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*Deinon to tiktein* – F2024 Draft

*I attach below my paper for the Classical Philosophy Colloquium. The paper is divided into three parts: (I) a background discussion of the kairos synousias (right moment for conception) with a literary bent, which sets the stage for the argument about Galen; (II) an introduction to the problem of “bad heredity” within Galen’s teleology; (III) the explanation of Galen’s unusual treatment of human parents as imperfect, failure-prone demiurges. My presentation in December will focus primarily on the interpretation of Galen’s On the Usefulness of the Part laid out in (II) and (III). For those hoping to read quickly, (II) and (III) should be self-standing.*

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δεινὸν τὸ τίκτειν καὶ φέρει φίλτρον μέγα  
- Euripides, *Iphigenia in Aulis* 917<sup>1</sup>

### *DEINON TO TIKTEIN*

#### Generation and Teleology in Galen’s *On the Usefulness of the Parts*<sup>2</sup>

This paper explores the ways in which generation and heredity become the focal point for anxieties over theodicy in the 1<sup>st</sup> to 2<sup>nd</sup> century CE. In it, I discuss what place a principle of intergenerational or ‘hereditary’ resemblance has in a just and well-ordered natural world. The problem looks something like this. From archaic epic on, we find in ancient writings a sense that offspring generally resemble their parents. This principle of intergenerational resemblance appears to span both physical and psychological characteristics: appearance and ‘personality.’ But for those ancient thinkers committed to divine oversight of the natural world, the notion of systematic resemblance is not straightforward. On the one hand, ‘heredity’ seems to be instrumental to the good order of the natural world. On the other, it does not seem like an obviously good idea on the part of an intelligent designer to assure the transmission not only of good characteristics from parent to child but of bad characteristics as well. Why would ‘Nature’ repeat her ‘errors’ in this way?

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<sup>1</sup> “To give birth has strange power, and it carries a great spell”; with thanks to Leven 2022, 298.

<sup>2</sup> Earlier versions of this paper were delivered at Yale University (spring 2023) and Columbia University (fall 2023); along the way, it has benefited from many many pairs of eyes, especially those of my dissertation committee. I thank Zhixi Wang for very helpful comments on the most recent version. As is the case for the human parents who feature here: all errors are entirely my own.

In what follows, I lay out one solution to this problem, in the works of the 2<sup>nd</sup> century CE doctor and Platonist philosopher, Galen of Pergamon. Picking up a set of anxieties from his broader cultural milieu over the material transmission of bad *pathē* from parents to children during conception and gestation, Galen reinterprets these instead as cases of errant human *agency*. Their regular occurrence reflects human beings' systematic tendency toward error and wrongdoing as rational agents, rather than any material or mechanical fact about the structure of the natural world. This emphasis on human agency accords a special status to human parents within Galen's theology, making them partners in the work of creation.

Behind this argument about Galen is a larger (historical) argument, that the problem of 'ancestral fault' (the punishment of descendants for their ancestors' wrongdoing) in ancient poetry and theology is closely entangled with the problem of intergenerational resemblance in ancient medicine and biology. In the larger project, I trace this entanglement through the works of Galen and his near-contemporary, the philosopher and biographer Plutarch. I argue that, in their works, medicine and theology converge on an overlapping interest in the 'transmission of fault': the various ways that offspring carry consequences for their ancestors' actions on their very bodies. I also argue that these entanglements between medicine and theology have dropped from view thanks in part to a tendency in Classical scholarship to sequester medicine and theology, treating them as isolated domains of thought. In reading alongside Imperial Greek authors like Galen and Plutarch, for whom Classical and Archaic philosophy, science, theology, and literature were explicitly entangled domains of knowledge, we can begin to recover the long and complex exchange between scientific, literary, and philosophical traditions around the problem of heredity.<sup>3</sup>

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<sup>3</sup> On the integration of scientific, philosophical, and cultural knowledge in Imperial Greek thought see (inter alia) Von Staden 1997; Gill, Whitmarsh, Wilkins 2009, as well as (of particular importance to my approach here) various treatments of Galen as philosopher, such as Chiaradonna 2009 and van der Eijk 2014, and of Plutarch's interactions with natural philosophy and medicine, such as Meeusen 2016.

While the problem of the ‘transmission of fault’ is wider than just this, this paper focuses especially on how it is picked out by a concern over when you have sex to conceive. The problem of timing conception (or of the *kairos synousias*) is a critical meeting point for medical and theological perspectives on heredity. Across authors and genres, it indexes worries about the ethical responsibilities and quasi-divine powers attendant on human beings’ involvement in the godlike task of creating other human beings. In particular, it draws attention to human beings’ participation in generation as rational agents, whose voluntary choices affect reproductive outcomes, alongside and sometimes in tension with their involuntary physiological processes.

Part one of this paper thus locates the argument about Galen within the wider context of exchange between medicine and theology over the *kairos synousias*, introducing the problem by way of Plutarch’s reading of the archaic Greek poet Hesiod. Part two gives some background on Galen’s theology, explaining the paradoxical role that reproduction and heredity play within his teleological masterpiece, *On the Usefulness of the Parts* (*UP*). Part three lays out Galen’s solution to bad heredity as a problem of theodicy in *UP*. This solution entails a surprisingly expansive vision of human agency and responsibility over creation.

## I. Plutarch and Hesiod: Ancestral Fault and the *Kairos Synousias*

The locus classicus for thinking about ‘ancestral fault’ in the ancient world is a passage from Hesiod’s *Works and Days* describing the reproductive misfortunes of the perjurer. It reads:

ὄς δέ κε μαρτυρήσιν ἐκὼν ἐπίορκον ὁμόσσας  
ψεύσεται, ἐν δὲ Δίκην βλάψας νήκεστον ἀασθῆι,

τοῦ δέ τ' ἀμαυροτέρη γενεὴ μετόπισθε λέλειπται·  
ἀνδρὸς δ' εὐόρκου γενεὴ μετόπισθεν ἀμείνων.

“He who willingly lies, having sworn an oath  
if he has damaged justice [and] he is damaged irreparably,  
the lineage that is left behind to him for the future is more obscure [than it would  
otherwise be]  
whereas the lineage of the man who keeps his oath in the future is better.”<sup>4</sup>

These lines fit within Hesiod’s broader agenda of thinking about fertility, reproduction, and heredity as important sites of human vulnerability to divine punishment and reward.<sup>5</sup> In a later passage, for instance, Hesiod observes that in the household of the just man, “the women give birth to children resembling [their] parents” (Hesiod, *Works and Days* 235: τίκτουσιν δὲ γυναῖκες ἐοικότα τέκνα γονεῦσιν). In both these passages of *Works and Days*, what seems to underlie the phenomenon of intergenerational resemblance is a principle of justice: thanks to divine intervention, parents receive the offspring they *deserve*. This principle of *desert* is also an explanation of *resemblance*. Good parents are rewarded by good offspring. Bad parents are punished by bad offspring (just as bad as they are, or maybe—the perjury passage seems to suggest—even worse).

This is not the only reproductive advice that Hesiod hands out in *Works and Days*.<sup>6</sup> In the closing section of the poem, amidst a long series of the *kairos* prescriptions, Hesiod also has a series of more practical suggestions regarding the best moment for conception, or the *kairos*

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<sup>4</sup> Hesiod, *Works and Days* 282-285. Text from West 1978; trans. mine, unless otherwise noted. Compare the fate of the man who seizes wealth with violence: “easily the gods make him obscure, and they diminish his house” (Hesiod, *Works and Days* 325: ῥεῖα δέ μιν μαυροῦσι θεοί, μινύθουσι δὲ οἶκον), lines which—Proclus reports (fr. 108 Marzillo)—Plutarch famously wished to excise these lines, though the reasons for this excision are not clear. Hunter speculates that, perhaps under the influence of Callimachus, Plutarch rejected *sterility* as an appropriate form of divine punishment; see Callimachus, *Hymn to Artemis* 124-128.

<sup>5</sup> See discussion of Hesiod and “ancestral fault” (as well as the long afterlife of these Hesiodic passages) in Gagné 2013.

<sup>6</sup> Compare Hesiod, *Works and Days* 782 on what dates are best for bearing sons and what dates are best for giving birth to daughters; *Works and Days* 376 advising the farmer to have only one son.

*synousias*.<sup>7</sup> On the face of it, Hesiod’s *kairos* prescriptions seem like a rather different type of reproductive advice than his theory of divine justice quoted above, and not especially relevant to ancestral fault. But there is an interesting twist here. Centuries later, when Plutarch reads Hesiod’s *Works and Days*, he runs these different types of Hesiodic reproductive advice together. On Plutarch’s reading, both Hesiod’s theology of divine punishment and his “medical” assessment of the *kairos synousias* are based on the same underlying theory of the transmission of fault: namely, that a bodily transmission of *pathos* from parents to children takes place at conception.

We find Plutarch’s most systematic engagement of the question of ancestral fault and Hesiodic reproductive counsel in a text called *On Delayed Divine Vengeance (De Sera)* which offers a lengthy argument that ancestral fault is just, in the context of a broader defense of god’s justice and providence. One key move in Plutarch’s argument is the claim that offspring typically inherit their ancestors’ tendency towards wrongdoing. Plutarch uses one of Hesiod’s *kairos* prescriptions as proof of this principle, writing:

Ἦ κατὰ τοῦτο μὲν ὁ θεὸς οὐδὲν τοῦ Ἡσιόδου σοφώτερος διακελευομένου καὶ  
παρεγγυῶντος,  
μηδ’ ἀπὸ δυσφήμοιο τάφου ἀπονοστήσαντα  
σπερμαίνειν γενεήν, ἀλλ’ ἀθανάτων ἀπὸ δαιτός,  
ὡς οὐ κακίαν μόνον οὐδ’ ἀρετήν, ἀλλὰ καὶ λύπην καὶ χαρὰν καὶ πᾶν πάθος<sup>8</sup> ἀναδεχομένης  
τῆς γενέσεως...

Or is God no wiser than Hesiod who orders and advises,  
“not to sow offspring when returning from an ill-omened funeral  
but from a feast of the immortal gods,”

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<sup>7</sup> These *kairos synousias* prescriptions include Hesiod, *Works and Days* 694-698 (on sexual maturity); 812-813 (on good days for sex and bearing children); 735-736 (on not bearing children on the way home from a funeral).

<sup>8</sup> Klaerr & Vernière 2003 [1974]: πάνθ’ ὄσ’; De Lacy & Einarson 1959: πᾶν πάθος. I have made the arguably controversial decision here to print and translate the text of De Lacy & Einarson. “*Pan pathos*” seems to me a clever suggestion, but there are plenty of instances besides this where Plutarch makes clear that he conceptualizes heredity in terms of the transmission of *pathē*, even if we are not willing to accept Post’s reading. Moreover, the text, not the sense, is in question; the Budé translates: “non seulement le vice et la virtue, mais le chagrin, la joie, *tous les sentiments* se transmettent avec la vie” [emphasis mine] (Klaerr & Vernière 1974: 159).

since generation not only takes up wickedness and virtue, but also sorrow and joy and **every affection** (*pan pathos*)....<sup>9</sup>

To a modern reader, this passage from *De Sera* is most likely a little bizarre. It jumps from describing similarity of character between parents and children (“wickedness and virtue”) to describing the transmission to children of passing emotions felt by the parents at the moment of conception (“sorrow and joy and every affection”). This conflation, however, is very common in pre-modern theories of heredity, both ancient and medieval.<sup>10</sup> These so-called “soft” theories of heredity do not mark a clear distinction between inheriting, for instance, your mother’s habitual bad temper and her chance irritation at the moment of conception; her general silliness and temporary silliness induced by alcohol.<sup>11</sup> They thus do not strongly distinguish what we would today call “congenital” influences—influences from the parents’ behavior and the pre-natal environment—from what we would today call “hereditary” influences—influences which result from the parents’ genetic material.<sup>12</sup> As a consequence, these soft theories lay heavy emphasis on the moment of conception, or *kairos synousias*, and the state of both parents during conception. In regulating the *kairos synousias*, they try to achieve a sort of proto-genetic engineering, managing which *pathē* are passed on to offspring, and which are not. Plutarch’s thinking in this passage is characteristic of these soft theories of heredity.<sup>13</sup>

