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The Reproduction of Species: Humans, Animals and Species Nonconformity in Early Rabbinic Science*

Abstract: Tracing an early rabbinic approach to the human, this article analyzes how the Tannaim of the Mishnah and Tosefta set the human side by side with other species, and embedded their account within broader considerations of reproduction, zoology and species crossings. The human here emerges at the intersection of menstrual purity law and Temple sacrificial law in the tractates of Niddah and Bekhorot and is part of a reproductive biology that sought to determine the boundaries and overlaps between species. This rabbinic biology ought to be understood amid ancient conversations about what constitutes a proper member of a species, in terms of reproduction, resemblance and variation. The article shows how, even as it disavows genealogical links between humans and animals (and indeed across other species), rabbinic reproductive biology nonetheless implicates humans among and as animals.

Key words: Rabbinic science of reproduction; likeness; bodily variation; species.

Introduction

The idea in Gen 1:26 of humans as created "in the image of God" has loomed large in Jewish and Christian discourse. In the realms of theology, philosophy, and politics, the *tselem elohim* retains its potent ability to underpin diverse and contradictory "Judeo-Christian" positions. The divinizing

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notion of the human is enlisted to call for both inclusion and exclusion on the basis of variation across sexuality, gender, animality, race, and (dis)ability. Examples abound: from the Jubilee Vatican Committee's statement on people with disabilities,[1] to the United Church of Christ calling for support for the Black Lives Matter movement;[2] from Ted Cruz inveighing against same-sex marriage,[3] to an Orthodox Jewish rabbi advocating for the inclusion of LGBT people;[4] and from Barack Obama urging for health justice,[5] to the second principle of the Texas Republican Party's Platform, which establishes the sanctity of "innocent human life … from fertilization to natural death."[6]

While being dubbed an image of God (*tselem elohim*) may endow certain entities (e. g., zygotes) with "sanctity," exclusion from this category (on the basis of animalized, raced, gendered, sexed or disability-related variation) may result in naturalized violence.[7] Hitler's *Mein Kampf* described Jews as "an embodied protest against the aesthetics of the image of God."[8] Condemning the offspring of interracial marriage, it called for "images of God and not deformities half man and half ape."[9] Here, the *imago dei* undergirds racial purity and is set against disabled, animalized and racialized others.

In these examples, the logics of *tselem elohim* link or oppose quite different entities (from reproductive material to non-humans to LGBTQ people) in multivariate ways. These cases vividly display the material consequences for life, death, disposal and value when we set the human over other entities, or describe certain entities as non-human, animal or "mere" material. The hierarchical binary of human and non-human based in *tselem elohim* finds

1 www.vatican.va/jubilee_2000/jubilevents/jub_disabled_20001203_scheda5_en.htm.

2 See www.ucc.org/justice_racism_black_lives_matter; also "Black Lives Matter Imago Dei" t-shirts of Black Campus Ministries, www.newengland.intervarsity.org/swag.

3 See www.christianpost.com/news/marriage-was-gods-idea-and-he-will-preserve-it-with-or-without-us-ted-cruz-asks-pastors-to-preach-pray-against-gay-marriage-137927.

4 Harvey Belovski, www.keshetuk.org/uploads/1/3/8/6/13861493/keshetuk_factsheet_denominations_a3spreads.pdf.

5 See www.obamawhitehouse.archives.gov/the-press-office/2015/06/09/remarks-president-catholic-health-association-conference.

6 See www.texasgop.org/wp-content/uploads/2016/01/PERM-PLATFORM.pdf.

7 E. g., toward animals; see Peter Singer, "Prologue, Ethics and the New Animal Liberation Movement," *In Defence of Animals*, ed. Peter Singer (Oxford: Blackwell, 1985) 2–3.

