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Seed from the brain (Alcmaeon of Croton 24 A 13 D-K¹) Sexual and cognitive development from childhood to adolescence in Greek and Roman antiquity*

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ABSTRACT

The conceptualization of the body shared by natural philosophers, physicians, and lawmakers gave rise to a series of significant and enduring socio-political consequences. Humoral physiology established the foundational assumptions of women's biological inferiority relative to the male body model, delineating the spaces of marginalization in relation to the attainment or loss of those levels of completeness deemed necessary to fulfill one's social duties according to sex and age. Likewise, the reflection on the encephalo-myelogenic origin of seed, attributed to Alcmaeon of Croton, and its connection to the division of human life into hebdomads appears to have deeply influenced juridical formalization of socio-political roles based on biological criteria. This contribution thus seeks to bring together three interconnected issues within a unified framework: spermatogenesis as a marker of sexual and intellectual maturation; the hebdomadal division of life; and the transition from childhood to adolescence in both Greek and Roman law.

Key words: Alcmaeon of Croton - Seed - Embryology - Childhood - Hebdomads - *Inspectio corporis* - Gender Issues

Premise

The conceptualization of the body functions as a normative model, shaping behaviors and social roles through construction of anthropological and political frameworks that become crystallized over time – even when the physiological premises that originally inspired them have been surpassed. The role assigned to women in ancient Greek and Roman societies, for instance, is profoundly marked by a biology of inferiority crafted by natural philosophers and physicians in opposition to the supposed perfection of the male body, and subsequently transmitted to lawmakers. Philosophy, medicine, and law, through their overlapping discourses, ultimately converge into a set of enduring convictions that span long temporal periods and, in particular, owe their persistence to the epistemological legacy of Hippocratism and Galenism. Gender, in this context, emerges as the most conspicuous effect of this entrenched inheritance. More broadly, the physiology of incompleteness becomes the critical criterion of marginalization, affecting both men and women alike whenever their bodies are no longer—or not yet—capable of fulfilling the socio-political functions ascribed to them by constitutional frameworks. Children and the elderly are its most evident manifestations².

The conception of the body as a vessel traversed by humors informs the socio-political organization according to sex and age just as it does in matters of health—even when Galen, in addition to understanding health as humoral balance, also associates it with the use (*χρεία*) of the organs³. The individual's socio-political fulfillment (*τελειότητα*), or completeness, progresses in tandem with its physiological *τελειότητα*. Spermatogenesis and menarche mark the transition of boys and girls into adulthood insofar as they become capable of reproduction—that is, when the appropriate degree of bodily heat and moisture necessary for embryogenesis is attained—with the crucial difference that in the male, sexual maturity also coincides with intellectual maturity. This results in an anthropological and juridical structuring of society upon which the West has historically constructed its narrative of gender disparity.

The testimonies⁴ that identify in Alcmaeon's biological thought a connection between the brain and semen, and anchor its maturation within a hebdomadal framework, allow for delineation of a long-term trajectory that appears to culminate, in Roman legislation, in the *inspectio corporis* of Sabinian legal thought—thus legitimizing the construction of the socio-political order on a physiological basis. This theme involves three unquestionably complex issues to which scholars have devoted considerable attention that, in this context, is intentionally brought to bear within a unified interpretive framework. However, both in relation to the specific issues and to the broader synthesis, the same caveat applies: our modern notions of coherence and rationality are not those of the ancients. There remains a strong temptation to reduce ancient thought to a system, but perhaps here – as in many other cases – it would be more fruitful to remain open, rather than reductive, to the possibility of a system whose elements interact and function according to a logic that is, at least in part, alien to us.

This analysis focuses on three interrelated and historically complex elements: (1) the origin and nature of seed; (2) the structure and meaning of the hebdomadal series; and (3) the legal transition from childhood to adolescence in Greek and Roman law.

1. Origin and Nature of the Seed

Erna Lesky is widely acknowledged for having marked a significant milestone in the study of ancient theories concerning the origin of the seed⁵. Her approach reflects her dual training as both a biologist and a philologist, and her monograph undoubtedly embodies the long-lasting cultural vitality of the Vienna medical school between the late 19th century and the first half of the 20th⁶. The pioneering spirit and taxonomic rigor of her work—at times perhaps criticized for excessive schematism and for a ‘strategic’ inconsistency in the evaluation of sources—led her to identify three origins of the seed: the hematogenetic, the pangenetic, and the encephalo-myelogenetic.

