded in this way without involving or invoking, at the same time, an irreducible structure of paradox of which Plato is (more or less) aware, and which subsequently characterizes the structure of generality involved in the application of any logical structure of unification at all to a total world of beings in time.

If the Visitor's attempted solution to the problems of the thinkability of becoming, change, and non-being in the *Sophist* in accordance with the method of synthesis and diaeresis invoked there can thus be considered only, at best, partially successful, does Plato's apparent later further development of this structure in terms of the *apeiron* and unity ultimately succeed in solving these problems in a complete and consistent way? In fact, it does not. As we have already seen, the metalogical (or ontological) problematic can here do no better than point to the originally *paradoxical* situation of the dialectic that links being and becoming, a paradoxical structure that is unfolded with the constitutive paradoxes of totality, reflexivity, givenness and time themselves. That Plato is eminently aware of these paradoxes is shown by their elaborate development in the *Parmenides*, and if he is ultimately thereby moved to refer to the more basic structure of the *apeiron* and the *one* in their problematic relation and to place this relation at the basis of the very possibility of the givenness of forms and of objects, he does not on this basis resolve these original problems themselves but rather only contributes to demonstrating their underlying structure. Even given all that Plato says, or what we can infer or guess from what he is reported to have said, about the role of the two principles of the unlimited dyad and the one in giving rise to numbers, forms, and the determinate nature of things in temporal flux, it remains possible to pose the paradox of the thinkable being of the one as such, in terms of which it will always invoke "one more," unto the infinite, and the related paradox of the unlimited possibility of differentiation which will never settle upon a determinate identity for a singular something until it can be subject to an infinite *complete* process of maximal differentiation. Above all, there remains the originally paradoxical character of the presence of the instant, which seems to take place in no time at all and to be capable of having no determinate character, but rather to be in itself the medium of the inherence of all contradictions, of the contradictory as such.

The "reappearing" Socrates of the *Philebus* presents the method that he recommends there in full and apparent awareness of these structural paradoxes, and does not so much suggest that the method itself can resolve them completely and finally as that it is itself structurally prescribed by them. The "god-given" method is, in any case, appropriate as a response to the more original ontological situation "passed down" from ancients who are themselves situated "closer" to the gods, and the basis for its specific availability as a *techne* is attributed mythologically or metaphorically (as also in the *Phaedrus*) to the problematic methodological gift of the god Theuth to men in granting the original possibility of letters and writing. If the dialectical method is thus presented as any kind of solution to the constitutive problems of totality, infinity, and temporal becoming, these are thus presented as ontologically given problems from which, literally, 'only a god can save us.' It remains possible, before or beyond this mythological, theological, or onto-theological reference and whatever it might be thought to guarantee in Plato's text, to witness there the insistence of the underlying problematic dynamics of paradox that are themselves unfolded again in contemporary investigations into the metalogical structure of being and time.

According to this metalogical structure as I have tried to suggest it here, the paradoxes of the infinite inhere in the structure of given time in two senses: both cosmologically, in relation to time as a whole, and punctually, in relation to the structure of the instant or "now" that is always becoming-other and always destroying itself. If we can indeed see in Plato's text an original development of these problems,

one which is, as I have suggested, subsequently covered up and put out of play by the Aristotelian conception of the *dunami on* which will regulate thought about the infinite up until Cantor, it is nevertheless possible, on the basis of contemporary metalogical as well as ontological investigations, to bring them out and clarify them today in a new and different light. Since such a clarification of the underlying problematic situation *also* has the effect of exposing to questioning, in its light, the original form in which the givenness of time is thought in the Western tradition, it also relates in a determinate way to the articulate closure of the metaphysical epoch of presence that Heidegger announces. It here becomes possible, in particular, to think the original problematic structure of given time on the basis of a dynamic of ideas that does not any longer presuppose the givenness of time in the privileged form of a (simultaneous) present, or at any rate provides basic terms for deconstructing and displacing this privilege on the basis of a more structurally basic thinking of the form of presence itself. That such a thinking becomes possible at a certain determined moment is one of the implications of what Heidegger calls *Ereignis*, and the specific historical and also metalogical conditions that make it possible *also* can suggest forms and means for a thinking of being and time that is no longer constrained within the presumptive structures of ontotheology as grounding and grounded from below and above. We turn to the more detailed consideration of the structure of this possible thinking, and what (in particular) it implies about the *contemporary* ontological situation, in the next chapter.