8 Adolf Hitler, *Mein Kampf*, trans. Ralph Manheim (Boston: Houghton Mifflin, 1998) 178.

9 Hitler, *Mein Kampf*, 402. Compare Mel Chen, *Animacies* (Durham: Duke University Press, 2012) 89–126, on John Austin's discussion of marriage (which, without a speech act, would be "a mockery, like marriage with a monkey," 94) and the racialized, heteronormative connotations therein.

support in a long tradition of commentary that upholds a transcendent notion of the divine, with corollary dualisms of humanity and animality, heaven and earth, soul and body, mind and matter, and man and woman.

We find cautions against uncritical humanisms, related to some of the problems in the foregoing examples, in posthumanist scholarship, animal studies, feminist science studies, disability studies and feminist new materialisms.[10] In differing ways, these scholarly and philosophical approaches tend to de-emphasize the kinds of dualisms just mentioned (including those of agency/passivity; living/dead; human/non-human), while re-centering or blurring the differences between human and non-human.[11] In Jewish studies scholarship, we find a more recent modulation of an earlier tendency to go to rabbinic notions of the human solely for "high" or spiritualizing (and self-congratulatory) reflection on the *tselem elohim* and to cast the *tselem elohim* as a distinctive contribution to humanity's self-conception.[12] This has been effected partly by not shying away from the implications of the notion of the divine body.[13] Yet, even these more materialist versions give an embodied twist to what is nonetheless a species-exclusive approach to the human.[14]

10 See, e. g., Chen, *Animacies*; Rosie Braidotti, *Posthuman* (Cambridge: Polity Press, 2013); Cary Wolfe, "Human, All Too Human," *PMLA* 124, no. 2 (2009) 564–575; Mira J. Hird, "Biologically Queer," in *Ashgate Companion to Queer Theory,* ed. N. Giffney and M. O'Rourke (Aldershot: Ashgate Press, 2009) 347–362; Diana Coole and Samantha Frost, eds., *New Materialisms* (Durham: Duke University Press, 2010); Donna Haraway, *When Species Meet* (Minneapolis: University of Minnesota Press, 2007).

11 On non-human entities, such as bacteria, and their enfolding within the human, see, e. g., Myra Hird, "Animal Transex," *Australian Feminist Studies* 21, no. 49 (2006) 35–50, and Jane Bennett, *Vibrant Matter* (Durham: Duke University Press, 2010) 12, 23, 48, 112, 120. Braidotti considers the possibilities in the techno-scientific present, which "writes hybridity into our social and symbolic sphere and as such it challenges all notions of purity"; *Transpositions* (Polity, 2006) 99.

12 E. g., Alexander Altmann, "'Homo Imago Dei' in Jewish and Christian Theology," *Journal of Religion* 48 (1968) 235–259; Yaakov (Gerald) Blidstein, "Great Is Human Dignity," *Shenaton ha-Mishpat ha-Ivri* 9–10 (1982–83) 127–185.

13 E. g., Yair Lorberbaum, *In God's Image* (New York: Cambridge University Press, 2015); Rachel Neis, *The Sense of Sight in Rabbinic Culture: Jewish Ways of Seeing in Late Antiquity* (Cambridge: Cambridge University Press, 2013); Daniel Boyarin, "Gender," in *Critical Terms for Religious Studies*, ed. Mark C. Taylor (Chicago: University of Chicago Press, 1998) 117–136; Jonathan W. Schofer, "The Image of God," *Journal of the Society for Textual Reasoning* 4/3 (2006); Alon Goshen Gottstein, "The Body as Image of God in Rabbinic Literature," *Harvard Theological Review* 12 (1996) 137–162.

14 However, Schofer finds the rabbis disrupting expected, hierarchical binaries of beast/angel as residing in the body of the human. See Jonathan W. Schofer, "The Beastly Body in Rabbinic Self-Formation," in *Religion and the Self in Antiquity*, ed. D. Brakke, M. L. Satlow and S. Weitzman (Bloomington: Indiana University Press, 2005) 197–221.