To Alcmaeon, Lesky attributes the role of *πρῶτος εὑρετής* (first discoverer) of the encephalo-myelogenetic theory⁷, which would appear to link the physician from Croton to Pythagorean circles, if we are to credit the testimony of Alexander Polyhistor as preserved in Diogenes Laertius⁸, according to whom:

[...] τὸ δὲ σπέρμα εἶναι σταγόνα ἐγκεφάλου [...]	[...] seed is a drop of brain [...].
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E. Lesky places in the same lineage Hippon of Samos/Reggio/Metapontum⁹, whom Iamblichus¹⁰ includes in a general catalogue of Pythagoreans originating with Aristoxenus, despite Aristotle clearly distinguishing him from Alcmaeon in his treatise *On the Soul*¹¹.

In a concise survey of the nature and properties of the soul, Aristotle notes above all the lack of homogeneity in identification of its defining principles: some claim they are corporeal, others incorporeal, and others still combine the two. Nor is there agreement on the number of such principles. The common assumption seems to be that the soul is capable of both cognition and motion. Hence its association with elements closely akin to incorporeality and movement, such as fire (Heraclitus); its overlap with intellect and its identification with spherical atoms especially prone to motion (Democritus); and the distinction between intellect and soul, albeit the attribution of the same cognitive and kinetic principles to both (Anaxagoras)—to mention only a few significant examples from this doxographical overview, which seems to be carefully constructed.

Alcmaeon is classified among those who ascribe to the soul an aerial and immortal nature, which is such because the eternity of its motion replicates the motion of celestial bodies (and just prior to this, Aristotle states that the Pythagoreans identify the soul with the corpuscles moving in the air or with their very movement, which is intrinsic as it remains active even when the air is still). In the transition from Alcmaeon

to Hippon, the nature and properties of the soul begin to overlap with those of the seed. Hippon, *among the most uncultivated* (τῶν δὲ φορτικωτέρων), associates the soul with water¹² and considers the seed, inasmuch as it is moist, a sort of forerunner of the soul, the origin of which he locates in the marrow, as attested by the famous and controversial passage of Censorinus¹³. His identification arises from a series of observations on animals¹⁴.

Philoponus' commentary on the theory that Aristotle attributes to Hippon emphasizes the identification of the soul with water, since if being and living derive from γονή, and γονή, like water, is moist, then water and ψυχή share the same nature. Thus, γονή is the generative principle of the soul¹⁵. This association evokes two seemingly distant references, which are, in many respects, quite dissimilar: the first is the text of the Orphic gold tablet from Hipponion (5th-4th century BCE)¹⁶, in which the souls of the uninitiated find refreshment (ψύχονται, l. 4)¹⁷ by drinking from a spring to the right, beside a white cypress tree, thereby reactivating the cycle of metempsychosis; the second is a passage from the treatise *On the Nature of Man* by Nemesius of Emesa, who adopts the Galenic theory concerning the formation of the psychic pneuma¹⁸. In particular, in chapter 6, when discussing the organs responsible for the δύναιμις (faculty) of imagination—located in the anterior cavities of the brain—Nemesius attributes the activation of the nerves' perceptive capacities to the moistening (διάβροχος) action of the psychic pneuma. Moisture appears to be a long-standing characteristic of substances endowed with generative (and regenerative) and cognitive powers (with perception functioning as a preliminary act of intellection)¹⁹. Moisture, movement, and heat are qualities of male semen—as shown in the Hippocratic treatise *On the Nature of the Child*²⁰, where semen is compared to wine, which likewise possesses heat and motion, enabling a comparison with the effects of intoxication on male fertility²¹. Similarly, blood—warm and moist, vital and perceptive—is also attributed these same properties²².

And indeed, Aristotle refers to blood when reporting Critias' position²³, since the defining property of the soul is sensation, and this property, he notes, characterizes the nature of blood. This makes for a fitting conclusion on the part of one who held that semen originates from blood. Alcmaeon and Hippon appear to substantiate the generative substance—one through motion, the other through moisture. For Alcmaeon, it is motion that links soul and semen; for Hippon, it is the moist nature. What seems to divide them, however, is the source of semen: for Alcmaeon, it is the brain; for Hippon, the spinal marrow. A possible compromise solution seems to emerge from the third testimony that E. Lesky identifies in support of a Pythagorean line of thought regarding the encephalo-myelogenic origin of semen—namely, the passage in Plato's *Timaeus*²⁴, where, even though the primacy of the marrow is maintained, the brain is described as “that portion of the marrow intended to contain the divine seed, like a ploughed field” (τοῦ μυελοῦ [...] τὴν μοῖραν ἐγκέφαλον [...]). From this there follow both the consubstantiality of brain and spinal marrow and the role of the brain as the

field for the divine seed, by virtue of which the brain is more sensitive and more intelligent (εὐαίσθητοτέρα [...] καὶ φρονιμωτέρα).

