Are Dogs Logical Animals ?

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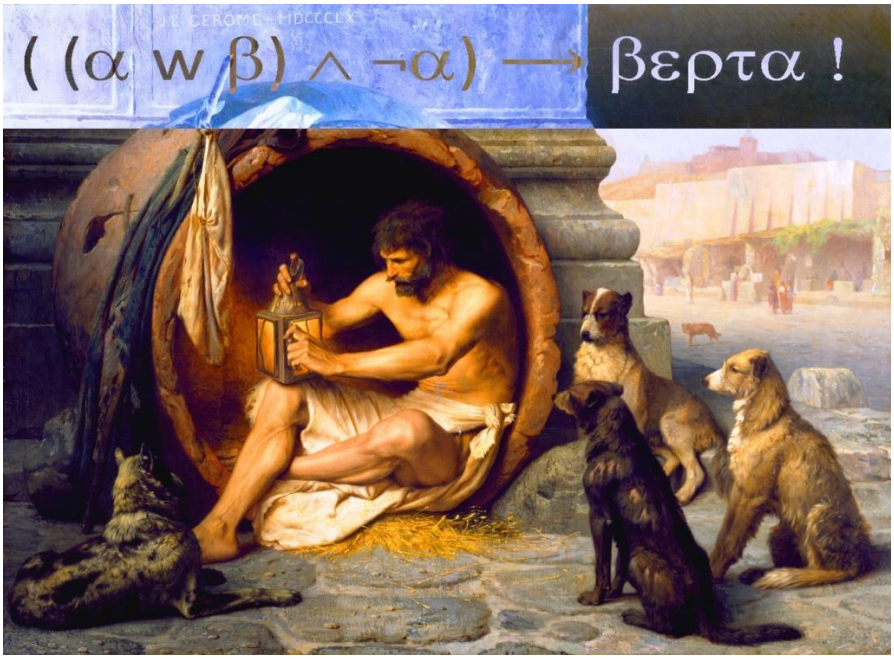


Autre être fidèle du tonneau sans loques
malgré ses apparitions souvent loufoques
le chien naît pas con platement idiot
ne se laisse pas si facilement mener en rat d'eau
il ne les comprend certes pas forcément toutes
à la première coupe
ne sait pas sans l'ombre deux doutes
la fière différance antre un loup et une loupe
tout de foi à la croisade des parchemins
il saura au non du hasard dès trousser la chienlit et non en vain
reconnaître celle qui l'Amen à Rhum sans faim
Baron Jean Bon de Chambourcy

1. Human beings and other animals

In Ancient Greece human beings have been characterized as *logical animals*. This traditional catching is a bit lost or/and nebulous. What this precisely means is not necessarily completely clear because the word *Logos* has four important aspects: language, science, reasoning, relation. The Latinized version of "logical", i.e. "rational", does not fully preserve these four meanings. Moreover later on human beings were qualified as "homo sapiens" (see Beziau 2017).

In this paper we will try to clarify the meaning of "logical animals" by examining if dogs can also be considered logical animals. An upside question of "Are dogs logical animals?" is: "Are human beings the only rational animals?". It is one thing to claim that human beings are logical animals, but another thing is to super claim that human beings are the *only* logical animals.

And there are also some related questions, if we consider the semantic cloud surrounding *logical*, in particular: "Are dogs intelligent?".

Everybody knows more or less what a dog is. We are of course talking about real dogs, dead or alive, famous or anonymous like Laika, Kiko, Rin Tin Tin, not Snoopy Dogs, Snowy Dogs, Hot Dogs. We will be cynical enough not to give a proper definition of a dog. For our discussion, based on a real experiment, not a thought experiment, this is fairly enough.

2. The forking story of Bobon and Bertha

Once upon the time there was a dog called "Bobon du Chateau" (nicknamed "Bobinho") who was chasing a cow named "Alpha Bertha" ("Bertha" for short).[1] The cow was going fast and Bobinho had difficulties to closely follow her, especially that he had hurt one of his legs by playing with his famous fantasy pussy cat who bit him. Cats can very dangerous especially if they are not real cats (see Beziau 2019b). At some point he did not see her anymore, but anyway they were both on the same path and moreover there was the smell of the cow. Bertha smelled good and even without a path, Bobinho would have been able to follow her. But because there was a path,

[1] Our paper is written as a kind of funny tale. We believe that something can be funny and serious at the same time (see our recent paper on this topic: Beziau 2019c). We would also like to remind Schopenhauer's aphorism: "A sense of humor is the only divine quality of man", which fits well here considering that Schopenhauer was very fond of dogs.

Bobinho's nose was not always sticking to the ground, he was enjoying frisky walking, looking at the birds, butterflies, and raindrops.