I seek to offer an alternative: tracing an early rabbinic approach to the human, I show how the Tannaim set the human side by side with other species and consider a range of bodily variation. They embed this account of humans and other species in broader considerations of reproduction, embryology and zoology. What emerges is a thinking about humanness through a rabbinic "biology" that seeks to determine the boundaries and – more importantly – the overlaps between species. This rabbinic biology partakes in ancient conversations about what constitutes a proper member of a species, in terms of reproduction, resemblance and variation.

The evidence for a cross-species and bodily-variant account of the human clusters in the tractates Niddah and Bekhorot.[15] While the sources in Niddah treat the human fetus amid various materials emitted from a woman's uterus, those in Bekhorot discuss variant human and non-human animal bodies. Both tractates consider cases of cross-species offspring.[16] In making the case for a broader "rabbinic biology," I show how these two sets of deliberations are profoundly interrelated, just as they are in Aristotle and Galen. This allows us to side-step some noted contemporary reflexes (as related to liveness, death and reproductive politics).[17] And by drawing on classical rabbinic thought, I hope to upend the facility with which the so-called Judeo-Christian tradition is often rhetorically deployed.

I begin by laying out some of the stakes in ancient "scientific" conversations about "generation" and briefly consider ancient science and rabbinic literature in light of critical and feminist science studies.[18] I then turn to the

15 I cite the Mishnah according to *Shishah Sidre Mishnah*, ed. H. Albeck (Jerusalem: Mosad Bialik, 1957–59) and the Tosefta according to *Tosefta Kifeshuta*, ed. Saul Lieberman (New York: Jewish Theological Seminary, 1962) or *Tosephta*, ed. M. S. Zuckermandel (Jerusalem: Wahrman, 1970).

16 By "cross-species" offspring, I refer to cases where two parents of species X delivers an entity that resembles species Y. These are entities whose species-appearance is *de novo* and does not derive from their parents. By "interspecies" offspring, I refer to the offspring of two different species (species X and Y) that manifests hybrid features (X and Y) or resembles the male parent (Y) (the rabbinic term for such entities is *kil'ayim*). Interspecies and cross-species offspring may look the same.

17 On the mixed effects of life-centered rhetoric, anthropocentric individualism and the "technologically bio-mediated" present, see Braidotti, *Posthuman*, 105–42.

18 The term "generation" conveys the ancient meanings of creating, bearing, and begetting implied in Greek, Latin, (*gennao* and *generare*) and Hebrew (y-l-d). These can refer to male or female dimensions of procreation (e. g., Gen 4:1 and 5:3) and beyond (e. g., Gen 2:4, heaven and earth). Daryl McGowan Tress notes "the contrast between modern concepts of reproduction leaning on metaphors of production and manufacture of artifacts, and the ancient focus on procreation and begetting of living things as a process which occurs in a larger natural nexus"; D. M. Tress, "Metaphysical Science of Aristotle's *Generation of Animals*," in *Feminism and Ancient Philosophy*, ed. Julie

sources in Niddah and Bekhorot, focusing on their shared concerns with creaturely classification, as part of a broader rabbinic reproductive biology. I close with a discussion of two key instances in these tractates where attempts to distinguish the human founder, arguing that, even as it disavows genealogical links between humans and animals, rabbinic reproductive biology implicates humans among and as animals.

1. Ancient reproductive science

1.1. Sources from Antiquity

The author-compiler of *Problems*[19] has a strict criterion by which he assesses materials that emerge from the human body: likeness.[20] Deviations are not offspring, making uterine entities "called monsters" born of "corrupted seed" the same as "worms" generated by excrement.[21] Only "uncorrupted seed" produces something that "comes to be naturally like" the source: "if from a horse, a horse; if from a human, a human."[22] Materials are thus distinguished by their derivation or deviation from the right kind of material, which is what ensures a strictly mimetic likeness, whether in terms of species identity (human or animal) or able-bodiedness (the same, or a monster).

