

ON STERILITY ('HA X'), A MEDICAL WORK BY ARISTOTLE?

Whether its title, ὑπὲρ τοῦ μὴ γεννᾶν, is authentic or not, the work transmitted as 'Book X' of Aristotle's *History of Animals* (*HA*) deals with a wide range of possible causes for failure to conceive and generate offspring. It sets out by saying that these causes may lie in both partners or in either of them, but in the sequel the author devotes most of his attention to problems of the female body. Thus he discusses the state of the uterus, the occurrence and modalities of menstruation, the condition and position of the mouth of the uterus, the emission of fluid during sleep (when the woman dreams that she is having intercourse with a man), physical weakness or vigour on awakening after this nocturnal emission, the occurrence of flatulence in the uterus and the ability to discharge this, moistness or dryness of the uterus, wind-pregnancy, and spasms in the uterus. Then he briefly considers the possibility that the cause of infertility lies with the male, but this is disposed of in one sentence: if you want to find out whether the man is to blame, the author says, just let him have intercourse with another woman and see whether that produces a satisfactory result (636b11–13; see also 637b23–4). The writer also acknowledges that the problem may lie in a failure of two otherwise healthy partners to match sexually, or as he puts it, to 'run at the same pace' (ἰσοδρομῆσαι) during intercourse, but he does not go into this possibility at great length (636b15–23), and he proceeds to discuss further particulars on the female side. There is some discussion of animal sexual behaviour in ch. 6, but compared to the rest of *HA*, the scope of the work is anthropocentric, and the lengthy discussion of the phenomenon of *mola uteri* with which the work concludes is also human-orientated.

Among the relatively few scholars who have occupied themselves with this work (on which the last monograph dates from 1911),¹ it has been the source of continuous disagreement. Apart from numerous difficulties of textual transmission and interpretation of particular passages, the main issues are (i) whether the work is by Aristotle, and (ii) if so, whether it is part of *HA* as it was originally intended by Aristotle or not,² and (iii) if not, what the original status of the work was and how it came to be added to *HA* in the later tradition. From the eighteenth century onwards, the view that the

¹ G. Rudberg, *Zum sogenannten zehnten Buch der aristotelischen Tiergeschichte* (Uppsala, 1911). For some briefer discussions see H. Aubert and F. Wimmer, *Aristoteles. Tierkunde*, vol. 1 (Leipzig, 1868), 6; L. Dittmeyer, *Aristotelis De animalibus historia* (Leipzig, 1907), v; P. Louis, *Aristote. Histoire des animaux*, vol. 1 (Paris, 1964), xxxi–xxxii and vol. 3 (Paris, 1969), 147–55; A. L. Peck, introduction to Aristotle, *Historia animalium*, Books I–III (Cambridge, MA and London, 1965), lvi–lviii; O. Gigon, *Aristotelis Opera III: Librorum deperditorum fragmenta* (Berlin, 1983), 502–3; F. Poschenrieder, *Die naturwissenschaftlichen Schriften des Aristoteles in ihrem Verhältnis zu den Büchern der hippokratischen Sammlung* (Bamberg, 1887), 33; V. Rose, *De Aristotelis librorum ordine et auctoritate* (Berlin, 1854), 172ff.; L. Spengel, *De Aristotelis libro decimo historiae animalium* (Heidelberg, 1842); E. Zeller, *Die Philosophie der Griechen*, vol. II, 2² (Leipzig, 1921), 408ff.

² It should be noted that the question of 'belonging to *HA*' does not necessarily depend on the book's Aristotelian authorship being settled, if one is prepared to consider the possibility (once popular in scholarship but currently out of fashion) that *HA* was, from the start, a work of multiple authorship.

work is spurious seems to have been dominant,³ with alleged doctrinal differences between *HA X* and other writings of Aristotle, especially *Generation of Animals* (*GA*), constituting the main obstacles to accepting the text as genuine. These concerned issues such as the idea that the female contributes seed of her own to produce offspring, the idea that *pneuma* draws in the mixture of male and female seed into the uterus, the idea that heat is responsible for the formation of moles, and the idea that multiple offspring from one single pregnancy is to be explained by reference to different places of the uterus receiving different portions of the seed—views seemingly advocated in *HA X* but explicitly rejected in *GA*. In addition, arguments concerning style (or rather, lack of style), syntax, and vocabulary, as well as the observation of a striking number of similarities with some of the Hippocratic writings, have been adduced to demonstrate that this work could not possibly be by Aristotle and was more likely to have been written by a medical author.

However, this view has in more recent times been challenged by at least two distinguished Aristotelian scholars. Tricot conceded that there were differences of doctrine, but argued that *HA X* represents an earlier stage of Aristotle's thinking on the matter which he later abandoned and critically reviewed in *GA*.⁴ More recently, Balme has argued that the accounts in *GA* and *HA X* do not contradict each other and that there is no reason to assume that the latter work is not by Aristotle—indeed, Balme claimed that our interpretation of *GA* would benefit from accepting *HA X* as Aristotelian, since Aristotle's silence, in *GA*, on the rival (Platonic) view that the uterus changes its place in the female body would be explained by the fact that he had already refuted this view in *HA X*.⁵ According to Balme, the work known as *HA X* is by Aristotle but does not belong to *HA*,⁶ because it makes use of causal explanation whereas the rest of *HA* deliberately refrains from this.⁷ Thus in Balme's view the relation of *GA* to '*HA X*' is the reverse of that between *GA* and the rest of *HA*, which Balme believes to be not the preliminary data-collection which it was always held to be, and on which the explanatory biological works (*GA*, *PA*, *MA*, *IA*) were believed to be based, but a later summary based on these explanatory works.⁸ In the case of '*HA X*', however, Balme claims that we are in fact dealing with a preliminary study of the role of the female in reproduction which is later 'refined'—but not contradicted—in the more mature *GA*.

Yet the issue is by no means definitively settled. Quite recently, Föllinger, in her monograph on theories of sexual differentiation in ancient thought, once again advocated scepticism with regard to the question of authenticity.⁹ Apart from pointing out a number of serious difficulties involved in Balme's argumentation, her main argument against Aristotelian authorship is that the author does not speak of the process of reproduction in the characteristically Aristotelian terms of form (*εἶδος*) and matter (*ὑλη*).

