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ТЕОРЕМА ПРО ОНТОЛОГІЧНУ ВИПАДКОВІСТЬ МОЖЛИВИХ СВІТІВ: У ЗАХИСТ РЕЛЯТИВІЗМУ ВІДНОСНО ОНТОЛОГІЇ МОЖЛИВИХ СВІТІВ

У статті робиться спроба вирішити питання онтології можливих світів для семантики можливих світів як інструменту сучасної логіки. Автором висувається припущення, згідно з яким у можливих світах допустима будь-яка довільність щодо їх онтології та повноти опису, доки ця довільність не впливає на істинність/хибність суджень у можливому світі. У випадку ж, якщо певного роду онтологічний параметр, який ми вводимо після встановлення істинності/хибності судження для конкретного можливого світу, певним чином змінює значення судження, цей параметр є недопустимим, оскільки можливий світ стає інструментально непридатним для конкретного дослідження, задля якого цей можливий світ змодельовано.

Ключові слова: *модальна логіка; семантика можливих світів; логічна семантика; епістемічна логіка; аналітична філософія; філософія логіки.*

Introduction. The ontology of possible worlds, since D. Lewis [11], R. Carnap [3; 4; 5], J. Hintikka [7; 8] and Saul. Kripke's works [9; 10], despite the interest to it in contemporary philosophy, still hasn't got solutions to some of its primordial problems, debates on which proceed since 80ies till nowadays. Mostly, the modern philosophers still continue to separate the possible worlds onto physically and metaphysically possible (sometimes, giving no clear distinction of them), to reject Lewis's modal realism ([1; 2; 12]) or to make changes to it (as in [13; 14; 15]), supporting its initial positions, to turn back to Leibniz's approach to possible worlds etc (for example, such an approach can be seen in views of Nelson Goodman [6]. It cannot be considered as his strict position, but his ideas are partially tight with this approach. The idea of coming back to Leibniz's ideas has its beginning in some of Carnap's works; see [4; 5]); and such vagueness leads to continuation of questioning about possible worlds constitution: what is the allowed degree of their difference from our world, how can it be justified and what should be the parameters of creation of possible worlds in general? Despite the fact that some philosophers accept either physically, or metaphysically possible worlds, there is also the position that is opposite to it, and which accepts only physically possible worlds. (Our article is, first of all, addressed to them; however, its formulations would be interesting to the scientists that accept any types of possible worlds). Briefly summarizing, we would say that according to one of them, the possible world may be such as it can be thought, i.e. it can allow any kind of "metaphysical" changes in the process of its modeling. Kripke's position, according to which the possible word is mainly the formal-logical entity that we operate, but not the real world, can be also added to this approach (Hintikka's ideas are also related to this approach in his concepts of "model multitudes" and "the relatedness of alternative"). It is also senseless to think about its relatedness with actual world for pragmatic reasons.

According to the second position, the possible world cannot contain metaphysical adjustments, but can only fit the parameters that are known to human knowledge; possible worlds, according to such a position, rather depict different conditions of our real world, but not represent themselves as the single holistic phenomena that either can have some relation to our world, or don't have any at all. To this position, the fixation of possible worlds, its nexus with our physical reality, is undisputed. Having designated the most widespread and conventional positions, we'd like also to point out our own: in problems concerned to possible worlds ontology, we rather adhere the first one, considering the possible world phenomenon from instrumental point of view. However, such a position shouldn't be confused with epistemological relativism or constructivism. It may only partially refer to pragmatic approach to the tools of cognition; yet, we refuse any kinds of metaphysical (like religious or mystics) or pseudo-scientific tools to be used in scientific research. When we note such an attitude towards possible worlds, we accept them as rational tool of human cognition that is in terms with modern science, but we stand against its "metaphysical" or non-scientific modification - metaphysically possible worlds are accepted by us only on certain conditions and for certain tasks, but not for proving some metaphysical propositions or religious claims to be true for our reality. According to it, the possible world as one of the instruments of science can be physically and metaphysically possible as well. Such claim also needs understanding the margins of ontological difference of possible world from actual world are allowed.

And to clarify the problem of ontological randomness of possible worlds in general, we have formulated the theorem, which we would try to prove in this article, also illustrating the example of its practical use. We named it "the theorem on possibility of ontological randomness in possible worlds". The theorem is the following: in modeling of the possible world, for any particular possible world W_n, formally unlimited number of random changes in ontological structure and differences with the real world is accepted, on condition that the presence, as well as the absence of these changes or differences in no way influences the true/false meaning of the considered propositions in the possible world W_n (since the true/false meaning of the propositions is defined before these changes or differences were imposed).