K. Ward (New York: Routledge, 1996) 33 (and see 32). On the emergence of the concept of "reproduction" in the mid-19th century (and its association with mechanized replication) instead of "generation," see Nick Hopwood et al., "Introduction: Communicating Reproduction," *Bulletin of the History of Medicine* 89 (2015) 380, 384.

19 Pseudo-Aristotle, *Problems,* ed. and trans. Robert Mayhew (Loeb Classical Library [LCL]), vol. 316).

20 See Daryn Lehoux, "Why Doesn't My Baby Look Like Me?" in *Probabilities, Hyoptheticals, and Counterfactuals in Ancient Greek Thought*, ed. Victoria Wohl (New York: Cambridge University Press, 2014) 208–229. Scholars consider *Problems* to contain the work of more than one author and to have been redacted in late antiquity. See Ps. Aristotle, *Problems* 4, 878a 1–4: "Why, if the animal is born from our seed, is it our offspring, but if it comes from some other part or excretion, it is not ours? For many things come to be from what is putrefying as well as from seed. So why, then, if something is like us, is it more our own, but if it is like another, it is not?"

21 See Ps. Aristotle, *Problems* 4, 878a 20–24; Lehoux, "Baby," 210.

22 Ps. Aristotle, *Problems* 4, 878 a1–3 and 878a 20–28. Compare these questions and distinctions to t. Bekhorot 1:5–13, whose topics range from classifying cross-species births to excretions and varieties of nested entities (e. g., honey from bees, to fish eggs within the fish, to fish swallowed by other fish). Cf. Aristotle's repeated maxim "the human generates the human" and D. M. Balme, "*Anthropos anthropon gennai,*" in *Human Embryo* (University of Exeter Press, 1990) 20–31.

Not all ancient thinkers took such a hard line. Aristotle, whose single-seed theory of generation continued to be influential in late antiquity, in some ways had a tighter notion of what likeness should consist: resemblance to the male parent.[23] Deviations from this, beginning with female progeny, were steps toward monstrosity,[24] but even extreme dissemblance – a delivery that "no longer has the appearance of a human being at all, but that of an animal only" – was still properly called offspring.[25] For Aristotle, resemblance was tied to male seed: male seed acted upon female matter (blood), imparting form to it, and it was the failure of the seed to master the material that caused deviation.[26] We see how gender, animality, disability and materiality combine in Aristotle's reproductive system.[27]

While Galen, a contemporary of the Tannaim, drew from the Hippocratic two-seed theory in which both parents contribute seed, he followed Aristotle in accepting species nonconformity as offspring and as variation within same-species reproduction.[28] Others, such as Pliny and Soranus, suggested that variation or "misshapenness," including species nonconformity,

23 Aristotle, *Generation of Animals* 767b–769b, ed. A. L. Peck (LCL, vol. 336). Compare Gen 5:3, in which Adam "begets" a son in his image and likeness (no Eve, no "male and female" entity per Gen 1:26).

24 Aristotle, *GA* 767b 8–10.

25 Aristotle, *GA* 769b 8–11 (and 767b 5–7). The animal (*zōon*) is more general than the more individual characteristic of human.

26 See E. Bianchi, who argues that an active/passive dualistic hierarchy for Aristotle's theory of generation overlooks the role of "unruly" female matter which (necessarily) disrupts the reproductive process; *Feminine Symptom* (New York: Fordham University, 2014).

27 On this section of *Generation of Animals* as "the founding association of femaleness and disability," see Rosemarie Garland Thomson, *Extraordinary Bodies* (New York: Columbia University Press, 2017) 19–20, 27–28. See also her "Integrating Disability, Transforming Feminist," *NWSA* Journal 14 (2002) 1–32, in which she argues that "feminist disability theory presses us to ask what kinds of knowledge might be produced through having a body radically marked by its own particularity, a body that materializes at the ends of the curve of human variation" (20) and shows the links between "medicalization" and aesthetics (10–12).