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<sup>9</sup> Plutarch, *De Sera* 562B

<sup>10</sup> van der Lugt 2008, 4

<sup>11</sup> A particularly clear example of this thinking is

<sup>12</sup> For discussion of this connection

<sup>13</sup> One of the clearest statements of this conflation is the opening passages of ps.-Plutarch, *On the Education of Children*, which moves from discussion of similarity of character between parents and children to discussion of the *kairos synousias*, clearly putting equal weight on both. This anxiety over affection and conception is often traced (by post-Hellenistic philosophers) back to Zeno, Chrysippus, and/or Plato (by allusion to the *Laws*). In *De Cohibenda Ira* 463a Plutarch associates it with Zeno as well as with Plato, *Laws* 775c-d4 (see Klaerr and Vernière 1974, 215). Note that Plutarch must tread a delicate line in dealing with this issue, hence perhaps the appeal to Plato’s authority. It is very important for Plutarch to represent character heredity as a case of body’s influence on soul in order to avoid the possibility that his account of character heredity in *De Sera* be mistaken for the Stoic belief in a hereditary soul. Character heredity was one of the canonical Stoic proofs for the corporeality of the soul, which Plutarch forcefully criticized in *De*

In Plutarch's reading of Hesiod, the poet's knowledge of the *kairos synousias* is a marker of both his medical and his theological wisdom.<sup>14</sup> In *De Sera*, Plutarch links Hesiod's account of the *kairos synousias* to a theology of divine punishment. God must punish offspring for the wicked things their ancestors do, as a form of preventative cure aimed against the bad character the offspring have almost certainly inherited from their evil ancestors. This argument seems more obviously related to Hesiod's account of the perjurer than to his *kairos* prescriptions. Indeed, a passage from Proclus' *Commentary on Works and Days* typically attributed to Plutarch offers precisely the same explanation of ancestral fault as *De Sera*, this time (as we might have expected all along) invoking Hesiod's account of the divine punishment of the perjurer rather than the *kairos* prescription as evidence.<sup>15</sup> In *Symposium of the Seven Sages*, by contrast, Plutarch makes clear that he considers Hesiod's general understanding of the *kairos synousias* to be a mark "that Hesiod is skilled in medicine" (*Symposium of the Seven Sages* 158A-B: ἰατρικὸς γὰρ Ἡσίοδος).<sup>16</sup> In

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*Stoicorum Repugnantiis* 1053D-E. (For competing interpretations of the Stoic view, see Gourinat 2008; Zanatta 1993: 408-410; Babut 2004: 326-327; Long and Sedley 1987: 312; Boys-Stones 2007: 80-88). For a Platonist, the rational soul itself cannot be hereditary, since it must travel by metempsychosis from life to life. There is, however, plenty in Plato (particularly in the *Timaeus*) to warrant understanding character heredity in terms of bodily influence in the way that Plutarch seems to do here; see Boys-Stones 2007, 41-42 for examples and discussion. Indeed, this bottom-up understanding of heredity seems to have been enormously popular in Hellenistic and post-Hellenistic Philosophy, across different philosophical schools. Often, it is defended by analogy to drunkenness, as another case in which the body affects the soul. Thus, the opening sentence of the ps.-Aristotelian *Physiognomy* (805a1-805a5) is an account of psychosomatic sympathy whose prime example is drunkenness, the point of which is to defend the possibility of character heredity, since both (on the author's account) are analogous examples of the transmission of an affection from the soul to the body.

<sup>14</sup> This is not the only place in Plutarch's corpus, where Hesiod's *Works and Days* becomes the occasion to weave together medicine and theology. In *Advice about Keeping Well* 127D Plutarch runs together the Hesiodic observation that Zeus took away the voice of diseases (*WD* 102-104) with [Hippocrates], *Aphorisms* II, 5 observing that diseases are in fact preceded by many warning signs; for further discussion, see Holmes 2010, 1-2. The case I discuss here has a few additional problems, however, as the Hesiodic statements Plutarch quotes are not in any way straightforwardly connected with disease or with other obviously medical topics.

<sup>15</sup> Plutarch's commentary survives via Proclus' commentary, printed in Marzillo 2010; for the attribution of this particular lemma to Plutarch, see Amendola 2020 on fr. 39 Sandbach.

<sup>16</sup> (Note however, that scholarly consensus suggests this particular reference to Hesiod on the *kairos synousias* is most likely connected with the question of sexual maturity, not of attendance at a funeral). For

reading Hesiod as both medical expert on the *kairos synousias* and theologian of divine punishment, Plutarch imaginatively finds in *Works and Days* both medical and theological contributions to an account of the transmission of fault.

I should make clear that I think that Plutarch is reading imaginatively, filling in archaic poetry with Imperial science. Let me propose one way of marking the difference between Hesiod and Plutarch. Hesiod interprets intergenerational resemblance as itself a kind of rough justice, ensuring that each person receive their proper desserts: good parents are rewarded with good children, bad parents by bad children. Heredity is thus the realization of divine justice in the natural world.

Plutarch, by contrast, envisions a more complicated relationship between nature and justice. He writes, “But to those whose natures were attracted to and admitted of the congenital trait, justice came, pursuing their resemblance (*homoiotēta tēs kakias*) of wickedness” (Plutarch, *De Sera* 563A: ἀλλ’ ὅσων ἡ φύσις ἔστερξε καὶ προσήκατο τὸ συγγενές, τούτων ἡ δίκη διώκουσα **τὴν ὁμοιότητα τῆς κακίας** διεξῆλθεν). There is a natural—by which Plutarch here means corporeal and material—transmission of *pathos* at conception.<sup>17</sup> In extending illness or wickedness to the next generation, nature allows justice to cure otherwise incurable forms of wickedness or illness, by affording a longer period of time in which to take action against them. The material transmission of *pathos* is thus, in roundabout fashion, part of the long game of divine punishment and divine justice. But it is not itself the realization of divine order, so much as a backdrop against

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Hesiod’s authority in *Symposium of the Seven Sages* see Stamatopoulou 2014; Hunter 2014a; Hunter 2014b; for the specific allusion (Hesiod, *WD* 694-698), see Hunter 2014b and bibliography ad loc. recording scholarly discussion of which of the *kairos* prescriptions is at issue here.

<sup>17</sup> In Buturovic 2023 and work-in-progress, I address in detail the argument that the nature at stake (here and elsewhere in Plutarch discussions of heredity & character heredity) is a set of bodily affections. Note that my point here is not that there is no ontological significance to this *physis*, but that it is transmitted by way of what Plutarch would, in his own division between affections of the body and affections of the soul, call “affections of the body.”



which divine justice acts. What I will set out in what remains of this talk is the unusual path Galen cuts between these two ways of thinking: about intergenerational resemblance as a realization of divine order, on the one hand, and as an unruly material transmission of *pathos* during conception and gestation, on the other.

Notwithstanding some important differences, Plutarch and Galen share a commitment to a world overseen by a providential guardian, devoted to justice and order. Both, therefore, must confront the problem of theodicy which I outlined at the beginning of the paper: why, in a well-ordered universe, a seeming natural law would assure the transmission of bad characteristics from generation to generation. Plutarch's solution seems to be the following: 'nature' assures the transmission of wickedness via the material transmission of *pathos*. In doing so, it gives justice the opportunity to cure that wickedness—a cure which would be impossible on the scale of one single's individual's life. Bad heredity, then, belongs in a just and well-ordered world, inasmuch as it goes hand-in-hand with the principle that offspring carry responsibility (and especially, liability to punishment) for their ancestors' wrongdoing. Galen, by contrast, is strongly committed to a view of heredity as a source of order in the natural world, not an unruly material transmission. In endeavoring to carry through this commitment, Galen tells a paradoxical story about reproduction and theology.

## II. Galen on Teleology, Generation, and Difference

The best way into the paradox is Galen's teleological masterpiece *On the Usefulness of the Parts* (*UP*), a treatise on the model of Plato's *Timaeus* and Aristotle's biological corpus, but longer and

more anatomically detailed. (The English translation is in two volumes and runs over 700 pages). *UP* moves through each part of the body, explaining how the design of that part demonstrates the care and intelligence of the divine designer.<sup>18</sup> Unlike Aristotle (but like Plato), Galen sees the functioning of the natural world as a case of *directed* teleology; the teleological plan of nature corresponds to the intentions of an intelligent designer whom Galen calls either Nature (*physis*) or the Demiurge (*dēmiourgos*). His plans are enacted in the natural world, by ways of each individual's natural faculties: the capacities of attraction, retention, etc. that enable physiological processes.

Like Plato's Demiurge, Galen's Demiurge is extraordinarily skilled, but not omnipotent; he is constrained by the qualities and capacities of the matter on which he acts.<sup>19</sup> There are, however, two critical differences between Plato's Demiurge and Galen's Demiurge. First, whereas Plato's Demiurge remains mostly aloof from the work of crafting mortal bodies, a task which he delegates to the "Young Gods," Galen's Demiurge seems to be *himself* the craftsman of human and animal bodies.<sup>20</sup> Second, unlike Plato's Demiurge, Galen's Demiurge does not create by reference to independent realm of Forms. One consequence of this shift, beautifully explored by Julius Rocca and Aileen Das, is the unusually friendly relationship of Galen's Demiurge to matter. Matter may need to be brought to order and may even demand specific compromises on the part

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<sup>18</sup> On Galen's teleology see Marechal 2020; Hankinson 2017, 255-256; Flemming 2009, 73-75; Schiefsky 2007 passim; Hankinson 1989, 213-214 and passim; Hankinson 1988, 139 and passim. For major treatments of Aristotle's biological teleology see Johnson 2005; Leunissen 2010.

<sup>19</sup> A point that Galen makes by way of a contrast to the Christian and Jewish God, rather than the Stoic nature, as we might expect. For the argument that the conflict between total creationism, on the one hand, and limited creationism, on the other, is first manifest in the division between Stoicism on one side and Platonic/Aristotelian thought, on the other and subsequently evolves into a conflict between Platonic/Aristotelian thought against Christian (and more broadly, monotheistic) thought, see Walzer 1949, 18-37.

<sup>20</sup> For the identification of Galen's demiurge with Plato's demiurge or with Plato's young gods, see Flemming 2009, 74; Rocca 2017, 210-217. For the identity of Galen's demiurge more broadly, see further Schiefsky 2007, 3; Flemming 2009 for the argument that Galen's demiurge resembles the Roman emperor.

of the designer. But it is the Demiurge's collaborator, a source of natural movements in its own right.<sup>21</sup> The Demiurge's skill consists in his capacity to collaborate with the existing tendencies of *certain* matter to work towards a certain general goal (*skopos*); there is no independent external paradigm (like the Forms) of which this collaboration falls short.<sup>22</sup> Thus, where Plato's *Timaeus* invokes Demiurge, Matter, Form, and Young Gods to explain the making of natural bodies, Galen's *UP* imagines a set of strikingly direct interactions between Demiurge and matter.

Within this system of teleology, reproduction has a paradoxical character. Most of Galen's iconic discussions of Demiurge and matter (the colonist, clockwork and farmer models) cluster in the vicinity of Galen's discussions of reproduction, particularly in books eleven and fourteen. For the most part, the "marvelous art" (as Galen repeatedly calls it) looks like the designer's decisive stroke of genius, paradigmatic of (and essential to) the harmonious collaboration between matter and Demiurge. Reproduction assures species immortality and the functional adaptation of every species, two cornerstones of Galen's teleology. But reproduction also turns out to be the likeliest site of teleological failure. *UP*, in general, avoids any mention of disease and dysfunction. The notable exception to this rule is a protracted passage in book eleven, with close ties to the nearby account of the Demiurge-farmer. The passage lists the problems introduced by human beings' careless attitude towards generation. It strikes a discordant note, as pessimistic about the poor odds for human flourishing as the rest of *UP* is optimistic.

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<sup>21</sup> See Rocca 2018, 212 for the direct participation of matter in craftsmanship and especially Rocca's discussion of *On the Elements*: "[the Elements] are the craftsmen of plants and living creatures."

