

ACTUAL AND POSSIBLE WORLDS : AN INTUITIONISTIC APPROACH

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The concept of possible world is an intuitionistic concept, since the problems relating to this concept can be apprehended through intuition. This concept, however, is not a new one, it is indeed an ancient concept and has had a long history. Philosophers over the years, have been using this concept in order to explain various philosophical issues. Contemporary philosophers have thought that the concept of a possible world provides a powerful framework for illuminating and resolving a great many philosophical problems - such as that of clarifying modal concepts - of ethical concepts, of probabilification, of counterfactual situation, of disambiguation of sentences, of propositional attitudes and so on. In the present context I propose to confine myself only to examining the relevance of possible world in modal logic. But prior to that, let us look at the historical and theoretical development of the concept.

Historical Background of the Concept of Possible World :

It was Aristotle who had introduced the concept of 'possibility' variously. Anscombe in her celebrated article "Aristotle and the Sea Battle"¹ has promulgated this concept in an illuminating way. Insightful explanations have also been found in Hintikka's article on "Aristotle's Different Possibilities."²

In modern times, it was Leibnitz, who has made an epoch-making attempt in understanding our world in terms of 'possible worlds'. Leibnitz's idiom has come to be called the *possible world's idiom*. The problems which he intended to solve are : "Is this the best of all possible worlds?" Why God did create this particular world rather than some other possible worlds? He says, "There are the eternal truths. They did not obtain only while the world existed, but they

would also obtain if God had created a world with a different plan”³ For Leibnitz, possible worlds are compositional in the sense that all possible worlds of any substance is the totality of all substances compossible with it. Every possible world, says Leibnitz is made up of a family of possible substances and there we apprehend a compossibility or conglomeration with every substance. It brings a mutual adjustment of substances of possible worlds. In course of an apt metaphor, Leibnitz comments that “the substance of a possible world “mirror” one another in their mutual accommodation”⁴. Like the Kantian cleavage of analytic and synthetic and Hume’s wedge between relations of ideas and matters of fact, Leibnitz distinguishes between truths of reason and truths of fact. He holds that a statement concomitant with truths of reason can be shown to be true in all possible worlds. It appears that the force of this claim is similar to the one made by Quine, when he said that an analytic proposition comes out true in every possible situation. To have Quine’s own worlds : “A statement is then explained as analytic when it comes out true under every state description. This account is an adaptation of Leibnitz’s “true in all possible-worlds”⁵. Following Leibnitz we can define the concept of possible world in saying that things might have been different from the way they actually are and each of the alternative ways is a possible world. A statement is analytic if it comes out true in every possible world or every possible situation.

In recent times the concept of possible world’ has been promulgated by many a thinker in ethics, in counterfactual situations and above all, in modal predicative logic, differently of course not in the same tune as Leibnitz did but in a new direction. We can cite the name of C.B. Daniels who at the outset of his book *The Evaluation of Ethical Theories* justifies the relevance of the idiom of possible world in the ethical field. He compares a possible world with an ideal world - a world whose belonging is ideally true. He says, “... and ethical theory is simply a determination of a unique set of ideal worlds. an ideal world, relative to a theory that determines it as ideal, is a possible-world, a fairy world perhaps, in which everything the theory says ideally true is in fact true. An ideal world relative to an ethical theory is a world in which everything the theory says ought to be the case is the case.”⁶ Other philosophers have thought that the concept of possible world assumes importance, since it works favourably in counterfactual situations. For them counterfactual supposition is not a redundant speculation nor is it a pointless one. Counterfactual supposition is very much

effective as well as useful in logic and other sciences. David Lewis is a thinker of significance, who says, “ ‘If Kangaroos had no tails, they would topple over’ seems to me to mean something like this : in any possible state of affairs in which Kangaroos have no tails, and which resembles our actual state of affairs as much as Kangaroos having no tails permits to it the Kangaroos topple over. I shall give a general analysis of counterfactual conditions along these lines.’”⁷

The logical structure of the world presupposed by Wittgenstein in *Tractatus* is based on the concept of possible world. Although Wittgenstein does not mention the concept of possible world in the *Tractatus*, nevertheless, there is an underpinning of the concept in terms of the concepts of actual and possible states of affairs. When Wittgenstein says that ‘the facts in logical space are the world’⁸ he understands the logical space as a space of ‘possible worlds’. Wittgenstein characterizes the logical space as a space of ‘possible states of affairs’. These states of affairs refer to the world as a whole, as a space of possible worlds.