Proof 1. The first proof of our theorem is dedicated to possible truths ($\Diamond p$) that are true in some worlds (or at least in one of them). Let us take the following proposition: "Romney became President of USA in 2012" and designate it as *p*. Let us also designate the real world as W_R, and the possible world as W_n, "~" as "not" and "→" as an implication "if…then…". Then we deal with the following basic propositions:

$$\Diamond p \vDash W_R \to \sim p$$
$$\Diamond p \vDash W_n \to p$$

Then, we would also add the following set of ontological constituents of the world W_n in the following propositions: "all people in W_n have got black and white vision", "the Earth in W_n has no satellite", "the Solar System in W_n has 11 planets", and "in W_n Franz Kafka didn't become a writer". We would demarcate the set of these propositions as *q*. It is also necessary to add, that without this set of claims, the actual world would be identical to the possible world W_n, and in this case (in case of absence of *q*), the only difference between the actual and the possible world would be the result of US presidential election in 2012. It can be expressed in following way:

$$((W_R \to \sim q) \wedge (W_n \to \sim q)) \to \sim p \vee p)$$
$$((W_R \to \sim q) \wedge (W_n \to \sim p)) \to (W_R \equiv W_n)$$

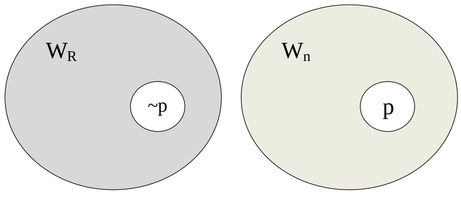
This notation is related to description of the possible world properties. Thus, we see the following: *q* makes the possible and actual worlds different from each other on the level of a number of ontological properties (and one random event, if we talk about Kafka's fate in W_n), and if the set *q* would be excluded from the possible world and *p* would be false in it too, W_n would have been fully identical to the actual world. All these conditions which were designated as *q* and which indicate the specific difference of world W_n from W_R, however, have no influence on fact, whether Romney becomes President or not in the world W_n, if we assume that the elections in this world are conducted in the same way they are in our world. Therefore, we'd assume the following:

$$(W_R \to \sim q) \to \sim p$$
$$(W_n \to q) \to p$$

To the world W_n, *p* would be false only if we provide certain evidences in favor of the fact, that at least one of the differences that are included in *q*, has influenced on US presidential election in 2012 in W_n. Let it, for example, be the black and white vision of Romney, which somehow brought him victory. But if we claim this, we, therefore, bring it in not as random, but as necessary ontological condition for W_n, i.e. we set fixed parameter that represents the differences of W_n from W_R, but in this case, this parameter is not included into *q*, the property of which as the variable is the denotation of permissibility of random number of arbitrary parameters, which has relation to W_n (as a set of its specific properties), but that is irrelevant to the proposition *p* itself. Thus:

$$(W_n(q) \to p) \wedge (W_n(\sim q) \to p)$$

And if the differences set by *q* are considered as the parameters which do not influence on *p*, we can regard them as random ones, adding unlimited amount of differences of W_n from W_R to *q*. For example, in this possible world English-speaking people write from right to left, the water is denoted as XYZ, an average yearly temperature on Earth is two degrees lower than on "our" Earth, and the constellation of Orion in W_n doesn't exist. As long as these differences of ontological structure of W_n from our world do not affect the proposition *p*, they are potentially infinite. Schematically it is figured out in the following way:



We consider the truth/the falsity of *p* that describe the fact *p* in physically possible world W_n. Its physical structure fractionally differs from actual world and has all presuppositions for event, that would result into meanings *~p* for our world and *p* for W_n. Let us add to W_n one more proposition: "In 2011 the meteorite fell onto US and wiped the country off the Earth". We would designate this proposition as *a*. In case of *a* inclusion to W_n, such a disjunction for *p* appears:

$$((a \in W_n) \to \sim p) \dot{\vee} (\sim(a \in W_n) \to p)$$

But if we consider that *p* is false in actual world and may be false in some possible worlds but not in W_n (where it is considered to be true), *a*, therefore, appears "unacceptable" proposition to W_n. And if $a \in W_n$, we still have no paradoxical situation - such an inclusion leads to appearance of one more possible world, W_n^2, to which proposition *~p* (because of $((a \in W_n) \to \sim p)$) is true. Thus, we deal with the following:

$$a \to \sim p$$
$$(a \notin W_n) \wedge (a \in W_n^2)$$
$$W_n^2 \to \sim p$$

Non-random ontological difference, that is to say, the difference that influences on truth/falsity of proposition *p* for W_n, therefore, makes *~p* the true proposition in possible world W_n^2, because the implication of *a* into W_n changes it in such way, that the possible truth *p*, which is the prerequisite part of proposition $(\exists p)((W_R \to \sim p) \wedge (W_n \to p))$ ("there is *p*, that is true to W_n and false to W_r"), becomes false in both worlds which is paradoxical to our predetermined parameters of *p*'s true/false meaning. This problem of non-random differences that appeared firstly to W_n is solved by the appearance of W_n^2 as a separate possible world that has a certain type of relation to actual world and to the possible world W_n. This relation is the following:

$$(\exists p)((W_n \to p) \wedge ((W_R \vee W_n^2) \to \sim p))$$
$$(\exists q)(((W_n \vee W_n^2) \to q) \wedge (W_R \to \sim q))$$

But besides this relation, there is also one proposition that belongs only to W_n^2 and which actually constitutes it as a separate possible world:

$$(\exists a)(a \in W_n^2) \wedge (a \to \sim p)$$

In other words, the ontological differences from the real world that do not affect the truth of *p*, coincide in possible worlds, while the falsity of *p* coincides in actual world and W_n^2, but for W_n^2 it is conditioned by additional proposition *a* that is true only for W_n^2 (while the falsity of *p* in actual world is set a priori). At first sight, these conclusions may be seen as insignificant, but later it would be shown that such a detailed parsing was necessary.

Up to this moment, we dealt with physically possible world. Now we should examine our proof for metaphysically possible world, after which the general form of proof for possible truths should be formulated. The brilliant example of metaphysically possible world that fits to our issue can be the universe of sci-fi series "Star Trek". In this case, the possible world W_n would represent the series universe, and W_R would remain the actual world, and the proposition "Jean-Luc Picard in 2365 was the captain of starship Enterprise" would stand as *p*. The proposition is true in possible world and only in it (since in reality there is nothing of what is said in the proposition). The ontological structure in metaphysically possible world of "Star Trek" universe is strictly predetermined. The events that happened in this world are predetermined as well. To put it bluntly, the possible world W_n in this case is factually outlined by the frames of the series' creators (scenarists, producers, directors). Nevertheless, we still can assume random complex of occasions for this possible world, which would not affect the truth of *p*, as well as the other events that took place in this possible world: we, for example, can "invent" life on the planets that haven't been shown in the series, or the dialogues between main characters that were omitted by the creators of possible world but could have possibly been. In fact, we construct metaphysically possible world, the only difference of which from W_n is the existence of additional propositions that do not come in contrary with the existing propositions of W_n, and, as a result, *p* would be true. (Such additional propositions for the possible world of "Star Trek" universe have got their factual embodiment in different spin-offs of "Star Trek" series that, by plot, continue and widen the given possible world without intrusion into the events that have already took place.)

And if we include a certain proposition *a*, namely the following: "In 2364 Jean-Luc Picard was killed by borg", *p* becomes false and we deal with the world W_n^2 again, and this world would not contradict the metaphysically possible world of "Star Trek" universe ontologically, while it would differ in the true/false meaning of *p* and, therefore, in all the occasions connected to it. This difference, as well the additional information about W_n, can be seen in such possible worlds, as spin-offs of the official "Star Trek" series in videogames, commixes or books. They all do have relation to W_n's ontology, but the propositions of the world are different by their meaning, since they only develop, negate or continue the primordial propositions that were made by the original creators of the possible world of "Star Trek" universe. In this case, we deal with the following situation, which would also clarify our previous parts of the proof 1:

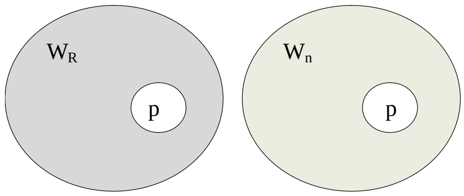
$$(W_n \to p) \lor (q \in W_n) \to p$$
$$(a \in W_n) \to \sim p$$
$$(a \in W_n) \equiv W_n^2$$
$$W_n^2 \to \sim p$$