<sup>22</sup> See Rocca 2018, drawing on Das 2014, for discussion of how this picture relates to Galen's commentary on the *Timaeus*: "[Galen] refers to the Demiurge constructing the world not with reference to the eternal cosmic Paradigm, but to a more general aim or goal...The notion that the cosmos is the product of providential design is thereby highlighted. The ordering by Necessity...of the pre-cosmic state of disordered matter...is reworked by Galen to claim *that Necessity and Intellect (qua Demiurge) work together.*" (emphasis mine)

If reproduction plays a paradoxical role in teleology, ‘heredity’ lies at the heart of that paradox. In *UP*, Galen thinks a good deal about the patterns of congenital similarity and difference that structure the natural world both at and below the level of the species: in modern terms, about heredity. ‘Species heredity’ (that is, species immortality and functional adaptation) is one of the designer’s great strokes of genius, the clearest manifestation of the “marvelous art” of reproduction. Resemblance at the level of the family or subspecies is a much more ambivalent good. In this section, I first explain why ‘species heredity’ is a centerpiece of Galen’s teleology. I then focus in on the trickier problem of patterns of congenital similarity and difference below the level of the species, and especially on the loaded question of human difference.<sup>23</sup> In section three, I turn to the case of outright bad heredity, which will require that we say more about the role of human parents in generation.

## II.1 Species Heredity and the “Marvelous Art” –Immortality and Functional Adaptation

In a passage in book fourteen dedicated to sexual and reproductive anatomy, Galen imagines Nature as a colonist, who puts in place various provisions designed to preserve the long-term welfare and stability of her city. Because individual animals made out of matter could not be immortal, Nature instead designed the “marvelous art” of reproduction to ensure the immortality of each species:

Μάλιστα μὲν οὖν ἀθάνατον ἡ φύσις, εἴπερ οἶόν τ’ ἦν, ἐσπούδασε τὸ ἑαυτῆς ἀπεργάσασθαι δημιουργημάτων μὴ συγχωρούσης δὲ τῆς ὕλης, (ἐξ ἀρτηριῶν γὰρ καὶ φλεβῶν καὶ νεύρων καὶ σαρκῶν οὐχ οἶόν τ’ ἦν τὸ συγκείμενον ἄφθαρτον γενέσθαι,) τὴν ἐνδεχομένην αὐτῷ βοήθειαν εἰς ἀθανασίαν ἐμηχανήσατο δίκην ἀγαθοῦ πόλεως οἰκιστοῦ, μὴ τῆς ἐν τῷ παρακρήματι συνοικήσεως μόνης φροντίσαντος, ἀλλ’, ὅπως ἐπὶ τὸ πᾶν ἢ τὸ πλεῖστον γε ἡ πόλις αὐτοῦ διαφυλάττειτο, προνοησαμένου. πόλις μὲν οὖν εὐτυχῆς εἰς τοσοῦτον, ὡς διὰ τὸ μῆκος τοῦ χρόνου μηκέτι μνημονεύεσθαι τὸν οἰκιστὴν αὐτῆς, οὐδεμία πω φαίνεται γεγεννημένη. τὰ δὲ τῆς φύσεως ἔργα πολλαῖς μυριάσιν ἐτῶν ἤδη τε διήρκεσε καὶ εἰσαῦθις

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<sup>23</sup> The broader problem of how Galen accounts for human difference is addressed in van der Eijk 2014; Flemming 2022

παραμενεῖ, θαυμαστήν τινα τέχνην ἐξευρούσης αὐτῆς, ὡς ἀεὶ τῷ διαφθειρομένῳ ζῳῷ νέον ἕτερον ἀντικαθίσταται. τίς οὖν ἤδη ἡ τέχνη κατὰ τε ἄλλα σύμπαντα καὶ κατὰ τὸν ἄνθρωπον, ὡς μηδὲν ζῳοῦ γένος ἀπόλοιτο, μένοι δ' εἰς ἀεὶ σῶόν τε καὶ ἀθάνατον, ὁ λόγος ὅδε διδάσκειν ἐπαγγέλλεται, τὴν ἀρχὴν ἐνθένδε ποιησάμενος. ἅπασιν τοῖς ζῳοῖς ὄργανά τε κυήσεως ἢ φύσις ἔδωκε, καὶ τινα συνῆψεν αὐτοῖς μὲν τοῖς ὀργάνοις ἐξαιρετον δύναμιν γένεσιν ἠδονῆς, τῇ χρησομένη δ' αὐτοῖς ψυχῇ θαυμαστήν τινα καὶ ἀρρήτον ἐπιθυμίαν τῆς χρήσεως, ὑφ' ἧς ἐπεγειρόμενα καὶ κεντριζόμενα, κἄν ἄφρονα, κἄν νέα, κἄν ἄλογα παντάπασιν ἦ, προνοεῖται τῆς τοῦ γένους διαμονῆς, ὥσπερ εἰ καὶ τελέως ἦν σοφά. γινώσκουσα γάρ, ὡς οἶμαι, τὴν οὐσίαν, ἐξ ἧς ἐδημιούργησεν αὐτὰ, μὴ προσιεμένην ἀκριβῆ σοφίαν, ἀντὶ ταύτης ἔδωκεν αὐτοῖς ὁ μόνον ἠδύνατο λαβεῖν δέλεαρ εἰς σωτηρίαν τε καὶ φυλακὴν τοῦ γένους, ἠδονὴν σφοδροτάτην τῇ χρήσει τῶν μορίων συνάψασα.

Certainly Nature would have been eager to make the work of her hands immortal if she could have done so. But when her material did not admit of this—for anything composed of arteries, veins, nerves, bones and flesh could not be made incorruptible—she contrived what was possible to help it toward immortality, being like a good founder of a city, who not only takes thought for colonizing it in the first place but also plans how his city may be maintained always, or at least for a very long time. Now obviously no city has been so fortunate that its founder is no longer remembered because such a long time has passed [since its founding], but the works of Nature have already endured for many thousands of years and will endure hereafter; for **she has discovered a marvelous art whereby, when an animal dies, she may always put a new one in its place.** What this art is, then, with respect to man and all the other animals, to the end that every kind of living creature may avoid destruction and persist, safe and deathless forever, I intend to tell in this book, beginning with the following point: To all animals, Nature has given instruments for conception, and to the instruments themselves she has joined a remarkable faculty to produce pleasure and to the soul that is to make use of them a marvelous, inexpressible longing to do so, which rouses and stings the animal so that **even though it is** foolish, young, and **altogether without reason**, it provides for the continuance of the race as if it were perfectly wise. For knowing, as I suppose, that the substance from which she had created animals does not admit of perfect wisdom, Nature by adding a passionate pleasure to the use of the parts gave them in its stead the only thing which they could receive as an incitement to preserve and maintain the race.<sup>24</sup>

The “marvelous art” of reproduction (a phrase that recurs repeatedly in book fourteen) makes Nature’s creation not only beautiful and intricate in its own right, but also self-sustaining. The *marvel* of reproduction, Galen emphasizes repeatedly, consists in the fact that animals are

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<sup>24</sup> *UP* 14.2 [Helmreich II, 285]; trans. May 621 with modifications. May writes that “the art [of reproduction] is displayed in man and all the other animals,” which I have replaced with the weaker phrasing, “with respect to man and all the other animals.” For reasons that will become clear below, I think Galen considers “parts” and perhaps nonrational animals, but not rational animals, to “show forth” the marvelous art of reproduction.

motivated to carry it out, even without any assistance from their own reason or understanding. Simply in pursuing their own sexual pleasure, animals assure the immortality of their species.

The colonist might seem, at first glance, like a surprisingly non-interventionist figure for Galen's Demiurge, given what I have just said about his active participation in creation. The colonist lays down initial laws and then retreats from the task of governance. But notice that Nature is the subject of *kathistaito*; she herself undertakes the task of "replacing" each animal. Just a few lines later, moreover, Galen refers to *tous diaplattontas hēmas theous* ("the gods that form us").<sup>25</sup> Galen was famously agnostic about the question, what forms the fetus during embryological creation. But he regularly implies (particularly in *UP*) that the Demiurge plays a direct role in at least some aspects of embryological formation. Most of Galen's middle works (*Natural Faculties*, *Mixtures*, *UP*) drive home this ambiguity, emphasizing that each act of embryological formation is due to the activity of connate matter, perhaps with a little help from the Demiurge. At least here, then, I take it that Galen's point is not to suggest that the Demiurge is a remote figure, uninvolved in embryological formation.<sup>26</sup> Rather, he is interested in how animals are motivated to reproduce. The colonist passage emphasizes how extraordinarily well, even by the standards of *UP*, the Demiurge's intention (species immortality) is realized by the matter and the instruments of animal reproductive anatomy. Even if it is the realization of a divine ambition (the first cause), for each animal reproduction is nevertheless wholly motivated and timed by their own "matter and

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<sup>25</sup> Though I do not enter into this here, one of the sort of puzzling plurals discussed by Rocca on the question of Galen and the Young Gods.

<sup>26</sup> I address the intersection of these passages with debates about formation in detail in Buturovic 2023. Formation is due either to connate matter or to the activity of the Demiurge; the question is whether (and in what cases) the Demiurge must involve himself directly in the formative activity of the connate matter. But I think motivation, not formation is centrally the issue at stake here. The more puzzling question that *UP* leaves open is to what extent the Demiurge is involved in the meeting of seed and blood that begins the process of conception. See 29n below.

instruments” (second cause).<sup>27</sup> Strikingly, in making this point Galen groups animal desire (*epithumia*) and pleasure (*hēdonē*) with divine intention, not with matter and instruments. He thus suggests that reproduction can be explained by the body alone without any appeal *either* to the intentions of the Demiurge or to the animal’s desires.

I take this same point to explain much of the strikingly mechanistic language Galen uses in book fourteen.<sup>28</sup> In a passage we will look at more closely below concerning breasts and uteri, Galen compares the physiological processes that prepare the breasts and uteri breastfeeding and childbirth to a clockwork mechanism, which functions “without needing a supervisor.”<sup>29</sup> As in the case of the colonist model, the point of the clockwork model is not, I think, the non-involvement of the Demiurge in reproduction (and in particular, in embryological formation), but that the timing (*kairos*) of the urge to reproduce, even if it is experienced by the animal as pleasure or desire, is programmed directly into the matter and instruments of animal bodies.

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<sup>27</sup> *UP* 14.9 [Helmreich II, 313]; trans. May 1968, 640: “However, I shall now penetrate not to the first and most important cause (since I have said in previous discussions that Nature has contrived all such things so that the race [*genos*] may continue incorruptible forever) but to the cause derived from the material and the instruments. For animals acquired this desire and pleasure not simply because the gods that formed us wished a vehement desire for love to be born in us or a vehement pleasure to be coupled with it, but because a suitable material and instruments had been prepared for this purpose” (οὐ τὴν πρώτην ἔτι καὶ κυριωτάτην αἰτίαν ἐξιχνεύουσιν, (εἴρηται γὰρ ἐν τοῖς ἔμπροσθεν λόγοις, ὡς ὑπὲρ τοῦ διαμένειν ἄφθαρτον εἰσαεῖ τὸ γένος ἐμηχανήσατο τὰ τοιαῦθ’ ἢ φύσις,) ἀλλὰ τὴν ἀπὸ τῆς ὕλης τε καὶ τῶν ὀργάνων. οὐ γὰρ ἐκ τοῦ βουλευθῆναι μόνον τοὺς διαπλάττοντας ἡμᾶς θεοὺς ἢ σφοδρὰν ἐπιθυμίαν ἐγγίνεσθαι τῶν ἀφροδισίων, ἢ σφοδρὰν ἡδονὴν ἐξεῦχθαι, τό τ’ ἐπιθυμεῖν καὶ τὸ ἡδεσθαι τοῖς ζώοις ὑπῆρξεν, ἀλλ’ ἐκ τῆς ὕλης τε καὶ τῶν ὀργάνων, ἐπιτηδείων εἰς αὐτὰ παρασκευασθέντων).

<sup>28</sup> On mechanism in ancient biology (and this passage in particular), see Berryman 2009; Webster 2023.

