

METAPHYSICS AND EPISTEMOLOGY

Necessity and possible worlds

1. Let's take the following examples:

- (1) Everyone wants to live together with other people, but it is not the case that everyone wants to live together with other people.
- (2) There is someone who is taller than herself.
- (3) Some bachelors are married.

These three situations are all impossible: they couldn't have been actual. Indeed, we feel that what does not allow those situations to be realized are just the concepts I used: the concept of negation (*not*), the concept *is taller than*, the concept of a bachelor. Let's also take the following examples:

- (4) Aristotle is a musical note.
- (5) Water is not a compound of hydrogen and oxygen.
- (6) The number 7 is in Italy.

These situations are impossible, too, and here we feel that what does not allow them to be realized is the essence, the character of the entities involved: of Aristotle, water, the number 7. On the other hand, one has the feeling that all the examples (1)–(6) involve the same kind of impossibility: those situations are somehow absurd and could not be actual even if the laws of nature were different. This kind is called (in older terminology) 'logically impossible in the broad sense' and (in the terminology that has prevailed) 'metaphysically impossible'.

That kind can be contrasted with what is physically impossible and what is logically impossible in the narrow sense. Physically impossible are the situations that go against the laws of nature. Logically impossible in the narrow sense are the situations that go against the laws of logic, as in example (1).

Correspondingly, we talk about logical necessity in the broad sense or metaphysical necessity: a situation is metaphysically necessary iff its not being actual is something metaphysically impossible. Examples of such necessity: that every book is a book, that if George is an uncle of Peter's then Peter is a nephew of George's; that water is a compound of hydrogen and oxygen.

We use the term 'modal' to refer to whatever is related to necessity and possibility. So we talk about modal assertions (that is, assertions about what is necessary or possible), modal logic, etc. The symbols '□' and '◇' mean, respectively, 'it is necessarily the case that' and 'it could have been the case that'.

In the following, whenever I say 'necessary'/'possible'/'impossible' and the like, I will mean 'logically necessary [possible/impossible] in the broad sense'. Finally, a situation is *contingent* iff it is actual but not necessary. Examples: that the Earth revolves round the Sun; that our course takes place on Thursday.

2. Even when we focus on one kind of necessity, we can distinguish between two kinds of statements: statements of necessity *de dicto* and statements of necessity *de re*. Examples of the first category:

- (7) It is necessarily the case that every human being is a human being.
- (8) Necessarily, $7 + 5 = 12$.

Examples of the second category:

- (9) It is the case about every human being x that, necessarily, x is human.

- (10) There exists something for which it is necessarily the case that that thing exists.
 (11) Plato is necessarily a philosopher.

Statements of necessity *de dicto* have the form 'It is necessary that p'. Statements of necessity *de re* are of two kinds. Either, like (9) and (10), they begin with a quantifier (e.g. 'it is the case about every human being x that', 'there exists something'), in its scope there occurs an expression of necessity (e.g. 'necessarily', 'it is necessarily the case that'), and, in the scope of that expression, there occurs a variable that is bound, as we say, by that quantifier or, instead of a variable, another expression (e.g. 'that thing'), explicit or understood, which functions like a bound variable. Or, like (11), they single out a specific thing and tell us that that thing necessarily has the feature so-and-so. Correspondingly, we distinguish between statements of possibility *de dicto* and statements of possibility *de re*.

(We talk about *quantifiers* in English, Greek, etc. by analogy with the quantifiers of the symbolic languages of logic. The terms 'quantifier', 'scope' and 'variable' come from logic, and one can find an explanation of them in any contemporary logic textbook.)

In order to understand the difference between (7) and (9) in sense, let's see what is said by someone who denies them. Whoever denies (7) says that there might have been humans who were not humans. No one will say that. But whoever denies (9) says that there are humans who might not have been humans. This will be said by whoever believes in transmigration and considers that e.g. I could have transmigrated as a dog and so might not have been human now.

3. Since the 1960s many philosophers have been talking about possible worlds. The idea is that (necessarily, p) iff (in every possible world, p). The most widely discussed, but also most controversial, theory about possible worlds is D. Lewis's and is called 'modal realism'. In the following I present it as he develops it in the book *On the Plurality of Worlds*.