Finally, we have the following expression:

$$\Diamond p \models (\exists p)(\exists q)((q \lor \sim q \to p) \land (q \lor \sim q \to \sim p))$$
$$\Diamond p \models (W_R \to \sim p) \land (q \notin W_R)$$
$$\Diamond p \models (q \in W_n) \land (a \notin W_n)$$
$$\Diamond p \models W_n \to p$$
$$\Diamond p \models ((q \in W_n) \lor (q \notin W_n)) \to p$$
$$\Diamond p \models ((a \in W_n) \to \sim p) \to W_n^2$$
$$\Diamond p \models W_n^2 \to \sim p$$

The final set of logical expressions is made regardless of certain examples - this is the model of proof for the possible truths in possible worlds in general. By *p* we denote the possible truth that is true for possible world (W_n) and false for actual world (W_r); *q* denotes the set of random parameters, which constitute the difference of ontological structure and events of the world W_n from the actual world, and which do not affect the truth/falsity of proposition *p*; *a* denotes the proposition which implies the parameter that directly affects the truth/falsity of *p* and which creates, in case of change of proposition's true-false meaning after the inclusion of proposition *a*, the new possible world W_n^2. The difference of this new possible world from W_n lies only in falsity of proposition *p* that is true to the world W_n.

Proof 2. The second proof is related to necessary truths, the propositions that are true in actual world and in every possible world. Basing on the *proof 1*, the proof for necessary truth now would be briefer. The connection between possible world and the real world looks like the following (the color of circle depicts the differences of ontological structure that would be denoted as *q* for W_n and ~*q* for W_R):



The variables preserve meanings that we have in previous proof. According to them, we'd have the following:

$$\Box p \models (\forall p)(p)$$
$$\Box p \models (\exists q)(q \lor \sim q \to p)$$
$$\Box p \models \sim((q \notin W_n) \to (W_n \equiv W_R)) \Leftrightarrow (q \in W_n)$$
$$\Box p \models (W_R \to \sim q) \to p$$
$$\Box p \models (W_n \to q) \to p$$
$$\Box p \models (\sim((a \in W_n) \to \sim p)) \to \sim a$$

The given results are fixed and don't change for $\Box p$, and the only expression that represents the opposite, in this case can be depicted as following:

$$a \to \sim p$$
$$((((a \in W_n) \to \sim p) \to \sim W_n) \to W_n^2)$$

Since the falsity of *p* is forbidden by the premised condition (by which we mean here the expression $\Box p \models (\forall p)(p)$), then, if the proposition *a*, that negates the truth of *p*, appears, the whole possible world is negated; and its negation leads to the appearance of a new possible world, which, in general context, do not satisfy the conditions of necessary truth of *p* in all possible worlds: $\Box p \models$ if p is false in W_n^2 then W_n^2 does not exist as the possible world, related to W_R. By this we should understand, that, if we turn to conventional denotations of possible worlds semantics, nonempty set G that represents the set for possible worlds of W_R, doesn't include the world W_n^2 ($W_n^2 \notin G$). Then we may deal with the following question: how the modeling of a new possible world, included into G set is permissible? Firstly, its difference from W_n should be pointed out. For example, apart from the formally infinite set of properties *q*, that are included to W_n and the potential new world as well, and that do not affect the truth of *p*, we would also include one more set of differences of ontological structure. Such a set would have, for example, the following propositions that are true for this new world: "all people in this world have got a green skin", "there are only three continents on Earth in this world", "the metal ions of this world have no bridging ligands at all", "it is known for certain that tachyons exist in this world" (while to our world it is just the hypothesis, we know about their existence for sure for this possible world, since we are creating its ontological parameters), " the gravitation acceleration in this world is g = 10,1". We would denote this set of propositions as *w*, and the possible world, where these ontological differences from the actual world and world W_n are met, as W_n^3. The meaning of p is preserved from the first proof ("Romney became President of USA in 2012"). Then, to include this possible world into the set G, where *p* is always true according to our primordial conditions of *p* as the necessary truth, we have the following:

$\Box p, G \models (\forall p)(p)$

$\Box p, G \models (W_R \to p) \wedge (W_n \to p)$

$\Box p, G \models (W_n^3 \in G) \to (W_n^3 \to p)$

$\Box p, G \models (w \in W_n^3) \wedge (q \in W_n^3)$

$\Box p, G \models ((w \in W_n^3) \wedge (W_n^3 \to p)) \to (w \to p)$

$\Box p, G \models ((\forall p)(p)) \to ((w \notin W_n^3) \to (W_n^3 \to p)) \to (\sim w \to p)$