³ For a survey of older scholarship see D. M. Balme, 'Aristotle *Historia Animalium* Book Ten', in J. Wiesner (ed.), *Aristoteles. Werk und Wirkung*, vol. 1 (Berlin, 1985), 191–206.

⁴ J. Tricot, *Aristote. Histoire des animaux*, vol. 1 (Paris, 1957), 17.

⁵ Balme (n. 3); see also Balme's introductory remarks in Aristotle, *History of Animals VII–X* (Loeb Classical Library, Cambridge MA and London, 1991), 26–30, and his notes to the text and translation (*ibid.*, pp. 476–539).

⁶ For the ancient evidence that it was added later to *HA*, see below.

⁷ Cf. also Louis (n. 1), vol. 3, 148.

⁸ Balme, introduction to *HA* (n. 5), 21–6.

⁹ S. Föllinger, *Differenz und Gleichheit. Das Geschlechterverhältnis in der Sicht griechischer Philosophen des 4. bis 1. Jahrhunderts v. Chr.* Hermes Einzelschriften, 74 (Stuttgart, 1996), 143–56.

It seems to me that many of Föllinger's objections to Balme's analysis are justified and that her cautious attitude to the question of authenticity is prudent, because in the present state of scholarship (i.e. in the absence of a proper commentary on *HA X*), truly decisive arguments in favour of or against Aristotelian authorship are very difficult to find and any judgement is likely to remain, to a considerable extent, subjective. However, this does not necessarily mean that scepticism is the only acceptable position. It is one thing to establish divergences of opinion between two works, but quite another to say that these divergences cannot coexist in the mind of one thinker, or at different stages in the development of his thought. Indeed, there are other, notorious and perhaps much more serious divergences of doctrine between works whose Aristotelian authorship is beyond dispute, or even within one and the same work (see below), so the question is whether the divergences between *HA X* and *GA* are such that they cannot conceivably be derived from Aristotle's own mind.

In this short article, however, I will approach this question from a rather different angle by drawing attention to the special nature of *HA X*. I will argue that the divergences of doctrine between *HA X* and other Aristotelian works need not exclusively be interpreted as evidence of different authorship, or indeed of a development in Aristotle's thought, but may be better appreciated when we relate them to differences in scientific status and methodology between these works. To put it briefly, '*HA X*' is a 'practical', i.e. medical, work, unsystematic and limited in scope, intended to provide diagnostic clues to the possible causes of failure to conceive, or in other words, pursuing knowledge that is useful for practical application.¹⁰ Thus it is very different in nature from a thoroughly theoretical, systematic, and comprehensive work such as *GA*. From this perspective, it becomes understandable that '*HA X*' mainly discusses additional factors that are supplementary to the account of *GA*, and on the other hand does not mention a number of factors which play such a crucial role in *GA*. It also explains the book's anthropocentric approach, the fact that it deals almost exclusively with problems on the female side and why it so persistently considers aspects of failure to conceive in relation to whether they require, or allow of, 'treatment' (*θεραπεία*).

The assumption that Aristotle wrote medical works at all (and that '*HA X*' was one of them) may need some elaboration. As is well-known, Aristotle makes a clear distinction between practical and theoretical sciences¹¹ and is well aware of its implications for the way in which a particular topic is discussed within the context of one kind of science rather than the other¹²—such implications pertaining, among other things, to the degree of exactitude with which the topic is to be discussed, the kind of questions to be asked and the amount of technical detail to be covered (a good example of such differences in treatment is the discussion of the soul and its various parts in the *Ethics* and in the *De Anima*). As far as medicine is concerned, Aristotle expresses a similar view on the differences between the theoretical 'study of nature' (*φυσικὴ φιλοσοφία*) and the practical¹³ art of 'medicine' (*ἰατρικὴ*). This becomes clear

¹⁰ The possibility that *HA X* is different in style and doctrine from other Aristotelian works because it is practical in nature and addresses a wider readership is suggested by Gigon (n. 1), 503, but he does not elaborate this, and he also seems to think that the work was revised and updated by a later Peripatetic in the light of new evidence.

¹¹ See e.g. *Metaphysics* 1025b25, 993b21; *Topica* 145a16.

¹² See e.g. *Nicomachean Ethics* 1094b1ff., 1098a21ff., 1102a5ff.

¹³ Strictly speaking, medicine is a 'productive' art for Aristotle, since its purpose, health, is distinct from its activity (cf. *EN* 1140a1–23; *Pol.* 1254a2; *Magna Moralia* 1197a3); but this distinction is irrelevant for the contrast 'theoretical' vs. 'practical'.

from three well-known passages in the *Parva Naturalia*,¹⁴ where Aristotle not only speaks approvingly of doctors who base their medical doctrines on ‘starting points’ (ἀρχαί) derived from the study of nature, but also of ‘the most refined students of nature’ (τῶν περὶ φύσεως πραγματευθέντων οἱ χαριέστατοι) who deal with the principles of health and disease; the latter thing is what Aristotle himself apparently did, or intended to do, in his work *Περὶ ὑγείας καὶ νόσου* (which is not extant).¹⁵ To be sure, in the third of these passages (*De resp.* 480b22ff.) Aristotle stresses that although medicine and the study of nature are, up to a point, coterminous, they are different in method as well as in subject-matter; hence, scholars have concluded that any discussion of medical topics by Aristotle was (or would have been) fundamentally different from works such as those contained in the Hippocratic Corpus.¹⁶ However, this conclusion seems to ignore the fact that Aristotle’s remarks here in the *PN* apply to his project of ‘the study of nature’ (to which also the *Περὶ ὑγείας καὶ νόσου* would have belonged), and fails to take account of the possibility that Aristotle, within another, more specialized and technical framework, may have gone into far greater medical detail.