<sup>29</sup> On clockwork analogies, see Webster 2023; Berryman 2009 & further discussion below. To drive home the observation that the language in book fourteen is uncharacteristically mechanical, a few quick notes about Galen’s use of this language elsewhere: Galen uses the same phrase, “without needing a supervisor” in *Natural Faculties* to describe the capacity of seed to attract the right amount of blood during conception, thus beginning the process of embryological formation. But Galen remains nervous about this model. In the late embryological work *Formation of the Fetus* he turns against the clockwork model, arguing that one single movement could not trigger the complex chain of motions involved in the formation of a human being. There, his immediate target is Aristotle’s one-seed embryology (*GA* 2.1, 734b9–17) but the language of the view he attacks is quite similar to that of his own discussion in *UP*. See Hankinson 2017, 261–266 for further discussion of the shift.

Crucially, the marvelous art of reproduction is responsible not only for species immortality, but also for species differentiation. In a passage from book eleven, arguing back against the Atomists’ anti-teleological accounts of the natural world, Galen observes:

...ἐγὼ μὲν οὐδὲ τοῦτ’ ἔχω συμβαλεῖν, ὅπως ἐστὶν **ἀλόγου κινήσεως ἔργον**. εἰ γοῦν εἶδές ποτε προβάτου καὶ λέοντος ὀδόντας, ἔγνωσ’ ἂν οἶμαι τὴν ἀνομοιότητα. τὸ δὲ καὶ ταῖς μὲν αἰξίν ὁμοίους τοῖς προβάτοις...τὸ δὲ τοσοῦτου τοῦ γένους ἰχθύων ὄντος μηδὲ καθ’ ἓν αὐτῶν ἐπιλαθομένας τὰς ἀτόμους ἐργάσασθαι τινὶ πόδας ἢ τράχηλον ἀκριβοῦς μνήμης ἔργον. ἐπὶ μὲν γὰρ ἀνθρώπου μόνου ἢ ἐνός τινος γένους ζώων ἢ τῶν ἀτόμων εὐτυχῆς κινήσεις ἴσως ἂν πιστευθεῖη, τὸ δ’ ἐν ἅπασιν ὁμοίως εὐτυχεῖν αὐτὰς ἄπιστον, **εἰ μὴ καὶ νοῦν ἔχοιεν**.

I cannot make out how it can be the work of **unreasoning motion** to prepare many sharp, strong teeth for fierce animals; for if you have ever seen the teeth of the sheep and the lion, you know, I suppose, that they are not alike...when the fish tribe is so numerous, for the atoms not to forget and make feet or a neck in a single one of them is the work of an accurate memory! Perhaps one might believe in the fortunate motion of the atoms for man alone, or for a single kind of animal, but that they should have similar good fortune in all animals is incredible, **unless atoms also have intelligence**.<sup>30</sup>

That every fish offspring of fish parents turns out also to be a fish, with anatomy and behavior to suit, is the best possible indication not only of the good order of the natural world, but also of the intelligence (*nous*) of its designer. Species heredity (the principle that fish give birth to fish, not lions) assures what we today call “functional adaptation.”

In short, the marvelous art of reproduction is most clearly designed for what we would today call species heredity: species immortality and functional adaptation. Notably, in both of the passages celebrating the central role of sex and reproduction in the maintenance of a well-ordered natural world, Galen’s focus is primarily on reproduction by *non-human, nonrational animals*. Fishes and other “entirely irrational animals” (*pantapasin alogon*) demonstrate, more self-evidently than human beings, the “marvelous art.”

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<sup>30</sup> *UP* 11.8; trans. May 1968, 519



## II.2 Subspecies Variation – Errors of the Craftsman

Of course, species differentiation, for Galen, has a ready teleological explanation to hand: different animals have different functions and therefore need different bodies to suit those functions.<sup>31</sup> Subspecies variation, in general, represents a much trickier case, and human difference a particular problem. If all human beings have broadly the same function, it is not clear why there should be any human diversity at all within Galen’s teleologically ordered natural world, let alone systematic patterns of difference and similarity at the level of the family or ethnic group. Galen does have two explicit solutions to this question in *UP*, and both have to do with processes of generation and formation. Each concerns one of Galen’s partners in creation, Demiurge and matter.

Most straightforwardly, some congenital variation can be explained by the fact that Galen’s Demiurge occasionally makes errors.<sup>32</sup> In Book 17 of *UP*, Galen observes:

σὺ δ’ ὦ γενναιότατε κατήγορε τῶν ἔργων τῆς φύσεως, οὐδὲν μὲν τούτων βλέπεις, ὅτι δ’ ἐν μυρίοις μυριάκις ἀνθρώποις ἅπαξ πού τινα ἐποίησεν ἕξ δακτύλους ἔχοντα, τοῦτο μόνον ὀργᾶς. εἰ δὲ Πολύκλειτος ἕς τι μικρὸν οὕτως ἤμαρτεν ἐν χιλίοις ἀνδριάσιν, οὐτ’ ἂν αὐτὸς ἐμέμψω, καὶ τοὺς ἐγκαλοῦντας ἀγνώμονας ἐκάλεις. ἀντίστρεψον οὖν αὐτὸ, καὶ σκέψαι, τί ποτ’ ἂν εἴποις, εἰ κατὰ μὲν τοὺς χιλίους ἤμαρτεν ἡ φύσις, ἐν ἐνὶ δὲ μόνῳ κατώρθωσεν. ἄρ’ οὐκ ἂν τύχης ἔφασκες, οὐ τέχνης ἔργον εἶναι τὸ κατορθούμενον; εἰ δ’ ἐν μυρίοις, ἔτι δὴ μᾶλλον; ἀλλὰ νῦν, ὅτ’ οὐκ ἐν χιλίοις ἢ μυρίοις ἀνθρώποις, ἐν μυριάκις δὲ μυρίοις ὀρῶμέν τι διημαρτημένον, εἰς τύχην ἀναφέρειν τολμᾶς τὰ κατωρθωμένα, θαυμαστῆ τι δικαιοσύνη περὶ τὴν φύσιν χρώμενος.

you, O most noble accuser of the works of Nature, have no regard for any of these things and see only that out of ten thousand times ten thousand men she has made a single one with six fingers. If Polyclitus made one such small error in a thousand statues, you yourself would not blame him and you would say that his accusers had no judgment. Well, then, look at this from another angle and see what you would say if Nature went wrong in a thousand cases and succeeded only in one. Would you not say that the one successful case was the result of chance, not of skill? And if she went wrong in ten thousand cases, would you not be still more justified? But as it is, when you see that Nature has failed with one

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<sup>31</sup> Boys-Stones 2007, 101; Hankinson 1988, 139. This is an argument also found in Aristotle, *PA* I 641b23-38, a passage which Galen explicitly takes up in Galen, *Mixtures* I 566-567 K (Helmreich 36).

<sup>32</sup> Explaining the principle that we can tell Nature’s “mistakes” from her “designs” based primarily on the rarity of the former, see Galen, *De Methodo Medendi* 14,14 990-991 K.

single man not out of just a thousand or ten thousand, but out of ten thousand times ten thousand, you dare to refer to chance what she has done correctly, thus treating her with a most remarkable sort of justice!<sup>33</sup>

There is a certain simplicity to Galen’s solution to the problem of theodicy posed here. Even granted the occasional lapse, he points out, Nature is still far better at what she does than any earthly craftsman. Both in Galen’s discussion of the Demiurge’s errors here and in *Method of Healing* he suggests that these “errors of the divine craftsman” rarely impede function. In *Method of Healing* he seems even to go so far as to explain that they are primarily recognizable as “errors” because they are rare, not because they are prima facie worse.

### II.3: Subspecies Variation – Matter and the Farmer-Demiurge

In between these two extremes, orderly species variation and errors of the divine craftsman, falls the murkier question of the influence of matter. Galen spells out the interaction between matter and the Demiurge in greatest detail in the context of a protracted comparison between Demiurge and farmer. The Demiurge-farmer plants and cultivates his crops, but the soil in which he plants them also plays an important role in how they turn out. This model is indebted to language found in Plato’s *Timaeus*, though it takes things in a somewhat different direction. The Demiurge, Galen explains, has two responsibilities: the “selection of matter” and the “choice of the better in what is being made.”<sup>34</sup> The “selection of matter” is particularly important here. On the one hand, the

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<sup>33</sup> *UP* 17.1 [Helmreich II 444]; trans. May 1968, 728.

<sup>34</sup> “We say, then, that God is the cause of two things, namely, the choice of the better in what is being made and selection of material” (*UP* 11.15 [Helmreich II, 158-159]; trans. May 1968, 533-534: ἀμφοτέρων οὖν τὸν Θεὸν αἴτιον εἶναι φαμεν, τῆς τε βελτιόνος ἐν αὐτοῖς τοῖς δημιουργουμένοις αἰρέσεως καὶ τῆς περὶ τὴν ὕλην ἐκλέξεως). Note that these are the same two sites of potential divine intervention in Galen’s embryology, as I highlighted above. In the embryology, the two things Galen finds hardest to explain without divine intervention are: the selection of matter (the moment in which the seed takes up just the right amount of blood to become the nature of a new being) and formation (particularly, cases of outstandingly excellent formation).

Demiurge is actually able to work with quite a wide range of matter: “...just as all soil, except that which is very poor, is the object of the farmer’s skill, so too every healthful temperament of the body admits the skill of the Creator of animals.” On the other hand, his powers are not without limit; he cannot “make a horse out of beef or ashes.”<sup>35</sup>

As a consequence of this model of divine involvement in the natural world, every part of the body has what Galen calls a “twofold generation” (*dittē genesis*) It is the way it is because of the “providence and craft” of the designer and because of the “nature of the place”: the characteristics of the matter from which it is made. Different parts of the body are explicable in terms of divine design versus matter to differing degrees; the hair on the head, for instance, is a carefully cultivated product of divine design. The hair in the armpits and pubic regions is more like a weed, which sprouts spontaneously because of the “nature of the place”: just like in the case of weeds, due to excessive moisture. Galen spells out the contrast between these two types of hair in a dense agronomical passage, alluding to the *Timaeus*:<sup>36</sup>

ἄρουράν τε γάρ ἐστι θεάσασθαι πολλάκις, ἢ πυρῶν, ἢ κριθῶν ἀνισχόντων ἔτι, καθάπερ τινὸς ἀπλῆς τε καὶ μικρᾶς πόας, καὶ τι χωρίον ἕτερον ὁμοίως αὐτῇ δασύ, τῆς ὄντως πόας μεστόν· ἀλλὰ τοῦτο μὲν ἢ σύντροφος ἰκμὰς ἐδάσυνε, τὴν δ’ ἄρουραν ἢ τοῦ γεωργοῦ πρόνοια. καὶ τοῖς γε μὴ δυναμένοις διακρίναι τὴν ἰδέαν ἀπὸ τῆς ἄλλης πόας τῶν ἄρτι τῆς γῆς ἀνιόντων σπερμάτων ἢ τάξεις αὐτῇ μόνη τῆς ἐκφύσεως ἰκανὴ γνωρίσαι· τό τε γὰρ ὁμαλὲς αὐτῶν τῆς γενέσεως καὶ τὸ τῆς ἕξωθεν περιγραφῆς κατὰ γραμμὰς τεταμένως γινόμενον ἰκανὸν **ἐνδείξασθαι τὸ κατὰ τέχνην τινὰ καὶ πρόνοιαν τοῦ γεωργοῦ δεδασύνθαι τὸ χωρίον.**

One can often see a field in which wheat or barley is growing up as yet like tender, short grass, and another spot similarly thick with vegetation and full of real grass. The rich growth in the latter has been produced by natural moisture, but the farmer’s providence has produced the field. For those unable to distinguish from the other grass the form of the seeds just sprouted from the earth, the orderly arrangement of their growth will be sufficient indication. For the evenness of their germination and the fact that the edges of the field

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<sup>35</sup> *UP* 11.15 [Helmreich II, 158-159]; trans. May 1968, 533-534. Galen offers this explanation in the context of a contrast between his own and Mosaic cosmology; see see Walzer 1949. On the limitations of Galen’s demiurge see also Flemming 2009, 73-75; Holmes 2014, 230-232; Hankinson 2017, 256; Hankinson 1989, 224-225; Marechal 2020, 67.

