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GALEN ON INFERTILITY  
IN THE COMMENTARY ON THE HIPPOCRATIC APHORISMS, BOOK 5

Within the rich corpus of his writings, Galen did not devote specific treatises to gynaecology<sup>1</sup>. He rather addressed gynaecological issues in embryological or anatomical treatises, such as *De uteri dissectione* (written between 145 and 149 AD and reworked after 166 AD), *De semine* (written probably between 169 and 180 AD), and *De foetuum formatione* (written after 193 AD)<sup>2</sup>. In addition to these writings, his *Commentary* on the fifth book of the Hippocratic *Aphorismi*, written in its first version probably around the year 175 AD (that means after *De uteri dissectione* and *De semine*) and re-worked later on<sup>3</sup>, also represents an important source for Galen's view on gynaecology. In fact, exactly half of the aphorisms – thirty-six among seventy-two aphorisms – concerns questions and issues pertaining to gynaecology<sup>4</sup>. The work is crucial for analyzing how Galen interpreted and reworked the authority of Hippocrates on various topics related to this field. In the six centuries that separate the redaction of the Hippocratic *Aphorismi* from Galen's *Commentary*, medical knowledge made great progress in the field of gynaecology, especially through the anatomical discoveries achieved in 3<sup>rd</sup>-century BC Alexandria. Between the first and second century AD, both Aretaeus of Cappadocia and Soranus of Ephesus wrote about gynaecological problems. Furthermore, we know that Galen practiced vivisection of pregnant animals, focusing his attention especially on embryological issues<sup>5</sup>.

In his *Commentary*, Galen devotes particular attention to those aphorisms dealing with female infertility, and he stresses the great impact that diagnosing the infertility of a patient could have on society. In fact, women's fertility was a very important issue especially in ancient Rome, where – from a legal point of view – a man was authorized to divorce from his wife, if she was sterile<sup>6</sup>. Both in the Greek and in the Roman society, the quintessential

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<sup>1</sup> I wrote this paper within my post-doc fellowship at the University of Hamburg in 2016 and during my stay at the Humboldt-University of Berlin: I thank Christian Brockmann and Philip van der Eijk for their support. This contribution represents part of my work on the critical edition with translation and notes of Galen's *Commentarium in Hippocratis Aphorismorum librum V*, which I am currently preparing for the *Corpus Medicorum Graecorum*.

<sup>2</sup> For an overview on the dates of Galen's works, see Boudon-Millot 2012, pp. 351–374 (with references to previous studies). On the date of *De semine*, cf. De Lacy 1992, p. 47.

<sup>3</sup> On the different stages of composition and elaboration of Galen's *Commentary on Aphorismi*, see Ecça 2019.

<sup>4</sup> Some remarks on these Hippocratic aphorisms and inter-textual references with other medical works are to be found in Hanson 2004.

<sup>5</sup> See Hanson 2008, p. 95.

<sup>6</sup> See Hanson 1990, pp. 330–331, with further bibliographical references, and Gardner 1991, p. 81.

female dysfunction was barrenness, because women were considered, at least from a biological point of view, as childbearing bodies<sup>7</sup>.

In this paper, I will in-depth analyze how Galen dealt with and commented upon the Hippocratic text concerning female infertility. In particular, I will investigate how Galen proposed his proper medical theories, developed according to the important discoveries made since the Hellenistic time, without, however, denying or contesting the authority of Hippocrates<sup>8</sup>.

#### 1. GAL. IN HIPPOCRATES' APHORISMS. V 59

The 59th aphorism of book 5 concerns the diagnosis of women's barrenness through fumigation (θυμίαμα) of aromas. This is the lemma according to Galen's reading (Kühn XVIIb 857,2-6)<sup>9</sup>:

V 59 [IV 554,3-6 Littré] Γυνή ἢν μὴ λαμβάνῃ ἐν γαστρὶ, βούλει δὲ εἶδέναι εἰ λήψεται, περικαλύψας ἱματίοισι θυμία κάτωθεν. καὶ ἢν<sup>10</sup> μὲν πορεύεσθαι σοι<sup>11</sup> δοκῆ ἢ ὁδμῇ διὰ τοῦ σώματος<sup>12</sup> εἰς τὰς ῥίνας καὶ ἐς τὸ στόμα, γίνωσκε ὅτι αὐτῇ<sup>13</sup> οὐ δι' ἑαυτὴν ἄγονός ἐστιν.

If a woman does not conceive, but you wish to know if she will conceive, cover her round with wraps and burn perfumes underneath. And, if you think that the smell passes through the body to the nostrils and to the mouth, be assured that the woman is not barren through her own physical fault.

According to Hippocratic gynaecology, the womb was connected to all parts of the body by vessels that were tributary to a large tube, which connected the upper part (the nostrils) to the lower part (the vagina) of the woman's body<sup>14</sup>. For this reason, one of the most common

<sup>7</sup> Cf. the observations by Manuli 1983, p. 153 and Hanson 1990, p. 316. On this topic, see Byl - De Ranter 1990, Flemming 2013 and Bourbon 2016.

<sup>8</sup> When necessary, I will provide some passages according to the provisional text of my own edition and add some considerations on the manuscript tradition in the crucial points. The main manuscripts that preserve book 5 of Galen's *Commentary* are P (*Parisinus gr.* 2266, 12<sup>th</sup> cent.), V (*Vaticanus gr.* 283, 12<sup>th</sup> - 13<sup>th</sup> cent.), M (*Marcianus gr.* 278, 13<sup>th</sup> cent.), S (*Scorialensis Φ III 7*, 13<sup>th</sup> cent.), U (*Vaticanus Urbinas gr.* 65, 14<sup>th</sup> cent.), N (*Vaticanus gr.* 280, 14<sup>th</sup> cent.), J (*Parisinus Suppl. gr.* 447, 14<sup>th</sup> cent.).