At some point there was a fork in the path, and Bobinho, who was at this point looking at a nice raven, his nose up in the air, naturally went on the left path, but then since he was indeed interested in chasing Bertha not the raven, regardless of how beautiful the bird was, he put his nose back to the ground to check if Bertha had really gone this way. As he did not sense her smell, he immediately ran back to the right path without checking if Bertha had left her scent on this path

We will not relate the full story of Bobinho and Bertha here, if there was a happy ending or not, but we will focus on the fork.

3. Bobon is able to reason

Considering this real story, can we claim that Bobon is able to reason? The important point in this choice of fork is that the decision of Bobinho is not purely empirical. Let's describe the situation in detail. There are two paths, not to put the thing in too complicated a frame, let's call them "α" and "β". Bertha who is neither a mole nor a flying pig could have gone either on α, either on β. Getting slightly symbolical, let's put this dilemma as: α w β. Bobon first went for a kind of accidental reason on path α. Then, using his nose, he saw, or better smelled, that Bertha did not choose this path. This can be simply

expressed by "¬α", an abbreviation for "Bertha did not go on the α path". Then Bobon could have gone to path β and first put his nose to the ground to check if Bertha really went that way. But what he did was more extravagant: he did not use his nose but his intelligence, performing what is sometimes called a "disjunctive syllogism", which can be expressed by a tautology:

$$((\alpha \text{ w } \beta) \wedge \neg\alpha) \longrightarrow \beta$$

or an inference rule:

$$\frac{\alpha \text{ w } \beta \qquad \neg\alpha}{\beta}$$

How did Bobon know that Bertha went on β without seeing her going this way or smelling her scent on β ? By reasoning! If she did not go to path α and since there were only two paths, she must have gone on path β. This is a logical fatality. So the behavior of Bonbon is far from being 100% empirical.

Why did Bertha decide to go on path β ? We will not answer here if this was based on intelligence or not. We will also not discuss here if a mouse, a cat or a monkey can perform the forking action that Bobon did. We will leave these questions to the specialist of animal testing.

What is certain is that a robot can do this. It is possible to implement deep blue artificial intelligence in a moving machine shaped for example, as a sheep (hereafter Sheepic), in such a way that Sheepic will be able to direct her conduct in a similar way as Bobon or even be able to play chess, something that Bobon, or other real dogs, can't do.

If we say that Bobon reasons because he is performing the forking argument, there is no good reason to say that Sheepic is not reasoning. So our favorite rational animal Adam is now flanked by two reasoning non-human beings: on his left is a reasoning animal, Bobon, on his right, a reasoning machine, Sheepic. We have been careful enough to say "reasoning beings", not "rational beings", to avoid claiming right away that these three beings are all part of the same family.

4. Bobon is not a scientific animal

Can we say that Bobon is a rational animal? Let's make the following experiment, placing Bobon in front of the below table:

α	β	α w β
0	0	0
0	1	1
1	0	1
1	1	0

Will he understand something? He may wag his tail, but that's it! The same with Sheepy. Sheepy can indeed be programmed to wag her tail each time we show her a truth-table. That's the joy of logistic…

What we can claim is this simple: Bobon and Sheepic can reason but they cannot understand their reasoning. We can say that Bobon and Sheepic are *logical beings* but not *metalogical beings*. This meta way of phrasing the situation sounds nice, expressing the superiority of human Adam relatively both to the cynical Bobon and the robotic Sheepic (if we consider the "above"

meaning of “meta”). But this can properly be understood only by the happy fews, who know metaphysics, metamathematics and metaethics.

To avoid any confusion and make our claim more democratic, instead of saying that Bobon and Sheepic are not metalogical animals, we prefer to say that they are not scientific animals. They may have a logical behavior, but they don’t know the science of logic (see Beziau 2010).

In his famous treatise *An Investigation of the Laws of Thought* (1854) Boole wrote the following: “The design of the following treatise is to investigate the fundamental laws of those operations of the mind by which reasoning is performed; to give expression to them in the symbolical language of a calculus, and upon this foundation to establish the science of logic.”

Maybe Boole did not have in mind the minds of dogs and robots. Never mind: even if the science of logic he is talking about can be seen as describing some reasoning performances by Bobon and Sheepic, the science he is talking about can hardly have been developed by them and/or been understood by them.

We will not discuss here if one day a Super-Sheepic will be able to develop scientific theory, this is a hard artificial intelligence topic that we may tackle in another paper. The main menu of the present paper is the organic dog.

Putting aside robots, we can say that the forking tale does not prove that there are rational animals besides human beings, if we consider that rationality is not limited to performing reasoning, but also encompasses the science of reasoning, and science in general (science is one of the four meanings of the word “logos”).