Yet Aëtius, when reporting Pythagoras' view on the οὐσία (substance) of semen, affirms that “semen is a foam derived from the finest part of the blood, like a residue of nourishment, like blood and marrow”²⁵. Σπέρμα (seed), as a perceptible and extracorporeal manifestation of γονή (ἀπόκρισις, secretion), constitutes the τέκμαρ —the visible sign of both sexual and intellectual maturity. The second Aëtian testimony concerning the corporeal or incorporeal nature of semen²⁶ states: “Pythagoras, Plato, and Aristotle say that the *virtus* of semen is incorporeal, just like the νοῦς (mind, following the translation by Mansfeld and Runia) which moves, but that the substance which is ejaculated is corporeal”. Σπέρμα thus becomes a kind of visible crystallization of the ἀφάνεξ (the invisible). From this perspective, the question of its origin—whether the brain, marrow, blood, or abdomen—is significant insofar as blood, brain-marrow, or brain (as one of the flowed sites), as well as marrow and blood, are conceived as parts of an integrated whole that contributes to the synthesis of σπέρμα, endowing it with the seminal capacity for intellection.

The issue of incompatibility between the testimony of Aëtius (who presents Alcmaeon as encephalogenetic) and that of Censorinus (who describes Alcmaeon as pangnetic) recedes into the background, as does the question of the Eastern origin of the brain-marrow-semen triad²⁷ and its reconfiguration in Alcmaeon and Hippon²⁸. The emission of male semen—having flowed through the body (possibly along the network of vessels outlined by Diogenes of Apollonia, which superimposes a haematogenetic and a pangnetic hypothesis²⁹) —absorbs the characteristics of the body through which it passes. This is consistent with the general principle that everything expelled from the body acquires the color, smell, taste, texture, and even the sound that mark signs of health or illness³⁰. In this light, semen becomes a sign of both fertility and intellectual maturity, independently of its specific point of origin, but in relation to the site where perceptual processes and their organization are located³¹—that is, the physiological locus (whether the brain or the blood) deemed to catalyze or enable perception and the coordination of perceptions.

2. The structure and meaning of the hebdomadal series

In closing the section dedicated to the earliest Ionian thinkers, Zeller and Mondolfo devote an extensive and detailed note to the pseudo-Hippocratic treatise Περὶ ἑβδομάδων³². This is a text of peculiar character, one that links natural philosophy and medicine through the identification of a constant principle: namely, the hebdomadal series. The treatise is divided into two parts: the first (chaps. 1-11) presents a cosmology grounded in arithmological principles, centered on the number 7, which connects microcosm and macrocosm according to the principle of ontological continuity³³; the second (chaps. 12-53), more explicitly nosological in nature³⁴, addresses the topic of

fevers, linking their etiopathogenesis to the oppositional pair hot-cold and their progression to the prognostic arithmology of critical days (as developed by the so-called Cnidian school)³⁵. Setting aside the thorny debate over the dating of the work³⁶, the author addresses long-standing themes that underlie ancient anthropological thought, beginning from a precise superimposition of nature and the human body.

In particular, chapter VI—one of those we possess solely in its early medieval Latin translation (6th century CE, according to West³⁷)—associates parts of the human body with the Earth, following an approach grounded in *similia similibus*:

6. *Quae autem in terra sunt corpora et arbores naturam similem habent mundo [...]*.

This analogy presupposes a necessary relation of equivalence and likeness between parts and whole, on the grounds that the whole is composed precisely of those same parts. The pair *corpora et arbores* alone already evokes a substantial identity that fuels the rich productivity of vegetal metaphor within physiological discourse³⁸. Chapter 5, also extant in Greek, contains an explicit reference to the formation of the seed at the age of fourteen, i.e., at the conclusion of the second hebdomad:

5. [...] παῖς δὲ ἄχρι γωνῆς ἐκφύσεως ἐς τὰ δις ἑπτὰ· [...].

The associations between cosmos and the human body are highly specific:

Earth	Body
<i>media quidem lapidosa</i>	<ossium> <i>imitationem habens</i>
<i>quod autem circa eam est</i>	<i>hominum caro</i>
<i>Quod autem in terra calidum humidum</i>	<i>medulla et cerebrum hominis, <unde descendit> semen</i>
<i>aqua autem fluminum</i>	<i>imitation est venae et qui in venis est sanguinis</i>
<i>stagna autem</i>	<i>vesicae et longaonis</i>
<i>maria vero</i>	<i>qui in visceribus est humoris hominis</i>
<i>Aer vero</i>	<i>spiritus qui est in homine</i>

This analogy recurs both in mythological tradition and in medical literature:

Ov. <i>Met.</i> I 393-4	
<i>Magna parens terra est; lapides in corpore terrae ossa reor dici: iacere hos post terga iubemur.</i>	Our great mother is the Earth; I think that the bones the oracle spoke of are the stones in the Earth's body. We are commanded to throw these behind us.

