against any particular thing (for the whole period of time is divisible), so that in one part of it after another it will be true to say that the thing, itself and its parts, occupies the same space. If this is not so and the aforesaid proposition is true only at a single now, then the thing will be over against a particular thing not for any period of time but only at a moment that limits the time. It is true that at any now it is always over against something; but it is not at rest; for at a now it is not possible for anything to be either in motion or at rest. So while it is true to say that that which is in motion is at a now not in motion and is opposite some particular thing, it cannot in a period of time be at rest over against anything; for that would involve the conclusion that that which is in locomotion is at rest.

239b5-239b9

§ 9 · Zeno's reasoning, however, is fallacious, when he says that if everything when it occupies an equal space is at rest, and if that which is in locomotion is always in a now, the flying arrow is therefore motionless. This is false; for time is not composed of indivisible nows any more than any other magnitude is composed of indivisibles.

239b10-239b13

Zeno 's arguments about motion, which cause so much trouble to those who try to answer them, are four in number. The first asserts the non-existence of motion on the ground that that which is in locomotion must arrive at the half-way stage before it arrives at the goal. This we have discussed above.[43]

239b14-239b29

The second is the so-called Achilles, and it amounts to this, that in a race the quickest runner can never overtake the slowest, since the pursuer must first reach the point whence the pursued started, so that the slower must always hold a lead. This argument is the same in principle as that which depends on bisection, though it differs from it in that the spaces with which we have successively to deal are not divided into halves. The result of the argument is that the slower is not overtaken; but it proceeds along the same lines as the bisection-argument (for in both a division of the space in a certain way leads to the result that the goal is not reached, though the Achilles goes further in that it affirms that even the runner most famed for his speed must fail in his pursuit of the slowest), so that the solution too must be the same. And the claim that that which holds a lead is never overtaken is false: it is not overtaken while it holds a lead; but it is overtaken nevertheless if it is granted that it traverses the finite distance. These then are two of his arguments.

239b30-239b32

The third is that already given above, to the effect that the flying arrow is at rest, which result follows from the assumption that time is composed of moments: if this assumption is not granted, the conclusion will not follow.

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[43]See 233a21ff.

The fourth argument is that concerning equal bodies which move alongside   239b33-240a15
equal bodies in the stadium from opposite directions—the ones from the end of
the stadium, the others from the middle—at equal speeds, in which he thinks it
follows that half the time is equal to its double. The fallacy consists in requiring
that a body travelling at an equal speed travels for an equal time past a moving
body and a body of the same size at rest. That is false. E.g. let the stationary
equal bodies be AA; let BB be those starting from the middle of the A's[44] (equal
in number and in magnitude to them); and let CC be those starting from the end
(equal in number and magnitude to them, and equal in speed to the B's). Now it
follows that the first B and the first C are at the end at the same time, as they are
moving past one another. And it follows that the C has passed all the A's[45] and the
B half; so that the time is half, for each of the two is alongside each for an equal
time. And at the same time it follows that the first B has passed all the C's. For at
the same time the first B and the first C will be at opposite ends,* being an equal
time alongside each of the B's as alongside each of the A's, as he says,*[46] because
both are an equal time alongside the A's. That is the argument, and it rests on the
stated falsity.

Nor in reference to contradictory change shall we find anything impossible—   240a16-240a29
e.g. if it is argued that if a thing is changing from not-white to white, and is in
neither condition, then it will be neither white nor not-white; for the fact that it
is not *wholly* in either condition will not preclude us from calling it white or not-
white. We call a thing white or not-white not because it is wholly either one or
the other, but because most of its parts or the most essential parts of it are so: not
being in a certain condition is different from not being wholly in that condition.
So, too, in the case of being and not-being and all other conditions which stand in
a contradictory relation: while the changing thing must of necessity be in one of
the two opposites, it is never wholly in either.

Again, in the case of circles and spheres and everything that moves within   240a30-240b7
its own dimensions, it is argued that they will be at rest, on the ground that such
things, themselves and their parts, will occupy the same position for a period of
time, and that therefore they will be at once at rest and in motion. For, first, the
parts do not occupy the same place for any period of time; and secondly, the whole
also is always changing to a different position; for the circumference from A is not
the same as that from B or C or any other point except accidentally, as a musical

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[44]Reading *tou mesou ton A* (*tou mesou*, Ross).
[45]Reading *panta ta A* (*panta*, Ross).
[46]Ross excises the clause marked * . . . *.

man is the same as a man. Thus one is always changing into another, and the thing will never be at rest. And it is the same with the sphere and everything else which moves within its own dimensions.

