

2014

Aristotle & Cancer

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Citation of this paper:

Thorp, John, "Aristotle & Cancer" (2014). *Philosophy Presentations*. 10.
<https://ir.lib.uwo.ca/philosophypres/10>

Aristotle & the Cancer Question

The Question

We know the rough picture of how Aristotle thinks that nutrition works. We eat food; it is 'concocted' and refined into blood; this blood then travels out to the various parts of the body where it dries out, and becomes flesh. And so we are nourished; so we grow.

But there is a question: why don't we grow cancerously? Why don't our noses grow longer and longer? Why don't our ear canals fill up with flesh? Why don't our arms become clubs, our lips amorphous masses, our eyelids heavy immovable curtains?



The Formal Answer

Aristotle is aware of this problem. He writes:

The soul is the principal cause of growth, for... in the case of all complex wholes formed in the course of nature there is a limit or ratio (*peras kai logos*) which determines their size and increase, and limit and ratio are marks of soul.... (*de Anima* 416a15ff.)

But this, of course, is a purely formal answer: soul does it! But we want to know how it works, how does soul do this, what is the mechanism?

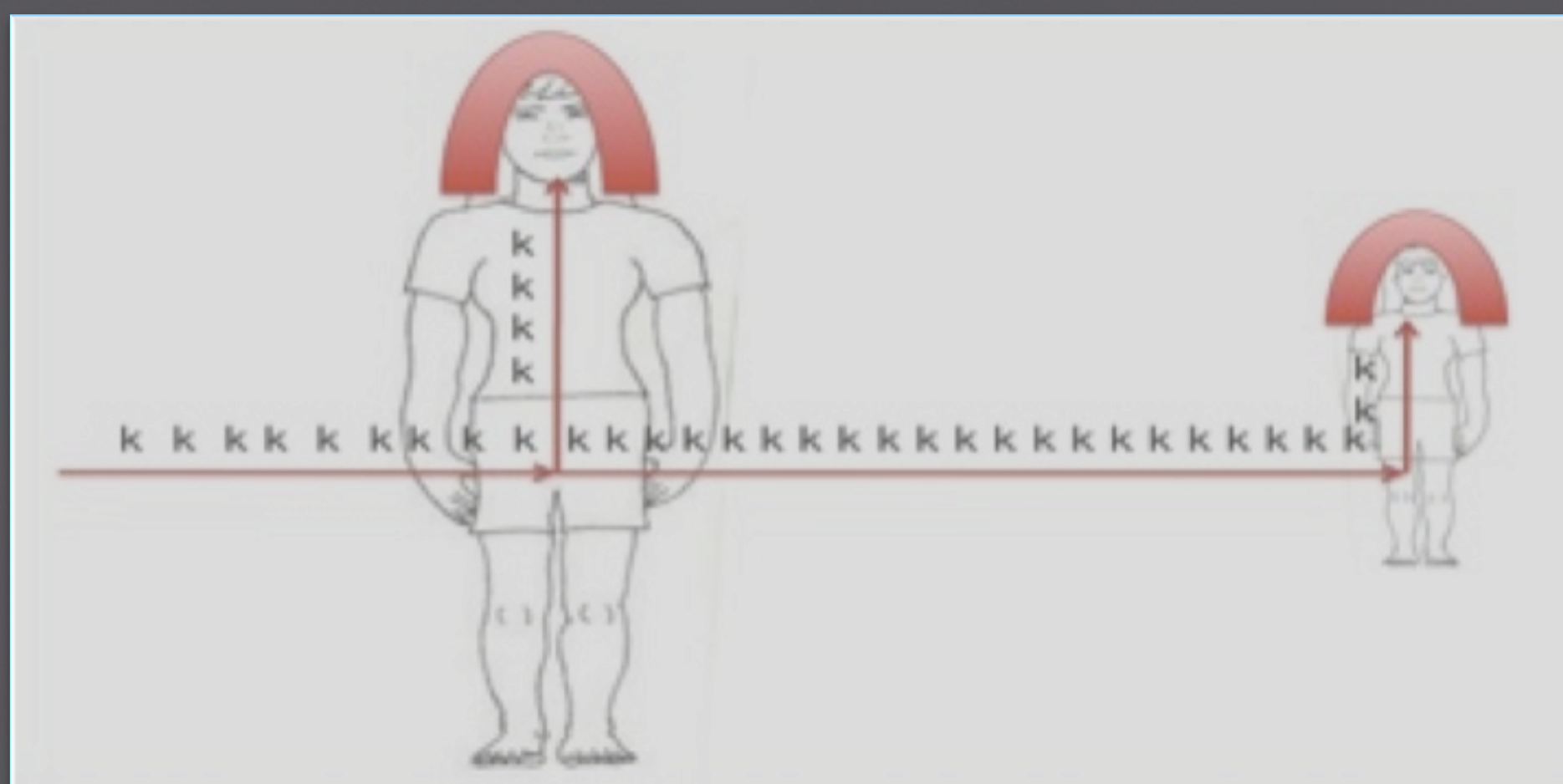
We want a *material* answer.

Groping toward a Material Answer

Genetics

Aristotle thinks that reproduction and nutrition are parts of the same process. Semen, whether male or female, is simply surplus refined food – food that is not needed for the nourishment of the parent's body. In the course of being 'concocted' it is somehow stamped with a code for a trait. A chunk of refined food, imprinted with the 'snub nose' code, or the 'red hair' code, travels either to the parent's nose or hair, or else, carried in semen, to the embryo that is forming in the mother's womb.

Nutrition and genetics are joined at the hip.



A person inherits a code for red hair; in the diagram "k" (for the Greek *kinêsis*) represents that code. The code has two effects: it causes food to become red hair in that person; and it causes food to become red hair in that person's offspring. The code shapes the food.

Nutrition

But there is a wrinkle.

The code does not make red hair in the gut; it imprints on the concocted food the character 'potential red hair'; that potentiality is actualized only when the flesh that is potential red hair reaches the hair; there the red hair that is already in place makes the potential red hair actual red hair.

How does this work? Is it magic? Or is it some kind of natural causality?

Three Observations

A textual ambiguity

An intriguing textual ambiguity governs this question. In the *de Generatione et Corruptione* Aristotle describes this process of informing the flesh (322a28-33). The text seems somewhat corrupt, but there occurs the word *aulos*. Depending how you accent it, this word can mean either 'immaterial' (*aïlos*) or 'duct' (*aulos*). If it is 'immaterial' then we are in the realm of magic. But if it is 'duct' we are in a more scientific realm: *homeopoesis*.

Homeopoesis

A standard causal mechanism in ancient science might be called *homeopoesis*, or contagion. If an object with property X touches another object, it imparts the property X to that object; it X-ifies it. Touch a hot thing to a tepid one and you heat that thing up.

In this text the problem is how to make the acceding flesh take the form of a duct (whether a vein, an ear canal, a nostril). If we take the reading *aulos*, we have a case of homeopoesis: the duct that is already there *ductifies* the acceding material. No magic needed!

Theoretic necessity

One might still complain that too much here is unexplained. How exactly does nutrition destine a bit of fleshy matter in the gut to become hair? How does the blueprinting work?

Aristotle has no answer. What he is doing is arguing a 'theoretic necessity'. Science does this. The gene was postulated a century before the discovery of DNA. Similarly, the 'language of thought' is postulated in linguistics, though we can't yet imagine its physical realization. Aristotle is in respectable company here.