Cens. <i>Die Nat.</i> IV 6	
[...] <i>homines primos aut Promethei molli luto esse formatos aut Deucalionis Pyrraeque duris lapidibus esse natos, [...]</i> .	[...] the first humans were either shaped from Prometheus's soft clay or born from the hard stones cast by Deucalion and Pyrrha. [...].

CH. <i>Morb.</i> IV 2	
[...] ἐπὶν δὲ φάγη ἢ πίη ὁ ἄνθρωπος, ἔλκει τὸ σῶμα ἐς ἑαυτὸ ἐκ τῆς κοιλίης τῆς ἰκμάδος τῆς εἰρημένης, καὶ αἱ πηγαὶ ἔλκουσι διὰ τῶν φλεβῶν ἀπὸ τῆς κοιλίης, ἢ ὁμοίη ἰκμάς τὴν ὁμοίην, καὶ διαδίδωσι τῷ σώματι, ὥσπερ ἐπὶ τῶν φυτῶν ἔλκαι ἀπὸ τῆς γῆς ἢ ὁμοίη ἰκμάς τὴν ὁμοίην.	[...] After a person eats or drinks, his body draws some of moisture I have described to itself out of the cavity, and the different springs each draw their own kind of moisture through vessels from the cavity – just as in plants each particular moisture draws its own kind out of the earth – and later pass it through the body. (transl. by P. Potter)

The late chronology (1st century BCE) proposed by Mansfeld supports the view that the content of the treatise depends on Posidonius of Apamea, a scientific authority widely acknowledged in the Roman world from Cicero to Seneca, which was likely also the source for Ovid³⁹.

However, the most significant aspect—despite the chronological issues—is the presence of the brain-marrow-semen triad in the hebdomadal section concerning the body (and Galen’s commentary on the passage: *Hippocrates, he notes, means that the marrow is assimilable to the brain*⁴⁰). Here again, the testimony regarding Alcmaeon and the emission of male semen coinciding with the fourteenth year of life (twice seven, as Aristotle remarks⁴¹) requires further investigation.

The application of arithmology to natural phenomena, to bodily physiology, and to the course of diseases is a well-established fact. In medical literature, the Hippocratic author of the treatise *On Fleashes* (5th-4th century BCE) organizes even intrauterine life according to hebdomads and affirms the viability of fetuses born at seven and nine months—an idea also found in an intriguing 16-line text contained in codex Vat. gr. 282 (16th century), fol. 432Av, and titled as a syllogistic demonstration of the reason why fetuses born at seven and nine months live, whereas those born at eight do not. This is a geometric demonstration of the thesis, accompanied by a right-angled triangle, appended at the end of the sixteenth book of the medical work of Aëtius of Amida devoted to gynecology⁴².

In the specific case of Alcmaeon, the association between semen and the brain as the seat of σύνεσις⁴³ would imply that sexual maturity coincides with intellectual maturity. Yet this could also be affirmed within a framework that posits a spinal origin of semen, or even one deriving from blood—as a tissue endowed with perceptive potentialities—which, in Aristotle, is transformed into semen in the final stage of coc-tion (that is, when the child has reached τελειότης, meaning the proper degree of heat and moisture necessary for the transition to adulthood). The naturally colder nature of women, and thus their inability to transform blood into semen, compromises the development of their deliberative faculty.

The overlap between male sexual maturity and intellectual maturity—which lays the groundwork for the divergence between the socio-political roles of men and

women—appears to be supported by the scholium on Plato’s *Alcibiades I*, where the philosopher addresses the education of boys among the Persians and notes that at the age of fourteen they are entrusted to four wise men responsible for their formation⁴⁴. M. Timpanaro Cardini⁴⁵ further reinforces this line of reasoning by referencing Heraclitus⁴⁶ and Aristotle⁴⁷.

Ἡ. καὶ οἱ Στωικοὶ ἄρχεσθαι τοὺς ἀνθρώπους τῆς τελειότης περὶ τὴν δευτέραν ἑβδομάδα, περὶ ἣν ὁ σπερματικὸς κινεῖται ὀρρός.	Heraclitus and the Stoics maintain that men reach maturity upon completion of the second hebdomad, during which the seminal fluid begins to move.
[...] ὁ δὲ παῖς ἔχει μὲν (scil. τὸ βουλευτικόν), ἀλλ’ ἀτελής.	[...]The boy possesses the deliberative faculty, but it is not yet fully developed.