The part of proof 2 that deals with inclusion of the possible world into G in which *p* is true in all possible worlds and in actual world, is applicable either for physically, or for metaphysically possible worlds. According to it, there is no need to double the expression for metaphysically possible world (that would include, for example, the elements of magic or cryptozoology). Then, the general form of proof 1 and proof 2 of our theorem on admissible ontological randomness of possible worlds would be the following. For possible truths:

$\Diamond p \models (W_R \to G) \wedge (W_n \in G)$

$\Diamond p \models (\exists p)(p \vee \sim p)$

$\Diamond p \models (q \vee \sim q \to p) \vee (q \vee \sim q \to \sim p)$

$\Diamond p \models (q \notin W_R) \wedge (W_R \to \sim p)$

$\Diamond p \models (q \in W_n) \wedge (W_n \to p)$

$\Diamond p \models a \to \sim p$

$\Diamond p \models ((a \in W_n) \to W_n^2) \wedge (W_n^2 \in G)$

$\Diamond p \models (W_n^2 \to \sim p)$

For necessary truths:

$\Box p \models (\forall p)(p)$

$\Box p \models G \to p$

$\Box p \models (\exists q)(q \vee \sim q \to p)$

$\Box p \models (W_n \in G) \wedge (q \in W_n) \wedge (W_n \to p)$

$\Box p \models (q \notin W_R) \wedge (W_R \to p)$

$\Box p \models a \to \sim p$

$\Box p \models (a \in W_n) \to W_n^2$

$\Box p \models (W_n^2 \to \sim p) \to (W_n^2 \notin G)$

$\Box p \models (W_n^3 \in G) \to (W_n^3 \to p)$

$\Box p \models ((w \in W_n^3) \vee (w \notin W_n^3)) \to (\sim w \vee w \to p)$

According to proofs that were formulated before, the theorem we formed in paragraph 1, has the following form of its expression in logic:

$\Diamond p \models (\exists p)(\sim p \vee p)$

$\Diamond p \models (W_R \to G) \wedge (W_n \in G) \wedge (W_n^2 \in G)$

$\Diamond p \models (W_R \to \sim p) \wedge (W_n \to p)$

$\Diamond p \models (\exists q)((\sim q \vee q) \to p) \wedge ((\sim q \vee q) \to \sim p) \wedge (q \in W_n)$

$\Diamond p \models a \to \sim p$

$\Diamond p \models (a \in W_n^2) \to (W_n^2 \to \sim p)$

$\Box p \models (\forall p)(p) \wedge (G \to p)$

$\Box p \models (\exists q)(\sim q \vee q) \to p$

$\Box p \models (W_R \to G) \wedge (W_n \in G)$

$\Box p \models (q \in W_n) \wedge (q \notin W_R)$

$\Box p \models (W_R \to p) \wedge (W_n \to p)$

$\Box p \models (((a \to \sim p) \wedge (a \in W_n^2)) \to (W_n^2 \to \sim p)) \to (W_n^2 \notin G)$

Now it is seen that proposed proofs compose the consistent system with a potential of its practical use, if the criteria that affect or don't the predetermined truth/falsity of propositions for the possible world are clarified. In this case, the number of parameters of possible world that do not affect the proposition is potentially infinite and can be limited only by presence (or absence) of their relation with the proposition whose truth/falsity we analyze for a certain possible world. To our mind, this theorem can receive wide use in field of possible worlds semantics and in modal logic in general. Lastly, we'd give an example of such a use.