That such an ‘other framework’ actually existed is suggested by the references, both in Aristotle’s own works and in the indirect tradition, to more specialized medical studies. Thus Aristotle himself refers on numerous occasions to a work called *Ἀνατομαί*.¹⁷ In his catalogue of Aristotle’s writings (V 25), Diogenes Laertius lists a work called *Ἱατρικά* in two books, a title that suggests that this was possibly a collection of medical problems not dissimilar to the first book of the extant—but presumably post-Aristotelian—*Problemata*.¹⁸ Interestingly, the same catalogue also lists a work *ὑπὲρ τοῦ μὴ γεννᾶν* in one book. Furthermore, Caelius Aurelianus quotes literally from a medical work *De adiutoriis* (‘On Remedies’, in Greek probably *Περὶ βοηθημάτων*) by Aristotle.¹⁹ There is also evidence that Aristotle wrote a doxographical work on the causes of diseases, which served as a basis for the literary activities of

¹⁴ *De sensu* 436a17–b2; *De divinatione per somnum* 463a4–5; *De respiratione* 480b22–31. Cf. also *De longitudine et brevitate vitae* 464b32ff.; *De partibus animalium* 653a8ff. For a discussion of these passages see P. J. van der Eijk, ‘Aristotle on “distinguished physicians” and on the medical significance of dreams’, in P. J. van der Eijk, H. F. J. Horstmanshoff, and P.H. Schrijvers (edd.), *Ancient Medicine in its Socio-cultural Context*, vol. 2 (Amsterdam and Atlanta, 1995), 447–59.

¹⁵ On this work, and its reputation in the later tradition, see G. Stohmaier, ‘Al-Farabi über die verschollene Aristoteles-Schrift “Über Gesundheit und Krankheit” und über die Stellung der Medizin im System der Wissenschaften’, in J. Irmscher and R. Müller (edd.), *Aristoteles als Wissenschaftstheoretiker* (Berlin, 1983), 186–9.

¹⁶ For example, H. Flashar, *Aristoteles. Problemata physica* (Berlin, 1962), 318: ‘Aristoteles sagt von sich selbst, er sei kein Fachmann in der Medizin und betrachte medizinische Fragen nur unter philosophischem oder naturwissenschaftlichem Blickpunkt.’ For a more positive attitude to the possibility that Aristotle wrote on medicine see G. Marengi, ‘Aristotele e la medicina greca’, *Rendiconti del Istituto Lombardo*, Classe di Lettere 95 (1961), 141–61.

¹⁷ The references can easily be found with the aid of Bonitz’s *Index Aristotelicus* or Gigon’s collection of fragments (see n. 1), fr. 295–324. For a recent discussion of this (lost) work see J. Kollesch, ‘Die anatomischen Untersuchungen des Aristoteles und ihr Stellenwert als Forschungsmethode in der Aristotelischen Biologie’, in W. Kullmann and S. Föllinger (edd.), *Aristotelische Biologie. Intentionen, Methoden, Ergebnisse* (Stuttgart, 1997), 370; see also W. Kullmann, ‘Zoologische Sammelwerke in der Antike’, in W. Kullmann, J. Althoff, and M. Asper (edd.), *Gattungen wissenschaftlicher Literatur in der Antike* (Tübingen, 1998), 130–1.

¹⁸ The Aristotelian authorship of this section of the *Problemata* was defended by G. Marengi, *Aristotele. Problemi di medicina* (Milan, 1966), and more recently by P. Louis, *Aristote. Problèmes*, tome I (Paris, 1991). Flashar (n. 16), 385, is more cautious.

¹⁹ *Celeres passiones* 2.13.87: *Hanc definiens primo De adiutoriis libro Aristoteles sic tradendam credit: ‘Pleuritis’, inquit, ‘est liquidae materiae coitio siue densatio’.*

the so-called Anonymus Londiniensis.²⁰ These medical works are lost (unless *ὑπὲρ τοῦ μὴ γεννᾶν* survives in the form of 'HA X'), but there is no reason to believe that they were not written by Aristotle—who was, after all, the son of a doctor and in whose works medical analogies and metaphors are prominent.²¹ The situation seems similar to that of the more specialized works on harmonics, acoustics, mechanics, optics, etc., attributed to Aristotle in the catalogues and the indirect transmission:²² here, as in the case of the medical works, there is no *a priori* reason to believe that Aristotle did not write them. The burden of proof lies on those who wish to deny the authenticity of these works, and since they are lost, the only basis for questioning their authenticity seems to have been a tacit distinction between 'philosophy' and 'science' and the assumption that these writings were too 'specialized' and 'unphilosophical' for the mind of Aristotle, who would have left it to his pupils (such as Theophrastus, Meno, and Eudemus) to deal with the technical details. There is, however, little evidence for this assumption, which has every appearance of a prejudice and does not do justice to the fact that Aristotle's 'philosophical' writings themselves contain a large amount of 'technical' detail.²³

If we assume that *On Sterility*, rather than being Book X of the *HA*, is one of these medical works—indeed, perhaps, the work *ὑπὲρ τοῦ μὴ γεννᾶν* mentioned in two catalogues of Aristotle's writings, which incidentally also list *HA* as containing nine books²⁴—we need not be surprised to see divergences between it and a thoroughly theoretical, comprehensive, and systematic work such as *GA*. For we can then appreciate that 'HA X' does not intend to give a comprehensive, theoretically satisfactory account of reproduction, and we can see why it discusses a number of factors that are supplementary to, and hence not envisaged in, the account of *GA*.

This brings us to a further methodological point. Even if one is reluctant to believe that Aristotle wrote medical works, the special nature of 'HA X' makes it pertinent to ask what sort of things we can reasonably expect the author to say. For the doctrinal divergences it shows are related to a *pattern* that can be perceived in Aristotle's works as a whole.²⁵ When Aristotle is dealing with *deviations*, irregularities, exceptions to the rule, deformations, errors or disturbances of certain vital functions, or variations in the degree of perfection with which these vital functions are performed—in short, aspects of a subject which are typically suitable to be dealt with in an appendix, or in a collection such as the *Problemata*²⁶—he often makes use of explanatory factors in

²⁰ Anon. Lond. V 37 and VI 42. The Aristotelian authorship of the work of which Anon. Lond. is an adaptation is taken seriously by D. Manetti, 'Autografi e incompiuti: il caso del Anonimo Londinese P. Lit. Lond. 165', *ZPE* 100 (1994), 47–58, and by Gigon (n. 1), 511. Other scholars, basing themselves on a passage in Galen's *Commentary on Hippocrates' On the Nature of Man* 1.25–6 (pp. 15–16 Mewaldt; XV 25 K.), assume that this work was in fact written by Aristotle's pupil Meno.

²¹ This is, of course, not to say that these analogies and metaphors *prove* that Aristotle had medical interests. But the frequency of these analogies is remarkable and may be significant. For a discussion of the role of medicine in Aristotle's thought and a bibliography on the subject see van der Eijk (n. 14). Little attention has been paid to the lengthy discussion of animal diseases in *HA* 602b12–605b21.