Hereby βουλευτικόν is understood as one of the two parts of the rational soul, which is divided into τὸ ἐπιστημονικόν and τὸ λογιστικόν = τὸ βουλευτικόν, since both calculating and deliberating have as their object the possible⁴⁸.

The testimony of Plato brings us back to Persia, where the brain-marrow-semen triad and the adoption of the hebdomadal division are found. Regarding the relationship between cycles of seven and physiological and pathological phenomena (from which the Hippocratic prognostic approach of critical days derives), Zhmud excludes the possibility of cultural influence from the Pythagorean circle⁴⁹: Aristoxenus (4th century BCE) appears to have been the first to associate odd numbers with critical days⁵⁰. Yet there may be another route through which the number 7 encountered Alcmaeonic physiology: that of cultic meaning.

In the two numerological systems of the ancient world—those based on hebdomads and those on enneads—the number 7, except for the nine days of Latona’s labor at Delos, seems closely connected to the Apollonian cult, which in Croton, as demonstrated by M. Giangiuglio’s research on archaic Croton⁵¹, is as old as the founding of the colony. Roscher himself, who first edited the pseudo-Hippocratic treatise *On the Hebdomads* and who extensively studied enneads and hebdomads in antiquity, devoted a comprehensive survey of sources in his *Die Hebdomadenlehren der griechischen Philosophen und Ärzte*⁵² to the cultic relationship between Apollo and the number 7. The arrival of Pythagoras in Croton reinforced the Apollonian cult⁵³.

Little remains to be said about the connection between Apollo and the realm of health and disease: I refer to his cathartic role in the Cyrenaic context, where epigraphic evidence allows one to identify precise relations between arithmology and embryological data related to purification from childbirth and abortion⁵⁴. But Apollo is also a celestial deity, and in the Near East the number 7 is linked precisely to sky observation (consider, for instance, the ziggurats and again Persia): there were seven known planets, seven stars observed in certain constellations, seven days in each lunar phase. Roscher likewise identifies a specific relationship between female physiology and lunar phases.

Thus it is conceivable that the number 7, starting from the cultic context and by ontological continuity, inspired the structuring of bodily phenomena according to the same hebdomadal parameter of the heavens. This, moreover, marked the path by which the Apollonian divination guided natural philosophers and physicians toward the prognostic predictability of visible signs, to the *τεκμαίρεσθαι* made possible through the *σύνεσις* of the brain, since men are unable to grasp the invisible with the clarity (*σαφήνεια*) of the gods.

3. The legal transition from childhood to adolescence in Greek and Roman law

The continuity between Alcmaeon's research and the Pythagorean circle justifies the possibility of interactions, on both biological and arithmological levels, between the Crotonian medical school and the sapiential community. The widespread and composite tradition stemming from Pythagoras—and the authority it acquired—profoundly influenced the choices of cultural elites and political systems. The Roman world too was deeply affected by this influence. The connection between Numa and Pythagoras—whose chronological inconsistency was already noted by ancient sources⁵⁵—constitutes a significant example of how a retrospectively constructed tradition could serve to legitimize the decisions of a ruling class already deeply permeated by Magna Graecian culture. The portrait of Numa drawn by Plutarch, which emphasizes the Pythagorean lineage of the reorganization of Roman society in the earliest regal period, can likely be attributed to the Platonic Academy. More broadly, the Pythagorean model of kingship is one of the most enduring themes in Pythagoreanism.

Roman annalistic tradition, in fact, allows us to place the original core of the narrative linking Numa to Pythagoras in the Tarentine circles of the 4th century BCE, possibly even in Aristoxenus himself. In the 4th century BCE, during the Samnite Wars, the Delphic oracle advised the Romans to erect two statues at the center of the city: one of the wisest Greek man, the other of the bravest. The choice of Pythagoras can likely be traced back to early exchanges with Tarentum (around the conquest of Neapolis, circa 326 BCE), where Archytas, and later Aristoxenus, revitalized the Pythagorean tradition⁵⁶.

The discovery in 181 BCE of two burial urns at the foot of the Janiculum Hill—one of which allegedly contained seven books in Greek *de disciplina sapientiae*, attributed to Numa himself and deemed “Pythagorean” by Valerius Antias—clearly bears all the hallmarks of a forgery. However, it simultaneously capitalizes on the plausibility of such a find within its reception context. Hence, the possible influence of the Pythagorean tradition on the political and legal organization of Rome⁵⁷.