It is necessary to find out the conditions, under which the proposition "childless father is a paradox" would be true. To avoid unnecessary repetition of denotations, we would define this proposition as *p*, the real world as W_R, the possible world as W_n etc. In actual world the proposition is false, because the word combination "childless father" can denote here such phenomena as: a priest who have no children (a spiritual father); somebody's nickname; the colloquial idiom that denotes a male who tries to "teach" the other people who are much younger than him, and who hasn't got his own children; the metaphorical notion of a male who has got a stepchildren and hasn't got his own. Thus, in actual world (W_R), proposition *p* is definitely false ($W_R \to \sim p$) (and therefore it is false for W_R language ($L_R \to \sim p$)). Nevertheless, we would insist that there a specific language L_n exists, to which it would be true that ($L_n \to p$). For such a language to exist, the existence of possible world W_n where this language would be used, is needed (since we are trying to find the conditions, on which *p* would be true not only as a part of some logical metalanguage we model for logical investigations, but as a part of a kind of possible reality which, no doubt, is related to logical investigations, yet differentiating from logical language, since we demarcate the concepts "metalanguage" and "possible world"). In such a world, for *p* to be true: there is no clergy and, as a result, no such a notion as "the spiritual father"; there is no figurative thinking and, as a result, there is no informal nicknames or metaphorical denotations; fathers cannot lose their own children (at the same time, there is no matter if mothers in this world are able to lose their children); fathers are unable to have stepchildren (and there is no matter, whether mothers are able to have them or not). We would denote such a set of criteria that are necessary for performing of proposition's *p* ("childless father is a paradox") truth, as *k*. For the purpose of economy, we would depict what is said about these conditions of truth in following expressions:

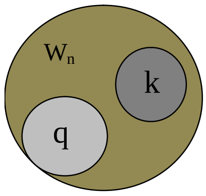
$$(\exists p)(((W_R)(L_R\rightarrow\sim p))\wedge((W_n)(L_n\rightarrow p)))$$
$$(k\in W_n)\wedge\sim(k\in W_n)\rightarrow W_n\equiv W_R$$
$$(k\rightarrow p)\vee(\sim k\rightarrow\sim p)$$

As it becomes clear, according to the expressions, *k* functions in two ways: firstly, as a condition of *p* truth in possible world W_n; secondly, *k* functions as sum of all the differences of W_n from the real world. Let us look back on some of notes regarding particular conditions, that are included into *k*. It was said that there is no matter, if mother is able to lose her children or not since it doesn't affect the truth/falsity of *p*. Let us suppose that mother in this world is unable to lose her children and empower this claim by the following proposition that includes additional changes of ontological structure that differ possible world W_n from the actual world: "in the world W_n mother is unable to lose her own children because there are no women in this world - it has single-sex society". To this claim, we would also add the following propositions that are true to W_n: "in world W_n children are grown in flowerbeds", "in W_n the bodies which are heavier than air are unable to fly", "in world W_n the Earth is flat", and "in W_n the Sun doesn't rotate". Let us denote the set of these propositions as *q*. Thus, we deal with metaphysically possible world. However, such a determination is not necessary and it is made to describe all the components and steps of our example of our theorem usage. Nevertheless, all the listed facts of this world do not negate the non-existence of childless fathers in it. No matter how people of this world look, is there a day-night shift, do people of this world believe in god or not, proposition p for this world would be true, since there are no childless fathers for its ontological structure, according to what, in logic of such a world, such a word combination would be paradox. The existence of parameters *k* in this world define the condition of *p*'s truth, therefore, if *p* us true, the existence of set of parameters *q* in W_n is irrelevant, since this set *q* doesn't affect *k* $((q\vee\sim q\rightarrow k)\rightarrow p)$. According to what was said, now we would include into W_n the proposition "one of the fathers in W_n has lost the son" and designate it as *a*. The proposition contradicts the set of criteria *k* that provided truth to proposition *p*, than we deal with the following problem:

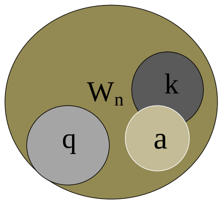
$$(a\rightarrow\sim k)\rightarrow(\sim k\rightarrow\sim p)$$

But it also clear that falsity of *p* makes the world W_n useless for our search of the world where *p* should be true. Thus, *a* is unacceptable, because $k\in W_n$ is the primordial condition of W_n existence (what can be illustrated as $(k\in W_n)\rightarrow W_n)$, and $(a\in W_n)\rightarrow\sim(k\in W_n)$.