²² See frs. 113–16 and 123 Gigon.

²³ A good example of such 'technical' aspects is Aristotle's discussion of various aspects of sense-perception in *GA* V.

²⁴ For further details see Balme (n. 3), 191.

²⁵ On this pattern, see P. J. van der Eijk, 'The matter of mind. Aristotle on the biology of "psychic" processes and the bodily aspects of thinking', in Kullmann and Föllinger (edd.) (n. 17), 231–41.

²⁶ It may not be a coincidence that there are more cases of scientific writing in antiquity where

respect of which it is not easy to see how and where they are to be accommodated within his account of the *standard* procedure.²⁷ Often when Aristotle focuses on such special, 'technical' aspects of a topic which he has first discussed in general outline and without qualification, apparent discrepancies of doctrine tend to occur, even within one and the same treatise. For example, in *GA* itself,²⁸ generation *without qualification* is explained in Books I and II as the male seed acting as the form and the female menstrual blood as the matter, but in Book IV attention is given to what the offspring will be like, whether it will be male or female, whether it will resemble the father or the mother, or the grandfather or grandmother from the father's side or the mother's side, etc. In the explanation of these variations a number of additional factors are brought into the picture, some of which point to a much more active role of the female part than the sheer passivity the first two books seemed to suggest (e.g. different degrees of *συμμετρία*, 'right proportion', between the hotness of the seed and the coldness of the menstrual blood). Indeed, in the course of this discussion, we are told by Aristotle that *συμμετρία* also determines whether there is going to be any offspring at all—which raises the question why Aristotle has not mentioned it earlier.²⁹

Now the topic of 'HA X' is precisely such a disturbance of a vital function, namely the power to generate offspring. As the first sentence says, the purpose of the treatise is to identify whether the causes of this disturbance lie in both partners or in either of them, so that on the basis of this an appropriate treatment can be determined:

The cause of a man and a woman's failure to generate when they have intercourse with each other, when their age advances, lies sometimes with both, sometimes only in either of them. Now first one should consider in the female the state of things that concern the uterus, so that it may receive treatment if the cause lies in it, but if the cause does not lie in it attention may be given to another one of the causes.³⁰

It is true that in what follows the author frequently refers to the normal, healthy state

the final book or part of a work seems rather different in nature and subject matter from the rest (cf. Book IV of the *Meteorologica*; Book IX of Theophrastus' *Historia Plantarum*; and the final parts of Hippocratic works such as *De morbo sacro*, *De carnibus*, *De vetere medicina*). However, if 'HA X' does not belong to *HA*, as I am claiming, this is irrelevant to the present argument. On the *Problemata* see below.

²⁷ Two examples may suffice. Aristotle's remarks (in *De caelo* and the *Meteorologica*) about atmospheric conditions influencing keenness of sight apparently presuppose an emanatory theory of vision which is difficult to accommodate within his 'canonical' view of normal visual perception as expounded in *An.* 2.5. And his remarks about various bodily factors being responsible for different degrees of human intelligence seem difficult to reconcile with his 'orthodox' view that thinking is a non-corporeal process. For a more elaborate discussion of these problems see van der Eijk (n. 25).

²⁸ On this well-known problem see E. Lesky, *Die Zeugungs- und Vererbungslehren der Antike und ihr Nachwirken*, Abh. d. Akad. d. Wiss. u. d. Lit. Mainz, geistes- u. sozialwiss. Kl. 1950, 19 (Wiesbaden, 1951), 1358–79; I. Düring, *Aristoteles. Darstellung und Interpretation seines Denkens* (Heidelberg, 1966), p. 533; Föllinger (n. 8), 171–9. For a recent discussion see C. G. Bien, 'Der "Bruch" in Aristoteles' Darstellung des Zeugungsbeitrags von Mann und Frau', *Medizin-historisches Journal* 33 (1998), 3–17.

²⁹ *GA* 767a25. (I owe this observation to Sophia Elliott, who has dealt with this tension in Aristotle's thought in her Cambridge Ph.D. dissertation). To be sure, Aristotle had briefly alluded to the principle of *συμμετρία* in 723a29–33, but this is in a polemical context and it is not elaborated. It is interesting to note that in 'HA X' the principle of *συμμετρία* is applied to generation without qualification (636b9), whereas in *GA* it is introduced when the question what the offspring will be like is at stake (767a24), although in the sequel it is also brought to bear on the issue of fertility.

³⁰ *προϊούσης δὲ τῆς ἡλικίας ἀνδρὶ καὶ γυναικὶ τοῦ μὴ γεννᾶν ἀλλήλοις συνόντας τὸ αἴτιον ὅτε μὲν ἐν ἀμφοῖν ἐστὶν ὅτε δ' ἐν θατέρῳ μόνον. πρῶτων μὲν οὖν ἐπὶ τοῦ θηλέος δεῖ*

of the relevant bodily parts, but this is because his procedure consists in eliminating potential causes in order to facilitate a diagnosis of the actual cause of the disturbance: if something functions normally, it can be ruled out as a cause of the disturbance. This procedure is very clearly expressed in 636b6–10:

But where none of these impediments is present but the uterus is in the state that we have described, if it is not the case that the husband is the cause of the childlessness or that both are able to have children but are not matched to each other in simultaneous emission but are very discordant, they will have children.³¹

It is as if the author has in mind a routine medical examination, in which one would go through a questionnaire: Is the womb healthy? Does the woman secrete fluid normally? Is the mouth of the uterus dry after intercourse, etc.? All these points are presented as indicators for the observer: they serve as clues to an answer to the original question, whether sterility is due to a defect in the female or in the male.

This 'diagnostic' character is underscored by the frequency of expressions such as 'on touching, this will appear . . .', or 'whether you touch this or not . . .'.³² It is as if he is giving instructions as to how one can determine the situation by touching various parts of the female body. Furthermore, the author shows a great interest in 'signs': he very frequently uses expressions such as 'this indicates . . .', 'you can infer from this . . .', 'this is not difficult to judge . . .'.³³ In fact, he seems more interested in the significance of certain symptoms or conditions than in how they are causally related to the disorder. A third point which is relevant in this respect is his frequently recurring observation that a particular condition 'is in need of treatment' (*θεραπείας δεόμενον*), or 'does not require treatment', or 'does not admit of treatment'.³⁴ To be sure, he does not indicate what sort of treatment should be applied, but he does seem to find it important to comment, in the case of each condition, on the curability, the need for cure, or the absence of this need.