By the term 'possible world', or merely 'world', he means 'spatiotemporal totality'. Something x is a spatiotemporal totality iff all its parts are spatiotemporally related to one another and there is nothing that is related to x spatiotemporally but does not overlap x (equivalently: anything that does not overlap x is not spatiotemporally related to x either). Two things are spatiotemporally related provided they have relations in space (e.g. the one is a certain distance from the other) or relations in time (e.g. the one begins existing a certain period of time after the other) or relations that combine space and time. Two things overlap provided either the one is part of the other or they have a common part.

Lewis's main position is that there are many worlds; if it could have been that a world was some way, there is a world which is that way. E.g., since there could have been blue swans, some world contains blue swans. There are no spatiotemporal relations between worlds (each one has its own spacetime), and there are no causal relations either.

The argument that Lewis uses to support his main position is the following: By accepting that there are many worlds, we can reasonably analyse various philosophical concepts on the basis of the concept of a world. In this way, we can unify various branches of philosophy and achieve theoretical economy in our philosophical system (that is, have a small number of basic concepts). Of course, there is an ontological cost: we need to accept the existence of many things that pretheoretically we would not be disposed to accept. But the benefit outweighs the cost. In order to strengthen his argument, Lewis systematically compares the benefit and cost of modal realism for philosophy to the benefit and cost of set theory for mathematics.

Thus Lewis is engaged in showing how we can analyse various philosophical

concepts on the basis of the concept of a world. The first analysis concerns the statements of modality de dicto. In Lewis's view, the sentence 'Necessarily, every swan is a bird' means 'It is the case for every world w that, in w , every swan is a bird'. (We see that in order for the analysis to stand, there must be many worlds. If there were only one, ours, the analysis would pronounce the sentence 'Necessarily, there are no blue swans' true, whereas it is false.) Correspondingly, the sentence 'It is possible that there should be a blue swan' means, in his view, 'It is the case for some world w that, in w , there is a blue swan'. The analysis contains the expression 'in w '. Lewis invites us to understand it by analogy with geographical expressions such as 'in Australia'. And he considers that the usual function of those expressions, as well as 'in w ', is to restrict any quantifiers that may occur in their scope; e.g. 'In Australia, all swans are black' (where the quantifier is 'all swans') means 'All swans that are in Australia are black', and 'In w , all swans are blue' means 'All the swans of w are blue'.

Lewis also analyses various other concepts, with greater or smaller success. E.g. he analyses counterfactual conditionals on the basis of the concept of a world and then uses those conditionals in order to analyse the concept of a cause. Again, he defines the term 'property' as 'set of possible objects'. (Possible objects are the worlds and the entities that make them up.) The idea behind that definition is that even properties that happen to correspond to the same set of actual objects (such as the property of having a heart and the property of having kidneys) will correspond to different sets of possible objects, so we can identify them with those sets. The problem for the definition is that, in some cases, it seems that two properties correspond to the same set of possible objects (such as the property of being a closed plane figure with three sides and the property of being a closed plane figure with three angles).

4. Some objections to Lewis:

(a) The most usual objection is that modal realism is characterized by ontological extravagance. Lewis believes that there are infinitely many worlds, among which are infinitely many material worlds, so he accepts more material objects than we accept either in everyday life or in science. Moreover, he believes in entities of many kinds that common sense rejects and science does not need to accept: talking donkeys, gods living on mountains, etc. Even if the analyses of philosophical concepts that he offers did not present special problems, it would be extremely doubtful if the theoretical benefit outweighed the ontological cost.

(b) Another objection concerns Lewis's views that involve the concept of the actual. Lewis considers that many entities (the other worlds and their parts) are not actual entities; they exist, but do not actually exist. The constituents of other worlds are animals (with flesh and bones), stars, particles, etc. but not actual entities. Our world is the only actual world. Why doesn't he accept that the other worlds and their parts are actual beings? Because he wants to avoid the view that all possibilities are actualized.

The objection is that the positions 'Every entity is an actual entity' and 'Everything that exists, actually exists' are as obvious as the simple truths of propositional logic; whoever denies them does not understand the logic that governs the concept of the actual.

