Zeno’s Paradox: The Dichotomy

The Dichotomy is, as the reading from the Stanford Encyclopedia of Philosophy describes it, “The non-existence of motion on the ground that which is in locomotion must arrive at the half-way stage before it arrives at the goal.” One way to illustrate this paradox is to imagine a Bugatti Veyron super car speeding around a race track in order to pass the finish line. According to Zeno the Bugatti should not only never be able to complete the lap, but it should not be able to start moving at all. This is because in order for it to complete the lap, it would first need to go halfway around the track and before it could go halfway around the track it would need to go around a quarter of the track. This means that the Bugatti would have to go to an infinite number of midpoints in order to move any distance. This is the reason why Zeno believed it should not be possible for the car to complete a lap around the track. Since it is physically possible for a car to complete a full lap around a track there are flaws in Zeno’s logic. The Dichotomy relates to calculus because it is similar to the idea of limits. A limit infinitely approaches a specific value. Just like the car in the example of the paradox. The car approaches the finish line yet, according to Zeno, never reaches it. If you think about the paradox in terms of calculus it seems like it should make sense but the ideas of the paradox obviously don’t translate to the real world. One flaw in Zeno’s logic is that the object, in this case the Bugatti, will eventually stop. This must mean that it is not moving to an infinite number of midpoints. Another flaw is that Zeno completely forgets about time. In the case of the super car racing around the track the car is going at different speeds as it accelerates. So it takes a different amount of time to traverse the same amount of distance as the car is changing speeds. Another point is that an object that is constantly moving, because it’s constantly going to a midpoint, would have to move for an infinite amount of time, which is not possible. An object that is in motion will arrive at the various midpoints as Zeno describes, but it will eventually reach an ending point because as the object travels time will elapse. Since time is linear the object will have moved the distance during a specific amount of time and will eventually reached its destination.