<sup>9</sup> The manuscript J does not preserve the text of Galen's *Commentary on Aphorismi V 58-61*, since some folia went lost.

<sup>10</sup> καὶ ἢν is the reading of V M S N, whereas P and U preserve the common error καὶ εἰ, followed by the verb δοκεῖ (P) or δοκῆ (U). The Hippocratic reading κῆν has the merit of avoiding hiatus, but it is not transmitted in the Galenic tradition.

<sup>11</sup> I take in the text the pronoun σοι, transmitted by V M S U and omitted by P N.

<sup>12</sup> The manuscripts V M S transmit the wrong reading στόματος instead of σώματος.

<sup>13</sup> The manuscripts V M S omit the pronoun αὐτῇ, whereas P U transmit it in the reflexive form αὐτή.

<sup>14</sup> On this point, see Manuli 1980, p. 399 and 1983, p. 157.

tests for diagnosing fertility was made through fumigation<sup>15</sup>: by burning smelling substances under the vagina, the fertile woman was expected to perceive the smell in her mouth, whereas the infertile woman could not, because her tube was blocked. Usually, the substances to be fumigated were put on hot ashes or in an earthenware pot, above which was placed a dish with a hole. During the procedure, the woman was sitting down and a reed attached to the hole of the dish conveyed the vapor to her genitals. The use of fumigation in order to test fertility was quite common in ancient medicine: similar practices for testing whether a woman was fertile or not, are to be found in different Hippocratic gynaecological treatises of the Classical period<sup>16</sup>.

Along with this diagnostic purpose, fumigation had also a therapeutic function in the case of the so-called ‘hysterical suffocation’ or – more simply – the ‘suffocation of the womb’ (ὕστερικὴ πνίξις)<sup>17</sup>. This typical female illness had a considerable difficulty in breathing as main symptom, and it was described as something similar to epilepsy, even though without or with weaker spasms. It was believed that this illness was due to the displacement of the uterus inside woman’s body, and this caused a sense of suffocation in the patient. The womb was considered like an independent living being, which could move in different directions (to the head, the heart, the liver etc.; in most cases it would move toward the upper part of the body). The displacement happened especially if the woman had no sexual intercourse for a long time, which caused the womb to dry and move to other parts of the body looking for moisture. The movement of the womb was related to the idea that there was a tube connecting directly the vagina to the nostrils. According to this idea, fumigation was useful for drawing the uterus back to its right place. If, for example, the uterus moved to the upper part of the body, two different applications of fumigation were possible. On the one hand, one could burn fetid substances under the nostrils of the ‘hysterical’ woman: in such a way the foul smell of the fumigated substances could push the uterus back to the bottom. On the

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<sup>15</sup> On the practice of fumigation, see Gourevitch 1999. The Greek words designating ‘fumigation’ are usually connected with the verb θύω, that literally means ‘to offer by burning’ (e.g. θυμία, θυμιάω, and especially ὑποθυμιάω). Around the word ‘fire’ (πῦρ) we find terms indicating ‘fomentation’ (e.g. πυρίη, πυριάω, πυρίημα). Usually, fumigation refers to a warm and dry smoke that arrives in the nose of the woman, obtained by burning a solid substance, whereas fomentation refers to a warm and wet vapor obtained by burning a liquid substance. However, the difference between the two techniques is far from being well-defined and their use in ancient Greek literature many times overlaps. Both fumigation and fomentation were strictly connected with the quality of the substances and with the medical theory of mixtures of the bodies.

<sup>16</sup> See, for example, Hipp. *Mul.* II 37 (Potter 358,13 – 360,6 = cap. 146: Littré VIII 322,8–21); *Nat. Mul.* 96 (Bourbon 81,15 – 82,4 = Littré VII 412,19 – 414,3); *Steril.* 2.1 (Bourbon 74,21–23 = cap. 214: Littré VIII 414,20–22). A detailed description of the practice of fumigation through the vagina is to be found in Hipp. *Mul.* II 24 (Potter 316,8 – 318,17 = cap. 133: Littré VIII 284,9 – 286,20); cf. also the correspondent *Commentary* on this aphorism by Stephanus (Westerink 156,17 – 160,13). On this topic, see Dean-Jones 1994, pp. 72–73 and Hanson 2004, pp. 296–297.

<sup>17</sup> On the so-called ‘hysterical suffocation’, see Manuli 1980, pp. 398–402; Manuli 1983, pp. 156–158; Dean-Jones 1994, pp. 73–74 and King 1998, pp. 205–233.

other hand, one could also make a uterine fumigation by burning fragrant substances under the vagina, so that their good smell could attract the uterus down to its natural position<sup>18</sup>.

