Spring 4-20-2012

Commentary on "Bivalence, Theories of Truth, Aristotle, and Lukasiewicz"

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April 19, 2012

0. Introduction [1]

Alison has presented a clear, well-structured and well-argued paper. And it was reasonably short and didn't need extra time—things that rarely happen at a philosophy conference. The only problem I have with the paper is that I don't understand it. The topics Alison raised are complex and require me to think longer about and more deeply than I had time to. To make things worse, I got lost already on the first two pages; so this is why I will limit myself mostly to preliminary observations. But this is not Alison's fault; not at all! Blame Aristotle, or me, or both. My main reservation will be that the paper is an exercise in ancient ontology and logic; but the ball game has changed, which means that there not much we could gain from Aristotle today.

1. Aristotle's World

Propositions. According to Aristotle, declarative sentences are "something about something" ($\tau\iota$ $\kappa\alpha\tau\acute{\alpha}$ $\tau\iota\nuo\varsigma$): 'something,' namely, the subject S of the sentence ($\upsilon\pi o\kappa\epsilon\acute{\iota}\mu\epsilon\nu o\nu$), is qualified as 'something' by a predicate P ($\kappa\alpha\tau\eta\gamma o\varrho\acute{\iota}\alpha$); P is predicated of S ($\kappa\alpha\tau\eta\gamma o\varrho\epsilon\tilde{\iota}\nu$) or attributed to S ($\upsilon\pi\acute{\alpha}\varrho\chi\epsilon\iota\nu$). The subject S, however, always denotes ($\sigma\eta\mu\alpha\acute{\iota}\nu\epsilon\iota$) a substance ($o\upsilon\sigma\acute{\iota}\alpha$); a subject can be characterized as what never can serve as a predicate ([Cat] V).

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[1]Not much, just some quick notes and key phrases to remind me of what I wanted to say.

Substances. Aristotle conceives of substances in a biological terms. Similar to a seed that potentially contains the mature tree, substances contain their own future, as least potentially so. (Admittedly, that's Leibniz' Aristotle, but here I suppress details for brevity's sake.) Equally important, all properties a substance may have are monadic properties, monadic properties our language denotes with predicates P. Notions that we now render as two- (or more) place relations, Aristotle takes them as predicates. For example, causality according to Aristotle is not a two-place relation between a cause and an effect, like a fire causing the destruction of the building, but a potential fire has, namely, fire has the property to destroy buildings. Note that in an Aristotelian framework it would make some sense to ascribe substances not only causal powers but, by extension, also the power to make sentences true or false.

Timed Truth. In this framework, and this seems to be an assumption shared among all ancient writers, truth is timed. When Aristotle is talking about truth, stock examples are not mathematical truths but, in a world filled with change, empirical statements. While it doesn't seem to make sense to ask "For how long will four remain divisible by two," it does make sense to ask "For how long will Callias remain healthy?" In this light, it made perfect sense for Aristotle to raise the question how the three tenses (past, present, and future) affect the truth of declarative sentences. Since everything we observe is interpreted in terms of substances and their emerging and vanishing properties, truth is linked to these changes and is timed, not sempiternal.

Underdeterminacy of the Future. Unlike Leibniz, who would later try to give a more consistent and more rigorous version of Aristotle's ontology, but also unlike the Stoics, and Chrysippus in particular, Aristotle seems to have been reluctant to assume that the changes substances undergo are deterministic in character; at least, or so it may seem, he denied that we know what those laws are due to the overwhelming complexity of intricate interactions among them.

2. Where I got lost

Definition 1 (explanation); quote: "Notice that my definition of bivalence requires that every declarative sentence has a truth-value" (p. 1).

Truth-Values. Do sentences have truth-values? Obviously, this is how many speak. But do sentences *have* truth-values as properties like concrete objects

have colors as properties? Tarski semantics has become an almost canonical way to speak about truth. In Tarski's world, however, truth is not a predicate sentences have (or have not) but a relation that obtains (or does not) between a situation (a possible world, a structure) and declarative sentences. Thus, if we assume that Tarski semantics are our current gold standard for truth talk, then, strictly speaking, sentences don't *have* truth-values.

Bivalence. Do sentences necessarily have a truth value? It depends, since what matters is what logic one is talking about. The principle of bivalence has been contested, and rightly so, I believe, by people working in the field of constructive logics. For otherwise we allow logic to become some sort of magic wand with which we can prove that certain objects with specific properties exists, while at the same time we are utterly unable to produce a witness, an example to prove we were right. From my point of view, bivalence is therefore not a logical principle, since there is not just one logic but many, and it may hold as a principle in some and fail in others.

Digression: Principle of Disjunction. Similar reservations apply to what is later introduced in Definition 5 as the principle of disjunction (p. 5). Versions of it may hold or not, depending on the logic or the concept of truth one is assuming. (Test, in particular, what happens if $Q = \neg P$.)

Definition 2; quote: "[a sentence q] is true if and only if there there is some current fact that makes it true, i.e., the current state of affairs is such that E will occur." (p. 1).

As I tried to say earlier, in Aristotle's world substances (or state of affairs) can be considered truth-makers. I don't see how this is justified in Tarski's world. The number two doesn't make the number three bigger just because the relation $2 < 3$ obtains. Likewise, a situation S doesn't make a proposition p true just because the situation $S \models p$ obtains. Let me explain.

Assume S_p to denote the present situation (the world as it is now), and S_f some future situation. Let E be an event, q_p the sentence "E occurs (presently)," and q_f the sentence "E will occur (in the future)." Then I take Alison's strong correspondence theory of truth to say:

$$S_p \models q_f \quad \text{iff} \quad \exists\,\text{SoA} \in S_p : \quad \text{SoA makes } (S_p \models q_f)$$
$$\& \qquad \text{SoA causes SoA}',\ \text{with SoA}' \in S_f$$
$$\& \qquad \text{SoA}' \text{ makes } (S_p \models q_f)$$