

Exploring Aristotle's Sources: Hippocratic Influence in *De Generatione Animalium*

In *De Generatione Animalium* Aristotle discusses the production of animals from conception to fetal development, both from his own understanding and that of Empedocles, Anaxagoras, Democritus, Alcmeon, and others. Aristotle examines their theories, most often critically, in relation to his own. The refutation of previous ideas is a regular part of Aristotelian biology. Curiously absent, however, is another authority on the inner workings of the human body: Hippocrates of Cos. Aristotle never mentions him by name in any work, even those whose subject matter of procreation, development, and death overlaps many Hippocratic treatises (Needham 1959). This does not mean that their influence is absent, however.

Aristotle was certainly familiar with *De Natura Hominis*, which he attributes to Hippocrates' son-in-law Polybus in *Historia Animalium* 512b.12 (Nutton 2013). After quoting a passage on blood vessels nearly verbatim, he goes on to criticize it as entirely incorrect. Polybus is only mentioned once in one other work. This paper posits that the influence of other Hippocratic texts went farther than this one passage in Aristotle's biology and will investigate the presence of the Hippocratic theories of generation, particularly the role of menstrual blood in health and reproduction, in Aristotle's explanation of gender and growth in *De Generatione Animalium*. I will argue that despite a lack of reference, Aristotle is using the Hippocratic writer of *De Natura Pueri* as a model for his explanation of embryological growth. It is easy to say that Aristotle must have read Hippocrates, but it is important to be specific in order to understand Aristotle's systematic view of the natural world in relation to those of his predecessors.

Firstly, the explanation of conception in *De Natura Pueri* closely follows that in *GA* II.738A-B:

- 1) Consideration of the effect of breath on seed (Aristotle in disagreement with Hippocrates)
- 2) Circulation of blood into/around the uterus and its effect on the child
- 3) Explanation of menstrual patterns (environmental influence, even ending with an explanation of the “pus” sometimes exuded by women)
- 4) Formation of the baby

Aristotle claims in *GA* 738b.1-5 that menstrual blood, the result of excessive female moisture, is used up during pregnancy in the creation of the body of the offspring:

<p>ἔνεκα δὲ τοῦ βελτίονος καὶ τοῦ τέλους ἢ φύσις καταχρῆται πρὸς τὸν τόπον τοῦτον τῆς γενέσεως χάριν, ὅπως οἶον ἔμελλε τοιοῦτον γένηται ἕτερον· ἤδη γὰρ ὑπάρχει δυνάμει γε ὃν τοιοῦτον οἴου πέρ ἐστι σώματος ἀπόκρισις.</p>	<p>For the sake of the better cause, the final one, nature moves it (menstrual blood) to this place (the womb) for the sake of generation, so that it will become another being like the one it would have been; for already it exists with character which is like that of the type of which it is a residue.</p>
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Hippocrates reaches a similar conclusion in *De Natura Pueri* 493:

<p>κατιόντος τοῦ αἵματος ἀπὸ τῆς μητρὸς καὶ πηγνυμένου, σὰρξ γίνεται· κατὰ δὲ μέσον τῆς σαρκὸς ὁ ὀμφαλὸς ἀπέχει, δι’</p>	<p>οὗ πνέει καὶ τὴν αὔξησιν ἴσχει. When the blood passing down from the mother congeals, it becomes flesh.</p>
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This claim, as are many in both Hippocrates and Aristotle, is the result of the observation of menses as opposed to the purely theoretical conceptions of some Presocratics (Dean-Jones 1989). Assuming that *De Natura Pueri* is indeed a work written during the late 5th century-mid 4th century, it is logical that Aristotle did not reach the above conclusion, with its unique focus on the importance of menstrual blood to female health and infant development, without having read

Hippocrates (Hanson 1991). Aristotle's focus on the patterns and causes of menstruation, seemingly tangential to the core argument of the text, recall the Hippocratic author's focus on regular menstruation as a component of female health. Furthermore, while in this case Aristotle is not quoting directly and has reformed the text in terms of teleological causation, the arrangement of the two passages is strikingly similar. Comparison of the two helps explain the formation of Aristotle's embryology in light of his sources, both named and unnamed.

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