Nevertheless, in the Hellenistic time Herophilos made important discoveries through dissection, such as the ovaries, the uterine (or Fallopian) tubes and the ligaments (called also ‘membranes’) anchoring the uterus in its proper place. These discoveries constituted an evident confutation of the idea that a tube could directly connect the vagina to the nostrils<sup>19</sup>. Probably thanks to these Alexandrian discoveries of tubes and ligaments, and consequently because of the impossibility that the uterus could freely move up and down in the female body, the practice of fumigation began to be controversial. Soranus of Ephesus, in the first century AD, refuses the use of fumigation as well as other popular practices for testing woman’s fertility<sup>20</sup>. He argues that this practice is outdated, since it goes back to the doctors Evenor and Euriphon, two physicians from the 4th and 5th century BC (that means, more or less contemporary with the figure of Hippocrates). Nevertheless, he does not explain extensively why fumigation is wrong, but he only claims that the general rule (ἐν τῷ καθόλου) for testing woman’s fertility is to check the condition of the uterus<sup>21</sup>.

On the contrary, in his commentary on aphorism V 59 Galen stresses the usefulness of fumigation for diagnosing fertility, quoting fragrant aromas such as incense (λιβανωτός), myrrh (σμύρνη), styrax (στύραξ) and others (ἄλλα)<sup>22</sup>. He seems to ignore on purpose that such test is based on the idea that a tube exists to connect nostrils and vagina, idea that evidently contradicts the empirical observation of the membranes anchoring the uterus. Galen is clearly more respectful than Soranus toward the authority of Hippocrates, and this appears evident especially in his Commentaries on Hippocratic works. Moreover, his recommendation to use fumigation is also confirmed in other writings with reference to the suffocation of the womb<sup>23</sup>. In order to explain the uterine suffocation, Galen does not accept the Hippocratic etiology of womb’s movement in search of moisture, since dissection from the time of Herophilos showed this was impossible. According to Galen, the suffocation is caused by the tension of the anchoring membranes. This condition is due to the retention either of the menstrual blood or of the female seed. The retention of menstrual blood can be caused by the blood’s thickness or by a closure of the vessels through which the blood passes into the womb. Even though Galen goes beyond the Hippocratic theory of the

<sup>18</sup> See e.g. Hipp. *Mul.* II 18 (Potter 304,12-17 = cap. 127: Littré VIII 272,15-20) and *Loc. Hom.* 47 (Joly 78,2-24 = Littré VI 344,22 - 346,17).

<sup>19</sup> See von Staden 1989, fr. 61 (Gal. *De sem.* II 1: De Lacy 146,20 - 148,16 = Kühn IV 596,6 - 597,15) and fr. 114 (Gal. *De uteri diss.* 5: Nickel 42,22 - 44,3 = Kühn II 895,8 - 896,2), with notes of commentary on pp. 165-169 and 296-299. On this point, cf. King 1998, pp. 37-38.

<sup>20</sup> On Soranus’ attitude towards a large mass of popular beliefs included in medical theories of earlier literature, see Lloyd 1983.

<sup>21</sup> See Sor. *Gyn.* I 35 (Ilberg 24,11 - 25,4 = I 11: Burguière - Gourevitch - Malinas 31,39 - 32,63); cf. *Gyn.* III 29 (Ilberg 112,4 - 113,6 = III 5: Burguière, Gourevitch, Malinas 30,111 - 31,147).

<sup>22</sup> These aromas are quoted together in Galen’s *De instrumento odoratus* 3,9 (Kollesch 42,21 = Kühn II 865,12-13).

<sup>23</sup> For example, in Galen’s *De comp. med. sec. locos* IX 10 (Kühn XIII 320,2-10), we find a recipe prescribing the fumigation of fetid substances for curing the suffocation of womb: cf. Manuli 1983, p. 178.

wandering uterus, however, among the customary remedies for treating uterine suffocation, he mentions also fumigation<sup>24</sup>.

In relation to the test of fertility, Galen explains the utility of fumigation with reference to the qualities of the womb. In fact, according to this test, women with a too hard and thick womb cannot perceive the aroma: such women are barren (Kühn XVIIb 857,13–18). Galen briefly quotes Plato's *Theaetetus* (149d), according to which the good midwives are those who are also “matchmakers” (προμνήστριαι; Kühn XVIIb 858,5–8): for midwives can recognise the mixture of the womb and, accordingly, find partners with complementary mixtures, so that they can generate. Nevertheless, Galen does not explain in detail the aphorism nor the parallel with Plato. He rather postpones a more extensive explanation to a later aphorism, that is aphorism V 62 on the mixture of the womb.

## 2. GAL. IN HIPPOCR. APH. V 62

The extensive commentary on aphorism 62 covers nine pages in Kühn's edition (Kühn XVIIb 860,11 – 868,18): it is the longest commentary of the book, and one of the longest in the whole work. According to Galen (Kühn XVIIb 860,11 – 861,2), the Hippocratic lemma reads<sup>25</sup>:

V 62 [IV 554,12–556,2 Littré] Ὀκόσαι ψυχρὰς καὶ πυκνὰς<sup>26</sup> τὰς μήτρας ἔχουσιν οὐ κνίσκονται<sup>27</sup>. καὶ ὀκόσαι καθύγρους<sup>28</sup> τὰς μήτρας ἔχουσιν οὐ κνίσκονται· ἀποσβέννυται γὰρ ἐν αὐταῖς<sup>29</sup> ὁ γόνος. καὶ ὀκόσαι ξηρὰς μᾶλλον<sup>30</sup> καὶ περικαέας· ἐνδείη γὰρ τροφῆς φθείρεται τὸ σπέρμα. ὀκόσαι δ' ἐξ ἀμφοτέρων τὴν κρᾶσιν ἔχουσι συμμέτρως, αἱ τοιαῦται<sup>31</sup> ἐπίτεκνοι γίνονται.