§ 10 · That having been demonstrated, we next assert that that which is without parts cannot be in motion except accidentally, i.e. in so far as the body or the magnitude to which it belongs is in motion, just as that which is in a boat may be in motion in consequence of the locomotion of the boat, or a part may be in motion in virtue of the motion of the whole. (By 'that which is without parts' I mean that which is quantitatively indivisible.) For parts have different motions— those in virtue of themselves, and those in virtue of the motion of the whole. The distinction may be seen most clearly in the case of a sphere, in which the velocities of the parts near the centre and of those on the surface are different from one another and from that of the whole; this implies that there is not one motion. As we have said, then, that which is without parts can be in motion in the sense in which a man sitting in a boat is in motion when the boat is travelling, but it cannot be in motion of itself. For suppose that it is changing from AB to BC— either from one magnitude to another, or from one form to another, or from some state to its contradictory—and let D be the primary time in which it undergoes the change. Then in the time in which it is changing it must be either in AB or in BC or partly in one and partly in the other; for this, as we saw, is true of everything that is changing. Now it cannot be partly in each of the two; for then it would be divisible into parts. Nor again can it be in BC; for then it will have changed, whereas the assumption is that it is changing. It remains, then, that in the time in which it is changing, it is in AB. That being so, it will be at rest; for, as we saw, to be in the same condition for a period of time is to be at rest. So it is not possible for that which has no parts to be in motion or to change in any way; for only one condition could have made it possible for it to have motion, viz. that time should be composed of nows, in which case at any now it would have moved or changed, so that it would never be in motion, but would always have been moving. But this we have already shown to be impossible: time is not composed of nows, just as a line is not composed of points, and motion is not composed of movings; for this theory simply makes motion consist of indivisibles in exactly the same way as time is made to consist of nows or a length of points.

Again, it may be shown in the following way that there can be no motion of a point or of any other indivisible. That which is in motion can never traverse a space greater than itself without first traversing a space equal to or less than itself. That being so, it is evident that the point also must first traverse a space equal to or

less than itself. But since it is indivisible, it is impossible for it to traverse a lesser space first: so it will have to traverse a distance equal to itself. Thus the line will be composed of points; for the point, as it continually traverses a distance equal to itself, will be a measure of the whole line. But since this is impossible, it is likewise impossible for the indivisible to be in motion.

Again, since motion is always in time and never in a now, and all time is divisible, for everything that is in motion there must be a time less than that in which it traverses a distance as great as itself. For that in which it is in motion will be a time, because all motion is in time; and all time has been shown above to be divisible. Therefore, if a point is in motion, there must be a time less than that in which it has itself traversed its own length. But this is impossible; for in less time it must traverse less distance, and thus the indivisible will be divisible into something less, just as the time is so divisible; for that which is without parts and indivisible could be in motion only if it were possible to move in an indivisible now; for in the two questions—that of motion in a now and that of motion of something indivisible—the same principle is involved.

241a15-241a25

No change is infinite; for every change, whether between contradictories or between contraries, is a change from something to something. Thus in contradictory changes the positive or the negative is the limit, e.g. being is the limit of coming to be and not-being is the limit of ceasing to be; and in contrary changes the particular contraries are the limits, since these are the extreme points of the change, and consequently of every alteration; for alteration is always dependent upon some contraries. Similarly for increase and decrease: the limit of increase is to be found in the complete magnitude proper to the peculiar nature of the thing, while the limit of decrease is the loss of such magnitude. Locomotion, it is true, we cannot show to be finite in this way, since it is not always between contraries. But since that which cannot be cut (in the sense that it is not possible that it should be cut, the term 'cannot' being used in several ways)—since it is not possible that that which in this sense cannot be cut should be being cut, and generally that that which cannot come to be should be coming to be, it follows that it is not possible that that which cannot have changed should be changing to that to which it cannot have changed. If, then, that which is in locomotion is to be changing to something, it must be capable of having changed. Consequently its motion is not infinite, and it will not be in locomotion over an infinite distance; for it cannot have traversed such a distance.

241a26-241b11

It is evident, then, that a change cannot be infinite in the sense that it is not defined by limits. But it remains to be considered whether it is possible in the sense that one and the same change may be infinite in respect of the time which

241b12-241b32

it occupies. If it is not one change, it would seem that there is nothing to prevent its being infinite; e.g. if a locomotion be succeeded by an alteration and that by an increase and that again by a coming to be: in this way there may be motion for ever so far as the time is concerned; but it will not be one motion, because all these motions do not compose one. If it is to be one, no motion can be infinite in respect of the time that it occupies, with the single exception of rotatory locomotion.