<sup>36</sup> Plato, *Timaeus* 77a-77b.

have been established in straight lines will be enough to show forth that this spot has been filled with vegetation by the art and providence of the farmer.<sup>37</sup>

The passage distinguishes between hair on the head, eyebrow, and eyelashes (which the Demiurge carefully cultivates, by his providence and craft), on the one hand, and hair in the armpits (which grows in accordance with the movements of matter), on the other.<sup>38</sup>

There is a theory of human difference lurking in the background here. Parts due to the “nature of the place”—so, parts like armpit hair—tend to exhibit much more variation than parts which are essential to the divine plan. This is crucial to Galen’s picture. Uncultivated hair, writes Galen, “has sprung from the moisture of the locations and is not a work of the Creator’s providence, and therefore much of it is produced in warm natures and very little or none at all when the nature is cold.”<sup>39</sup> Parts of the body that are outcomes of divine planning, by contrast, are much less subject to individual or sub-species variation: “The hair for which the Creator himself provides, however, as the farmer does for his field, is produced in all natures, warm, cold, dry, and wet, unless they have an excessively unbalanced, bad temperament, like rocky or sandy soil.”<sup>40</sup> Variations in connate matter are likely to cause members of one family to have more armpit hair than members of another. But they are very unlikely to cause one family to entirely lack eyelashes. This

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<sup>37</sup> *UP* 11.14 [Helmreich II, 160]; trans. May 1968, 534 with several modifications; most notably, May writes “the farmer’s providence has produced it *in* the field [emphasis mine],” which I think confuses the logic of the passage.

<sup>38</sup> Galen makes the same point in *Mixtures* II.5 619 K [Helmreich 69, 5-19]; trans. van der Eijk and Singer 2018, 135 where he calls the former set of characteristics those “according to the first plan” (*kata prōton logon*); for this phrase, see see *PHP* 6, 1, 8-9, II p. 362, 5-9 De Lacy 2005 (=V 507, 12-18 K) and the discussion of Jouanna 2003, 234-235. In *PHP*, Galen explains that it glosses “*kata physin*” or that towards which nature aims as a goal (*skopos*). Of particular importance to my argument here Galen goes on to spell out that any movement can be natural which aligns with the Demiurge’s plan, whether its source is intrinsic to matter or comes from outside.

<sup>39</sup> *UP* 11.14 [Helmreich II, 160]; trans. May 1968, 535: τῆς γὰρ τῶν χωρίων ἰκμάδος ἔκγονοι, καὶ οὐ τῆς τοῦ δημιουργοῦ προνοίας εἰσὶν ἔργα, καὶ διὰ τοῦτο θερμαῖς μὲν φύσει πάμπολλαι, ψυχραῖς δὲ ἢ οὐδ’ ὄλως ἢ ἐλάχιστα γίνονται.

<sup>40</sup> *UP* 11.14 [Helmreich II, 161]; trans. May 1968, 535: ὧν δ’ ὁ δημιουργὸς αὐτὸς προνοεῖται, καθάπερ ἀρούρας γεωργός, ἐν ἀπάσαις φύσεσιν ὑπάρχουσιν αὐταί, καὶ θερμαῖς, καὶ ψυχραῖς, καὶ ὑγραῖς, καὶ ξηραῖς, εἰ μὴ παντάπασιν ποτ’ εἰς ἀμετρίαν τινὰ δυσκρασίας ἤκκοιεν, ὥσπερ ἡ πετρώδης τε καὶ ψαμμώδης γῆ.

observation is connected with Galen’s account of the Demiurge’s responsibilities; the “selection of matter,” as we have just seen, is a task of the providential craftsman. One of the promises of Galen’s system of teleology seems to be that human beings are made from broadly the right kind of matter. Some connate matter may be easier or harder to work with or produce variable effects—and there are indications that Galen has a hierarchy, based largely on ethnic and racial prejudice, in mind—but the matter from which human beings are made is broadly suitable for the making of human beings.

Finally, the insistence on wetness tells us something about Galen’s understanding of the kind of complication that matter poses to divine creation. In the context of agronomy (for instance, the works of Pliny and Columella), moisture is—just as Galen observes—particularly associated with weeds.<sup>41</sup> Elsewhere in *UP* Galen himself associates wetness with the spontaneous generation of lower animals.<sup>42</sup> Whatever complications Galen imagines matter to pose to divine design are thus not primarily obstructive; rather, matter is unruly and over-creative.

### III. Galen on Human Generation

I return, then, to the problem with which I began: of where, if anywhere, “bad heredity”—or the transmission of outright negative characteristics—can be made to fit within Galen’s teleology. In addressing the relationship between matter and the demiurge, Galen has given us a couple of ways of thinking about patterns of congenital similarity and dissimilarity across *UP*. Differences

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<sup>41</sup> Intriguingly, agronomists report differing views on the causes of this association: either that the moisture carries seeds from elsewhere in large numbers, or that the moisture itself is the cause of the weed’s growth (a case of spontaneous generation). I discuss these differences further in what follows. See Pliny 18.50; Pliny 29.59; Pliny 22.79; Pliny 43.18; Pliny 19.15; Columella 2.14.9.

<sup>42</sup> Galen dedicates relatively little attention to spontaneous generation, but when he discusses it, he clearly flags the usual connection to moisture; see *UP* 17.1 [Helmreich II, 447]; trans. May 1968, 730: “For when in mud and slime, in marshes, and in rotting plants and fruits, animals are engendered which yet bear a marvelous indication of the intelligence constructing them, what must we think of the bodies above?”

between the animal species, vouched safe by species heredity, are central to Nature’s design; they are manifestation of Nature’s “most marvelous art” of reproduction. Below the level of species difference we find *extremely uncommon* congenital “errors” of formation on the part of the divine craftsman. We also find variation introduced by different connate matter. These latter two tend to produce variation especially in parts that are not too central to the divine design and, in particular, that do not interfere with a human being’s function.

Notice that there is no room for, say, hereditary disease, or any strongly negative hereditary trait on this picture. The interaction between Demiurge and matter, as it is explained by *UP*, can produce variation, but not outright dysfunction. In fact, in his surviving corpus as a whole, Galen is curiously reticent to speak about hereditary disease (notwithstanding that it features prominently in, for instance, the Hippocratic Corpus).<sup>43</sup> But, I will argue below, Galen does have an account that covers instances of what his contemporaries would have understood as hereditary disease or bad heredity, although it deliberately resists explaining these in terms of a straightforward theory

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<sup>43</sup> There are some passages in *Mixtures* that edge close to an account of hereditary disease, in that they suggest that certain mixtures predispose people to disease (a possibility that the case of rocky or sandy soil might leave open), e.g. see *Mixtures* II, 2 K 582 [Helmreich 46]; trans. Singer and van der Eijk 2018, 111 on the tendency of old people to become cold and therefore more susceptible to cold disease. But this is not in and of itself enough for an account of *hereditary* disease. Galen distinguishes between connate and acquired mixture (see, for instance *Mixtures* I, 5 K 535 [Helmreich 17]; trans. van der Eijk and Singer 2018, 70). The heart of the matter, then, would be whether *connate mixture* can cause disease. For ambiguous cases in this narrower sense, see: on certain individuals’ bad mixture and resulting tendency to disease *Mixtures* II, 6 622-623 K [Helmreich 71]; trans. Singer and van der Eijk 2018, 136-137; on good and bad mixture in connection with “Illyrians, Germans, Dalmatians...” etc. *Mixtures* II, 5 K 618 [Helmreich 68]; trans. van der Eijk and Singer 2018, 134. On this final example, see van der Eijk 2014, 104 pointing out the ambiguities of Galen’s picture, which does not quite make clear whether he understands forms of subgroup variations to be due to hereditary or environmental influences.

of material transmission.<sup>44</sup> In order to see this, however, we will need to look away from matter and the demiurge and instead towards human beings.<sup>45</sup>

### III.1: Resemblance versus Responsibility

The passage I turn to now (like the Demiurge-farmer, from book eleven) looks, at first glance, more like an anxiety over congenital factors broadly speaking, than over resemblance in particular.

This is not an entirely wrong intuition, but I hope in what follows to complicate this distinction. In the passage, Galen observes the various ways that human beings, as careless generators, betray the perfection of Nature’s design. He writes:

ἢ καὶ μάλιστα θαυμάζειν ἐστὶ τὴν φύσιν, εἰ ἐν τοῖς οὕτω παρὰ μικρὸν ἀεὶ μὲν **κατορθοῖ**, σπάνιον δὲ τὸ **σφάλμα**. καίτοι γ’ ὅσον ἐπὶ τε τοῖς σπείρουσιν ἡμᾶς καὶ ταῖς κούσαις οὐ τὸ **σφάλμα** σπάνιον ἐχρῆν, ἀλλὰ τὸ **κατόρθωμα** γίνεσθαι. μεθύοντες γὰρ μεθουσαις συνέρχονται καὶ οὐδ’ ὅπου γῆς εἰσὶν εἰδότες ὑπὸ πλησμονῆς [ἐτέραις] οὕτω διακείμενοι· ὥστε ἢ μὲν ἀρχὴ τῆς σπορᾶς εὐθὺς οὕτω πλημμελής. τὰ δὲ μετὰ ταῦτα τῆς κούσης **ἀμαρτήματα** περὶ τε τὰς τῶν συμμέτρων γυμνασιῶν ῥαθυμίας καὶ σιτίων πλησμονὰς καὶ θυμοὺς καὶ μέθας καὶ λουτρὰ καὶ ἀφροδισίων ἀκαίρων χρήσεις [ἄς] οὐδ’ εἰπεῖν δυνατόν. ἀλλ’ ὅμως καίτοι πρὸς τοσαύτας ὕβρεις ἢ φύσις ἀντέχει, καὶ κατορθοῖ τὰ πολλὰ. καὶ μὴν οὐτε πυροὺς οὐτε κριθὰς οὐτ’ ἀμπέλους οὐτ’ ἐλαίας οὕτω φυτεύουσί τε καὶ σπείρουσιν οἱ γεωργοί, ἀλλὰ πρῶτον μὲν, ὅπως εὖ ἐχούσῃ τῇ γῆ πιστεύσωσι τὰ σπέρματα, πολλὴν

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<sup>44</sup> An intriguing paradox in the long history of heredity: in fact, the introduction of the concept of heredity into medieval medical thought arrives partly in consequence of the reintroduction of Greek medicine, transmitted via its Arabic translators and innovators. Constantinus Africanus’ Latin translation of the Arabic translation of Galen’s commentary on the Hippocratic *Epidemics* adds the phrase *ex hereditate* to a discussion of gout in Galen that lists as one of its possible causes “damaged sperm.” See van der Lugt 2008, 16; 20 for this history; van der Lugt observes, “il est tout à fait significatif que l’expression *ex hereditate* dans ce dernier texte ne se trouve pas dans l’original grec, Galien utilisant ici une périphrase.” The text printed in van der Lugt 2008 16 36n is as follows: “Galien, *Commentarius in Aphorismos Hippocrati*, ad VI, 27, ‘Eunuchi non podagrizant fiunt, neque calvi fiunt’, éd. dans *Articella seu thesaurus operum medicorum anticorum*, Venezia 1493, sans foliotation (ici VI, 28): “[...] Ex hereditate etiam podagra comitatur. Sperma enim quia maculatum fuit necessario pedes filiorum debilitat passione duplicate ex parentum causa et ex sui culpa.” But this twist is only further indication of the blunt instrument that the modern distinction between “congenital” and “hereditary” affections is for thinking about concepts of transmission in the premodern world.

<sup>45</sup> Galen’s position here may seem strange for a practicing doctor. But Galen was far from the only physician who sought to explain away what we would today call hereditary disease instead by way of the combination of environmental factors and (with strongly moral undertones) reproductive malfeasance. For the prevalence of these debates in 19<sup>th</sup> c. US medicine, for instance, see Keel 2015; Keel 2018; Nuriddin 2019.

πρόνοιαν πεποιήνται· μετὰ ταῦτα δ', ὅπως μήθ' ὑπὸ περιττῆς ὑγρότητος κατακλυζόμενα σαπείη μήτ' ἀύχμοις ἀνανθείη μήτ' ἀποσβεσθείη διὰ κρύος...