Those women, who have cold and stiff wombs, do not become pregnant. And those with excessively wet wombs do not become pregnant; for the offspring is extinguished in them. Also the ones with dry and excessively heated wombs [do not become pregnant]: for the seed perishes due to lack of nourishment. But as for the ones with a well-proportioned mixture of both, they become pregnant.

<sup>24</sup> Gal. *De loc. affect.* VI 5 (Kühn VIII 414–430, and especially Kühn VIII 420,9–10). On this passage see Debru 1992.

<sup>25</sup> In Stephanus' *Commentary* (Westerink 166–169), this Hippocratic aphorism V 62 is divided in two parts, corresponding to his aphorisms V 65 and V 66.

<sup>26</sup> The manuscripts M V U J transmit here the adjective καθύγρους instead of ψυχρὰς καὶ πυκνὰς transmitted by P S N.

<sup>27</sup> The manuscripts M S J, probably following the Hippocratic tradition, transmit κνίσκονται(v).

<sup>28</sup> Instead of καθύγρους, the manuscripts M V U J transmit in this case ψυχρὰς καὶ πυκνὰς.

<sup>29</sup> In this case the correct reading is probably ἐν αὐταῖς, which is the result of a correction of U, which added ἐν before αὐταῖς; this reading seems to be confirmed by the Syriac translation (vd. Poignon 1903, p. 38 n. 4), whereas the Arabic text by Ḥunayn paraphrases this point. The manuscript P preserves just αὐταῖς, and N the masculine form αὐτοῖς; the group V M S J read αὐτῶν, which is probably a correction of the otherwise incomprehensible dative αὐταῖς without preposition. On the contrary, the Hippocratic tradition does not transmit any pronoun.

<sup>30</sup> The reading μᾶλλον, transmitted by P U N, is confirmed by the Syriac and Arabic translations.

<sup>31</sup> αἱ τοιαῦται is omitted by M V S J.

Galen's commentary on aphorism V 62 offers the perhaps most detailed explanation of the relation between female/male 'mixtures' (κράσεις) and fertility in ancient medical literature. It is not a case that Galen stresses again the importance of this aphorism by quoting it in his *Commentary on De natura hominis* (Mewaldt 26,16 – 27,1 = Kühn XV 47,17 – 48,5), written some years after the *Commentary on Aphorismi*, around 189 AD. In particular, Galen takes his cue from the third chapter of *De natura hominis*, in which the central topic is the idea that 'generation' (γένεσις) presupposes a 'mixture' (κρᾶσις) of different elements and reproduction must happen between living beings of the same species and with a physiological harmony<sup>32</sup>. The *Commentary on De natura hominis* is very rich of learned quotations, since, unlike the *Commentary on Aphorismi*, it was written for publication, when Galen had his own library at his disposal<sup>33</sup>. Probably for this reason, the readings that Galen transcribed in the *Commentary on De natura hominis* are much closer to the tradition of the Hippocratic *Aphorismi* than those that we find in his own *Commentary on Aphorismi*<sup>34</sup>.

Galen immediately links aphorism 62 to aphorism 59, stating that he would have changed the order so as to put the two aphorisms one after the other (Kühn XVIIb 861,4–13). Then, it becomes clear that his commentary on aphorism 59 just laid the foundations for a more detailed explanation of aphorism 62. The fact that Galen wrote a very long commentary on this aphorism is not surprising, if we consider that 'mixture' (κρᾶσις) is one of his most important medical concepts, which he developed in particular in his treatise *De temperamentis* (probably written between 169 and 180 AD)<sup>35</sup>. According to Galen, the main point (κεφάλαιον) of aphorism V 62 is the following (Kühn XVIIb 861,12–16). The well-mixed (εὐκράτοι) wombs are able to conceive; badly-mixed (δύσκρατοι) wombs, on the contrary, can be of two different kinds: if they are affected by a 'moderate' (μετρίως) δυσκρασία, they can conceive, but with some difficulties; if they are affected by a 'immoderate' (ἀμέτρως) δυσκρασία, they cannot conceive at all. Galen draws a distinction between moderate and immoderate bad-mixtures, which is similar to the distinction between an 'healthy' (ὕγιεινή) and a 'pathological' (νοσώδης) δυσκρασία that one can find in *De temperamentis* II 4 (Helmreich 63,10–12 = Kühn I 609,7–9).

Before we go on reading the commentary, it is important to briefly summarize Galen's ideas about how conception happens, as they emerge especially from *De uteri dissectione* and *De semine*<sup>36</sup>. The mouths of vessels in the woman, which conduct to the inner parts of the womb, must be open for conceiving, whereas they remain closed after the conception.

<sup>32</sup> See the useful commentary in the edition of Jouanna 2002, pp. 251–255.

<sup>33</sup> See Gal. *De libris propriis* 9 (Boudon-Millot 159,9 – 162,11 = Kühn XIX 33,14 – 37,9). Cfr. Manetti - Roselli 1994, pp. 1569–1570.

<sup>34</sup> For example, both the Hippocratic text and Galen's *Commentary on De natura hominis* have ἔχουσι τὰς μήτρας instead of τὰς μήτρας ἔχουσι that the *Commentary on Aphorismi* transmits, and they both omit the reading (ἐν) αὐταῖς; cf. above.

<sup>35</sup> On the notion of mixture in Galen see Boudon-Millot 2011; on the importance of this theory see van der Eijk 2015; cf. Mirrione 2017.

<sup>36</sup> For a general description, cf. Flemming 2000, pp. 29–303, and especially p. 298.