θεωρεῖν τὰ περὶ τὰς ὑστέρας ὅπως ἔχει, ἢν' εἰ μὲν ἐν ταύταις τὸ αἷτιον αὐταὶ τυγχάνωσι θεραπείας, εἰ δὲ μὴ ἐν ταύταις περὶ ἑτερόν τι τῶν αἰτίων ποιῶνται τὴν ἐπιμέλειαν (633b12–17, trans. Balme, slightly modified).

³¹ ὅσαις δὲ τούτων μηδὲν ἐμπόδιον ἦ, ἀλλ' ἔχουσιν ὃν τρόπον δεῖν εἶρηται ἔχειν, ἂν μὴ ὁ ἀνὴρ αἷτιος ἦ τῆς ἀτεκνίας, ἀμφοτέρω μὲν δύνανται τεκνοῦσθαι (trans. Balme). See also 635a31–2: 'Concerning the mouth of the uterus, then, those are the grounds from which to consider whether it is in the required state or not' (περὶ μὲν οὖν τὸ στόμα τῶν ὑστέρων ἐκ τούτων ἡ σκέψις ἐστίν, εἰ ἔχει ὡς δεῖ ἢ μὴ, trans. Balme).

³² μηδὲν ἀναισθητοτέρας εἶναι θιγγανομένας. τοῦτο δὲ κρίνειν οὐ χαλεπὸν (634a4–5); λέγω δὲ τὸ καλῶς τοιοῦτον ὅπως ὅταν ἄρχηται τὰ γυναικεῖα, θιγγανόμενον ἔσται τὸ στόμα μαλακώτερον ἢ πρότερον καὶ μὴ διεστομωμένον φανερώς (635a7–10); φανερώς ἔσται ἀνεστομωμένη ἄνευ ἀλγῆματος, κὰν θιγγάνῃ κὰν μὴ θιγγάνῃ (635a12–13); ἔτι δὲ θιγγανομένης τὰ ἐπὶ δεξιᾷ καὶ τὰ ἐπ' ἄριστερὰ ὁμαλὰ αὐτῆς εἶναι (635b15–16); ἔστι δ' οὐ χαλεπὸν γνῶναι, ἂν μύλῃ ἦ, θιγγάνοντα τῆς ὑστέρας (638b30–31; but the text is uncertain here).

³³ σημαίνειν (*passim*, e.g. 634a14, 26, 635a11, 12, 17, 23, etc.); τοῦτο δὲ κρίνειν (or γνῶναι) οὐ χαλεπὸν (634a5, 636b3); φανερόν (634a5); ἐπίδηλον γίνεται (634a29); περὶ μὲν οὖν τὸ στόμα τῶν ὑστέρων ἐκ τούτων ἡ σκέψις ἐστίν, εἰ ἔχει ὡς δεῖ ἢ μὴ (635a31–2); διασημαίνει (634a37); ὅγλοι (634b12); εἰδέναι . . . σημεία λαβεῖν φαίνονται (636b11–12). In themselves, these expressions are not peculiar to this treatise, but the high frequency and the emphasis the author puts on indicators is significant.

³⁴ θεραπείας δεόμενον (634a12, 21, 34, 634b7, 10–11, 31, 635a36, b27, 637b29); οὐ μέντοι νόσος ἀλλὰ τοιοῦτόν τι πάθος οἶον καθίστασθαι καὶ ἄνευ θεραπείας (634a39–41); οὐθὲν αὐταὶ δέονται θεραπείας (634b7); εἰδὲν μὲν οὖν ἰσχυρώς τῇ φύσει οὕτως ἔχουσιν ἢ ὑπὸ νόσον, ἀνίατον τὸ πάθος (635a2–4); ὃ ἐστὶ θεραπευτόν (636a25); καὶ ἱάτον καὶ ἀνίατον (636b3). In the short discussion of sterility in *GA* 746b16–25 Aristotle also distinguishes forms of sterility that can be cured and those that cannot.

These characteristics, in combination with the above-mentioned resemblances to the Hippocratic writings, suggest that we are not dealing with a biological but with a predominantly medical work, intended to provide instructions as to how to deal with an important practical problem. In the context of early Greek medicine, to establish whether a certain bodily affection *required* treatment, and whether it *admitted* of treatment, was of the highest possible significance: several Hippocratic writings reflect uncertainty and hesitation as to whether doctors should engage in treatment of certain afflictions.³⁵

This reading of 'HA X' is rather different from Balme's analysis of the purpose and the structure of the text. Balme clearly wishes to play down the medical character of the work: 'the book is not iatric and its "medical" content has been overstated . . . its subject-matter is not the sterile or diseased condition but the normal fertile condition'.³⁶ According to Balme, the book's 'central thesis' is that the female contributes seed to generation, and the discussion of the normal, healthy state and actions of the uterus 'are set out in order to elicit the female's contribution; incorrect conditions are mentioned only to show the contrast, and are dismissed as "needing treatment" without further discussion'.³⁷ This is a forced and hardly defensible reading of the text,³⁸ and Balme seems to be aware of this when he says that 'To follow the argument, which is swift and economical, one must dismiss the preconception that it concerns sterility.' The fact that this 'preconception' is actually inspired by the first sentence of the text (quoted above) is dismissed by Balme as being a case of 'Aristotle's normal dialectical manner', and places where Balme concedes that there is a 'lack of connecting argument' for what he sees as 'the purpose of the whole argument' (namely that the female contributes seed) are dismissed as instances of Aristotle's 'uncompromising presentation'.³⁹

Now this paper is not primarily intended to criticize Balme—indeed, it is difficult to see why it would be in the interest of Balme's main thesis (i.e. that the work is by Aristotle) to play down its medical character. A number of discrepancies between 'HA X' and other works of Aristotle can better be accounted for on the assumption that this is a practical, not a theoretical work: its predominantly human orientation, the fact that it only discusses animal behaviour in so far as this casts light on the human situation, the fact that the work mainly considers defects on the female side, and the fact that the possibility that the male is to blame is dealt with so superficially, all point in this practical direction. The author does not pursue the issue of male sterility and does not offer any guidelines as to what causes might be identified if his practical test (referred to above) were to suggest that there was something wrong with the male contribution. This is again different from the much shorter, but at the same time more wide-ranging account of sterility in *GA* (746b16ff.), where we do find a discussion of weakness of the male seed and of various means of ascertaining this.