According to Wittgenstein the world is the totality of facts in logical space. He understands an independent existence of an atomic state of affairs in logical space in terms of possible worlds. He goes on to say that the world as a fact is fitted into a ‘logical space’ of possible worlds. The dimension of this logical space is determined by the mutually independent components of a world description. A combination of atomic states of affairs consists of one atomic state of affairs of each dimension determines a ‘possible world’ : i.e. a possible state of affairs the world as a whole. Every atomic state of affairs, says Wittgenstein is independent and they belong to the logical structure of the world. Suppose, p and q are two existing states of affairs in our world. Then it is the case that p and q exist. Now, if we are to say that p and q are independent of each other, then we not only state a fact about the world as it is : but rather something about the world as it might possible be. Since both p and q are existent independently, each of them might have been existent or non-existent independently of what is true of the other. The ‘independence’ does not refer in particular to the actual world; it refers likewise to all possible worlds. So whether a state of affairs, says Wittgenstein, is independent of another state of affairs involves the question of that kind of world are to be considered ‘possible worlds’.

It was Kripke who argued for the relevance of possible world in order to establish the reference of proper name. Following Frege, he seeks to clarify the reference of a name in terms of rigidity.⁹ Frege holds that proper names are rigid designators and he defines rigid designator as one that designates the same thing in all possible worlds in which it designates. Like Frege, Kripke says a name is a rigid designator, if in every possible world it designates the same object. Let us presuppose that 'a' and 'b' are two rigid designators (proper names) and further suppose that 'a = b'. Now 'a' is identical with 'b' by virtue of the fact that each designates the same thing in one possible world, viz, the actual world. So, since they are rigid, they each designate the same thing in all possible worlds in which they both designate. Kripke holds that 'a = b' is true in all possible worlds in which 'a' and 'b' both designate and hence that 'a exists and b exists \rightarrow a = b' is true in all possible worlds whatever, and is therefore a necessary truth. This is all he really means when he claims that 'a = b' is a necessary truth.

Kripke then goes on to say what he means by a possible world. To use his own example, when we say, 'If Nixon had bribed such and such a Senator, Nixon would have got Carswell through', we are speaking of Nixon and Carswell, the inhabitants of the actual world. But what would have happened in the actual world if a certain 'counterfactual situation' of the world had been actual. To say that a designator designates, this or that in a certain possible world is to say that it has that designation in a certain counterfactual situation. This means to say that the designator has that designation when it occurs in the sentence which we use to specify the situation. The point on which Kripke mainly insists upon is that when we say "If Nixon had bribed such and such" it is Nixon we are talking of and not, e.g. some possible counterpart of Nixon. This means that the word 'Nixon' is used to designate Nixon even in counterfactual sentences and this is Kripke's main way of illustrating what he means by the claim that, 'Nixon' is a rigid designator. So an expression is a rigid designator iff it is used to designate the same thing both in actual and possible assertions. Or in other words, an expression is a rigid designator if it has to designate the same thing when it occurs in any counterfactual situations.