The liquid seed of both the man and the woman<sup>37</sup> is mixed together in the oven-like cavity of the womb and dries out. At first the placenta (χόριον) forms out of the mixed seeds, afterwards membranes, such as allantois and amnion, develop, and finally the embryo takes shape, which Galen considered as a living being (ζῶον) that adheres to the rough surface of the womb. The substance from which the embryo is formed is menstrual blood plus the two semens, the female and the male one. Nutriment comes to the embryo through the χόριον from the veins and arteries of the mother, and the embryo grows up in the womb through the nourishment provided by menstrual blood<sup>38</sup>.

Barren women are – Galen writes in his *Commentary* – those, whose constitution is immoderately badly-mixed “since the beginning” (εὐθέως ἐξ ἀρχῆς), that means, due to a genetic flaw. He quotes his theory on the eight possible bad mixtures (δυσκρασίαι) due to the prevalence of one or two primary qualities – cold, wet, hot and dry – (Kühn XVIIb 862,6–13), as it was exposed in his previous writing *De temperamentis*<sup>39</sup>. Four δυσκρασίαι are ‘simple’ (ἀπλαί), that means, caused by the predominance of just one primary quality; the other four are ‘composed’ (σύνθετοι), that means, caused by the predominance of a couple of primary qualities. Galen devotes to the coldness of the womb the longest section of his commentary (Kühn XVIIb 862,13 – 863,18), because women are usually colder than men by nature<sup>40</sup>: therefore, if the womb of a woman is even colder than the ordinary, she is for sure barren. The excessive coldness causes a thick womb, so that the ‘mouths of vessels’ (στόματα ἀγγείων) are too narrow and the placenta (χόριον) cannot grow up; even in the rare cases when it can develop, the embryo (κύημα) cannot get good nourishment. The predominance of the other qualities too – namely too moist, too dry or too hot wombs – turns out to be a possible cause of barrenness<sup>41</sup>, although Galen devotes only a few words to these cases.

By summarizing the meaning of the aphorism (Kühn XVIIb 863,18 – 864,10), Galen adds an interesting metaphor: he compares the ‘offspring’ (γόνος) in the uterus with cereals seeds (δημήτρια σπέρματα) and consequently the womb with earth<sup>42</sup>:

<sup>37</sup> Galen wrote about the female semen in *De sem.* I 7 (De Lacy 86,13–15 = Kühn IV 536,2–5): see the commentary in the edition by De Lacy 1992, pp. 215–216; cf. also the more extensive exposition in *De usu part.* XIV 6–11 (Helmreich 296,8 – 324,10 = Kühn IV 158,3 – 193,17). Cf. Kollesch 1987, pp. 17–19 and Nickel 1989, pp. 40–49.

<sup>38</sup> See Boudon-Millot 2008, p. 86, according to whom Galen distinguishes four phases of conception: (1) the state of the seed (γονή), (2) the state of κύημα, (3) the state of ἔμβρυον, (4) the state of παιδίον. Cf. also Hanson 2008, p. 103.

<sup>39</sup> Gal. *De temp.* I 8 (Helmreich 31,28 – 32,4 = Kühn I 559,4–9) and II 1 (Helmreich 40,3–10 = Kühn I 572,3 – 573,1).

<sup>40</sup> Cf. Kühn XVIIb 868,10–11: φύσει ψυχρότερόν ἐστι τὸ θῆλυ τοῦ ἄρρενος; cf. also *In Hipp. Aph.* V 69: Kühn XVIIb 884,5.

<sup>41</sup> See Hanson 2004, p. 299. In *Mul.* I 17 (Potter 58,6–17 = Littré VIII 56,5–19) the focus is on wetness and dryness of the womb. Diocles of Carystus too formulated the idea of a relation between the proportion of the four qualities and fertility, although he seems to refer to the quality of female seed and not of the womb: see *frr.* 42a, 42b and 42c van der Eijk, with relevant commentary in vol. 2, pp. 94–96.

<sup>42</sup> Magdelaine 1994, p. 656 finds here a comparison of the γόνος with the flame of a candle because of the verb ἀποσβέννυμι.

καὶ τοίνυν ἀκούσωμεν οὕτω τοῦ κατὰ τὸν ἀφορισμὸν λόγου παντός, ὅσαι ψυχρὰς τὰς μήτρας ἔχουσιν οὐ κνίσκονται διὰ τὴν πυκνότητα τῆς οὐσίας αὐτῶν. διὰ τί δ' ἡ πυκνότης ἐναντιοῦται τῇ κνήσει παρέλιπεν εἰπεῖν, ὡς ἡμῶν συνιέναι δυναμένων. καὶ ὅσαι δ' ὑγρὰς ἀμέτρως ἔχουσιν τὰς μήτρας οὐ κνίσκονται, σβέννυται γὰρ ὁ γόνος ὥσπερ ἐν τελματώδει γῆ τὰ δημήτρια σπέρματα. καὶ μὴν ὅσαι ξηρὰς ἢ περικαεῖς ἔχουσιν τὰς μήτρας ἐνδεία τροφῆς οὐ κνίσκονται· κατὰ μὲν γὰρ τὰς ξηρὰς<sup>43</sup> παραπλήσιόν τι συμβαίνει τοῖς εἰς ψάμμον ἢ εἰς ἀργιλλώδη γῆν ἢ πετρῶδη καταβαλλομένοις σπέρμασι, κατὰ δὲ τὰς ἀμέτρως θερμὰς τοῖς εἰς πᾶνυ θερμῆν, οἷαπερ ἐστὶν ἐν τοῖς ὑπὸ κῦνα καύμασιν.