The greatest possible admiration is due Nature when in such delicate matters she always does right and error is rare. And yet, how frequently in the fathers that beget and the mothers that bear us it must be not **error** that is rare but **right-doing**. For [those who are drunk] consort with [those who are drunk], and men that do not know their own whereabouts from repletion with women in the same state. Hence in this way the very beginning of our procreation is faulty, and then come the unspeakable **errors** of the pregnant woman, her indifference to proper exercise, her gluttony, passions, drunkenness, bathing, and untimely indulgence in love. Nevertheless, to such outrages Nature opposes many acts and performs them successfully. This is not the way in which farmers sow wheat or barley, or plant grape-vines or olive trees; for first they see to it in advance that the soil to which they entrust their seeds shall be in good condition, and then they take no little care that the seed shall not be deluged with too much water and rot, or withered by droughts, or killed by frost...<sup>46</sup>

In book fourteen, Galen will repeat a version of claim, observing that “first the untimely intercourse of the male and female” and “later the regimen of the pregnant women” are most often to blame when something goes wrong with a part of the animal (Galen, *UP* 14.7: τῆς δὲ τοιαύτης πλημμελείας ἢ τε πρώτη συνουσία τοῦ ἄρρένου πρὸς τὸ θῆλυ, **μὴ κατὰ τὸν προσήκοντα** γενομένη **καιρὸν**, ἢ τε μετὰ ταῦτα **τῆς κούσης δίαιτα** τὴν αἰτίαν ἔχει).<sup>47</sup> These two passages, taken together, set out quite a different view of generation than the view outlined in, for instance, the discussion of Nature as colonist or Nature as clockwork-maker. (They also offer a far more subtle contrast to the Demiurge-farmer, which I return to below). Here, Galen treats at least *human* generation as uniquely dangerous site for the transmission of illness and dysfunction, not an orderly process ensuring species immortality and functional adaptation. There are very few other mentions of disease in *UP*, clustering particularly in Galen’s discussions of digestion and residues.

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<sup>46</sup> Galen, *UP* 11.10 [Helmreich II, 143-144]; trans. May 1968, 524 with a minor modification; I have changed “drunkards” in May’s translation to “those who are drunk” to emphasize that the anxiety here is over parents’ state at the moment of conception, not over habitual drunkenness.

<sup>47</sup> Galen, *UP* 14.7 [Helmreich II, 308]; trans. May 1968, 637.



None, however, is so explicit about Nature’s long odds in assuring human flourishing as this discussion of human generation.<sup>48</sup>

As I hope to show in what follows, this passage picks up on anxieties found across many different roughly contemporaneous authors. But it is actually importantly different than these, as it is premised on a more careful distinction between the phenomenon of intergenerational resemblance and the material transmission of *pathos* at conception. In endeavoring to uphold this distinction, Galen will end up relying heavily on a further distinction between two ways of thinking about human generators: as agents responsible for their own and their offspring’s health, on the one hand, and as suitable “matter and instruments” for generation, on the other. Human beings are creatures made out of the right matter for successful generation and equipped by the designer with the right instruments. Nevertheless, they are systematically “unnatural,” sloppy, and even destructive generators.

Galen’s mention of *kairos* prescriptions and regimen here is a way of flagging a broad set of concerns, mostly drawn from *medicine* over potentially pathological congenital factors which human beings introduce into the process of generation. Galen’s concern for the *kairos synousias* tracks the worry which we have already traced through Hesiod and Plutarch, and which is also found in Plato, Aristotle, and especially the famous doctor and gynecologist Soranus. Soranus’ *Gynecology* offers one of our most sweeping medical explorations of childbirth in the Roman world.<sup>49</sup> In fact, Galen’s language here closely echoes a passage from Soranus advising on the *kairos synousias*:

ἵνα οὖν μήτε ἄμορφον ἀποτελεσθῆ τὸ γεννώμενον ἀλλοκότους φαντασίας ἐν τῷ μεθύειν τῆς ψυχῆς ὑπομενούσης, νηφέτωσαν αἱ γυναῖκες ἐν τοῖς πλησιασμοῖς, εἴθ’ ὅτι καὶ πρὸς τὰς

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<sup>48</sup> My impetus in using the phrase “long odds” comes from Holmes 2014, 231: “for Galen, as for a number of ancient medical and moralizing authors...the space of probable flourishing is open to our interventions in it and, more specifically, our impact on the material conditions of life.”

<sup>49</sup> Soranus, *Gynecology* I.36-41; trans. Temkin 1956, 34-40.

μητέρας **ὁμοιότης** τις οὐ κατὰ σῶμα μόνον, ἀλλὰ καὶ κατὰ ψυχὴν ἀναφέρεται τῶν γεννωμένων. καλὸν οὖν εὐσταθούση τῆψυχῆ καὶ μὴ παρακόπῳ διὰ μέθην **ὁμοιον** ἀποτελεσθῆναι τὸ γεννώμενον. παντελῶς γε μὴν ἄτοπὸν ἔστι τὸν μὲν γεωργὸν φυλάττεσθαι τὸ μὴ κατὰ διύγρων καὶ λιμναζομένων χωρίων ἀφεῖναι τὰ σπέρματα, τοὺς δὲ ἀνθρώπους ὑπολαμβάνειν, ὅτι καλῶς περιγενήσεται τῆς ζωογονίας ἢ φύσις διύγροις καὶ κατακεκλυσμένοις τοῖς σώμασιν <ὑπὸ> πολυυλίας ἐναποτιθεμένων τῶν σπερμάτων.

Thus, in order that the offspring may not be rendered misshapen, women must be sober during coitus because in drunkenness the soul becomes the victim of strange phantasies; this, furthermore, because the offspring bears some resemblance to the mother as well, not only in body but in soul. Therefore, it is good that the offspring be made to resemble the soul when it is stable and not deranged by drunkenness. Indeed, it is utterly absurd that the farmer takes care not to throw seed upon very moist and flooded land, and that on the other hand mankind assumes natures to achieve a good result is generation when seed is deposited in bodies which are very moist...<sup>50</sup>

In the passage from Galen, the emphasis falls on Nature’s marvelous success, notwithstanding human malfeasance; Soranus seems slightly less optimistic that nature can prevail against the odds.

But the picture of human wrongdoing as neglectful farming, particularly associated with moist soil and particularly threatened by drunkenness, is similar across the two authors.<sup>51</sup> Indeed, I suspect that this is a case of direct borrowing by Galen.<sup>52</sup>

As the Soranus passage and discussion of Hesiod above suggest, these *kairos* and regimen anxieties are, by the Imperial period, largely the province of medicine. They cluster around considerations of male and female sexual maturity, regimen, the “unspeakable errors of the pregnant woman” (to quote Galen’s turn of phrase) and any possibility of a disturbed emotional

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<sup>50</sup> Soranus, *Gynecology* I.39, 3; trans. Temkin 1956, 38.

<sup>51</sup> On the close association between drunkenness and wetness see (in addition to Galen and Soranus), for instance, ps.-Aristotle *Problemata* II, 4-5 871a-871b (on the problems with the seed of drunken men—that it is too moist); ps.-Aristotle *Problemata* III 11 872b (on why drunken people cannot have sex—because they are too moist); Plato, *Laws* 775c-e (again, that people who are drunk are too moist to conceive properly).

<sup>52</sup> For the relationship between Galen and Soranus, see Green and Hanson 1994. Soranus was a Methodist doctor but one about whom Galen (otherwise a lifelong enemy of the Methodists) speaks with uncharacteristic admiration. A wonderful exchange with Helen Ruger last year has left me thinking that there is much more in Soranus than I do credit to here.

state during conception or gestation (especially drunkenness).<sup>53</sup> For the most part, these worries over the *kairos synousias* and the regimen of the pregnant woman are anxieties over a transmission of *pathos*, either during conception or gestation. Recall Plutarch’s language in the passage quoted earlier that “every pathos” is transmitted “through generation,” as well as the passage from pseudo-Plutarch cited above.<sup>54</sup>

While this might sound like a worry over congenital influence, it is really a case of what I introduced above as a soft theory of heredity. In many of the contexts in which they survive, *kairos* and regimen prescriptions are explicitly cashed out in terms of anxieties about resemblance. In the passage above, for instance, Soranus enjoins against the drunkenness of the mother during conception because the offspring *resembles* the mother “*not only in body, but in soul.*”<sup>55</sup> His interest in resemblance is signaled by the language of “*homoiotēs*” and “*homoion.*” For Plutarch, as we saw above, the discussion of *kairos synousias* shades into an account of a full-blown character heredity spanning “not only wickedness and virtue but joy and pain” and a whole range of psychological characteristics. Among Galen’s contemporaries, then, there is a marked tendency to speak of a range of forms of material influence from parents on offspring as cases of intergenerational “resemblance,” spanning both body and soul.

While Galen may share his contemporaries’ anxieties over the transmission of fault, he does not understand the transmission of fault in the same way that they do. As I argue elsewhere, one of the things that Galen’s discussion of intergenerational resemblance in *On the Seed* makes clear is that he is an unusually *hard* theorist of heredity for an ancient thinker. He believes there is

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<sup>53</sup> In addition to the passages from Soranus cited just above (Soranus, *Gynecology* 36-41), see (for instance) Aristotle, *Politics* VII 1335b; Heliodorus, *Aethiopica* 4.8.3-5; Calpurnius Flaccus, *Declamations* 2. See also the discussion of Lehoux 2014, 223-226.

<sup>54</sup> van der Lugt 2008, 4; 52: “c’est moins la transmission que le moment de la conception qui determine les caractéristiques de l’enfant.”

<sup>55</sup> Soranus, *Gynecology* I.39 (trans. and commentary Temkin 1956, 37-38).

something special about the influence of connate matter (so, the parents' two *seeds*) on the process of formation, which no subsequent material influence (from nourishment or environment) can wholly override.<sup>56</sup> Indeed, we have already seen that connate matter, while it can encode some forms of individual variation, is unlikely to be the source of illness or dysfunction. The former passage makes clear that the "selection of matter" for the making of a new creature is one of the tasks undertaken or overseen by the Demiurge. One of the guarantees of Galen's teleology therefore seems to be that human beings are always made from *more or less* the right kind of matter for the human being, broadly healthy and suitable for its function. Galen is very concerned to distinguish this intergenerationally consistent, broadly providential endowment of connate matter, passed on by reproduction, from the kind of parental influence that introduces the negative congenital factors he worries about here.

Thus, he takes on the belief in the weighty significance of the *kairos synousias* and the regimen of the pregnant woman to the child also found in Soranus, Plutarch, ps.-Plutarch, and physiognomy. He accepts these as an important (maybe even the *sole*) basis for what we today would call congenital disease *and* bad heredity—so much so that they receive mention in *UP*, a work that otherwise tries to avoid discussion of illness and dysfunction.<sup>57</sup> But he is very clear that these cases of the transmission of fault are all matters of parental agency and parental (especially) maternal mismanagement of regimen: the unnatural machinations of *human* agents, not the material transmission of *pathos*. For Galen, these are not problems of affection (*pathos*), but of

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<sup>56</sup> Boys-Stones 2007, 105-106 lays out the strong view that the *diplastikē dynamis* is constituted by the movements of the connate matter, thus distinguishing the connate matter from any subsequent material influences (cf. Havrda 2017 for an alternate view on the basis of the formative faculty). In Buturovic 2023, I unpack this point (including the tension between the two views) further in light of Galen's embryology in *On the Seed*.

<sup>57</sup> See van der Eijk 2017 on the place of disease in Galen's teleological worldview, emphasizing that Galen is fond of blaming human beings for their own diseases across all of his works.

rational error (*hamartēma*), a distinction with which he is exceedingly careful throughout his corpus.<sup>58</sup> In shifting the problem of bad intergenerational resemblance dramatically toward questions of agency, error, and regimen and away from a systematic theory of the material transmission of *pathos*, Galen lays out robust picture of human parents as, on the one hand, naturally good reproducers with the right “matter and instruments” for reproducing, and, on the other, destructive agents who bring down destructive consequences on their offspring through error and neglect.

