

verseny11

*"In nature there cannot be two or more substances with the same nature or attribute"*

(Spinoza, *Ethics*)

This proposition of Spinoza forms a crucial part of his metaphysical foundation of ethics, therefore we must first examine its context in Ethics.

Ethics is a major work of Spinoza, which attempts to construct an ethical framework "demonstrated in the manner of geometry", as its subtitle says, that is, consisting of theorems which are proved using basic axioms.

His first step is to prove the existence of a philosophical god, which then forms the basis of existence and ethics. To show that this god is indeed absolute, he needs to prove that there is nothing comparable to it. Spinoza uses the quoted statement to rule out the possible existence of multiple philosophical gods, philosophical universes, final causes or ethics. In the end, there is but one substance: god.

His path is:

1. He takes Aristotle's definition of substance to the extreme:

substance in his sense is an autonomous being, existing as its own cause

2. He shows that the definition of substance constrains the attributes of any substance to the extent so any two substances will have exactly the same attributes

3. He uses this proposition (which he proves) to show that there cannot be two substances

4. He uses a variant of Anselm's ontological argument to show that a substance must exist

5. Now he has exactly one substance, which must be the only absolute cause of everything else. He calls this god.

Spinoza proves all of his propositions carefully, as if he was proving a theorem of geometry. Indeed, the first book that emphasized the importance of proofs was Euclid's Elements, the foundation of classical geometry.

In this work, Euclid proposes a few axioms and also a few "common notions", and derives his statements from these. His axioms are mathematical statements concerning points, lines and angles, but his common notions are more philosophical, some of them concerning the concept of *identity*, with statements like

"if one thing is equal to another, and the other is equal to a third, then the first and the third are also equal"

If one wants to refute Spinoza's statements, he could well say that his definition of substance is so strict that there is no substance at all, and then point to a perceived error in his proof of the existence of at least one substance. The discussion of such a refutation would be out of place here.

Thus we are not really motivated to refute Spinoza's quoted statement. We should rather note what it brings to Spinoza's metaphysical framework: the concept of identity, through exclusion of a multitude of gods, causes and universes. Without this concept, Spinoza's system would become chaotic or even polytheistic. Thus, we are motivated to examine the concept and significance of identity, in philosophy, theology, and mathematics.

## Identity in philosophy

Identity is a defining concept of the individual. In Western philosophy, it is quite self-evident that I can define myself as whatever I feel identical with. Thus, self-reference can be distinguished from the usual object-subject relation. But without a rigorous foundation, this concept can be attacked, and is indeed attacked by postmodernist thinker and by Buddhist philosophy that denies the identity of the self.

### Identity in theology

Monotheistic religions are motivated to show that their God is the one true God. In the Jewish and Christian tradition, this is an easy once belief in God is established, because on one hand, God himself reveals that there are no other gods, so once one believes, he must believe what He says. On the other hand, if one does not accept revelation, but accepts an argument for the existence of an omnipotent God, it is easy to argue that there cannot be two omnipotent gods, because then one's omnipotence would constrain the other, which would contradict its omnipotence.

However, the Christian tradition has the Trinity, which, at first glance, seems to be violation of monotheism. (This is why Islamic scholars regard the Christians as having deviated from true monotheistic faith) Christian apologetics deals with this problem by saying that the rules of identity (including the common notion of Euclid I have quoted above) do not apply to God, because he stands above logic.

This paradox is the starting point of Christian mysticism. The concept of identity is also crucial in Hindu philosophy. Many Indian philosophical schools use the concept of *advaita* (Sanskrit for non-duality), when referring to existence.

This concept takes identity to the extreme, going beyond Plato: there is one mode of existence, the spiritual. The material world is no more than illusion, and, more importantly, differences between two things or concepts are also imaginary. In this reality, everything is the same.

This results in a metaphysical setting like that of the Neoplatonists, with the One as the true good and existence and anything else its mere shadow. Of course, this is way of thinking closer to mysticism than to philosophy, but it would be unwise to ignore it.

## Identity in mathematics

Perhaps it is in mathematics where we can truly see the notion of identity "in action". Indeed, mathematics makes frequent use of this concept, but we don't get a single answer about what it really is. This is because, paradoxically, there is not one concept of identity in mathematics, but many. We all claim to understand what  $A=B$  means: we can just read it out as A equals B.

But we can formulate this same statement in other ways that have very few in common.

### 1. Identity as being One

This is more easily formulated in natural language: A and B are one. This refers to the fact that, is that when we take A, and we also take B, then together they are not more than they were individually: one. We can formulate it as  $|\{A,B\}|$  is the same as  $|\{A\}|$  and  $|\{B\}|$ , that is 1

This approach is used often, although mostly unwittingly, in mathematics. An example: if I have rolled a die seven times, then two rolls have had identical results. The proof is simple: if no two numbers were the same, then I have rolled seven distinct numbers. However, there are only six possible numbers I can roll with a die, so at least two numbers must have "collapsed" into one, that is, two were equal. This type of argument is called the pigeonhole principle (referring that seven pigeons can't fit into six pigeon holes), and is widely used in combinatorics despite its simplicity.