But it is also important to notice that Kripke is sceptical about the relevance of possible world in a counterfactual supposition. For him counterfactual supposition is not rigid like the reference of a proper name, since

the propensity for having qualitative descriptions of counterfactual suppositions have many sources. He raises a question : How can we identify an *a priori* proposition in all possible worlds if apriority is not identified with necessity? Even if it does, it may not hold good, remarks Kripke. His point is that since things are stipulated, they are not found in counterfactual suppositions. Moreover, possible world need not be given purely qualitatively as if we were looking at them through a telescope. He says, “..... that the properties an object has in every counterfactual world have nothing to do with properties used to identify it in the actual world”¹⁰

So far as logic is concerned the concept of possible world has widely been developed in intuitionistic logic. Jaakko Hintikka in his “On the Logic of Perception” has substantiated different possible worlds in terms of compatibility. He asks, “when does a know (believe, wish, perceive) more than b?” and answers that, “The only reasonable general answer seems to me to be that a knows more than b if and only if the class of possible - worlds compatible with what he knows is smaller than the class of possible - worlds compatible with what b knows”¹¹ Hintikka’s view is analogous to the view of Leibnitz. The former admits the principle of compatibility among possible worlds while the latter admits the principle of compossibility among possible worlds. We have noticed above that the concept of possible world has been employed both in order to illuminate the philosophical basis of logic, specifically intuitionistic logic and also many other novel areas of philosophical thinking.

After having examined the historical background of the concept of possible world, let us now proceed to examine the theoretical and logical implication of the concept.

Theoretical Implication of the Concept of Possible World :

Before we look into the theoretical implication of the concept of possible world, it would be worthwhile to clarify the way how we come to have the concept. How is a possible world conceptually apprehended? In a non-philosophical parlance the concept of a possible world does not amount much. The world of our every-day experience is the one and only one that we intend to realise. But philosophical survey always overlaps with the limitations

of the ordinary way of investigation. Logic presupposes the concept of possible world in various ways. In one sense a world may be thought of as possible and also as impossible. A world is called 'possible' if it be conceivable and a world would be termed 'impossible' if it is not conceivable. But this manner of thinking begs the question. Since conceivability does not imply the distinction between possible and impossible worlds. Failure in conceiving a fact does not imply that the fact is impossible; and ability to see a fact does guarantee the possibility of the fact. There is no formal contradiction in saying that an unconceivable fact is possible or that a conceivable fact is impossible. There was a time when it was conceived that the earth is round : but this does not mean that the fact that the earth is round is impossible. Similarly, there was a time when mathematicians had sought squaring a circle. They thought, so as they believed that there could be a procedure of proving the case. But subsequently, it has turned out to be impossible. At one time people believed or even conceived that the sum goes round the earth, but the helio-centric theory showed that it was impossible. It should be clear then that so far as conceivability is concerned, the distinction between possible and impossible worlds is held at a bay.

What then should be the suitable conditions for something to be possible? How do we distinguish the possible from the impossible world? What makes the distinction explicit? It is claimed that in lieu of the word 'conceivability' alone, the concept of possible world can be apprehended in terms of coherent conceivability or conceivability without inconsistency. One may fail to conceive that the earth is round; but the concept of earth being round in itself is perfectly coherent, and it may be conceived without inconsistency. Contrarily, it may be the case that one might have through of the possibility of squaring a circle but such a thought would land one into inconsistency.

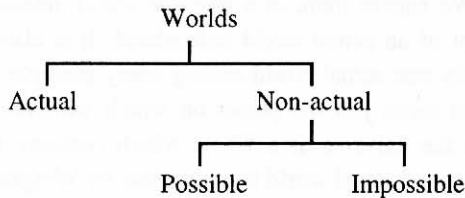
But the notion of coherent conceivability is a bit psychological and it turns the system of logic into a function of human psychology so as to claim that the laws of logic are the laws of thought. It may have some theoretical relevance for explicating the concept of possible world; but from a logical point of view it lacks validity of significance. If we are trying to understand the concept of the possible world in terms of logical concepts, such as consistency and/or inconsistency; we find ourselves in a predicament and we have all the chance of getting involved into a circularity. Since, then, we have to explain consistency in terms of inconsistency and vice-versa. It is coherently conceivable that what

is consistent cannot be inconsistent and what is inconsistent cannot be consistent. There is no formal contradiction owing to understanding consistency in terms of inconsistency. These concepts are taken as polar concepts in the sense that there cannot be any term that lies in between them. But this type of coherent conceivability leads us into a circularity and it does not enable one to find out a clear-cut distinction between possible and impossible worlds. The trap of circularity may be circumvented only by citing paradigm examples of possible world and also citing clear-cut example of impossible world. Intuitively by a possible world we mean a world in which there are more or less objects than the actual world or there may be some objects having different properties. On the contrary by an impossible world we mean a world in which a circle could be a square : a world in which there is an even square root of nine : and so on and so forth. Thus any attempt to outline the distinction between possible and impossible worlds is a matter of dispute, the distinction may perhaps be apprehended, of course by theoretical apprehension, only by adducing paradigm examples.