In order to tackle the objection, Lewis tries to explain why those positions appear to us to be true. In his view, when we use a quantifier, there is usually an implicit restriction to either the objects of the actual world or to only some of them (e.g. if I say 'All had a terrific time at the party', I don't mean that every person there is had a terrific time at the party). So when we hear the sentence 'Every entity is an actual entity', we usually

understand it as if it were the sentence 'Every actual entity is an actual entity'. But Lewis does not interpret it that way when he negates it.

Also, he has a theory about words such as 'actual' and 'actually'. He believes that they are indexical expressions, like 'here' and 'today', that is, their reference varies systematically with the circumstances in which they are used. When the words 'actual' and 'actually' are used in a world (with the linguistic meaning they have in our own language), they refer to that world. Whenever a speaker utters the sentence 'I am here', they say something true; similarly, whenever in a world a speaker utters the sentences 'I am in the actual world, only things in this world are actual things', what she says is true. The actual world, that is, ours, does not have an ontological status superior to the other worlds, just as here where I am at this moment is not a place superior to other places.

(c) A third objection is epistemological. We know that e.g. there could have been talking donkeys. (It is logically or metaphysically possible.) Consequently, according to Lewis's analysis of modal statements, we know that, in some world, there are talking donkeys. Yet, in his view, there exist no causal relations between worlds. So we cannot use our senses to perceive what is going on in other worlds; generally, no information is transmitted here from there. Hence we do not know what the other worlds contain. So he ought to say that we don't know if, in some world, there are talking donkeys.

Lewis replies that the objection presupposes a causal conception of knowledge: if someone knows a fact, then there is a causal relation between the fact and the knowledge he has. According to Lewis, our mathematical knowledge shows that the causal conception is wrong; we know many things about numbers, although there is no causal connection between them and us.

Here some philosophers have remarked that we can have knowledge about abstract entities, such as numbers, without being causally connected with them, but we cannot have knowledge about concrete entities without causal connection; and Lewis's worlds are concrete entities. (An entity is characterized *abstract* iff it is in neither space nor time and is not involved in causal relations. It is characterized *concrete* iff it is not abstract.)

Lewis retorts as follows: There is indeed a kind of knowledge that requires a causal connection (between the object and the subject) and a kind that does not, but the two kinds do not coincide respectively with knowledge about concrete entities and knowledge about abstract entities. They coincide respectively with knowledge of contingent truths and knowledge of necessary truths. Most truths about how things are in our world are contingent. E.g. it is a contingent truth that there are black swans in the world we live in; we could have lived in a world without black swans. On the other hand, mathematical truths are necessary, as are the truths about what is possible. (Here Lewis presupposes a principle that is included in some systems of modal logic but not in others, the principle $\diamond p \rightarrow \Box \diamond p$.)

5. Lewis denies that worlds overlap. So he cannot analyse statements of modality *de re* as he analyses statements of modality *de dicto*. If e.g. T is a table that in fact has four legs and Lewis analysed the sentence 'T could have had exactly three legs' as 'In some world, T has exactly three legs', he would have to consider it false because T is not part of any world other than the actual one. Yet the sentence is true, since we could have cut out one of the legs of T.

Thus Lewis, in order to analyse statements of modality *de re*, introduces the concept of *counterparts*. The counterparts of a thing in other worlds are the objects in those worlds that are very similar to the thing because of a common constitution or because of a common role or for other reasons; and each thing has just one counterpart in its own

world, itself. So he analyses the sentence 'T could have had exactly three legs' as 'There are a world w and a counterpart c of T in w such that, in w , c has exactly three legs'. And he analyses the sentence 'I am necessarily human' as 'It is the case for every world w and for every counterpart c of mine in w that, in w , c is human'. (In each one of those examples, the second 'in w ' is redundant, and we can ignore it. But it is needed in the analysis of the sentence 'T could have been bigger than every other table'. Why?)

This analysis has brought about many objections:

(a) When I say 'I am necessarily human', I talk about myself, not about others, but according to Lewis I talk about my various counterparts.

This objection was frequent earlier on, but Lewis emphasized that, in his view too, when I say 'I am necessarily human', I talk about myself, since the sense is that every counterpart of **mine** is Of course, Lewis adds that when I talk about how I necessarily am, I also talk about all my other counterparts.