Well, let us listen to the complete account according to the aphorism: *those who have cold wombs do not become pregnant* because of the thickness of their substance. [*scil.* Hippocrates] neglects to say why the thickness hinders conception, since we can understand it by ourselves. *Also those who have excessively wet wombs do not become pregnant, for the offspring is extinguished*, like the seeds of Demeter in the marshy earth. For sure *those who have dry and excessively hot wombs because of the lack of nourishment do not become pregnant*: in the dry ones it happens something similar to the seeds that are sown in sand or in clayey or rocky earth; in the excessively hot ones [*scil.* it happens something similar] to the seeds [*scil.* that are sown] in very hot earth, which are under a burning heat in the hottest time of the day.

If, on the one side, the offspring is like seed, on the other side a too moist womb is like marshy earth, a too dry womb is like sand or clayey or rocky earth, a too hot womb is like hot earth. Similar metaphors occur also in other treatises by Galen, although not strictly related to conception's theories, such as in *De temperamentis* and *De usu partium* with reference to hair in the skin, which are similar to plants growing in the earth<sup>44</sup>. They are common also in earlier embryological texts, such as the Hippocratic *De natura pueri*<sup>45</sup>. In particular, the metaphor of the embryo as a plant-like being is used especially for describing the initial phase of conception. It is worth noticing that in Galen's *Commentary* this metaphor does not refer only to the male seed in the female womb, but both to the female and to the male seeds in the female womb: the 'offspring' (γόνος) in question is namely the result of the combination of both seeds.

Galen does not restrict his commentary to the mixture of the womb, but he starts from this issue to discuss the necessary complementarity of the partners. Therefore, he takes into consideration man's sterility as well (Kühn XVIIb 866,1-16). The possibility that also men

<sup>43</sup> The words ἢ περικαεῖς ἔχουσιν τὰς μήτρας ἐνδεία τροφῆς οὐ κνίσκονται κατὰ μὲν γὰρ τὰς ξηρὰς, transmitted by all the main manuscripts, are omitted in Chartier's and Kühn's editions, probably because of a so-called *saût du même au même* (from ξηρὰς... to ...ξηρὰς) in a source used by Chartier.

<sup>44</sup> See *De temp.* II 5 (Helmreich 65,11-19 = Kühn I 612,13 - 613,5) and *De usu part.* XI 14 (Helmreich 161,2 - 162,6 = Kühn III 909,5 - 910,17).

<sup>45</sup> See Nickel 1989, pp. 23-27 and Hanson 1990, p. 317: "the Hippocratic liken the body of their woman to a ploughed and seeded field, and her uterus to a jug [...] for both the productive field and the upside-down jug, the major concern is the management of liquids - irrigation, retention, and release at the proper time."



could fail in generating was weighed in also before Galen, but without any therapeutically aim<sup>46</sup>. Already Aristotle, in *De generatione animalium* (and something very similar is to be found also in the pseudo-Aristotelian tenth book of *Historia Animalium*), claimed that the *συμμετρία* of the bodies of both parents is necessary for conception, but he did not specify which bodily parts were involved<sup>47</sup>. If we turn our attention to Galen's *Commentary*, the parallelism between the male and female contribution to generation is not exactly balanced. On the one hand, in other treatises Galen explicitly recognizes the existence of a female seed. On the other hand, in the above-mentioned passages, he does not draw a comparison between male and female seeds, as one could expect, but he considers the mixture (*κρᾶσις*) of the male seed and of the female womb<sup>48</sup>. Maybe this *aporia* can be solved, if we consider that also the female seed recolects in the womb, whose mixture of qualities was expected to be equivalent to the mixture of the female seed itself<sup>49</sup>.

However, in the commentary on aphorism 62 Galen claims that it is possible to apply to men the same argument used for women (Kühn XVIIb 866,1–16). He then explains that also male semen can suffer from a bad mixture (*δυσκρασία*): it can be too hot, too cold, too dry or too wet. In each of these cases, in order to make women pregnant, male semen needs to join with a womb, which has a complementary *κρᾶσις*: for example, if the male semen is too hot, the womb must be too cold and so on. We can therefore infer that in those cases, in which either the womb or the male semen are 'moderately' ill, suffering from a not too-bad *δυσκρασία*, the health – namely, the possibility of conceiving – is paradoxically given not by an healthy state of the partners, but by the complementary 'illness' of the two partners. To sum up, health is given either by the health – that is the good mixture – of both partners, or by two complementary moderate illnesses – that is two moderate *δυσκρασίαι* – of the partners. What Galen wants to stress – and that represents his personal contribution in commenting on the Hippocratic text – is that the physiological harmony of women and men, even in their illness, is necessary for conception. It is as if, according to Galen's conception's theory, the mutual relation and the compatibility of the *κράσεις* of the male and female partners counted much more than the mixture of the single partner.

In his commentary on aphorism 62, Galen repeats what he already wrote in reference to aphorism 59 and stresses how midwives are able to diagnose the constitution of female bodies: this ability allows them to find partners with a complementary mixture and match them (Kühn XVIIb 866,16 – 867,14). We can imagine, for example, that if a man was diagnosed by a physician to have a badly-mixed semen, he should seek for a woman with a

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<sup>46</sup> See Flemming 2013, p. 571.

<sup>47</sup> Arist. *Hist. An.* X 636b,6–10; *Gen. An.* 767a,13–23. On this point, see van der Eijk 1999, p. 495.

