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DID NĀGĀRJUNA KNOW MODAL LOGIC?

Conventionally, Aristotle has been considered the father of modal logic. So, his treatise *On Interpretation* (Περὶ ἑρμηνείας) is the first source where there are found well-defined logical relationships among different modal propositions, such as “it is possible that...” or “it is necessary that...” Recently, these relationships are formalized by mathematicians within logic **K**, the basic modal logic. Hence, we can state that Aristotle knew modal logic in the version of **K**, indeed. He was first who understood it well and was able to describe its main properties. There was also a Stoic version of modal logic, but it remains not formalized still, because there is a few Stoic fragments on modal reasoning to be formalized unequivocally. Nevertheless, we see that their modal logic was non-Aristotelian. Traditionally, *nyāya* and *mīmāṃsā*, the Indian logic and hermeneutics, have been considered a tradition beyond any modal logic, because we do not have clear direct Sanskrit analogies with expressions “it is possible that...” or “it is necessary that...” in the meaning of **K**. Nevertheless, there are many texts of early *madhyamaka* and *yogācāra* with clear modal reasoning, but not in the way of Aristotle (logic **K**). For instance, this reasoning is well presented in Nāgārjuna’s *Īśvara-karṭṛtva-nirākṛtiḥ-viṣṇnoḥ-ekakarṭṛtva-nirākaraṇa*. This short treatise is to propose a kind of critics of monotheism (the concept of *Īśvara*) by appealing to some modal relationships which can be formalized even mathematically. Later these critics became traditional for *madhyamaka* and *yogācāra* and there are many other texts on the same subject within a modal logic. This logic is of interest because there are some logical and terminological similarities to Stoic modal reasoning. For example, the Nāgārjuna’s term *siddha* can be understood as a Stoic „to be fated” or „to be necessitated”.

Nāgārjuna’s examples for the modality “it is impossible that it is” (or “it is necessary that it is not”): “oil [crushed] out of sand, which is known to us as nonexistent; wool on a tortoise, which is known to us as non-existent” [1]. Using these examples Nāgārjuna shows that if the Creator exists, He creates something from nothing, such as “wool on a tortoise”. It means that He can make “possible” from “impossible”. The assumption that “possibility” and “impossibility” exist simultaneously gives a contradiction and then it should be rejected. As a consequence, the Creator does not exist, too. The assumption of His existence should be rejected, also, as entailing a contradiction between the modalities “possible” and “impossible”.

This short Nāgārjuna’s argumentation is absolutely correct from the point of view of logic **K**. All existent items are possible: “If A, then it is possible that A”. Among non-existent items there are items B which are impossible: “it is necessary that not B”. From the statement “If A, then it is possible that A” it follows logically that “If it is impossible that A, then non-A”. These impossible items cannot be created, because the conjunction “it is possible that A **and** it is necessary that not A” is always false in **K**.

Thus, we can claim that Nāgārjuna knew a kind relationships of modal logic. He became a father of Indian rational thinking, indeed.

References

- [1] *Papers of Th. Stcherbatsky* (Soviet Indology series, no. 2). Indian Studies: Past & Present, 1969.