Actual and Possible Worlds :

It is important to note that the concept of possible world may be grasped in respect of actual world. The distinction, however, is very subtle, since the domain of possible worlds is contained in the domain of actual worlds. We cannot think of a possible world unless and until contained in the domain of actual worlds. We cannot think of a possible world unless and until we do not have the concept of an actual world beforehand. It is also important to observe that we have only one actual world among many possible worlds. By an actual world we do not mean just the planet on which we live : rather by an actual world we mean the universe as a whole which contains everything that really *exists*. The concept of actual world is made clear by Wittgenstein in the *Tractatus* when he goes on to say that the world (actual) is the totality of facts or in other words, facts in *Logical Space* are the world. A fact, says Wittgenstein, is something which makes a proposition as either true or false. A thing is claimed to be either true or false if it *exists in Logical Space*. Of course, the word 'exist' is used here in a timeless sense. It means that what existed in the past will also exist in the future. So an actual world includes all that was, is or will be. In this

sense an actual world is to be a possible world. It is presupposed that every world is the possible world of itself. The reason is simple, because if something actually exists then it may possibly have existed. In modal logic, it is claimed that if p is true (i.e. if p exists actually) then p is possibly true. This means that it is necessary that if p then Mp : i.e. in symbol $L(p \supset Mp)$. 'Something actually exists' is stronger assertion than 'something possibly exists;'. That is why the proposition ' $p \supset Mp$ ' is claimed to be logically sound. But its converse does not hold; i.e. if something is possibly true; then it can not be the case that it would be actually true. That is, the proposition ' $Mp \supset p$ ' is not logically sound. This makes it clear that we do not have any possible world independent of any actual world. So the concept of a possible world can be explained only in terms of an actual world. Equally and fundamentally, it is presupposed that we do have only one actual world among many possible worlds. This thesis is confirmed by the definition of possible world like this : Things might have been different from the way they actually are, and each of these alternative ways is a possible world. Realistically, we can say that an actual world is the paradigm of a possible world (every world is the possible world of itself). The concept of possible world lies in conceptual space or in Wittgensteinian sense it lies in *Logical Space*. The actual world is only one of an infinite number of possible worlds. The class of non-actual worlds contains all possible as well as all impossible worlds other than the actual world. The following table makes the distinction more perspicuous.



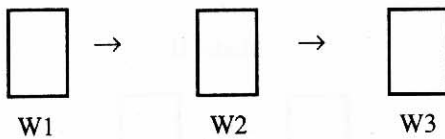
Logical Implication of the Concept of Possible World :

After having examined the theoretical aspect of the concept of possible world we shall now enter into the logical, of course modal logical, implication of possible world. In this sequel we shall demonstrate some possible world diagram through which the basic concepts of modal logic as well as some testing

of modalities will be examined. Here we discuss the basic modal concepts such as the concept of possibility and the concept of necessity¹² The modal concept of possibility is denoted by 'M' and the modal concept of necessity is denoted by 'L'.

We have already stated that in order to understand a possible world, we have to presuppose beforehand an actual world. This means that the concept of possible world can best be apprehended in context of an actual world. We had stated also that one may assume an infinite number of possible worlds of an actual world. Keeping this option in mind, we decide to confine ourselves for brevity's sake only to a limited number of possible worlds. We do this as we think this confinement does not render the system incomplete. In the present paper, we shall propose and consider only two models of possible worlds diagrams. In one model there obtains at most two possible worlds of an actual world. In another model there occurs at most three possible worlds of an actual world. But we do not of course rule out the possibility of an infinite number of possible worlds of an actual world. On the other hand, since every world (actual) is the possible world of itself, every world must have at least one possible world. And we claim, in the sequence that the following two models would be sufficient for testing the modalities in T-system in general.

