Brent Arehart // Everybody knows where babies come from. When two people love each other, a stork brings them a child. Where does the stork pick up the baby for distribution? Why, the baby factory, of course. How does the baby factory make babies? Well, they just make them, you know, like a car factory makes cars. Don't ask so many questions or your dinner will spoil!

I am not sure whether parents tell their children the myth of the baby-bearing stork anymore or if they ever actually did, but we all know it. The point is to deflect an uncomfortable conversation by telling a more "age appropriate" tall tale. The baby-bearing stork points to something deeper than our cultural sensitives, though. Reproduction has always been a complex subject—so complex, in fact, that we are still devising cutting edge experiments to ascertain otherwise routine parts of gestation. But despite such gaps in our knowledge, historically we have taken a lot for granted when it comes to the unseen aspects of generation. Even the notion that experiments can produce definitive results upon which to base theories—so fundamental to modern science—emerged from centuries of disputes about empiricism and epistemology. Thus, the intersection between experimentation and knowledge about sexual reproduction should make for a fruitful inquiry into where we come from and how we (think we) know what we know.

Let's examine two cases from antiquity.

The Chicken and the Hippocratic Egg. Storks are not the only bird that can tell us something about our origins, as the author of the Hippocratic treatise *On the Nature of the Child* suspected. To substantiate his theory of development in utero, he presented the following scenario:

> *If someone wanted to take twenty or more eggs, place them to hatch under two or more fowls, and on each day, starting from the second right up until the day on which the egg is hatched, take one egg, break it open, and examine it, then he will find that everything is as I have described—making allowance of course for the degree to which one can compare the growth of a chicken with that of a human being. [. . .] If someone has not yet seen it, he will be amazed that there is an umbilicus in a chicken's egg. But it is so. (Nat.Puer. 29.2-3 L, trans. Lonie, modified)*

It's not clear what the author means by "umbilicus," nor whether he made these observations personally. Nonetheless, what's most remarkable is the clear concern for reproducibility. Readers

do not have to take the author at his word; they can go see the evidence for themselves, and at that, it would be easy to setup. He is almost challenging us to follow through and be amazed.

Commentators have sometimes begrudged the use of "experiment" as too scientific to describe passages such as the one above, but I think this sentiment underappreciates the inquisitive ingenuity. Analogy was deeply embedded in ancient scientific thought [1]—which is not so untrue today when it comes to the ways in which scientific concepts are first taught. Even if the results are not technically correct, the author above still harnesses the power of analogy to great effect, illustrating an otherwise invisible process while also acknowledging potential limitations. Human embryos may not develop exactly as chickens do, but neither are the two wholly unrelated.

Galen's Frisky Farm Animals. How embryos develop is one thing, but how they come to be in the first place is another. Galen devoted an entire treatise to seed, in which he laid out the roles of male and female *sperma* during generation. (I have discussed the terminological issues with "semen" and "sperm" in antiquity elsewhere). In order to set the record straight, Galen believed he had to disprove certain ideas held by self-styled Aristotelians. Starting off with a bang, he takes us back to the basics of empirical demonstration:

> *Let us first examine closely the following point: whether the seed remains within the one who is about to become pregnant [. . .]. I watched horses, dogs, asses, cattle, goats and sheep, to see whether the female ever retains the seed in copulation or voids it every time. Right at the start information was given to me by the experts in such matters [. . .], but I confess to my own feeling, a feeling that I have had all my life: I have not trusted any of those who report such things until I have tested for myself what it was possible for me to test. (Sem. 1.1-2, trans. De Lacy, modified)*

Galen goes on to set up a so-called "double test," in which he keeps track of the animals that void seed after intercourse and the animals that retain it. Only the latter end up pregnant, thus disproving certain Aristotelians who claim that the seed gets ejected instead of "grasped" by the womb.

Since Galen found what he already expected to find, one could chalk all of this up to rhetorical posturing (of which Galen was certainly an afficionado [2]). Yet, the skepticism that lead him to subject conventional knowledge to a seemingly redundant test deserves pause. Sure, unlike, say, Louis Pasteur's experiment with spontaneous generation, Galen's did not fundamentally change the way we think about existence. But inherent in his "double test" was the recognition that observation without methodological intervention would not settle the question in dispute. We do not have to accept it as a perfect controlled experiment to see the value, both rhetorical and empirical, in it.

There are many more sexperiments from antiquity—and surely from other periods beyond my expertise too—than can be discussed here. To my knowledge, little has been done with them. But I

hope this piece has given a taste of what can be gleaned from unconventional passages about conventional wisdom.

References:

1. Lloyd, G.E.R. *Polarity and Analogy. Two Types of Arguments in Early Greek Thought.* Cambridge University Press, 1966.

2. Mattern, Susan. *Galen and the Rhetoric of Healing*. John Hopkins University Press, 2008.