### III.2 Medicine and Theology: Imperfect Creators

I have just argued that Galen tries, in *UP*, to reread a range of *kairos* and regimen anxieties customarily associated with material transmission of *pathos* instead in terms of human error and agency. But we can say more about the nature of this human agency, if we think about how Galen’s discussion here relates to his treatment of the two “limitations of teleology” laid out in section two: the influence of matter and the errors of the divine craftsman. Neither of these, as we have seen, poses any serious threat to the excellence of divine design, though both do produce patterns and instances of similarity and difference below the level of the species.

On the one hand, Galen seems to consider the errors of human parents to be something like the errors that the Demiurge makes. What concerns Galen here is human error (*sphalma*) and right-doing (*katorthōma*). Both of these words, but especially *katorthōma*, are relatively rare in Galen’s corpus, and their other uses are suggestive. The only other use of *katorthōma* in *On the Usefulness of the Parts* explicitly describes the excellence of divine creation.<sup>59</sup> And in *Method of Healing*

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<sup>58</sup> On error vs. affection in Galen, see (e.g.) Galen, *Affections and Errors* 3K; discussion in Singer 2013, 205-237.

<sup>59</sup> Galen, *UP* 11.13 [Helmreich II, 154]; trans. May 1968, 530.

Galen refers to the errors of the divine craftsman using *sphalma*.<sup>60</sup> On the other hand, the worry spelled out in the human-farmer seems also to be over material intransigence—in fact, the very same case of excessive wetness that Galen highlighted in his discussion of the demiurge-farmer. Thus, this passage captures human generators in two different lights: as farmer-designers, on the one hand, and as soil-matter, on the other. Strikingly, it represents a convergence of medicine and theology. Galen’s agricultural metaphor not only echoes the description of the demiurge’s providential interventions into the natural world, but also Soranus’ account of how human beings should decide the appropriate moment for conception. Parental and demiurgic creation alike can be understood as acts of farming, to which flooding and wetness pose a particular threat.

Under the auspices of these broader similarities, however, embryological and cosmological creation also turn out to be quite different. Indeed, I strongly suspect that this difference is part of what Galen aims to capture by the proximity of Demiurge-farmer and human-farmer passages. The Demiurge, as we saw, can master almost any matter. In the Demiurge-farmer passage Galen writes, “just as all soil, except that which is very poor, is the object of the farmer’s skill, so too every healthful temperament of the body admits the skill of the Creator of animals.”<sup>61</sup> Human beings, by contrast, should (and fail to) be more cautious of the material circumstances in which they undertake embryological creation. Thus, Galen counsels that they would do better if, like the farmer, they saw “to it in advance that the soil to which they entrust their seeds shall be in good condition.” Human beings have something in common with the farmer of the providence analogy, but they operate under vastly different constraints and with far less foresight and understanding.

On the one hand, then, each act of embryological creation has something divine about inasmuch as it is both an aspect of divine creation and an echo of divine creation. But, on the other

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<sup>60</sup> Galen, *De Methodo Medendi* 14.14 932 K

<sup>61</sup> *UP* 11.14 [Helmreich II, 161]; trans. May 1968, 535.

hand, unlike divine creation, embryological creation is a continual site for the reintroduction of disease and evil into the world by careless human agents. In this light, embryological creation is a dark mimicry of the perfection of divine creation, made even less appealing to Galen by the very fact of its subtle play of analogy and disanalogy with divine creation. The fundamental reason for this disanalogy is, for Galen, human beings' imperfection—*not* as matter (since the divine demiurge must also contend with forms of material intransigence like excessive wetness), but as agential creators in their own right: failure-prone demiurges. The force of this contrast between divine and human creation is strengthened by one of the unusual features of Galen's theology I highlighted above. In the absence of Forms, Demiurgic creation (what results from the Demiurge's collaboration with matter) *is* ideal—or, at the very least, not as obviously non-ideal as in an ordinary Platonic cosmology. There is no external paradigm, against which it falls short. Human creation, by contrast, is non-ideal, inasmuch as it regularly falls short of the properly natural state of affairs that should result from the Demiurge's direct collaboration with matter.

This concern over human's god-like agency and all-too-human tendency to error is closely linked to a broader concern over human mismanagement of regimen found across Galen's corpus. Besides the errors and perfection of divine creation, the other major context in which Galen brings up the language of *katorthōma* and *sphalma* repeatedly is in the context of his treatise on regimen, *Hygiene*, where the phrase "correct the fault" (*epanorthousthai to sphalma*) occurs four times, in descriptions of how human beings should correct against excessive or ill-timed bathing, eating, drinking etc.<sup>62</sup> In the passage from *UP*, then, Galen addresses himself to human generators as beings who are matter themselves, but who also have some capacity to manipulate their own matter, in a manner analogous to the Demiurge's corrections, cultivations, and manipulations. A

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<sup>62</sup> *Hygiene* 68 K; 313 K; 314 K; 318 K

medical, regimen-focused work like *Hygiene* makes clear that these dangers of errant human agency span all kinds of behaviors, not only generation. But generation seems to have a particular grip on Galen's imagination, as the only sustained case of disease and dysfunction and only discussion of regimen in Galen's teleological masterwork, *UP*, itself.

The analogies and disanalogies between embryological and divine creation which I have just spelled out tell us something about why this is. It is in creating other human beings that human beings most manifestly “play god.” They thus fail not only themselves but others when they choose poorly. In doing so, they make visible that their responsibility to the task of maintaining and upholding divine creation is wider than Galen would like. It extends beyond their own bodies and selves to the bodies and selves of others as well. The farmer language thus captures both: an anxiety over human beings' inflated godlike agency and an anxiety over their inability to manage the fallout from that agency. Human parents carry responsibility to cultivate life akin to the task of the demiurge, but without his foresight and capacity to work under any material circumstances. They are fallible and forgetful creators of their own and others' bodies.

### III.3: The Consolations of Rationality

For all the trouble it makes, the role of human beings as agential creators of life is actually key to Galen's solution to heredity as problem of theodicy. It is not an accident that Galen's emphasis on the role of reproduction in upholding the teleological order of the natural world comes primarily in the context of his discussion of *animal* sexual anatomy, whereas his picture of the demiurge-farmer goes hand-in-hand with his description of *human beings* as unruly generators. Human beings' agency may be a (frequently) destructive force, which prevents the smooth functioning of



the natural world, but it is also part and parcel of human beings' special status as the rational animals of the sublunary world.

Galen spells out the exact terms of this trade-off in a passage from book fourteen of *UP* mentioned above, concerning the clockwork functioning of breasts and uteri:

Ἄρ' οὖν ταῦτα πάντα περί τε τοὺς τιθοὺς γίνεται καὶ τὰς μήτρας, αὐτῶν τῶν ὀργάνων ἃ χρῆ πρᾶττειν εἰδότεων ἐκ λογισμοῦ τινος; ἢ οὕτω μὲν οὐδ' ὄργανα μείνειαν ἂν, ἀλλὰ **λογικὰ γένοιτ' ἂν ζῶα, καιρὸν** καὶ μέτρον κινήσεως ἐπιστάμενα, προστεθείσης δ' ἀνάγκης τινὸς αὐτοῖς ἐν τῇ κατασκευῇ φυσικῆς, εἰς τὰς εἰρημένας ἀγούσης κινήσεις, αὐτὰ μὲν ὄργανά τε καὶ ζώου μόρια φυλαχθήσεται, **τέχνην δὲ θαυμαστὴν ἐνδείξεται** τοῦ δημιουργοῦ; ὥσπερ γὰρ οἱ τὰς τῶν πλανωμένων ἀστέρων περιόδους μιμούμενοι, διὰ τινων ὀργάνων αὐτοῖς ἀρχὴν κινήσεως ἐνδόντες, αὐτοὶ μὲν ἀπαλλάττονται, τὰ δὲ, ὡς εἰ καὶ παρὼν ἔτυχε καὶ διὰ παντὸς ἐπιστάτης αὐτῶν ὁ δημιουργὸς, οὕτως ἐνεργεῖ, κατὰ τὸν αὐτὸν, οἷμαι, τρόπον ἕκαστον τῶν ἐν τῷ σώματι μορίων ἀκολουθία τέ τι καὶ διαδοχῇ κινήσεως ἀπὸ τῆς πρώτης ἀρχῆς ἐνεργεῖ, μέχρι παντὸς **οὐδενὸς ἐπιστάτου δεόμενον**.

Now have all these things taken place in the breasts and uteri because the instruments themselves knew by a certain power of reason what they had to do? But if so, would they not cease to be instruments at all and become reasoning animals instead, understanding **the proper time** (*kairon*) and duration of motion? And if, on the other hand, you add to their structure a certain natural necessity that leads to these motions, will they not be kept instruments and parts of the animal, and will they not show forth the wonderful skill of the Creator? For just as there are those who imitate the revolutions of the wandering stars [the planets] with models which by means of certain instruments<sup>63</sup> they endow with the principle of motion and who go away themselves while the instruments [continue to] act as if their creator were present and always controlling them, so in the same way, I suppose, each of the bodily parts by a certain consecution and succession of motion always from the very beginning acts **without needing a supervisor**.<sup>64</sup>

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<sup>63</sup> For a description of the machine referred to here, see Savage-Smith 1985: “A similar mechanical device for demonstrating the movement of the planets, sun, and moon against the background of the fixed stars was said by Cicero to have been constructed by the philosopher Posidonius, with whom Cicero studied in Rhodes. Other references to such contrivances can be found in the literature, including a possible one in Plato’s *Timaeus*, written in the fourth century BC, and a more detailed one in the major physiological treatise written in the second-century AD by the physician Galen. These and other mentions of such demonstrational devices indicate that they were not uncommon in learned circles in Hellenistic and Roman times. Unfortunately, specific details of the arrangement and its precise relation to a celestial globe are unknown. It has been conjectured that even the simplest possible device that could regulate the movements of the planets, sun, and moon would require a system of gears meshing in parallel planes.”

<sup>64</sup> *UP* 14.5 [Helmreich II, 295] K1822-1823; trans. May 1968, 627. The problem that organs cannot be animals returns in *Formation of the Fetus* and in *Natural Faculties*; the natural faculties are intended as the solution to this problem.

Here, of course, Galen’s point is that breasts and uteri are not rational animals, and therefore do not decide for themselves the *kairos* of their distinctive functions. But we can easily flip this passage on its head. It would be just as strange for rational animals to be breasts and uteri, as for breasts and uteri to be rational animals. *Parts* show forth the wondrous art (*thaumastē tekhnē*) of reproduction (as Galen put it, in both the clockwork and colonist passages). Rational animals, who use their own intellects to decide the *kairos* of particular actions, evidently do not.<sup>65</sup> The dichotomy between parts and rational animals in this passage drives home the paradox I want to highlight here. It is precisely in virtue of their rationality that human beings *fail* to show forth the marvelous art of reproduction. The pitfalls and affordances of being a rational animal include the possibility of rational, error-prone decision-making concerning the *kairos synousias*. Note that Galen contrasts rational animals, not animals in general, to breasts and uteri. The nonrational animals of the colonist passage (*pantapasin alogon*) are more like breasts and uteri than they are like rational animals. They reproduce at the appropriate times, because they are programmed to do so.

I use the phrase rational agency here, then, to highlight the peculiar ways in which rationality governs human action, particularly generation. As this passage suggests, human beings’ uteri generally do reach the correct size at precisely the moment when human beings attain sexual maturity. As in the case of nonrational animals, the parts of their bodies have been appropriately constructed and set in motion by the divine intellect—exceptionally so, thanks to the marvelous art of reproduction. But human beings, as agents whose voluntary actions are under the supervision

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<sup>65</sup> As with so many issues that he considers philosophical nit-picking Galen claims to be ambivalent about the question, whether animals have rationality. But he makes very clear that he considers human beings to be rational animals par excellence “on account of these things even if there is some share of reason in other animals, man is rightly named the outstandingly rational among them” (Galen, *Protrepticus* I [K 1]: [2.5 K] διὰ ταῦτα τοίνυν κἄν <εἰ> λόγου μέτεστι τοῖς ἄλλοις ζώοις, κατ’ ἐξοχὴν αὐτῶν [καὶ] ὁ ἄνθρωπος μόνος ὀνομάζεται λογικός.); trans. mine. Of all animals, human beings alone have the capacity to acquire arts (*tekhnai*) by choice (rather than by nature), through the imitation of both divine and natural processes.

of their own reason, do not necessarily reproduce at precisely the moment when their uteri are the correct size. Instead, they may use their reason to weight various considerations (which might include uteri, tenure clocks, and financial stability). To the extent that human generation lies *partly* under the control of human reason, it is therefore liable to problems introduced by rational error.<sup>66</sup> Paradoxically, errors are the most visible signs of the broader phenomenon of human beings' (partial) rational control over generation. As we have seen, rational/voluntary and involuntary factors (including those due to matter and due to divine intellect) determine the failures and successes of any act of generation. Regular species heredity is an effect of divine planning. Once in a while, divine intellect may make an error, introducing an anomaly. Minor variations between families and individual might be due to matter. What goes right might be due to Demiurgic intellect or else to human intellect planning wisely. Whatever regularly and repeatedly goes wrong, however, can only be due to human rational error.