In this case, we have the following consequence: the proposition *p* ("childless father is a paradox") is true for the possible world W_n, in which the set of criteria *k* is performed; at the same time, the number of W_n differences from actual world is formally unlimited by *k* itself: a random number of *q* ontological differences of this world, if none of the elements of *q* negates none of the elements of *k*, is possible; in case of such a negation, we can speak about the singular event *a*, which represents a kind of antinomy; this antinomy leads to impracticability of *p* truth conditions, and if it is, the world W_n doesn't satisfy our demands to this world (since our main and only demand was the truth of *p* in it). The task also casts light to our theorem proofs, showing the ability to connect its practical use with the set theory. For instance, by fact, here we deal with two subsets $k\wedge q$ which are included into the set W_n and which have no common elements: $((k\in W_n)\wedge(q\in W_n))$; $k=\{c, d, e, f\}$, $q=\{g, h, i, j, l\}$. It can be depicted as following:



Factually, *q* can broaden randomly, creating ontological differences of W_n from actual world. The truth of W_n for our conditions is violated, if subset a $(a=\{b\})$ is included in W_n that leads to following view:



Where *a*'s coincidence with *k* means not the common element, but the negation of one of *k*'s elements.

$$(k=\{c, d, e, f\})\wedge(a=\{b\})$$

Let the element *c* mean the proposition "fathers cannot lose their own children", then:

$$(a\in W_n)\rightarrow(b\in W_n)$$
$$(b\rightarrow\sim c)\rightarrow\sim p\Leftrightarrow\sim W_n$$

Thereby, as we can see, the appearance of proposition *a* violates and, as a result, disables the conditions of existence of possible world W_n, while *q* at the same time can increase up to the margins of subset *q* and W_n would perform the conditions of truth of *p* in it until *q* would not create the connections with subset *k*; such connection, that one of the elements of *q* would negate one of the elements of *k* that provides the existence of W_n.

The potential of further discussion. The only thing that philosophy explores is the whole world, but the world may be not enough for it. That is why we create the worlds of concepts, ideas, affects, percepts and possible worlds as well. The same is human mind in general do. In our article we tried to contribute to the contradictory question of possible worlds ontological status, having demonstrated that in possible world formally unlimited number of changes of ontological structure and differences from the actual world is permissible. The only limit to such an expansion of these differences can be only the fact of their influence on propositions, which are false or true in some conditions; and these conditions, therefore, are the conditions of a possible world existence and, what is more important, the purpose of its existence. It is also clear that our theorem has the property of universality and that it deals with the definition of status of possible world as well (not being restricted by attempts to indicate one of its ontological properties). Such a view on possible worlds phenomenon marks the position that we've mentioned before: in science they should be considered only as a scientific tool that may be "calibrated" according to the researcher's intention. The importance of purpose of possible world modeling is highlighted in work of Nelson Goodman, the one of the most notorious R. Carnap's followers, in his work "Ways of Worldmaking" in following words: "Not only motion, derivation, weighting, order, but even reality is relative. That right versions and actual worlds are many does not obliterate the distinction between right and wrong versions, does not recognize merely possible worlds answering to wrong versions, and does not imply that all right alternatives are equally good for every or indeed for any purpose […] the painter who sees the way the man-in-the-street does will have more popular that artistic success. And the same philosopher who here meta-philosophically contemplates a vast variety of world finds that only versions meeting the demands of a dogged and deflationary nominalism suit his purposes in constructing philosophical systems" [6, pp. 20-21]. Such thesis should not be confused with the demand of limitation of ontological differences of possible world from the actual. On the contrary, it highlights the first step of "worldmaking": the purpose. Since it is defined by the purpose, Goodman's claims about the restriction shouldn't be considered as imperative - if reality, to Goodman is relative, the reality of the possible world with any parameter is possible. The only rule of its creation, thus, would be the purpose of its constructor - and it doesn't matter if it satisfies the expectations of other philosopher and his demands on what should be the possible world; it matters if it is usable in a certain research (for what it was initially created) and if this research can be considered as a contribution to the scientific community. That is why, there should be no strict limits of the general ontological settings for such a worlds - it should be free from bounding relation with the actual world or the other possible worlds if there is no need for such a relation to us in a certain research (however, if these relations are the part of what we can call "strong" criteria for the possible world, they should exist and be unchangeable). The generality of the theorem has also obliged us to demonstrate its use on a specific example.

It is also clear that further researches in this field will demand the elaboration of such things as the status of "random changes" (their logical and phenomenological development as a concept) and their margins for each possible world (the second, however, will always remain specific for each research); we would also need the elaboration of a concept of "strong criteria" for propositions meaning in possible world, what may not be needed if in further researches we'd try to use for this purpose Kripke's rigid designators (if they in some specific case for some reasons won't suit as the conditions for the possible worlds, the notion of "strong criteria", however, would be our starting point in the search of such conditions). Nevertheless, we proposed the solution of one of the problems concerning the possible worlds ontology, through which, the possible world modeling would be able to get rid of unnecessary revisions of status (physical or metaphysical) and properties of the possible world's ontological structure if there is no strong need in such a revision in certain research. It is more likely, that when modeling the possible world, we should clearly point out the impossible without describing all its data since such data have no relation to the problem discussed. Paraphrasing the seventh thesis of L. Wittgenstein ("Whereof one cannot speak, thereof one must be silent."), we'd say: whereof it is no sense to argue, thereof must be silent.

