

Chapter 4

Three Part Invention

I hope I didn't brain my damage – Homer Simpson

4.1 Abstract

Bach wrote fifteen three-part inventions. In this three-part Dialogue, the Tortoise and Achilles – the main fictional protagonists in the dialogues – are “invented” by Zeno (as in fact they were, to illustrate Zeno’s paradoxes of motion). Very short, it simply gives the flavor of the Dialogues to come. *GEB pp. viii*

4.2 Study Questions

1. To what Escher print does Achilles refer at the beginning of the dialogue (I mean, what does that print look like)?
2. What is a Möbius strip? To what print does Achilles refer?
3. What is the relationship between the hole in the flag and the Mbius strip? *As soon as the Tortoise introduces the term Capitalized Essences, capitalized terms seem to abound. What are their significance? Write down those whose significance you dont see immediately on your Open Mysteries page.*
4. Is Zeno the sixth patriarch or is he not? If he isn’t, then why does Achilles think he is?
5. What story is recreated in this dialogue?
6. In what ways is this dialogue self-referential?
7. Do you understand the crux of the paradox (*Achilles paradox*) that Zeno relates?
8. Are you familiar with the *Dichotomy Paradox* to which the Tortoise refers?
9. Is there any significance in positioning the Tortoise upwind of Achilles?
10. Use ordinary algebra to find how long it will take for Achilles to catch the Tortoise. Assume that Achilles runs with a speed of 1 rod per second, so that his position is given by:

$$A(t) = \text{position of Achilles over time} = 0 \text{ rods from start} + (1 \text{ rod/sec})(t \text{ sec})$$

Assume also that the Tortoise runs with a speed of $1/2$ rod per second and has a head start of 10 rods, so that his position is given by:

$$T(t) = \text{position of Tortoise over time} = 10 \text{ rods from start} + (1/2 \text{ rod/sec})(t \text{ sec})$$

Play around with different values for the speeds, then see if you can derive a formula for the time at which Achilles catches the Tortoise in terms of their running speed A (for Achilles) and T (for the Tortoise). The Tortoise always gets a 10 rod head start.

11. What (if anything) is wrong with Zeno's argument?
12. What is a "rod" anyway?