THE PRINCIPLE OF NON-CONTRADICTION

THE PRINCIPLE

- For in no way may this prevail, that things that are not, are. --Parmenides
- The same thing cannot at the same time and in the same respect both be and not be. --Aristotle

DISCUSSION

- This is the most certain of all principles. For if it is impossible that contrary attributes should belong at the same time to the same subject, for the same man at the same time to believe the same thing to be and not to be; all who are carrying out a (logical) argument regard this as the starting-point (arche) even for reasoning. (Aristotle)

PRINCIPLE REJECTED BY HERACLITUS AND PROTAGORAS

But how do we know the principle is true? Indeed, both Parmenides and Aristotle regard it as necessarily true--true in "all possible worlds". Heraclitus and Protagoras think that it is not necessarily true. For Heraclitus says that "We are and we are not" and Protagoras says that truth is relative to the person, so that what is true for me, may be false for you.

DISTINCTION BETWEEN THE PNC AS A LOGICAL AND AS A METAPHYSICAL PRINCIPLE

The PNC can be understood both as a principle of reasoning, in relation to statements, or as a principle of reality, in relation to things. As the latter, it says, e.g., it is logically impossible for both "Socrates is in Athens" and "Socrates is not in Athens (e.g. he is in Larissa)" to be true. But as a metaphysical principle, it states that Socrates cannot be in both places at the same time. This is saying reality conforms to the structure of logical reason.

DIALECTICAL ARGUMENT FOR THE PRINCIPLE

Aristotle acknowledges that it is not possible to prove the principle--since the argument which would establish it would have to rely on it. But he thinks that as soon as his opponent asserts any doctrine as true, he can refute him.

- "We can demonstrate negatively that this view is impossible, if our opponent will only say something; and if he says nothing, it is absurd to reason. For such a man is no better than a vegetable."

Suppose Heraclitus says that his doctrine is true. What is argument Aristotle and Parmenides would make against him?

ARGUMENT AGAINST THE PRINCIPLE

Suppose the determined 'agnostic' concerning the PNC gives this as an answer:

- "I do not assert the PNC is false; only that it is not certain that it is true. I do not make the claim that something can both be and not be true, I only say it cannot be known that it cannot both be and not be true (or real). One can be agnostic about the PNC, just as one can be a agnostic about God.

EVALUATION: are you a

- "logical foundationalist," i.e. someone who regards the PNC as a a 'self-evident truth', a fundamental principle of rationality, which must believe we know, if indeed we know anything? (you may also think it is a fundamental principle of reality, that it is "logical" in nature).
- "logical anti-foundationalist," i.e. someone who regards the PNC as a mere belief, which may—or may not--be absolute, and which we do not and cannot know is "absolutely" certain. Therefore you will use it, to carry out reasoning, but you accept that you don't "know" it is absolutely true.
Parmenidean Logic and Fatalism
(cf. Aristotle, Interpretation 9)

Parmenidean logic may seem to imply fatalism, i.e. the inevitability of the future, that "what will be, will be." For suppose T = it is true that There will be a battle tomorrow; ~T it is false that There will be a battle tomorrow; B = the battle occurring; ~B = the battle not occurring, and ~ = not.

The sea-battle is what is now called a "future contingent event," i.e. it is something which we think could happen or could not happen; there does not appear to be anything fixed in the nature of things to make it happen necessarily. (We might think, for example, that there is something fixed in the nature of things to make the sun rise tomorrow, i.e. to make the earth continue to rotate on its axis and the sun to remain in the center of the solar system; this would be a future necessary event. Or are all events necessary, as this argument implies?)

Then it seems:
1. If T, then B. [If There will be a battle is true, then the battle must occur.]
2. If ~T, then ~B. [If There will be a battle is not true, then the battle must not occur.]
3. Either T or ~T [and not both], i.e. either (a) it is true there will be a battle, or (b) it is true there will not be a battle.
4. Therefore it is not the case that a battle both may occur and may not occur. [Contrary to what we believe about future contingent events of this kind.]

Does this mean that fatalism is true? If you reject the conclusion, what step in the argument do you think is flawed and why?

For the theologically minded, you may consider instead the medieval variation on this argument, to the effect that if God exists, human freedom is impossible, because God, being omniscient, must already have known before we did it what we will do at any given point in our lives, and therefore we were not free not to do it. Here, the claim is that if God knows what we will do, even though this might not cause us to make one choice or another, we cannot actually choose either alternative, which we assume we can if we are free. (This is sometimes called the "open future" principle of human freedom.) We must choose the one God already knows we will choose, and therefore we are not really free.
The Ship of Theseus (adapted from Marc Cohen)

Heraclitus' and Parmenides' writings raise the question of under what conditions an object persists through time as one and the same object. In ancient times, this problem came to be associated with the Ship of Theseus. One version of the problem goes like this: suppose Theseus replaces every plank of his ship on the voyage to and from Crete. (He carries a complete supply of new parts on board as his cargo.)