And in our case, the phenomena on which there is no sense to argue, are the random changes of ontological structure of the possible world that differ it from the actual. And if the description and properties of these differences do not influence in any sense on propositions of this possible world, we have the right to assume the random number of changes - from one to infinity. In other words, in possible world we should not be entertained by physical parameters - to us, the only important possible world's properties should be the parameters that factually affect the propositions in one or another way, that is to say, the parameters that represent the propositions meanings. No doubt that many philosophers would disagree with our position and would reject the possibility of randomness in possible worlds parameters; some others would support our position and may even develop it into, for example, some kind of "modal relativism" (similarly to Lewis's modal realism). But, as it was said before, the problem may need further discussion and variants of solutions for different issues on the given subject, that is why, any kind of critics or support would be significant - at least, it would be the indicator of scientific community's engagement into the problem. As for us, we hope only that our theorem may become a part of these further investigations and that it would be able to clarify (at least partially) the problem of possible worlds ontology. While dealing with possible worlds semantics (and ontology as well), we should also keep in mind N. Goodman's warning about possible worlds: "Mere acknowledgement of the many available frames of reference provides us with no map of the motions of heavenly bodies; acceptance of the eligibility of alternative bases produces no scientific theory or philosophical system; awareness of varied ways of seeing paints no pictures. A broad mind is no substitute for hard work" [6, p. 21]. Therefore, we should consider, that the given theorem deals only with possibility: we are able to do that (to create any ontological differences of possible world's structure), but only if we need to - and that depends on our interest and the type of activity.

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ТЕОРЕМА ОБ ОНТОЛОГИЧЕСКОЙ СЛУЧАЙНОСТИ ВОЗМОЖНЫХ МИРОВ: В ЗАЩИТУ РЕЛЯТИВИЗМА ОТНОСИТЕЛЬНО ОНТОЛОГИИ ВОЗМОЖНЫХ МИРОВ

В статье предпринимается попытка решить вопрос онтологии возможных миров для семантики возможных миров как инструмента современной логики. Автор выдвигает предположение, согласно которому в возможных мирах допустима любая случайность относительно их онтологии и полноты описания до тех пор, пока эта случайность не влияет на истинность/ложность суждений в возможном мире. В случае же, если определенного рода онтологический параметр, вводимый нами после установления истинности/ложности суждения, для конкретного возможного мира, определенным образом меняет значение суждения, этот параметр является недопустимым, поскольку возможный мир становится инструментально непригодным для конкретного исследования, ради которого этот возможный мир моделируется.

Ключевые слова: *модальная логика; семантика возможных миров; логическая семантика; эпистемическая логика; аналитическая философия; философия логики.*

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THE THEOREM ON ONTOLOGICAL RANDOMNESS OF POSSIBLE WORLDS: IN DEFENCE OF RELATIVISM TOWARDS POSSIBLE WORLDS ONTOLOGY

The article deals with the ontology of the possible worlds in possible world semantics. Possible worlds are considered from instrumentalist point of view (according to which we have no need in regulating of the relation of possible world to actual world in possible truths and necessary truths as well). Basing on such an approach, the author suggests an assumption, according to which there is any randomness towards ontology and description fulfillment of possible worlds is permissible, until this randomness doesn't affect the truth/falsity of propositions in possible world. In case if such an ontological parameter, that we include to certain possible world after proposition truth/falsity setting for this world, somehow changes the true/false meaning of the proposition, this parameter is unacceptable, since possible world becomes instrumentally useless for the certain investigation, for which this world is been modeled. To substantiate the theorem that expresses the author's position, the article includes the two proofs of the theorem: the first proof is related to possible truths, the second - to necessary truths. The proof includes physically possible worlds and metaphysically possible worlds (that are called also "impossible possible worlds" by Hintikka). In addition to the proofs of theorem, the author also suggests the example of practical use of theorem in possible world modeling and proposition analysis.

Keywords: *modal logic; possible worlds semantics; logical semantics; epistemic logic; analytical philosophy; the philosophy of logic.*

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