

ANALOGIA ENTIS

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Abstract

Analogy is used when notions are beyond those of colloquial language. This essay discusses cases of analogy in connection with the word IS. Examples from the field of philosophy and physics are presented.

Many scholars were interested in the problem of language. It is evident that the formation of language has had as its basis the pre-scientific experience, the experience of everyday life. Hence, the facts which are transcendent in relation to everyday experience cannot be easily expressed, due to the lack of corresponding notions. Such is the case in two fields. One is connected with a transcendence present in religion. The other one became evident when progress in science (mathematics, physics, chemistry, biology) resulted in another “transcendence”, stemming from emerging notions for which there was no place in common language. These notions then became parts of modern everyday language. As examples we could give a list of such notions functioning in physics: energy, momentum, electric current, voltage etc.

An interesting example of transcendence, which was beyond the then functioning language in the matters of religion, was presented by Professor Świderkówna, who discussed a fragment from the Old Testament: “And they heard the voice of the LORD God walking in the garden in the cool of the day” [1]. Świderkówna writes: “How is one to say that God is a Person, not an impersonal force, when the notion of a “person” does not exist? The easiest way is to present Him simply behaving as a man. An evening stroll of God in the Garden has to show, how close He is to man” [2].

Let us come back, however, to the “transcendence” which shows up in science. An important factor here is that nature happens to be “mathematical”, which means that it can be described by notions found in mathematics, such as: numbers, vectors, matrices, equations, operators etc. There is an expression, which came into use: “The language of physics is mathematics used as a language”. Many scientists claim that such a language is sufficient, proper and adequate.

Perhaps it would be so, if not for the fact that when dealing with notions used in physics, the notion of IS (something IS) remains difficult. This problem shows up in both the religious transcendence and the “transcendence” in science - in particular in microphysics as described by quantum mechanics.

We may observe a curious fact (perhaps connected with the problem of IS) that the most outstanding physicists - many of them Nobel price winners - were tempted to write books, in which they use a pre-

cient language, but not a “mathematical” one. Their language, however, emphasizes the matter of “transcendence”. Among the authors are: Schrödinger [3], Heisenberg [4], Weinberg [5] and Paul Davies [6]. This seems to indicate that mathematical language is still not sufficient. Some aspects have to be articulated by language common for both science and poetry. Here we find ourselves involved in the problem of analogy.

Analogy (analogia entis) was discussed by St Thomas Aquinas [7] mostly in connection with its application to the matters of religion. Werner Heisenberg writes about the analogy and the functioning of language in physics [8]. Władysław Stróżewski writes about analogy in connection with ontology[9].

When using analogy in describing transcendent (or “transcendent”) facts, we must remember about a kind of discipline, which has to be observed. The discipline demands from analogy adequacy and a clear similarity. And one statement more: analogy cannot provide certainty, only a greater or lesser probability. Matters of analogy presented in this essay deal with the problem of analogy connected with the word IS.

Let us mention that quite often we feel comfort (perhaps it is an illusion) when we replace some terms by others, in the language of philosophy. For instance, in Greek and scholastic philosophy the word “Being” (“ENS”) is used. Wittgenstein prefers to use the word “Fact”. Husserl uses the word “Phenomenon”. Both “Beings” and “Facts” need a “scene”, hence such terms as “Wittgenstein’s logical space” [10] or Plato’s space [11]”, where the word “space” (or “space-time”) is being used analogically to colloquial language.

When considering the notion of “Being”, we cannot resist a temptation to apply a kind of “mathematics” and write:

$$\text{Being} = \text{IS} \text{ “+” Essence}$$

or in Latin:

$$\text{Ens} = \text{ESSE} \text{ “+” Essentia.}$$

When we abstract from the second term concentrating on the first term only, we operate within the so-called metaphysical abstraction, which treats Being sub ratione entitatis. But outside of this abstraction we always have a “composition” of aspects: we talk about something - THAT IT IS and WHAT IT IS.

As already mentioned, the composition: Being = IS “+” Essence,

looks like a mathematical formula. We must be careful, however. We must avoid the temptation to come under the impression that we are dealing here with a sum. The quotation marks at the + sign have to warn us against such temptation. Nevertheless, we are dealing here with something similar to a sum, although the notions “IS” and “essence” cannot be “mathematised”. They are, so to say, transcendent in relation to mathematical notions. This transcendence indicates that we are dealing with an analogy. The composition of the IS and the Essence is a sum, but in an analogical sense. But as we have already said, the application of analogy demands a certain discipline: the analogy has to be as adequate as possible.

The analogy used in the now discussed case is not sufficiently adequate, because when the elements interact we should not be satisfied with just a sum. It is a too far reaching reductionism. It would be the same as saying that an atom is just a sum of its nucleus and electrons. It would be more adequate to add to such a sum a term representing the coupling. Thus it is (perhaps) better to write:

$$\text{Being} = \text{IS} \text{ “+” } \text{Essence} \text{ “+” } \text{Coupling term.}$$

This last term may be small (when the so-called coupling constant is small), or large (when the coupling constant is large).