The septenary division of intrauterine life also conditions the structuring of extrauterine life. The most famous text in this regard is Solon's elegy⁵⁸, which divides human life into ten *ἑβδομάδες*. As D. Musti⁵⁹ reveals, at line 14 of the 18 verses there is a caesura marking the transition from bodily development (up to 35 years) to that of the

νοῦς (mind). In the first of these two sections, specifically in the first three couplets, the theme is the passage from the age of ἄνηβος to that of ἥβη, which is completed in the second hebdomad and which Solon describes on a physiological basis (growth of hair and limbs). After noting the differences between the pseudo-Hippocratic treatise and the elegy—and more generally between the CH and Solon—Musti observes that the Hippocratic tradition limits itself to mere biological data, whereas Solon’s text has a markedly social and political purpose. Yet in both Athens and Sparta during the archaic period, social roles were nonetheless defined according to the biological phases of life. More generally, in Greek law it is difficult to establish a univocal indication because legal orientations were shaped by the individuality of the πόλις. In Attic law, boys could inherit property and act in court for a patrimonial cause two years after reaching puberty, fixed at sixteen years, that is, at eighteen years of age. However, a commentary by the grammarian Didymus Chalcenterus on Demosthenes’ orations, reported by Harpocration (as noted by M. Valente⁶⁰), places the attainment of puberty at fourteen years (thus the age of majority in Athens would be approximately sixteen years). While regarding the Athenian context, Harpocration’s annotation has been widely recognized as a misunderstanding of Didymus—at least due to confusion between biological and legal puberty—it remains true that in Sparta puberty began at fourteen years. In Sparta, the division of ages was more institutionalized and plausibly more linked to the biological necessity of guaranteeing the survival of the Spartiates. Perhaps Didymus’ commentary (1st century BCE) reflects the influence of Roman legal culture. In Roman law, *tutela impuberum* over orphans ceased upon reaching puberty, conventionally fixed by the Proculian school at fourteen years, but Cassius and Sabinus anchored it to the evidence of *inspectio corporis*, specifically to the capacity to generate offspring⁶¹:

Masculi autem cum puberes esse coeperint, tutela liberantur: puberem autem Sabinus quidem et Cassius ceterique nostri praeceptores eum esse putant, qui habitu corporis pubertatem ostendit, id est eum, qui generare potest; sed in his, qui pubescere non possunt, quales sunt spadones, eam aetatem esse spectandam, cuius aetatis puberes fiunt; sed diversae scholae auctores annis putant pubertatem aestimandam, id est eum puberem esse existimant, qui XIII annos explevit.

However, males, when they begin to be pubescent, are freed from guardianship: now Sabinus indeed, and Cassius, and our other teachers consider him to be pubescent who shows puberty by the condition of his body—that is, one who is able to beget; but in the case of those who cannot reach puberty, such as eunuchs, that age is to be considered at which others usually become pubescent; but the authorities of the opposing school think that puberty is to be evaluated by years—namely, they consider him to be pubescent who has completed fourteen years.

The distinction between *infantia minor* (up to 7 years) and *infantia maior* (up to 14 years) does not appear explicitly in legal texts but allows us to understand the functional tripartition that jurists articulate over time: *infantes* (those who cannot express

themselves: *infantia minor*), *qui fari possunt sed non intelligunt (infantia maior)*, and *qui possunt intellegere* (completion of 14 years). Sexual maturation at 14 years therefore coincides with the development of the capacity for autonomous understanding in a legal act⁶².

Conclusions

Even if indirectly, the Alcmaeonian model of σύνεσις, which matures with puberty at 14 years, seems to find a long-lasting echo in Sabinian law, which associates *intelligentia* with the recognition of sexual maturity at 14 years through *inspectio corporis*. Nevertheless, despite the success of the Aristotelian cardiocentric model and the problematic distinction between brain and spinal cord as the origin site of the seed, the physiology of sexual maturation glimpsed in the fragments of Alcmaeon and related testimonies provides the basis for a series of more general considerations. First of all, the study of ancient medical sources requires a broader framework than that of natural philosophy alone, precisely because conceptualization of the body is one of the areas where Greek culture most clearly overlays the strictly biological dimension with the mythological, cultic, and broadly sapiential spheres. The construction of these models is carried out through analogical procedures that only partially correspond to our modern notions of coherence and rationality. Yet their persistence regulates social relations and gender issues, even guiding legal decisions. The very long historical span over which the biological inferiority of the female body has been asserted has legitimized and supported a still unresolved gender issue up to the present day. It is likely, however, that the attribution of the sole generative seed to the male was not originally posited by Alcmaeon. The testimony of Censorinus⁶³ places the Crotonian among those who also attribute to the mother the possibility of a generative seed. The androcratic connotation—bordering on arrenogenesis—that the relationship between brain, male seed, and βουλευτικόν has assumed over the centuries represents a rigidification and simplification more consistent with the anthropological and cultural coordinates of the Attic world (first) and Roman society (later) than with those of the Doric and Magna Graecian world in general, where female bodily hygiene is associated with an active role in embryogenesis⁶⁴. Moreover, Censorinus' testimony (which places Diogenes of Apollonia, Hippon, and the Stoics on the 'patrilinear' embryogenetic side, and attributes to Anaxagoras, Alcmaeon, Parmenides, Empedocles, and Epicurus⁶⁵ the belief in the existence of a generative female seed) seems to contradict other authoritative sources. Let us consider only the cases of Hippon and Anaxagoras. According to the doxography of Aëtius, Hippon believes that women emit a seed just as men do, but that the female seed does not fulfill the generative function because it falls outside the womb⁶⁶. This does not mean that the female seed lacks fertilizing potential—especially considering that, if the male seed is not sufficiently thick and strong⁶⁷, the maternal