Yet if human rationality introduces the possibility of error, human beings' status as rational animals is also one of the wonders of divine creation. Throughout *UP*, Galen's emphasis is mostly on the ways in which parts show forth the craftsmanship of the Demiurge. But in the final of book

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<sup>66</sup> Galen is far from alone among Hellenistic/Imperial philosophers in posing questions about whether human generation falls under the supervision of human reason (or of nature. For instance, a report by Nemesius claims that the Stoic Panaetius transferred the power of reproduction from *psykhē* to *physis* (Nemesius, *De Natura Hominis* 72, 9-11). Nemesius himself agrees with Panaetius' reassignment (Nemesius, *De Natura Hominis* 85, 23-25), observing that male ejaculation and the desire for sex are involuntary (although the act of sex itself, *synousia*—Nemesius clarifies—is voluntary). The line of argument in Nemesius is indicative of the difficulty picking apart the rational/voluntary and natural/involuntary aspects of generation. There is also a well-known, particularly chilling piece of reasoning in Soranus concerning nonconsensual intercourse. Soranus suggests that the very fact that a woman was able to have sex must imply that she voluntarily desired it even if her moderation (*sōphrosunē*) obscured that urge (Soranus, *Gynecology* I.37). I suspect that Soranus is an important source for much of Galen's thinking about agency, intercourse, and reproduction in these passages. What seems to me interestingly distinctive of Galen's approach, however, is the close entanglement of the problem of "voluntary" control over sex and "rational" control over sex. In, for instance, *Protrepticus* I, Galen is very emphatic about the relationship between human rationality and human choice; the distinctive feature of human rationality is that, unlike non-rational animals, human beings can acquire arts by choice, not only through nature.

*UP*, he reveals a wider theological agenda. The real marvel *UP* describes, Galen explains, is the occurrence of intellect (*nous*) in the sublunary world of “mud and slime.”<sup>67</sup>

ὅπου γὰρ ἐν ἰλύϊ καὶ βορβόρῳ, καὶ τέλμασι, καὶ φυτοῖς, καὶ καρποῖς σηπομένοις ὁμῶς ἐγγίνεται ζῶα θαυμαστὴν ἔχοντα τὴν ἐνδειξίν τοῦ κατασκευάσαντος δημιουργοῦ, τί χρῆ νομίζειν ἐπὶ τῶν ἄνω σωμάτων; ἰδεῖν δὲ ἔστι νῦν φύσιν λογικὴν καὶ κατ’ αὐτοὺς τοὺς ἀνθρώπους ἐννοήσαντα, Πλάτωνα, καὶ Ἀριστοτέλη, καὶ Ἱππαρχον, καὶ Ἀρχιμήδην, καὶ πολλοὺς τοιούτους. ὁπότε οὖν ἐν βορβόρῳ τοσοῦτῳ (τί γὰρ ἂν ἄλλο τις εἴποι τὸ συγκείμενον ἐκ σαρκὸς, αἵματός τε καὶ φλέγματος, καὶ χολῆς ξανθῆς καὶ μελαίνης;) ἐπιγίνεται νοῦς περιττός, πόσῃν τινὰ χρῆ νομίζειν αὐτοῦ τὴν ὑπεροχὴν εἶναι καθ’ ἥλιον, ἢ σελήνην, ἢ τινα τῶν ἀστέρων;

It is reasonable to suppose that the intelligence dwelling in [the moon and stars] is as much better and more perfect than that in earthly bodies as their bodily substance is the purer. For when in mud and slime, in marshes, and in rotting plants and fruits animals are engendered which yet bear a marvelous indication of the intelligence constructing them, what must we think of the bodies above? But you can see rational nature in man himself when you consider Plato, Aristotle, Hipparchus, Archimedes, and many others like them. When a surpassing intelligence comes into being in such slime—for what else would one call a thing composed of flesh, blood, phlegm, and yellow and black bile?—how great must we consider the pre-eminence of the intelligence in the sun, moon, and stars?<sup>68</sup>

This passage moves quickly between two ways in which intellect is manifest in the sublunary world. The first is familiar from across all of *UP*. The intellect of the Demiurge is responsible for the form and function of the parts of the body, which “show forth his craftsmanship.” But the allusion to Plato, Aristotle, Hipparchus, and Archimedes suggests a different way in which intellect appears in our world of humors and slime: in human reason and its most outstanding practitioners.<sup>69</sup> The rational natures of Plato, Aristotle, Hipparchus, and Archimedes manifest the

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<sup>67</sup> For recent discussions of the appearance of intellect in the sublunary world at the close of *UP*, see Hankinson 2021; Hankinson 2022.

<sup>68</sup> *UP* 17.1 [Helmreich II, 447] K 359; trans. May 1968, 730. May translates *physin logikēn* as “the nature of the intelligence”; I have tried to bring out the force of *logikēn* as rational by my translation. Helmreich, however, athetizes *logikēn*.

<sup>69</sup> On the close similarities between the divine intellect responsible for formation and the human intellect (specifically, that both are irreducible to the movements of matter), see Havrda 2017.

appearance of divine intellect in the sublunary world, like the clockwork functioning of breasts and uteri.<sup>70</sup> Poorly timed conception is a small price to pay for the existence of rational animals.

There is, however, an important difference between these two manifestations of intellect in the sublunary world. Whereas matter is not an obstacle but as a collaborator in divine design, it is an obstacle to the perfection of human intellect. As Galen put it, at the close of the colonist passage: “nature knows, I think, that the substance from which she created [animals] does not allow of precise wisdom” (γνώσκουσα γὰρ, ὡς οἶμαι, τὴν οὐσίαν, ἐξ ἧς ἐδημιούργησεν αὐτὰ, μὴ προσιεμένην ἀκριβῆ σοφίαν). To the extent that intellect and matter do come into explicit tension, then, it seems to be especially with respect to the quality of human rationality (particularly, in its dealings with the human body), not with respect to the formation of bodies. To return to the farmer analogy, the problem for the divine designer is not wetness as such, but the human farmer’s inept management of his own wetness. At once farmers and soil, human beings are material intellects, error-prone rational animals saddled with a non-ideal relationship to the material motions of their own bodies.

To summarize, in Galen’s teleological works, species heredity (species differentiation and immortality) is one of the most important achievements of divine design. Below the level of the species, there are errors of the craftsman and within reasonable bounds variations in connate matter. Neither of these pose serious problems of theodicy. But the heart of the problem—a range

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<sup>70</sup> I do not think that Galen thinks one of these is so clearly better that it should replace the other: e.g. that all uteri should be supremely rational animals like Plato, or that it would be better if Plato were a uterus. Still, it worth noting that there are many places in his writings where Galen expresses an anxiety concerning the superiority of the intellect responsible for formation over human beings’ own rational intellect—particularly in their respective dealings with human bodies. The divine formative intellect seems to possess clearly superior understanding of the human body. The most famous passage making this point is the concluding aporia of Galen, *Formation of the Fetus* 6, 31-34 (K 700-702).

of cases which Galen's contemporaries by and large understand as bad intergenerational resemblance, the material transmission of undesirable *pathē* (associated with *akairos* generation)—Galen wants, in *UP*, to reread through the heuristic of error and rational agency, and thus to justify in terms of human beings' rationality. Sweeping up these cases of bad heredity, he reimagines them as cases of errant rational agency. Unlike excellence in philosophy or mathematics, this kind of rational agency is visible not so much in what human beings choose to do as in what they fail to know and fail to do, in their lapses and forgetfulness of regimen.

#### IV. Conclusion: The Transmission of Fault

Thus, the most extreme solution that Galen offers to bad heredity as a problem of theodicy is to understand it through the lens of the broader problem of human rational agency, which belongs in the natural world because—whatever its pitfalls—it is in its own right a manifestation of intellect in the sublunary world. Galen's reimagining of bad heredity as rational error vastly increases the scope of human beings' responsibility for their future offspring's health and well-being. As Philip van der Eijk notes, in one of few discussions of the farmer-parent passage, "Galen [suggests]... that it is humans who are, to a very large extent, responsible for their own, or their children's, health problems."<sup>71</sup> Plato in the *Timaeus* offers a version of this view, observing that "those giving birth are to blame more than those who are born" (*Timaeus* 87b).<sup>72</sup> But Galen goes a step further in *UP*. He gives human parents a significance so marked that they approach Plato's Young Gods. In practice, Demiurge and matter have a third, error-prone partner in creation: the rational agencies of human parents.

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<sup>71</sup> van der Eijk 2014, 100 29n

<sup>72</sup> See Boys-Stones 2007, 42 for discussion of this passage, in the context of Plato's views of inherited character as a whole.

To return to Plutarch and Hesiod, the problem of the transmission of fault motivates Plutarch's sweeping account of the offspring's responsibility for their ancestors' wrongdoing in *De Sera*. The problem of the transmission of fault motivates, for Galen, a sweeping account of the responsibility of ancestors for their offspring. In different but related ways, for each of these authors the case of the transmission of fault troubles any straightforward concept of personal agency and responsibility, even in a just, divinely governed world. The transmission of fault forces attention to the fact that human *embodiment* blurs the boundaries of personal responsibility, implicating human beings in expansive, but specific, forms of responsibility for the lives, the actions, and even the forgetfulness of particular others.

I close by returning to the problem of medicine and theology with which I opened this paper. In his magisterial tome on the Greek tradition of ancestral fault and theology, Renaud Gagné offers extensive discussion of Plutarch's *De Sera* as the central philosophical engagement with the concept of ancestral fault in ancient Graeco-Roman thought.<sup>73</sup> Medicine, however, only appears only once in Gagné's book—and it is modern, not ancient medicine. In an opening anecdote about the continuing importance of heredity in the modern world, Gagné reminds readers that their doctors probably ask them their parents' and grandparents' medical history.<sup>74</sup> One implication of this observation seems to me to be that the afterlife of the ancient theology of ancestral fault is the modern science of heredity. This way of mapping medicine (as modern) and theology (as ancient) is not so different from E.R. Dodds' observation that in Euripides "heredity...takes the place of the Aeschylean Ancestral curse."<sup>75</sup> The assumption that there is a one-way road from theology to

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<sup>73</sup> For the ancient tradition of "ancestral fault," see (inter alia) Glotz 1904; Gantz 1981 (on Aeschylus); Lloyd Jones 1983; West 1999 (endeavoring to dismantle the scholarly understanding of "ancestral fault"); Parker 2003 (on "miasma"); Dodds 2004; Sewell-Rutter 2007; Gagné 2013.

<sup>74</sup> Gagné 2013, 1-2

<sup>75</sup> Dodds 1994, 99.

medicine—whether in the fifth century (Dodds) or between the ancient and modern worlds (Gagné)—is part of what I hope to complicate in this paper, suggesting instead that there is a continuing dynamic exchange between medicine and theology, giving shape to the problem of “the transmission of fault” already in ancient thought. Gagné’s book offers up a brilliant history of the concept of ancestral fault, parametrized in one way, as a problem of theology. But there is a different story to be told about the partly intersecting problem of *the transmission of fault* I have sketched out here: as an embodied anxiety, medical and theological, about the ways that the body, by the circumstances of its creation and continuing survival, implicates a person in forms of responsibility and obligation and suffering and punishment that have very little to do with their conscious actions, and much more to do with the actions or the lapses of others.



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