A little more discipline relating to this analogy: for a mathematician as well as for a physicist, connecting IS and Essence with a + sign is not permitted, since IS and Essence are different qualities. A more correct “formula” should perhaps be:

$$\begin{aligned} [\text{Contribution of Being to reality}] &= [\text{Contribution of IS}] \text{ “+”} \\ &[\text{Contribution of Essence}] \text{ “+” } [\text{Coupling term}]. \end{aligned}$$

A physicist and mathematician can recognize here a formal similarity to the following equation:

$$\begin{aligned} [\text{Hamiltonian of the atom}] &= [\text{Hamiltonian of the nucleus}] + \\ &[\text{Hamiltonian of the electrons}] + [\text{Coupling term}]. \end{aligned}$$

If we were right in claiming that the procedure presented above shows an increasing adequacy, we can conclude that the IS and the Essence cannot be easily separated. A separation is more difficult when the coupling is large. We could have discussed an alternative proposition and replace the sum with a mathematical notion of convolution [12] between the IS and the Essence. In any case, abstracting to the situation *sub ratione entitatis* may be difficult. Many of us know how difficult (at least in practice) deconvolution in physics is.

A by the way remark: similar discussions might be applied to the problem of hylomorphic composition: Material object = Matter “+” Form, and, in particular, to the composition: Man = Body “+” Soul. It is possible, that in the case when the coupling constant is large, the separation of the soul from the body may be doubtful.

Let me here touch upon the problem of God. The words heard by Moses on Horeb mountain (Sinai) [13]: “I AM THAT I AM”, may be paraphrased as: An essence of God is to be. So says theology. Perhaps we could say that, in the case of God, the coupling term dominates to such an extent, that the whole procedure of analogy is completely inadequate. This was known to St Thomas Aquinas who said that it is almost impossible to say who God IS, and we can only reach an understanding of who God IS NOT.

We may now ask which are the objects of physics that these considerations apply to. They, of course, apply to all macroscopic objects, since these objects were a basis for creation of notions such as ESSE, ESSENTIA etc. In the case of microscopic objects (atoms, electrons etc.), they may be similarly treated only when they were actualized in the process of measurement (the collapse of wave function). It is not so simple, however. More will be said below. Now I would like to say a few things concerning the objects in potentia, which in quantum mechanics correspond to superposition of states. It is necessary to make here an explanation [14].

Status of a microscopic object, such as atom, ion, electron etc. is obtained from the Schrödinger equation. Usually, such status is a superposition of states permitted by this equation. Superposition, i.e. a sum whose terms (states) are multiplied by coefficients, which constitute the probabilities of their actualization. We may ask: Is such an “object” - in superposition of states - a Being? Of course, it is not an actual Being - it is not a “wirkliches Sein” according to Edith Stein. It may be called a Being in potentia. Can we say: such Being IS? Edith Stein considers here a subtle difference between the words “die Möglichkeit” and “das Vermögen”. “Die Möglichkeit” means a universal potentiality, so to say. “Das Vermögen”, on the other hand, is a potentiality to be actualized in permitted states [15]. Edith Stein says that a potential Being in the “das Vermögen” meaning has some degree of IS. Werner Heisenberg [16] seems to claim the same, calling the situation in a superposition of states a packet of “tendencies”,

which is perhaps the same as “das Vermögen” of Edith Stein.

A philosophizing physicist feels here a need for an “ontological citizenship” for the notion of “information”. Perhaps the IS of an object in the superposition of states is that of an information which tells us what and with which probability may be actualized? We may ask if such a Being obeys the mathematical analogy: Information = IS “+” Essence “+” a coupling term, and in what sense? But without a well established status of the notion of information, it is too early to discuss this subject.

Eventually, our object - perhaps as a packet of information - reaches the detector i.e. the measuring device, and then occurs something, which has no explanation in the results of the Schrödinger equation: one state is being chosen from the superposition. This state shows up actually, not just potentially. But ATTENTION! If our detector was constructed so, that it measures the position (location) of our object, the position (location) is actualized, the velocity (momentum), however, remains still in a status of superposition of states, i.e. in a status of a potential Being (“tendency” according to Heisenberg, “das Vermögen” according to Edith Stein). If our detector was made so that it measures the momentum, then the momentum is actualized, whereas the position is then in a status of *potentia*. Hence our object, unlike a macroscopic one, IS actual only under some aspect.

It is worthwhile to quote here Werner Heisenberg [16] who, when discussing the problem of superposition of states says: “if one considers the word ‘state’ as describing some potentiality rather than reality - one may even simply replace the term ‘state’ by the term ‘potentiality’ - then the concept of ‘coexistent potentialities’ is quite plausible, since one potentiality may involve or overlap other potentialities.”

In conclusion, we may come back to the meaning of the word IS, in the colloquial and analogical sense. When we say “Stone IS” we have in mind a Being actually existing. Its meaning is well understood, in the colloquial sense. If we say “God IS”, we use the word IS analogically, since we cannot separate the Essence of God from IS. God’s essence is TO BE. When we say “electron IS” we have a dilemma: if it is an electron “flying” to the detector, we think about an IS in a sense of the information packet, characteristic for a superposition of states. Hence this is an analogical IS. But if we think of a

registered electron, for instance with a determined location, we have the location actualized, as in the colloquial sense, but the momentum has still a potential sense. Therefore, from the point of view of the wholeness of Being, we have an analogical meaning of IS, even if the electron has been registered.

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