womb influences the γονή in the sense of conceiving a female individual⁶⁸. The fact that, in Hippon's account, the conception of a female—due to the predominance of the maternal womb over a weak seed—precedes the doxographical discussion on the causes of monstrous births⁶⁹ seems to imply, as a biological presupposition, the belief that the female component acts as a factor of deviation.

As for Anaxagoras, the Aristotelian view prevails, according to which he regarded the male as the sole contributor of the generative seed, and the woman as a kind of chamber hosting the embryo⁷⁰. O. Kember⁷¹ pointed out the absence of both the name Anaxagoras and the distinction between a male generative seed and a female hosting chamber in the Latin translation from Arabic by Michael Scot (13th century). However, the Arabic translation from the Greek by Yaḥyā ibn al-Biṭrīq, as edited by J. Brugman and H. J. Drossaart Lulofs⁷², appears to preserve the passage as it is transmitted in the Greek manuscript tradition, thereby supporting the placement of Anaxagoras among those who held that only the male seed is fertile—contradicting the testimony of Censorinus. John Philoponus, by contrast, makes no mention of this in his commentary⁷³.

Despite all efforts to resolve the contradictions within such an intricate doxographical tradition, it may be necessary to relinquish the expectation of a fully coherent framework—at least in the sense we assign to that term today. The complexity of ancient embryology is such that conceptual affiliations are shaped by the intention to emphasize one aspect over another. They therefore reflect the aims of the transmission context, which at times is difficult to discern and may lead to the devaluation of one testimony in favor of another, as E. Lesky does with Censorinus⁷⁴.

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10. Iamb. *VPyth.* 267.
11. Arist. *de An.* 405 a 30-405 b 6.
12. Cf. Hippol. *Haer.* I 16 (ὕδωρ γονοποιόν); Aët. IV 9 (Ἰππῶν ἐξ ὕδατος τὴν ψυχὴν γίνεσθαι).
13. Censor. *de Die Nat.* 5, 2-3.
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15. Phlp. *in de An.* 405 b 1, pp. 88-89 Hayduck. Cf. Casertano G, Ippone l'ateo e la storia dell'umido. *Αρχαί*. As origins do pensamento ocidental 2021;31:1-20, pp. 14-15.
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17. On the association between ψύχομαι and ψυχρότης, cf. Pugliese Carratelli G, Ref. 16. pp. 59-60, who contrasts the life-giving action (ἀνάψυξις / ἀναψυχή) of flowing water - characterized as ψυχρὸν ὕδωρ- with the stagnant or boiling nature of chthonic waters. This opposition is attested in Roman funerary epigraphy. In addition to the two inscriptions cited by Pugliese Carratelli (already identified, in fact, in their connection to the Egyptian cult of Isis and Osiris by Lévy I in *Les inscriptions araméennes de Memphis et l'épigraphie funéraire de l'Égypte gréco-romaine*, *Journal asiatique ou recueil de mémoires, d'extraits et de notices: Histoire, philosophie, sciences, littérature et langues des peuples orientaux* 1927;210(2):281-310, pp. 299-301), namely *IGUR* 1269 (Melas) and *IGUR* 432 (Aurelia Prosodos), Lévy also includes *IGUR* 1287 (Olimpia), *IGUR* 720 (Korellia Aigle), and *IGUR* 628 (Giulia Politice). On this topic, see also the contributions of Delia D, The Refreshing Water of Osiris. *Journal of the American Research Center in Egypt* 1992; 29:181-190, and Pubblico MD, The Emergence of the Osiris Cult in the Italian Peninsula and Its Main Features: A Reassessment. *Religions* 2023;14(484):1-21.
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19. Cavarra B, Cilione M, Giorgio Valla and the Theory of Perception Between Physiology and Natural Philosophy. *Medicina nei Secoli* 2024;36(2):91-106, pp. 100-101. Alcmaeon's observations (cf. Casertano G, Ref. 16. p. 11. See also Menon *ap. Anon. Londin.* 11,