What Balme seems to mean when he denies the 'iatric' nature of the work is that it is not written by a practising doctor and that it is not intended for a medical readership, e.g. midwives or doctors. However, Balme seems to make this claim on

³⁵ See the discussion by H. von Staden, 'Incurability and hopelessness', in P. Potter, G. Maloney, and J. Desautels (edd.), *La maladie et les maladies dans la Collection Hippocratique* (Quebec, 1987), 76–112.

³⁶ Balme (n. 3), 194. ³⁷ Ibid., 195.

³⁸ Apart from the considerations already mentioned above, there is also the frequent use of $\delta\epsilon\iota$ in relation to the normal state: 'it should be like this . . .' (e.g. 634a1)

³⁹ Ibid., 196.

the basis of the alleged absence of what he calls 'the typical Hippocratic discussion of diseases and remedies'. As Föllinger has pointed out, this concept of Hippocratic medicine is too simplistic.⁴⁰ There is no such thing as 'typical Hippocratic' medicine or 'Hippocratic doctrine'. The Hippocratic Corpus is the work of a great variety of authors from different periods and possibly different medical schools; as a consequence, the collection displays a great variety of doctrines, styles, and methods. There are several works in the Hippocratic Corpus that were certainly intended for a wider readership than just doctors and explore in great detail the 'normal', 'natural' state of affairs (e.g. the embryological *Nature of the Child*); and in the case of some works in the collection (e.g. *On the Art, Breaths*) it has even been questioned whether they were really written by a doctor with practical experience. This indicates that the distance between the Hippocratic writers and Aristotle was not so great and that we must assume a whole spectrum of varying degrees of 'specialism' or 'expertise': we need not assume that Aristotle was a practising doctor himself in order to allow for a vivid interest, on his part, in medical details, nor need we assume that in 'HA X' he was addressing an audience of doctors or midwives (although this is an interesting possibility). In this respect, the fact that 'HA X' does not go into therapeutic details (see above) may be significant: it simply says that a condition is 'in need of treatment', but it does not say what the proper treatment consists of.⁴¹ But it is clear from the treatise that the author has been listening carefully to what such medical experts had to say.⁴²

Nor is there any reason, from this point of view, to be worried about resemblances to the Hippocratic writings. As recent research has shown, Aristotle's awareness of Hippocratic views seems to have been much greater than used to be assumed,⁴³ and several Hippocratic works were at least known in the Lyceum, as is shown by the abundant use made of them in the first books of the extant *Problemata physica*. The fact that 'HA X' shows greater receptivity to medical doctrine than other Aristotelian works may be related to the fact that, as Balme has observed, 'HA X' does display certain characteristics of *Problemata*-literature, and the text may well be identical to, or a version of, what Aristotle refers to (in *GA* 775b36–7) as a section of 'the *Problems*' where a more elaborate discussion of the cause of *mola uteri* is said to have taken place. It could be seen as an elaborate answer to the question 'why it is that women often do not conceive after intercourse'—a question which has indeed made its way into later doxographical literature⁴⁴—although its length is rather excessive compared to most other *Problemata*-chapters.

What is there to be said, in the light of these considerations, about the objections to Aristotelian authorship raised by earlier scholars? Leaving aside arguments about

⁴⁰ Föllinger (n. 9), 147–8.

⁴¹ The only statement to this effect is in 635b28, where the treatment the uterus is said to require is compared with the mouth's need to spit (ὥσπερ καὶ τὸ στόμα πύσσει sc. δείται).

⁴² Indeed he is critical of 'many doctors' (638b15) who misidentified cases of dropsy as cases of *mola uteri*.

⁴³ See e.g. C. Oser-Grote, 'Das Auge und der Sehvorgang nach Aristoteles und der hippokratischen Schrift De carnibus', in Kullmann and Föllinger (n. 17), 333–49, and id., *Aristoteles und das Corpus Hippocraticum* (forthcoming). See also the literature quoted in van der Eijk (n. 18), 447, n. 2.

⁴⁴ See e.g. Aëtius V 9 and V 14 (Diels, *DG*, 421, 424). For the relation between *Problemata* and doxography see J. Mansfeld, 'Physikai doxai e *Problemata physica* da Aristotele a Aezio (ed oltre)', in A. M. Battezzatore (ed.), *Dimostrazione, argomentazione dialettica e argomentazione retorica nel pensiero antico* (Genova, 1993), 311–82.

style and indebtedness to Hippocratic doctrines, which are inconclusive,⁴⁵ the main difficulties are the view that the female contributes 'seed' to generation and the view that air (*pneuma*) is needed to draw the seed into the uterus. With regard to the first difficulty, Balme and Föllinger have pointed out that also in *GA* Aristotle frequently calls the female contribution 'seed', or 'seed-like' (*σπερματικός*),⁴⁶ which is understandable when one considers that for Aristotle both the menstrual discharge and the sperm have the same material origin. In fact, Aristotle seems to waver on the precise formulation, and the view which he is really keen to dismiss in *GA* is that the female seed is of *exactly the same nature* as the male (*GA* 727b7)—a view he attributes to other thinkers but which is not expressed, at least not explicitly, in '*HA X*'. The fact that in '*HA X*' this female contribution remains an unspecified fluid, whereas it is identified as menstrual blood in *GA*, which Balme regards as a later 'refinement', need not be a serious problem as long as one accepts that '*HA X*' does not intend to give a full, accurate account of normal, successful reproduction. This would explain why menstrual blood is mentioned in '*HA X*', but only in the context of irregularities in menstruation, which are to be taken as signs pointing to a certain cause of failure to conceive (*HA* 634a12ff). In fact, throughout '*HA X*' it remains unclear what exactly the female contribution consists of. To be sure, there is frequent mention of an emission, by the female, of fluid,⁴⁷ indeed of seed (*σπέρμα*);⁴⁸ but on two occasions (636b15–16, 637b19), the female is said to 'contribute to the seed' (*συμβάλλεσθαι εἰς τὸ σπέρμα*).⁴⁹ And in the only apparently unambiguous statement to this effect, in 637b30–1 (*φανερὸν ὅτι παρ' ἀμφοῖν γίνεται πρόεσις σπέρματος εἰ μέλλει γόνιμον ἔσσεσθαι*), the text does not make clear what actually happens at the moment of conception. Interpreters have usually assumed that the author believes that both male and female seed *mix* in the mouth of the uterus and that this mixture is subsequently drawn into the uterus with the aid of *pneuma*. Now if this was his position, it would be tantamount to the view which Aristotle vigorously combats in *GA* 727b7 (*οὐδὲ μεμιγμένων ἀμφοῖν γίνεται, ὥσπερ τινὲς φασιν*),⁵⁰ and we would have a serious inconsistency. Yet on looking closer at the actual evidence for this, it is by no means certain that this is what the author has in mind. The statement in 637b30–1 quoted above can also be taken to mean that female ejaculation brings about a favourable condition—but not necessarily constitutes the material agent—for fertility, which would explain why it is so often mentioned as an indicator:⁵¹ the fact that she ejaculates (also in sleep), indicates that she is ready to receive the male seed and draw it into the uterus, because it shows that the uterus is positioned in the right direction.⁵² This does not contradict Aristotle's