And if we if keep this general meaning in mind, using it also at the adjective level, we can say that dogs are not rational animals, or in a less cynical way, that dogs are not logical animals.

5. Acknowledgements and Dedication

My meeting with Stan Krajewsky was on a religious basis, but in a logical way. We did not meet in a church but at a university, the University of Warsaw, a temple of logic:

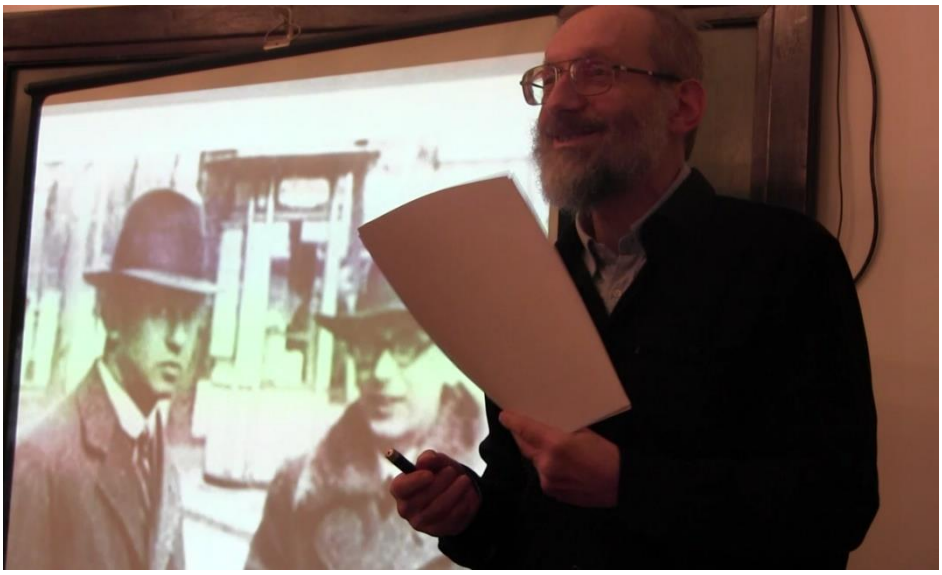
With my friend Ricardo Silvestre, we launched the series of events known as the *World Congress on Logic and Religion* (WoCoLoR), by organizing the 1st edition in João Pessoa, Brazil, April 1-5, 2015 (see Beziau and Silvestre 2017).

At this meeting there was a young Polish missionary, Marcin Trepczyński, who proposed to organize the 2nd edition in Warsaw. Back in Poland he talked with his mentor, Stan Krajewski. I visited them in Warsaw in September 2016 to prepare the organization of the event. That's the first time I met Stan.

The second time was at the *2nd World Congress on Logic and Religion*, which indeed took place at the University of Warsaw, June 18-22, 2017. Stan was pivotal for the success of this meeting, in particular inviting Michałl Heller, recipient of the Templeton Prize. On my side I invited Laurent Lafforgue (Fields Medals) and Saul Kripke (Schock Prize). We had other famous participants like Jan Woleński and Dov Gabbay. At the end we had a really exceptional event and we expect the 3rd edition taking place in Varanasi, India on November 8-12, 2021, also to be outstanding.

I then met Stan for the 3rd time at the *6th World Congress and School on Universal Logic*, which took place in Vichy, France, June 16-26, 2018 where he participated in the workshop *The Lvov-Warsaw School: Past, Present and Future* and where the related book was launched (see Beziau 2018), including two papers by Stan (Krajewski 2018a, Krajewski 2018b).

We met virtually for the 1st edition of *World Logic Day*, which was celebrated in about 60 locations in the word on January 14, 2019, a celebration organized by Stan and Marcin at the University of Warsaw (see Beziau 2019a).[2]



Then Stan came to Rio de Janeiro for CREATIVITY 2019, the *1st World Congress of the Brazilian Academy of Philosophy* I organized in honor of Newton da Costa's 90th birthday

Stan has collaborated and been friend with two other guys I know: Walter Carnielli and Dick Epstein. For this reason, I included implicit references to both of them in this paper: Dick is fond of Dog and "Carnielli" in Puppy Guarani means "Chip". *Chips with (hot) dogs floating in Cat Soup*, a tasty goulash mix! Multilinguistic humour à la Goscinny, approved by Dogmatics and Daltonics, Itzogoud …

I am very glad to dedicate this paper to Stan and hope we will have a fruitful future collaboration.

[2] They also celebrated the 2nd edition of the World Logic Day, January 14, 2020, organized under the auspices of UNESCO, after my proposal to make this day part of the calendar of UNESCO international days was approved by this organization.

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