<sup>48</sup> We know also from his *De semine*, that both female and male seeds are homeomerous parts, but the quality of female seed is not at all taken into account here. Galen treats the mixture of the qualities of female and male seed in *De semine* II 4 (De Lacy 176,9 – 178,15). Cf. Nickel 1989, p. 43: "Ferner sollte darauf aufmerksam gemacht werde, daß sich Galen bei seinen qualitativen Bestimmungen des weiblichen Spermas offensichtlich von dem Gedanken leiten ließ, einen Zusammenhang zwischen der geschlechtsspezifischen Konstitution des weiblichen Individuums und der Qualität des von ihm produzierten Spermas herzustellen."

<sup>49</sup> On the configuration of female generative parts, see Flemming 2000, pp. 296–297.

complementary mixture, who could give him children: therefore, he had to recur to a midwife. Galen quotes then the platonic *Theaetetus*, in which Socrates says (149d,5–8): {ΣΩ.} Ἄρ' οὖν ἔτι καὶ τόδε αὐτῶν ἦσθησαι, ὅτι καὶ προμνήστριαί εἰσι δεινόταται, ὡς πάσσοφοι οὔσαι περὶ τοῦ γινῶναι ποίαν χρῆ ποίω ἀνδρὶ συνοῦσαν ὡς ἀρίστους παῖδας τίκτειν; “(Socrates) Well, have you noticed also this about them, that they are the most skillful of matchmakers, since they are very wise in knowing what kind of woman has to join to what kind of man, so as to produce the best possible children?”<sup>50</sup>. Plato’s and Galen’s points of view are clearly different. While Plato – in the *Theaetetus* as well as in the *Respublica* – had a sort of eugenics in mind, according to which ‘the best possible’ children could be generated, Galen adopts here a medical and physiological point of view: he is especially interested in the matter of infertility. For the infertility caused by a moderate bad-mixture was up to a certain point – as we have seen – a curable disease, since it could be cured by looking for the right partner with a complementary bad-mixture. This was the task of midwives acting as matchmakers, who were expected to recognize the infertility of their female patients. The expertise of a good midwife was an important topic in the imperial era, as we can infer from Soranus’ work *Gynaecia*<sup>51</sup>. It also seems that in the time of Soranus and Galen the role of the midwife was appreciated and qualified as an art (τέχνη). Galen himself received much information about embryology and gynaecology from midwives and dedicated his treatise *De uteri dissectione* to one of them<sup>52</sup>.

Finally, Galen points to the tool, by which midwives could diagnose the bad-mixtures of the womb: the word διάγνωσις stands emphatically at the beginning of the new and last paragraph (Kühn XVIIb 867,14 – 868,18)<sup>53</sup>. The most useful (χρησιμωτάτη) diagnostic approach for all the eight kinds of δυσκρασία is the fumigation with aromas, discussed in the 59<sup>th</sup> aphorism. In this description of fumigation’s usefulness, Galen points to the relation between the ‘faculty’ (δύναμις) that the fumigated aromas possess to penetrate woman’s body and the ‘mixture’ (κρᾶσις) of the womb. Nevertheless, he seems to deliberately omit the question of how – from an anatomical and physiological point of view – the aromas can move from the vagina to the mouth of the woman. Although he is perfectly aware that there is no large tube that directly connects vagina to nostrils, as Hippocrates thought, he has to avoid addressing this issue in order to not question the authority of Hippocrates. It seems that Galen uses a Hippocratic diagnostic tool, even if outdated – as Soranus noticed –, in order to corroborate his theory on mixture. In the case of too cold womb, the smell of the vapors will not reach woman’s nostrils and mouth, and the same will happen in the case of a too dry womb. A too wet womb kills the smell of the aromas, just as it kills the semen. The case of too hot womb, even though rare because woman’s body is usually cold, is slightly

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<sup>50</sup> The image of the platonic midwife portrayed in the *Theaetetus* plays an important role in the medical literature: see Hanson 1996. On this point, cf. also Manuli 1983, p. 187.

<sup>51</sup> About midwives, see Nickel 1979, p. 516; Gourevitch 1984, pp. 217–223; King 1998, pp. 176–177; cf. Eccia 2017.

<sup>52</sup> Cf. Nickel 1989, pp. 16–17.

<sup>53</sup> On the importance of recognising and diagnosing the mixture of the body, see van der Eijk 2015.

more complicate. If the womb is so hot<sup>54</sup>, that it kills the aromas before they reach woman's mouth and nostrils, then the fumigation should be sufficient for diagnosing the bad-mixture. However, if the heat does not prevail on the aromas, fumigation may not be sufficient, and it may be necessary to infer the bad-mixture "from other indicators" (ἐξ ἄλλων γνωρισμάτων)<sup>55</sup>.

As alternative indicator for diagnosing a too hot womb, Galen mentions a physiognomic element: that means, the fact that women with a too hot womb usually appear thin, dark and hairy (λεπταί... μέλαιναί καὶ δασεῖαι). Galen recurs here to an indicator he already mentioned in the second book of *De temperamentis*, where he said that a hot and dry mixture is hairy (II 5: Helmreich 64,14–18 = Kühn I 611,7–11) and that the hair is black if it is too hot (II 5: Helmreich 67,15–17 = Kühn I 616,3–6)<sup>56</sup>. Galen addresses this issue in *De methodo medendi* as well, with reference to people with a too hot and dry constitution<sup>57</sup>. He probably reworked the Hippocratic heritage on physiognomic, as it clearly appears from his account in the *Quod animi mores*, where he refers to the theory formulated by Hippocrates in *De aere aquis et locis*, according to which people living in a dry country are usually thin and hairy<sup>58</sup>.

