4. Language unbound

Someone once told me that there is no word in Chinese for “hill”. This puzzled me. How then, if you are a native Chinese speaker, can you refer to one? Would you have to just point, or ignore it? The answer is really quite simple and Chinese speakers have no trouble with hills. Just because there is no single word for something doesn't mean you can't refer to it using more than one word (Chinese has the same word for “mountain” as “hill”, and simply describes them as “big” and “small” respectively).

Thinking about this, it occurred to me that whenever we encounter something for which there is no word in our language, we simply describe it using more than one word. Over time, perhaps familiarity and repetition will reduce this description to a single word. This is one way that languages evolve. The point is that while it seems that languages are a fixed set of words, grammar, idioms, etc., in fact they are evolving. That is why there is no limit on their power to describe things.

Logic and mathematics are ways of representing things. While logic is the rules for converting propositions in general (which describe the relations between things), mathematics is the rules for converting a certain type (quantitative relations). A method of representing things is what we call a language, and therefore, logic and mathematics can be thought of as languages (I mentioned this in the *Commentary 2* with reference to the thoughts of Jacob Bonowski).

Because languages are living, evolving processes, it is always possible to find some way to describe anything using them. If we think of logic and mathematics as languages, it is not surprising that mathematicians have found ways to describe motion and change.

In Zeno's paradoxes we encounter absurdity. This happens when metaphorics conflict. Think of a metaphoric as a bundle of qualities. It is used when one (or more) of those qualities are shared. In absorbing the idea however, we tend to attribute the whole bundle, unless and until further description (other metaphorics) are used to disqualify particulars. With every idea however, the absorption of at least some extraneous qualities, that is to say, some “over-stretching”, is bound to happen.

The absurdity in Zeno's paradox of the flying arrow occurs because of the metaphoric bundle of *infinity*. When you look up into the sky at night you get the idea of infinity, your line of sight feels endless. When you deal with the mathematics of division you encounter indefinite division. It happens for example when you divide 1 by 3. The answer is 0.33 recurring. When we describe this sequence as “infinite”, we invoke the metaphoric bundle of *infinity*. The shared quality is endlessness, but the bundle contains other, extraneous qualities.

To grasp the idea of indefinite division I invite you to imagine you are the officer in charge of loading two boats. It is your responsibility to distribute their weights evenly. On first check you find that one boat is heavier, so you move some passengers from it to the other one. Then you find that the second boat is heavier, so you move some passengers back. Eventually you will get the difference between the two boats within the weight of a single passenger.

Being a zealous officer, you decide to ask the passenger to leave some of their luggage on one boat and get on the other one. This is going too far. If you then get the passenger to open their luggage so you can redistributing the things inside, you have crossed the line from too far to crazy. The lesson you ought to learn is this: depending on how accurately you measure the weights, you are never going to get the weight of the two boats exactly even. Think of this as *the elusive precision of division*.

When thinking of dividing 1 by 3, instead of using the metaphoric of *infinity*, use the metaphoric of *the elusive precision of division*. The former contains the extraneous quality of space, while the latter does not. When trying to understand Zeno's flying arrow from the metaphoric of *infinity* the extraneous quality of space implies distance and time, producing a sense of absurdity. Use the metaphoric of *the elusive precision of division* and no absurdity is felt.

Now think again of mathematics as a language. It is as if Zeno introduced things for which the language had no words, just like a “hill” to a native Chinese speaker. In the absence of a single word, two are used. When necessary a more elaborate description is used, which over time will no doubt be reduced. There is nothing in the least problematic about a language adapting and expanding to describe the things it encounters. Mathematics took a very long time, but found a way to deal with Zeno's paradoxes.

The important lessons here are these. Firstly, finding new physical phenomena makes new mathematical descriptions necessary. Because mathematics is a language to represent relations in the world, what happens in the world must always take priority. The Platonist mystification of mathematics allows you to ignore absurdities. This is possibly why mathematicians took so long to describe Zeno's paradoxes.

Secondly, the beauty of languages is the power of recombination. Everything from the Garden of Eden to Hogwarts has been created by language. Neither of these, nor much in-between, exist. Just because something can be described in a language does not mean it exists. The tendency to assume that things like multiple dimensions must exist because maths predicts it, is also the product of Platonic mystification.

To finish this commentary I'd like to say something about “essentialism”. To get there, it will help to reiterate the old story, starting with the Sophists of ancient Athens, who denied the possibility of truth. If reason can produce absurdity, they argued, then it is unreliable. If life is an open arena of multiple, personal truths, whoever asserts theirs most effectively is the winner. Socrates bristled. On the contrary he said, reason can find truth. He inspired followers like Plato, who set up the Academy for this noble cause.

Interrogating ideas to produce precise definitions enriches your understanding of words and the concepts they represent. This is the pearl of the Academy, often buried in its mystifications and “essentialism”. Herein is the problem, definitions are not essences. Not understanding this lead the Academicians to conclude that essences existed independently of the imperfect forms they actually encountered in the physical world.

Consider the example used in the pedagogic essay, a horse, what is its essence? Coming up with a definition isn't too difficult, it is a large, grazing mammal, for example. This definition however, does not cross my mind when I use the word or contemplate its essence. I know what a horse is because I've seen one. At some point in my life, before I could even speak or form any memories I can access today, I saw a horse. I touched its fine fur, felt its warmth, heard the sound of its breath and smelt it. I even sat on it, and know what it feels like to be carried by one.

All this raw experience is embedded and immovable in my mind. It is part of the bundle that can be referred to by the word “horse” and used as a metaphoric. I can combine this metaphoric with others to describe abstractions that are beyond my experience, think of the sea horse, horse-power, a vaulting horse, the horse-head nebula. If “essence” is to mean anything, it can only be the trace of raw experience that fills the metaphoric in my mind.

Plato and his Academy's mistake was to seek essences in definitions. Their inevitable failure allowed a new kind of Sophistry to bounce back in the various guises of Scepticism.

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