This approach, however is fundamentally related to counting, and to the concept of one (although it isn't always related to the arithmetical number one). Because of this, this is the monotheistic thinker's preferred mathematical idea of identity.

Indeed, this approach establishes identity of A and B by noting that there cannot be external interaction between the two, so A and B must be the same. This is exactly the method presented above to prove that there cannot be two omnipotent gods: their interaction would be absurd.

## 2. Identity as indiscernibility

This is the approach of 17th century philosopher and mathematician(!) Gottfried Leibniz, who introduced the twin theses of the indiscernibility of identicals and the identity of the indiscernibles.

According to these, A and B are identical if and only if any logical formula that is true for A is true for B and vice versa. Spinoza's proposition states, although in a less formalized way, the same.

As its formulation shows, this approach is invariably linked with mathematical logic and is accordingly used there frequently.

### 3. Identity as zero difference

The second idea is further advanced in mathematics by refining the criteria for indiscernibility by fixing a method used.

For example, if the selected method for discerning is counting, then six apples are indiscernible from six pears. We forget quality to examine quantity alone

With this approach to identity, we deliberately "forget" some information to see more clearly. For example, Euclid uses the concept of congruent triangles, that are, after forgetting their position and their orientation, are indistinguishable. There is also the concept of similar triangles, that are indistinguishable after forgetting their position, their orientation and their size. We can see that similarity and congruency are two criteria of identity for triangles, one being slightly stronger (that is, requiring more common properties) than the other. With both being valid mathematical concepts, we cannot say which is the more fundamental relation.

The properties that remain are collectively called the shape of the triangle. Thus, congruent triangles may be said to have identical shape. If A and B are numbers, we can rearrange  $A=B$  to  $A-B=0$ .

This means that whatever the difference between A and B, it is something our current criteria ignores. Algebra, the branch of mathematics that is said to deal with relationships between different structures mostly deals with the relationships between the concept of zero (that is, the inert, neutral, ignorable element) in those structures.

Then comes the question: is there something infinitely neutral, that is ignored by every possible criteria? The answer is the concept of Zero.

If we accept the concept of this Zero independently of mathematics, we will have another criteria of identity: A and B are identical if and only if their difference is zero. This Zero is exemplified by, but not always identical to the arithmetic zero. (As the One is exemplified by but not always identical to the arithmetic one)

Heidegger, in his lecture *What is Metaphysics?*, criticized modern science for not wanting to know nothing about nothing, that is, it defines Zero to be insignificant. From this perspective, this is a critique of Leibniz identity of indiscernibles, or Spinoza's quoted proposition. Heidegger would say that Spinoza's error was not wanting to know about the difference between his philosophical god and that god himself, and thus avoided the conflict that makes metaphysics really significant.

## Comparison

These approaches have their respective traditions: the first is supported by ancient religions, myths and philosophies, the second is supported by the Western tradition of reason, and the third one has a diverse history of interpretation.

The first approach cannot explain the origin of the One. This is why scholastic philosophy placed the One, along with Truth, Beauty and the Good, above the categories of Aristotle.

Thus using the concept of One to establish identity requires a firm belief, but from then, it can produce very intuitive results.

The second approach is based in an optimistic belief in human reason: things that cannot be settled by logical reasoning are in a way unimportant. The separation of this idea from the idea of the One can be traced from the Enlightenment (Leibniz, Kant and many others) through the Positivists of the nineteenth century, culminating in Wittgenstein's *Tractatus Logico-Philosophicus* final proposition 7.

If the difference between A and B cannot be captured by language, then we should remain silent about it, says Wittgenstein.

The third approach is like a bridge between the two. It can approximate the world of Parmenides by selecting a weak method of discernment, thus regarding any two objects indiscernible, and it can approximate the second approach by selecting the strongest possible method of discernment. Because of this very wide range of options, it may be accused of being relativist, or even nihilistic.

This is true in some sense, but on the other hand if we accept the third option, we will have the opportunity to simultaneously use more than one method, and even to see the connection between two different levels of discernment.

## Conclusion

With different notions of identity examined, we can reexamine Spinoza's proposition. We see that it more or less coincides with the second approach, but it is used only in an argument relating to Spinoza's pantheistic god, and as he states there are no more substances (in contrast to Aristotle, who posits many substances in the world), this argument is not used later in his *Ethics*. From this point on, as a pantheist, Spinoza is closer to the first approach (using an Absolute as a point to refer to) in ethical matters. And also, from the fact that Spinoza decided to write the book in as a series of logical proofs, we know that he held logic in high regard.

Thus, Spinoza used a synthesis of the three different approaches to identity. I think this is an example for all philosophers to follow.