Model I



In the above model, we have three worlds such as W1, W2 and W3. It is admitted in our system that every world is the possible world of itself. It will be seen that the concept of an actual world preserves the principle of reflexivity. The implication sign (i.e. \rightarrow) in the above model is used to identify the possible world/worlds of an actual world. However, the force of the implication sign is not reciprocal. It is used to mean that if W2 is the possible world of W1, then W1 can not be the possible world of W2. And if W3 is the possible world of W2 then W2 cannot be the possible world of W3. When we consider W1, W1 is an actual world and W2 is the possible world of W1. Now if W2 is the

possible world of W1, then W1 cannot be the possible world of W2 since W2 itself is a possible world of W1. If we admit a reciprocity between two worlds then we have to admit the two assertions, Viz; (i) If p is actually true then p is possibly true (i.e., in symbol ' $p \supset Mp$ '); and (ii) If p is possible true then p is actually true i.e in symbol ' $Mp \supset p$ '). But assertion (ii) is not logically sound. We can understand, as we have already stated, a possible world in context of an actual world, but we can not apprehend an actual world in terms of a possible world. Again W3 cannot be the possible world of W1 since the implication sign of W1 does not point to W3. It may be noticed from M-I that no actual world has more than two possible worlds. We may now determine the possible worlds of M-I in the following way :

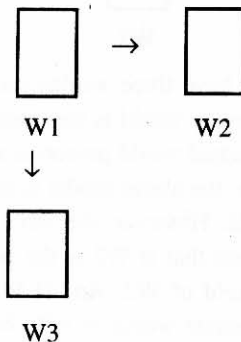
Worlds possible to W1 = W1 and W2.

Worlds possible to W2 = W2 and W3.

World possible to W3 = W3 itself.

When we examine W1, W1 is the actual world and W1 and W2 are its possible worlds. Since every world is the possible world of itself and hence W1 is the possible world of W1. W2 is the possible world of W1, since the implication sign of W1 points to W2. When we examine W2, W2 is the actual world and likewise W1, W2 and W3 are the possible worlds of W2. But when we examine W3, we find that W3 itself is the actual as well as the possible world of W3 (Principle of reflexivity). Let us pass on to Model II.

Model II



Modelwise M-II is different from M-I. But as far as rules and principles are concerned M-II remains the same like M-I. Unlike M-I W1 of M-II possesses three possible worlds. since the implication sign of W1 does point to W2 and W3. (likewise the numbers of possible worlds of W1 may be increased numerically by pointing '→' from W1). The reason is simple since W1 is the possible world of W1 and there we find two implication signs of which one points to W2 and the other points to W3. Consequently, W2 and W3 are also considered to be the possible worlds of W1. We may now determine the possible worlds of M-II in the following way :

Worlds possible to W1 = W1 and W2 and W3.

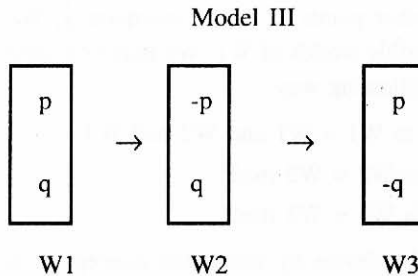
World possible to W2 = W2 itself.

World possible to W3 = W3 itself.