(b) This objection is due to Plantinga. The statement

(12) Let's take Socrates and Xenophon; the latter could have been more similar than the former (in his way of life, achievements, etc.) to how Socrates actually was is true. But Lewis's paraphrase

(13) There are a world w , a counterpart c of Socrates in w , and a counterpart d of Xenophon in w such that [in w] d is more similar than c to how Socrates actually was.

is false. For if d is more similar than c to the actual Socrates, then d , and not c , is Socrates' counterpart in w .

Lewis's answer to such objections runs as follows: Socrates may have two counterparts in the same world. Perhaps, the one resembles the actual Socrates a lot in his ancestors and genetic make-up, and the other resembles him a lot in his achievements. And it may be that the latter counterpart is also a counterpart of Xenophon (resembling him in genetic make-up). So (13) is true if (12) is true too.

(c) Lewis regards the false sentence

(14) T exists necessarily
as synonymous with the true

(15) It is the case for every world w and every counterpart c of T in w that, in w , c exists.

Lewis replies to this objection that if we cannot find a satisfactory analysis for some statements that contain modal expressions like $\langle\langle \Box \rangle\rangle$ and $\langle\langle \Diamond \rangle\rangle$, so much the worse for those symbols; we can set them aside and talk directly about worlds and counterparts.

(d) The way he analyses statements of necessity de re, combined with the view that, in some cases, one thing has two counterparts in the same world, leads Lewis to reject the principle of the necessity of identity:

(16) $(\forall x)(\forall y)[(x = y) \rightarrow \Box(x = y)]$.

(In words: for every object x and every object y , if x is identical with y , then necessarily x is identical with y .) Lewis's paraphrase of (16) is: for every object x and every object y , if x is identical with y , then it is the case for every world w , every counterpart c of x in w , and every counterpart d of y in w that c is identical with d . According to many philosophers, that rejection constitutes an unacceptable conclusion. Principle (16), however, is on its own a complex issue in the logic and metaphysics of modality, so here I simply note it.

Ending the presentation of Lewis, let's note that he tries to analyse modal statements without presupposing modal concepts; he explains both the concept of a world and the concept of a counterpart without relying on terms such as 'possible' and 'necessary'.

6. Quite a few philosophers believe that there are many possible worlds but they are all actual entities. Plantinga, Adams and Stalnaker are such philosophers. According to Stalnaker, possible worlds are properties. According to Adams, they are sets of propositions. According to Plantinga, they are states of affairs.

Plantinga starts with an ontology of states of affairs (s.a.'s). Examples: Quine's being a philosopher, Quine's being a politician, 9's being a prime number. He distinguishes between the s.a.'s that are actual and those that are not, as well as between the possible ones and the impossible. A s.a. *includes* another iff the former could not have been actual without the latter also being actual. E.g. Quine's being a philosopher includes someone's being a philosopher. A s.a. *precludes* another iff it could not have been that both were actual. E.g. Quine's being a philosopher precludes no one's being a philosopher. A s.a. *s* is *maximal* iff, for every s.a. *t*, *s* includes *t* or precludes *t*. Schematically we can say that a s.a. is maximal provided it gives an answer to every question. Finally, when he uses the term 'possible world', Plantinga means 's.a. that is possible and maximal'. And when he uses the term 'the actual world', he means 'the s.a. that is actual and maximal'.

According to that concept, possible worlds (including the actual one) are not spatiotemporal totalities, nor are they sums of people, desks, mountains, stars, etc. They are entities of the category of s.a.'s. And all possible worlds, just like all s.a.'s generally, are actual entities, although they are not all actual s.a.'s.

Plantinga, too, uses the expression 'in *w*' when he talks about possible worlds. But he doesn't mean it by analogy with geographical expressions. Unifying the explanations he provides, we may consider that when he says 'in *w*, *p*', he means 'It is not possible that *w* should be an actual s.a. but it should not be the case that *p*'.

Plantinga is not trying to analyse modal statements without presupposing modal concepts.

His views on possible worlds have an ontological cost. It's one thing to accept that there are s.a.'s, and another thing to accept that there are maximal s.a.'s, s.a.'s that, so to speak, give an answer to every question. In the book *The Nature of Necessity*, Plantinga offers no argument for the view that there are such entities. He doesn't believe in infinitely many spatiotemporal totalities (like Lewis), but he does believe in infinitely many possible worlds in his own sense of the term.