Why is Time in Aristotle both Continuous and Discontinuous?

Book IV of Aristotle's *Physics* presents two definitions of time: time as a number of motion according to the 'before' and 'after' (cf. 219b1-2) and time as a continuum measuring continuous motion (cf. 219a10-14). The *Metaphysics* (Δ, 1020a9-11) defines a number as a discontinuous plurality, composed of indivisible units. As such, time is a discontinuous plurality of indivisible instants or nows. On the other hand, a continuum is an interval, whose parts are themselves divisible intervals. Book VI of the *Physics* asserts: "I call 'continuous' that which is divisible into [parts that are] always divisible" (232b24-25). Therefore, the parts of a continuous time are infinitely divisible intervals. The question then to be answered is the following. How is it possible for a continuous time, exclusively composed of infinitely divisible intervals, to be combined, without contradiction, with a discontinuous time, exclusively composed of indivisible instants or nows?

Coope's *Time for Aristotle* (2005) suggests an all-new interpretation, which answers the conundrum by supposing that time is a special kind of number, i.e. a number that has the particularity to be continuous (p. 88-9). She speaks of an extended sense of number, and adds in a footnote: "In this sense, of course, a line too is a kind of number" (p. 94). Unfortunately, this interpretation is too bold. We first observe that neither the *Physics* nor the *Metaphysics* holds the view that a number may be continuous in some special cases. The only textual reference, as suggested by Coope (pp. 92-3), is located at 220a27-32. Here Aristotle distinguishes a number in an absolute sense, i.e. a number *simpliciter*, from a particular number, i.e. a plurality of something. For instance, five horses is interpreted in two ways: while 'that by which we number' is the number *simpliciter* five, 'that which is numbered' is the counted plurality of five horses. Hence, when Aristotle says that time is 'that which is numbered' and *not* 'that by which we number' (cf. 219b5-8, 220b8-9), he understands time, not as a number *simpliciter*, but as a plurality of instants or nows. Yet, Coope's interpretation (p. 90) suggests that a plurality of something is 'that by which we number', which makes little sense of Aristotle's distinction, since this would mean that the plurality of five horses is the same thing as the number *simpliciter* five; and one may wonder how to understand 'that which is numbered', if it is no longer regarded as a plurality of something.

The passage 220a27-32 explains how time can be regarded as both a number and a continuum; but *this* does not mean that a number *is* a continuum. Let us examine the argument. We are told that the smallest number *simpliciter* is two¸ namely: 'that by which we number' must at least count two things. A plurality of something (i.e. 'that which is numbered') has also a smallest number, but a caveat is required. While a plurality always has a smallest number, the thing of which there is a plurality has no smallest number, since the thing itself is continuous in magnitude; that is, the thing in magnitude is devoid of indivisible parts. Aristotle mentions two instances. Suppose a plurality of lines: its smallest number is two lines. Yet, no smallest number pertains to the line itself, since a line is continuous in magnitude, i.e. its parts are infinitely divisible lines. Thus, a number is *not* a continuum: while a plurality of lines is a number of indivisible unit lengths, the line itself is a continuum with no indivisible parts. The second instance is about time. Time as a number is a plurality of indivisible nows, whose smallest number is two nows; but time itself is continuous in magnitude, and has no smallest number. No parts of a continuous time are countable: its parts are infinitely divisible intervals, and *not* indivisible nows.

The passage 220a27-32 aims to underline the dual aspects of time, according to which time is *both* a discontinuous plurality of indivisible nows *and* a continuous interval of infinitely divisible parts. Just after 220a27-32, Aristotle concludes: "It is also evident that it [time] is not said to be fast and slow, but to be much and little, and long and short. For, as a continuum, it is long and short, and as a number, it is much and little." (220b1-3). It is an epistemic distinction. Time as a number is a plurality of nows counted by the soul: it is a *plural* quantity, which is nothing but little or much. By contrast, time as a continuum is a *single* quantity with no plurality at stake: the absence of indivisible parts indicates that there is no number for the soul to count. In other words, the continuous interval of time, measuring continuous motion, is nothing but long or short. To grant continuity to a number would mean that a number is long or short in the same way that a continuum is much or little, and we would end up with absurd expressions from an Aristotelian standpoint, such as a 'plural continuum' (with many distinct parts) and a 'singular plurality' (with no distinct parts). On the contrary, if we claim that time is *both* a continuum *and* a number, we merely say that time has two contrasting meanings, such that time as a continuum (i.e. a single interval of infinitely divisible intervals) can *only* be long or short, and time as a number (i.e. a plurality of indivisible nows) can *only* be much or little. In so far as a temporal number does not mirror a temporal continuum, we may conclude that these dual aspects are irreducible to each other.