⁴⁵ See the discussion of the linguistic evidence by Louis (n. 1), vol. 3, 151–2; Balme (n. 3), 193–4; and Föllinger (n. 9), 146–47.

⁴⁶ For example, in 727b7, 746b28, 771b22–3, 774a22. To the passages already quoted by Balme and Föllinger, *GA* 747a13ff. should be added, where the mechanism of a certain type of fertility test applied to women (rubbing colours on to their eyes and then seeing whether they colour the saliva) is explained by Aristotle by reference to the fact that the area around the eyes is the most 'seedlike' (*σπερματικώτατος*).

⁴⁷ 634b29, 37; 635a21; 635b37; 636a6, 10ff.; 636b4–5, 37; 637a2–3; 637a15; 637a37; 637b12; 637b19; 637b31; 638a1.

⁴⁸ 634b37, 635b37, 636a11–12, 637b31.

⁴⁹ Cf. the use of *συμβάλλεσθαι εἰς τὸ κύημα* in *GA* 739a21 and *συμβάλλεσθαι εἰς τὴν γένεσιν* in *GA* 729a21–2.

⁵⁰ Cf. also *GA* 739b16 ff.

⁵¹ 634b30ff., 635b2, 635b22 ff., 637b25–32.

⁵² See 635b2: *πάντα γὰρ ταῦτα σημαίνει δεκτικὴν τὴν ὑστέραν εἶναι τοῦ διδομένου, καὶ*

statement in *GA* 739a21 that the fluid women discharge during intercourse does not represent the female material contribution to conception, nor his insistence that the fact that women also discharge this fluid while having erotic dreams is no sign of it actually contributing to conception. To be sure, *HA* 638a8 and 638a20ff. speak of a mixture ('Why do not the females generate by themselves, since it is granted that the uterus draws in the male emission too when it has been mixed . . . if the emission from both has not been mixed'),⁵³ but this is in a rather special context (the discussion of the *mola uteri*) and again it does not specify what the contribution of each partner consists in. On two other occasions, however, it is said that the woman draws in 'what she has been given' (635b2 τὸ διδόμενον, 637a2 τὸ δοθέν), which not really suggests that what is drawn in is a mixture of two contributions from both sides.

It seems that '*HA X*' contains no statement that really contradicts the orthodox Aristotelian view that conception takes place when male seed and female menstrual blood meet. To be sure, this view is nowhere expressed or even suggested in '*HA X*'; but as said, '*HA X*' does not offer, and probably does not intend to offer, a complete, profound, philosophically satisfactory account of animal reproduction: this is why it does not discuss the reproductive role of menstrual blood, why it does not say what exactly happens when male and female contribution meet, and why it does not speak in terms of 'form' and 'matter'. And to say emphatically—as the author of '*HA X*' does—that the female also contributes to generation is not inconsistent with this orthodox view from *GA*.

Yet one may object that even if it is not a problem that the author of '*HA X*' calls the female contribution 'seed', the fact remains that he seems to say that the female contribution is ejaculated in a moment of sexual excitement, which is not what Aristotle says about menstrual blood in *GA*.⁵⁴ This makes it very hard to believe that the female contribution, as depicted in '*HA X*', would have to be identified after all with menstrual blood.⁵⁵ Yet perhaps this depends on what one means by 'contribution': even in *GA*, Aristotle concedes that the female ejaculation during intercourse facilitates conception in that it causes the mouth of the uterus to open (739a32ff.). So although the fluid itself does not constitute the female contribution in a material sense, the mechanism of its emission does contribute, though perhaps indirectly, to the female's ability to receive the male seed. A possible objection to this interpretation is whether the fluid would then still qualify as 'seed'. I see no immediate answer to this question, except that it is the kind of difficulty that, one could imagine, might cause Aristotle, in *GA*, to be more specific and to conclude explicitly that the female

προσπαστικὰς τὰς κοτυληδόνας καὶ καθεκτικὰς ὧν λαμβάνουσι καὶ ἀκούσας ἀφιεΐσας. Cf. also *GA* 739a35.

⁵³ διὰ τί οὐ γεννᾷ αὐτὰ καθ' αὐτὰ τὰ θήλεα, ἐπεὶπερ καὶ μυχθὲν ἔλκει τὸ τοῦ ἄρρενος . . . ἐὰν μὴ μεμιγμένον ἔστί [sic] τὸ ἀπ' ἀμφοῖν (trans. Balme).

⁵⁴ Even though, as Balme notes ([n. 3], p. 198), 739a28 allows that some of the menstrual blood may already be outside the uterus when conception takes place; and Aristotle sometimes uses the verb 'ejaculate' (προΐεσθαι) for menstrual discharge (*GA* 748a21). See also *HA IX* (VII) 582b12ff. on the various possible positions of menstrual blood at conception.