### 3. GAL. IN HIPPOCR. APH. V 63

As we have seen, Galen decided to talk about the infertility of the male partner in the commentary on aphorism 62, although only the Hippocratic aphorism 63 deals with this topic. Galen's decision is due to the fact that he considers aphorism 63 to be spurious, since it does not match the 'thought' (διάνοια) and 'style' (ἐξομήνεια) of Hippocrates (Kühn XVIIb 865,16–18). The following is the Hippocratic text of this aphorism, as it was read by Galen (Kühn XVIIb 869,1–7):

V 63 [IV 556,3–7 Littré] Παραπλησίως δὲ καὶ ἐπὶ τῶν ἀρρένων· ἢ γὰρ διὰ τὴν ἀραιότητα τοῦ σώματος τὸ πνεῦμα<sup>59</sup> ἕξω φέρεται, πρὸς τὸ μὴ παραπέμπειν τὸ σπέρμα, ἢ διὰ τὴν πυκνότητα τὸ ὑγρὸν οὐ διαχωρεῖται<sup>60</sup> ἕξω, ἢ διὰ τὴν ψυχρότητα οὐκ ἐκπυριᾶται<sup>61</sup>, ὥστε ἀθροίζεσθαι πρὸς τὸν τόπον τοῦτον, ἢ διὰ τὴν θερμοσίαν τὸ αὐτὸ τοῦτο γίνεται.

<sup>54</sup> In comparison to the text printed by Kühn (XVIIb 868,2–3), after the *nominativus pendens* λοιπὴ δὲ ἡ σφοδρὰ θερμοῦτης we have to read the expression εἰ μὲν τῷ νικᾷν "if it prevails", transmitted by the manuscripts P and N.

<sup>55</sup> On the term γνώρισμα in Galen, see Debru 2014.

<sup>56</sup> Cf. van der Eijk 2015, pp. 686–687.

<sup>57</sup> Gal. *Meth. Med.* VIII 2 (Johnston - Horsley 366,1–4 = Kühn X 543,9–11): οἷς γὰρ ἐν τῇ κράσει τοῦ μὲν ὑγροῦ τὸ ξηρόν, τοῦ δὲ ψυχροῦ τὸ θερμὸν πλεονεκτεῖ, τούτοις ἢ μὲν ἕξις τοῦ σώματος ἰσχνὴ καὶ δασεῖα καὶ μελαντέρσα.

<sup>58</sup> See Gal. *Quod animi mores* 8 (Bazou 49–61 = Kühn IV 798–804), where Galen refers, for example, to Hipp. *De aere aquis et locis* 24 (Jouanna 249,7 – 250,2 = Littré II 92,3–6).

<sup>59</sup> The manuscripts M V S U J transmit τὸ πνεῦμα after the verb φέρεται.

<sup>60</sup> P transmits the future διαχωρήσει, V<sup>2</sup> (a later copyist of V) J and N transmit the active form διαχωρεῖ, which is perhaps a correction by the copyists.

<sup>61</sup> The group M V S U transmits the reading ἐξ πυριᾶσθαι, whereas J transmits εὐπυριᾶσθαι.

It is similar with males. Either because of the porosity of the body the air is brought outwards, so as not to push the seed; or because of the density the liquid does not go through; or because of the coldness it is not heated, so as to collect at this place; or because of the heat this same thing happens.

The main reason why Galen rejects aphorism 63 as spurious is based on the theory of mixture as well. In fact, Galen expected aphorism 63 to take into account the bad-mixtures of the male semen, in line with the exposition on the female womb of aphorism 62 (Kühn XVIIb 869,10–15). However, aphorism 63 seems to be imprecise on this issue: instead of the usual four simple *δυσκρασίαι* (too cold, too dry, too wet, too hot), the text discusses the porosity of the body and the density of the semen, along with the coldness and heat of the body. Galen condemns the use of different criteria to explain male and female infertility because, in his opinion, this approach makes it difficult to speak about fertility or infertility as determined by the combination of partners, thus leading the wrong assumption that this is an individual condition.

#### 4. CONCLUSIONS

In his *Commentary* on the fifth book of the Hippocratic *Aphorismi*, Galen devotes the greatest attention and longest explanation to that aphorism (V 62), which deals with the theory of mixture (*κρᾶσις*). As is well known, Galen inherited this theory from Hippocrates, and in particular from his treatise *De natura hominis*, and he elaborated and elevated it to the status of key-theory for understanding and treating human body. His commentary on aphorism V 62 is largely based on the system of principles and ideas that Galen had previously explained in *De temperamentis*. However, in the *Commentary*, he adapts this general theory of the bodily mixture to the specific field of gynaecology, and in particular to the mixture of wombs. At the same time, these pages of his *Commentary on Aphorismi* provide him with an important starting point to write, some years later, the *Commentary* on that section of *De natura hominis* devoted to the relation between bodily mixture and generation. The explanation of aphorism V 62 is a very good example of how Galen dealt with the texts of Hippocrates. He did not distance himself from Hippocrates even in those cases, in which the anatomical discoveries made during the past centuries (in this case, uterine tubes and ligaments) made some Hippocratic theories or methods (like the fumigation as fertility test) out-of-date. On the contrary, Galen used and reworked the authoritative statements of the ‘founder of medicine’ in order to strengthen and impose his medical theories.

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