Question: Does Theseus arrive on the same ship as he left on? Let A = ship he started on and B = ship he finished on. Does A = B? If not, why not? Suppose he had left one original part in. Is that enough to make A = to B? If not, suppose he had left two, etc. Where do you draw the line?

In addition, Theseus was followed by another ship, Scavenger, who picks up every plank he leaves and completely rebuilds his ship with them. When Scavenger arrives in Athens, his ship is composed of precisely the parts that composed the ship Theseus started out in. Now C = the ship the Scavenger finished his voyage on. Question: Is A=C?

On one interpretation, the Component Parts Identity theory (CPI), the identity of an object depends on the identity of its component parts. This view asserts that sameness of parts is a necessary condition of identity. If we want to allow that an object can persist through time in spite of a change in some of its components, we must deny CPI. An object x, existing at time t1, can be numerically identical to an object y, existing at time t2, even though x and y are not composed of exactly the same parts. This seems reasonable, but once you deny CPI, where do you draw the line?

CPI tells us A = C. The ship on which Theseus started, A, is identical to the ship on which the Scavenger finished, C. So we have two ships: (A/C) sailed out by Theseus and sailed in by the Scavenger, and (B) created sailed in by Theseus. The alternative is to abandon CTI and hold that A = B. On this account, we still have two ships: one ship (A) was sailed out by Theseus and (B) sailed in by Theseus, and another one (C) was created (out of used parts) during the voyage and sailed into port by the Scavenger.

(1) requires Theseus to have changed ships during the voyage—that he was on (at least!) two different ships. The problem with (2) is that it must hold A is not=C. Yet every part of A is a part of C, and every part of C is a part of A! So A and C are two different ships even though their parts are the same; and A and B, though they have no parts in common, are the same ship. These results seem almost as paradoxical as the view that there are no persisting objects.

CPI seems too strong. It denies identity to objects that we think of as persisting through time. But what do we replace it with? Spatio-temporal continuity, the intuition behind our (2), is promising. A persisting object must trace a continuous path through space-time. And this is compatible with a change of parts, so long as the change is gradual and the form or shape of the object is preserved through the changes of its component materials. So it appears that we can replace CTI with the Spatio-Temporal Continuity theory (STC).

But STC is problematic. Consider that an object can be disassembled and then reassembled. (E.g. a bicycle is taken apart. The parts are then placed in a number of separate boxes, which are then shipped, separately, across country. The boxes are then unpacked and the bicycle is reassembled.) How do we account for its identity? STC breaks down in this case, for there is no continuously existing bicycle-shaped object tracing a smooth path through space-time. But CTI gives us the right result: the reassembled bicycle is made of exactly the same parts as the one that was taken apart, and so is numerically the same bicycle. If neither CTI nor STC provides a satisfactory account of identity over time, how should we understand it? We are still struggling with Heraclitus's puzzle.

- Which theory do you think best accounts for identity over time? Or do you propose a different theory? What are your reasons?
- how might you apply this problem to the question of personal identity over time?
Reconstruction of Zeno’s argument (Aristotle):
   1. When the arrow is in a place just its own size, it’s at rest.
   2. At every moment of its flight, the arrow is in a place just its own size.
   3. Therefore, at every moment of its flight, the arrow is at rest.

Aristotle: The argument falsely assumes that time is composed of "nows" (i.e., indivisible instants). There is no such thing as motion (or rest) "in the now" (i.e., at an instant). In other words, the argument assumes an A-series concept of time, rather than a B-series concept of time. But the B-series concept of time is the true theory of time:

   • A-series. Time is composed of a series of points or instants, which run together like the old time movies ("flickers"). The problem here is that even these instants take some duration to run when they are part of the movies. If they took no duration to run, wouldn't Zeno be right?
   • B-series. Time is not composed of a series of points or instants, though it is divisible into that. Time, and motion, is composed of a whole of some duration. In other words, in this case, the whole is prior to the 'part'--or better yet, the "moment" is not really a part of time, there is no "point" at which the arrow is at rest. (There is no 'instant' of time.) On this view, the concept of "instantaneous velocity" depends logically on the "limit" concept. If in fact that "limit"--i.e. a true instant--were reached and the arrow's flight were composed of these, there could be no motion. Aristotle sees this, and therefore sees the need to develop a different concept of motion, which does not conceive of it (or time) as composed of instants, but of actions and durations.

Does Aristotle solve Zeno's problem?

*One further puzzle arising from modern physics: how do we incorporate Aristotle's solution into the notion of instantaneous velocity, which is an important concept in Newtonian mathematical physics: the velocity of x at instant t can be defined as the limit of the sequence of x's average velocities for increasingly small intervals of time containing t.)