- 22 = 38 A 11 D-K, according to which, in the view of Hippon, good health is associated with a proper degree of moisture; when a living being dries out, it loses the capacity for perception (*ἀναισθητεῖ*) and dies. Empirical evidence supporting this belief includes the observation that old people are dry and less receptive to perception, and that the sole of the foot becomes insensitive when it is dry).
20. CH *Nat. Puer*: IV 2. Indeed, the qualities of the male seed in the passage in question are inferred indirectly and, overall, do not appear to differ from those of the female seed.
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41. Arist. *HA* 581 a 12.
42. Ieraci Bio AM, *Embriologia more geometrico demonstrata*. *Galenos* 2016;9:207-216. On this issue, see also both the Hippocratic treatises *De septimestri partu* (spurio) and *De octimestri partu*.
43. Plato’s testimony in *Alcibiades I* (cf. ref. 44) and the androcratic culture of Athens crystallize the connection between σύνεσις and male seed, although the fragments attributed to Alcmaeon do not seem to justify such a strict association, and the Magna Graecian context of natural science appears more open to valorization of the female contribution in embryogenetic processes. The relationship between σύνεσις and semen thus also becomes a gendered issue that merits further investigation. Galen, in articulating the biological link between psychology and organ physiology, draws on myth through Euripides and attributes σύνεσις to Medea by virtue of the exceptional nature of her being. Medea constitutes an example of *μεγαλόσπλαγχνος* because she intensely possesses all the faculties and impulses of the three viscera, and he adds:
- [...] *With regard to the rational part, there are clear signs of wisdom, for even in these actions Euripides portrays her not as an ordinary woman, and the signs of her intelligence are plainly evident – in the way she devises her revenge against her enemies and in the inner deliberations through which she seeks to soothe and restrain her anger, avoiding impious acts.* (*Gal. de plac. Hipp. Plat.* III 4, 25 de Lacy).
44. *Sch. in Alcib. prior.* 121 e 3, no. 59 Cufalo.
45. Timpanaro Cardini M, *Pitagorici antichi*. Milano: Bompiani; 2010. p. 159.
46. 22 A 18 D-K = [9] HER. R66 L-M.
47. Arist. *Pol.* I 1260 a 13–14.
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50. Aristox. fr. 23 Wehrli.
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52. Roscher WH, Ref. 35. pp. 210-214.
53. Cilione M, Ref. 14. p. 100.
54. Cilione M, *Il μίασμα abortivo nelle leggi sacre di Cirene e Cos*. *Medicina nei Secoli* 2016;28(1):19-38, p. 27.

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63. *Alk* 37 Wöhrle.
64. Gazzaniga V, Cilione M, Maschile e femminile nella trasmissione dei caratteri ereditari: da Atene a Sparta, *Medicina nei Secoli* 2016; 28(3):901-920, pp. 904-911.
65. Given the difficulty of identifying medical content attributable to Epicurus, PHerc. 1390/908 (no later than the 2nd century BCE) offers a valuable point of comparison concerning embryogenetic issues (cf. Giorgianni F, Ranocchia G, Corti A, Scrittore epicureo anonimo opera incerta PHerc. 1390/908: edizione, introduzione e commentario, tavole. *Galenos* 2019;13:17-109, pp. 96-97). The text, both anonymous and untitled, appears to suggest the contribution of both male and female seed in conception (col. 9, 6–7: τῶν γεν|ν|η|ς| <ώ>|γ|τ| [ων] σύ|γ|ο|δο|ν). This biological assumption, moreover, is consistent with the role assigned to women in the Epicurean κῆπος.
66. Aët. Plac. 5.5.3 Mansfeld-Runia.
67. Aët. Plac. 5.7.3 Mansfeld-Runia.
68. Aët. Plac. 5.7.8 Mansfeld-Runia.
69. Aët. Plac. 5.8.1-3 Mansfeld-Runia.
70. *Arist. GA* 763 b 30.
71. Kember O, Anaxagoras' Theory of Sex Differentiation and Heredity. *Phronesis* 1973;18:1-14, pp. 2-4.
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73. *Phlp.* (Mich.) in *GA* 763 b 20, p. 166 Hayduck.
74. Lesky E, Ref. 14. p. 250; Zhmud L, *Pythagoras and the early Pythagoreans*. Oxford: University Press, 2012. pp.374-380; Cilione M, Ref. 14. pp. 61-62.