So this then is the device by which the concept of actual and possible worlds in modal logic can be marked off. Let us examine the implication of basic modal concepts in respect of possible world. The concept of possibility (M) and the concept of necessity (L) are taken as the basic modal concepts. By the term 'possibility' we mean logical possibility and by the term 'necessity' we mean logical necessity¹³. In modal logic the concept of truth and falsity can be understood in two senses - something merely happens to be true/false; and something which is bound to be true/false. A proposition is necessarily true if it is bound to be true in every possible world. On the other hand a proposition is necessarily false if it is bound to be false in every possible world. The proposition 'P is necessarily true' is denoted by 'LP' and the proposition 'P is necessarily false' is denoted by 'L-P'. Similarly, the proposition 'P is possibly true' is denoted by 'MP' and the proposition 'P is possibly false' is denoted by 'M-P'. Now LP is true, if P is true in every possible world of an actual world; LP is false, if P is false at least in one possible world of an actual world. Similarly, MP is true if P is true in at least in one possible world of an actual world and MP is false if P is false in every possible world of an actual world. So far as true values are concerned the concept of L and M may be compared with the truth-functional conjunction and disjunction respectively. A conjunctive proposition is truth functionally true if all the components of the conjunction are true; otherwise false. Similarly, LP is true in an actual world if P is true in every possible world of the actual world; otherwise false. A disjunctive proposition is truth - functionally true if at least one component of the disjunction is true :

otherwise false. Likewise, MP is true in an actual world if P is true in at least one possible world of the actual world : otherwise false.

Keeping the above proviso in mind, let us determine the value of Lp and Mp in respect of the following model.



M-III has three worlds, viz, W1 W2 and W3. Every world contains two propositional variables such as p and q. But no two worlds remain same, since they possess different senses of the propositions p and q. The above model, however, is drawn arbitrarily, it could have been drawn otherwise as well. In our system, however, every world must be differentiated from other world in respect of the sense of the proposition the worlds possessed. This is exactly what happens in the above diagram. All the worlds possess two propositional variables, namely p and q : but the senses of the propositions they have are different. W1 says that both p and q are true : W2 asserts that p is false but q is true : W3 says that p is true and q is false.

Now Lp is false in W1, since the possible worlds of W1 are W1 and W2 and p is false in W2. So Lp is false in W1. Lp is also false in W2 on the same ground. But Lp is true in W3, since the possible world of W3 is W3 and p is true in W3. Mp is true in W1 since W1 and W2 are its possible worlds and p is true at least in one of the possible worlds of W1. So Mp is true in W1. Mp is also true in W2 on the same ground. Mp is true in W3, since W3 is the possible world of W3 and p is true in W3. It seems clear from the above that if p is necessarily true in an actual world then p must be possible true i.e. as we have seen in the case of W3. But it may be the case that if Lp is false in

an actual world. Mp may be true in that particular world. (here in the case of W1 where Lp is false, but Np is true). This means that the falsity of Lp sometimes implies the truth of Mp.

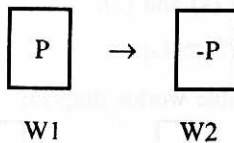
Let us now determine the value of L(p,q) and M(p,q) in respect of the above model. As both p and q are true in W1, [p,q] is true in W1. Likewise, 'p.q' is false in W2, since p is false in W2; and 'q.p' is false in W3, for q is false in W3. Now, the possible worlds of W1 are W1 and W2 and 'p.q' is false in W2, so L(p,q) is false in W1. L(p,q) is false in W2 and W3 respectively on the same ground. But M(p,q) is true in W1, since at least one of the possible worlds of W1, namely W1 itself, in which 'p.q' is true, M (p,q) is false both in W2 and W3, since (p,q) is false in every possible world of these two actual worlds.

The upshot of the above consideration makes it clear that the value of the actual world is determined in terms of the values of the possible world/worlds. Our aim is to determine the value of the actual world : but we take the aid of the possible worlds in order to determine whether something is bound to be true or bound to be false; necessarily true or necessarily false.

Testing of Modalities in T-System

Case - I : If p is actually true then p is possibly true i.e., the proposition 'p ⊃ Mp' is logically sound.

Possible worlds diagram



Determination of possible worlds

Worlds possible to W1 = W1 and W2.

World possible to W2 = W3 itself.

Justification

1. $p = T$ in $W1$
2. $p = F$ in $W2$
3. $Mp = T$ in $W1$ for (1) and (2). So
4. $p \supset Mp = T$ in $W1$ for (1) and (3).

