

A Dialog about Aristotle's Four Causes

Many years after her adventures in Wonderland, Alice, lying on the grass, is reading Aristotle's Physics. She is wondering aloud about Aristotle's four causes...

Alice: The four causes are “the factors that make a thing what it is”¹... Then, does Aristotle mean by the cause the reasons for why a thing is the way it is? He classifies all causes into four types: (1) the material cause (the materials *out of which* a thing is) (2) the formal cause (*what* the thing or its kind is) (3) the efficient cause (the agent *by which* a thing is) (4) the final cause (*end for which* the thing is).

... when suddenly a handsome young man appears, cultivating the garden.

Alice: Oh. Hello Sir. I thought I was alone. Pardon me my loudness.

Candide: Hello My Lady. I am quite fond of philosophy myself. My interest is piqued. Let's apply Aristotle's theory to a thing. Here, this shovel. What are the reasons it is the way it is? Shouldn't we say what and how it is before saying why? Briefly then: it is hard; it is gray; it is a long stick tipped by a hollow blade. Why is it so? (1) Because it is made of metal, (2) because it is a gardening tool, (3) because it was made by the art of tool making, (4) because it is made for digging. Indeed, Aristotle's four causes explain the why of a thing.

Alice: But can Aristotle's four causes explain the why of any thing? And must any explanation use them? In short, are they sufficient and necessary? I can use logic to explain something without reference to the four causes. If every A is B, and C is A, then C is B. For example, if every man is mortal, and Socrates is a man, then Socrates

¹ Aristotle. *Physics*. Translated by Robin Waterfield, and edited by David Bostock. New York: Oxford University Press, 1999. (Selections)

is mortal.

Candide: Perhaps. But you can characterize your explanation in terms of the four causes. In your example, Socrates is mortal, because he is a man – it's the formal cause.

Alice: Very well. I am not sure I find this characterization very illuminating... Would the four causes have helped me in Wonderland? Of the mushroom, the Caterpillar said, "One side will make you grow taller, and the other side will make you grow shorter"². Why is the mushroom the way it is? What is it made of (material)? What are its genus & its form (formal)? By which process did it become (efficient)?

Candide: You see. The four causes give you a systematic approach to study the why of things.

Alice: What about the final cause? Can I ask what does the mushroom exist for? I surely cannot say that the mushroom was created for me to grow and shrink. It seems circular, if I want to understand the "why". I can understand the final cause of artifacts, in terms of the goals of the designer. But does the final cause apply to beings of Nature?

Candide: Aristotle intended his causal theory to apply to study of Nature. An attribute of a being cannot just be a coincidence if it happens regularly. The final cause explains the regularity of the connection.

Alice: Regularity? Surely, there is no need for the final cause in Wonderland! In this world, living beings indeed regularly exhibit the same attributes. Have you heard of Darwin's theory? Animals are fit for this world, because they have evolved from generation to generation to survive. The teeth grow the way they do because they are good for the

² Carroll, Lewis. *Alice in Wonderland*. Edited by Richard Kelly. Ontario: broadview literary texts, 2000.

animal. We don't need the final cause to explain why animals are fit. The efficient cause is the process of Natural Selection: struggle for life, survival of the fittest.

Candide: Could the struggle for life explain why there is evil in this world? Is evil caused by the merciless competition among beings to survive? This struggle would be the efficient cause. What about the final cause? Pangloss would maintain, "The world is the best of possible worlds." After the devastating earthquake in Lisbon, Pangloss said: "For all this is a manifestation of the rightness of things, since if there is a volcano at Lisbon it could not be anywhere else. For it is impossible for things not to be where they are, because everything is for the best."³ The earthquake in Lisbon was not caused by living beings: it is due to the earth, its materials and structure and movement. Still the earthquake is only evil if living beings suffer. It takes living beings to experience evil. However, I must admit that the earthquake is more the exception than the rule: In my experience, most of my troubles came from other human beings. We live in our fabricated world of causality. The final cause has a place in the human world.

Alice: Did Aristotle intend his causal theory to explain concrete things only, or also abstract concepts like "evil"? How effective is his classification in understanding the reasons for a thing? In Science, we look for general rules that can explain phenomenon. The causes are always material or efficient. Take, for example, Newton's law of universal gravitation states. We are not so much interested in the type of a cause, than in the precise calculation of the effect. Science is in the realm of the "How" not the "Why". In Science, isn't the "Why" just a greater "How"?

Candide is nowhere to be found. "How curious," says Alice. Then, she opens her eyes.

³ Voltaire. *Candide*. Translated by John Butt. London: Penguin Books, 1947.