⁵⁵ Related to this is the difficulty that in *GA* 727b7–11, Aristotle seems to think that the sexual act does not influence fertility, whereas the author of '*HA X*', as we have seen, regards 'keeping the same pace' (ἰσοδρομεῖν) as a very important, indeed a crucial factor for conception (636b15–23). However, it seems that the author of '*HA X*' does envisage the situation referred to in *GA* 727b9–11, for ἰσοδρομεῖν becomes relevant only after the other conditions for male and female fertility have been met. Nor does the author of '*HA X*' assume that ejaculation is necessarily accompanied by pleasure.

emission during intercourse does not constitute the female contribution in the material sense.

As far as the role of *pneuma* is concerned, the view criticized in *GA* 737b28–32⁵⁶ is that *pneuma* is involved in the *emission* of seed by the male,⁵⁷ not that it is involved in the seed's being drawn into the uterus, which is what 'HA X' claims (634b34, 636a6, 637a17). As the use of terms such as ἀπόκρισις, ἐξόδους, συνεκκρίνειν, and ἐκκρίνεσθαι in this *GA* passage shows, Aristotle is not discussing copulation but the transport of seed from various sections within the body of the discharging agent to the genital organ (the οἰκείος τόπος) where it is discharged.⁵⁸

As for the explanation of *mola uteri* in terms of heat, which seems to contradict *GA* 776a2, where Aristotle insists that this is not due to heat but to a deficiency of heat (καὶ οὐ διὰ θερμότητα, ὥσπερ τινές φασιν, ἀλλὰ μᾶλλον δι' ἀσθένειαν θερμότητος), it should be said that the author of 'HA X' seems to toy with the idea rather than actually commit himself to heat as a cause. At 638a19–20, he asks whether it is through heat that this phenomenon occurs (πότερον δὲ διὰ θερμότητα γίνεται τὸ πάθος τοῦτο . . .), but in the course of his answer he gets side-tracked; at 638b1 he addresses himself again to this possibility, but again fails to make up his mind as to the actual cause:

But is heat the cause of the affection, as we said, or is it rather because of fluid—something that in fact constitutes the fullness of pregnancy—that it closes its mouth as it were? Or is it when the uterus is not cold enough to discharge it nor hot enough to concoct it?⁵⁹

There is no clear answer, and this is again typical *Problemata*-style, stating various alternative explanations that must have been in the air. Contrary to Föllinger,⁶⁰ I find it not at all difficult to imagine that in *GA* Aristotle would refer to one of such possible explanations by means of ὥσπερ τινές φασιν, even if he himself had considered it on another, possibly earlier occasion.

The only problem concerning a divergence of doctrine for which I fail to see an immediate solution is the explanation of multiple offspring from one pregnancy in *HA* 637a8ff. to the effect that different places in the uterus each receive a different portion of the seed. This seems to be the very theory which Aristotle rejects in *GA* 771b27ff. Balme comments in a footnote ad loc. that *GA* 'corrects and further develops' the view expounded in *HA* X, but this is a very gentle way of putting it. However, it is not very clear what the author is up to in 637a8ff., and there are several textual problems that make it difficult to fathom the meaning of this passage.

Clearly, then, not all difficulties have disappeared.⁶¹ To sort this all out, a probing analytical commentary on 'HA X' is needed, which would examine the alleged incon-

⁵⁶ Cf. also 739a3.

⁵⁷ A view which is incidentally advocated in *HA* IX (VII) 586a15.

⁵⁸ That this is the subject matter of this passage is also indicated by the fact that in the sequel Aristotle is discussing how the female residue reaches the uterus (which is also called οἰκείος τόπος in 739a3–5) in order to be discharged.

⁵⁹ πότερον δ' ὥσπερ εἴρηται, διὰ θερμότητα γίνεται τὸ πάθος ἢ μᾶλλον δι' ὑγρότητα (ὅτι καὶ ἔστι τὸ πλήρωμα) οἷον μύει, ἢ ὅταν μὴ οὕτως ἢ ψυχρὰ ἢ ὑστέρα ὥστε ἀφείναι, μὴ δ' οὕτω θερμῇ ὥστε πέφαι; (trans. Balme).

⁶⁰ Föllinger (n. 9), 150.

⁶¹ As said above (p. 497), the discussion of sterility (ἀγονία) in *GA* 746b16ff. displays several differences with regard to 'HA X', although there are no genuine inconsistencies. The *GA* passage distinguishes various kinds of sterility with various causes but these are stated in very general terms, and the cases 'HA X' mentions could well be accommodated within this typology: they are

sistencies with *GA* on the basis of close consideration of each individual context in which a relevant statement is made, and which would also examine in much closer detail the relationship with the Hippocratic writings (where the differences may be just as significant as the similarities). However, such a commentary would at least have to take account of the difference in status, method, and purpose between '*HA X*' and *GA*—which seems undeniable—and consider the consequences of this for the kind of things we can reasonably expect the author to say.

So although Balme's analysis of the text is open to serious question and many of Föllinger's objections to his arguments are justified, Balme's conclusions have some plausibility, although they would be better presented in the form of a hypothesis in need of further investigation: '*HA X*' is by Aristotle—at least there is no reason to believe it is not—but it is to be disconnected from the other books of *HA* and regarded as a separate work. It is possibly identical with the work entitled *ὑπὲρ τοῦ μὴ γεννᾶν* which is mentioned in the same ancient catalogues that also list *HA* as having nine books—a detail that need not carry much weight but fits the argument nicely. How the work came to be added to *HA* in the later tradition is not difficult to imagine, seeing that it provides a more or less smooth continuation of the subject-matter of Book IX (VII). The work known as '*HA Book X*' constitutes one of the several 'medical' works attributed to Aristotle in the indirect tradition. Thanks to its erroneous inclusion in *HA* in the later transmission, it is the only one of these works to have survived.⁶²

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all instances of infertility that arises when man and woman get older (*προϊούσης δὲ τῆς ἡλικίας*), and they are due either to physical defects (*πηρώματα*) or to disease (*νόσος*); some are curable, others incurable.

⁶² Earlier versions of this paper were presented at a seminar on Aristotle's *HA* at the University of Louvain (May 1996), during a meeting of the Arbeitskreis Alte Medizin, Mainz (June 1998), and at the University of Liverpool (April 1999). I am grateful to the audiences present on those occasions for their valuable comments. I am particularly indebted to Sophia Elliott and Sabine Föllinger who, while strongly disagreeing with my main thesis, offered valuable written comments on a penultimate draft, and to Jonathan Powell for his helpful comments on style.