Case - 2 : 'If p is necessarily true then p is possibly true' - This proposition is logically sound (i.e. in symbol, $Lp \supset Mp$ is logically valid); but its converse does not hold good (i.e.; in symbol $Mp \supset Lp$ is not logically sound).

Possible worlds diagram

**Determination of possible worlds**

Worlds possible to $W1 = W1$ and $W2$.

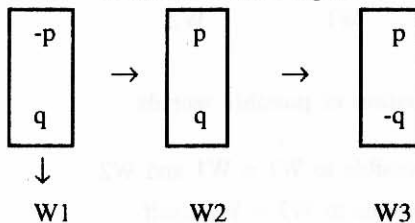
World possible to $W2 = W2$ itself.

Justification

1. $p = T$ in $W1$
2. $p = F$ in $W2$
3. $Lp = F$ in $W1$ for (1) and (2).
4. $Mp = T$ in $W1$ for (1) and (2).
5. $Lp \supset Mp = T$ in $W1$ for (3) and (4).
6. $Mp \supset Lp = F$ in $W1$ for (4) and (3).

Case 3 : $L(L \supset Lq) \vee L(L \supset Lq)$

Possible worlds diagram



Determination of possible worlds

Worlds possible to $W_1 = W_1$ and W_2 .

Worlds possible to $W_2 = W_2$ and W_3 .

World possible to $W_3 = W_3$ itself.

Justification

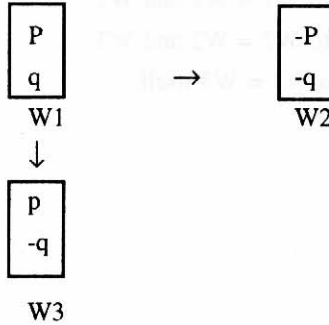
1. $p = F$ in W_1
2. $p = T$ in W_2
3. $p = T$ in W_3
4. $q = T$ in W_1
5. $q = T$ in W_2
6. $q = F$ in W_3
7. $Lp = F$ in W_1 for (1) and (2).
8. $Lp = T$ in W_2 for (2) and (3).
9. $Lq = T$ in W_1 for (4) and (5).
10. $Lq = F$ in W_2 for (5) and (6).
11. $Lp \supset Lq = T$ in W_1 for (7) and (9).
12. $Lp \supset Lq = F$ in W_2 for (8) and (10).
13. $L(Lp \supset Lq) = F$ in W_1 for (11) and (12).
14. $Lq \supset Lp = F$ in W_1 for (9) and (7).
15. $Lq \supset Lp = T$ in W_1 for (10) and (8).
16. $L(Lq \supset Lp) = F$ in W_1 for (14) and (15). So
17. $L(Lp \supset Lq) \vee L(Lq \supset Lp) = F$ in W_1 for (13) and (16).

So the given formula is proved invalid in the above T-setting.

Case - 4

$$MLp \supset LMp$$

Possible worlds diagram

**Determination of possible worlds**

Worlds possible to W1 = W1, W2 and W3.

World possible to W2 = W2 itself.

World possible to W3 = W3 itself.

Justification

1. $p = T$ in W1
2. $p = F$ in W2
3. $p = T$ in W3
4. $q = T$ in W1
5. $q = F$ in W2
6. $q = F$ in W3
7. $Lp = F$ in W1 for (1), (2) and (3).
8. $Lp = F$ in W2 for (2).
9. $Lp = T$ in W3 for (3).
10. $MLp = T$ in W1 for (7), (8) and (9).
11. $Mp = T$ in W1 for (1), (2) and (3).
12. $Mp = F$ in W2 for (2).

13. $Mp = F$ in $W3$ for (3).
14. $LMp = F$ in $W1$ for (11), (12) and (13). So
15. $MLp \supset LMp = F$ in $W1$ for (10) and (14).

So the given formula under consideration is proved invalid in this particular T-setting.

We have tested a few modalites of T-setting by possible world diagrams. But we claim that this technique is adequate for testing any modality in T-system. Thus it is shown that the concept of possible world has gained a lot of significance in solving problems in modal logic, apropos the intuitionistic School.

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