28 See Michael Boylan, "Galen's Conception Theory," *Journal of the History of Biology* 19 (1986) 47–77; see p. 67 on female matter (in addition to seed) conferring features and species identity, per Galen, *On the Seed* 2.2. Galen, Aristotle and others thought through human reproduction in parallel to animal reproduction, assuming parallels between animal and human systems; see Wilberding, "Embryology," *Companion to Science, Technology, and Medicine in Ancient Greece and Rome*, ed. Georgia L. Irby (LOC: Wiley Blackwell, 2016) 331. In *Usefulness of the Parts of the Body* 3.1, Galen rejected the possibility of centaurs (horse-human hybrids) due to the impossibility of humans and horses successfully reproducing.

was the result of sense-impressions during conception.[29] Vision thus interrupted processes of generation as replicating likenesses, introducing instead "mimetic dissemblance."[30] In Soranus' example, women who gazed at monkeys during conception delivered monkey-like infants.[31]

Another explanation for species nonconformity was inter-breeding. While admitting that bodily variation including species nonconformity or hybridity occurs, Aristotle and Galen denied that these creatures were the outcome of inter-breeding (due to gestational differences): such cases were "resemblances only."[32] Pliny was ambiguous, citing both individual and racial cases of animal-human hybridity in his discussions of "monstrous" births and "monstrous races," including one report of offspring born to Indians who mated with animals.[33]

These samples of late ancient theories of reproduction all revolve around a fixation on resemblance (or "mimetic dissemblance"), though they differ on how likeness comes to be and on how to explain and classify dissemblance. Their thinking through of these processes not only crosses issues of gender and (dis)ability (or "monstrosity"), but also dovetails with those regarding species identity and race. As we will see, the Tannaim entertained similar concerns about likeness and variation, but were far less preoccupied with seed or the mechanics of generation. This is in contrast to later rabbinic texts.[34] In Tannaitic sources, we find few references to the notion

29 See Soranus, *Gynecology*, 1:39 and 1:47. In his edition, Owsei Temkin (Baltimore: Johns Hopkins University Press, 1994) 37–38 and 48 renders both *kakamorphos* and *amorphos* as "misshapen." Soranus just mentions women; Pliny, *Natural History* 7.52 refers to either parent's sensory impressions. Versions of this idea can be found in Heliodorus, *Aethiopica* 4.8; Galen, *De hist. phil.* 116 and *De Theriaca ad Pisonem*. See Rachel Neis, *Sense of Sight*, 36, 39, 131–137, 159–166 (and sources there).

30 See Éric Michaud, "Potent Image," *Res: Anthropology and Aesthetics* 65–66 (2015) 364–374.

31 Soranus, *Gynecology*, 1:39.

32 Aristotle, *GA* 769b18–19.

33 Examples of "races": Pliny, *Nat. Hist.* 7:23 and 7:30; examples of individual cases: *Nat. Hist.* 7:32–34, women who birthed elephants or snakes, and hybrid births (such as a hippocentaur, whose body Pliny viewed). See Mary Beagon, *The Elder Pliny on the Human Animal: Natural History, Book 7* (Oxford: Clarendon Press, 2005) 46–47.

34 E. g. Leviticus Rabbah 14:6, 9; y. Kila'im 8:4, 31c; b. Niddah 31a–b: These later sources name three "partners" who contribute different elements to the fetus: human female, male, and God. Gwynn Kessler treats primarily Amoraic sources on embryology, contextualizing them in light of Greco-Roman gynecology and embryology while arguing that the Amoraim used embryos to think through Israel's relationship with God (*Conceiving Israel*, 77–126). She also notes how Leviticus Rabbah 14 elevates God's role in procreation but "disassociates sexual intercourse," parents and reproductive fluids from it (123). See also Reuven Kipperwasser, "'Three Partners in a Person,'" *lectio difficilior* 2 (2009). Sources such as Genesis Rabbah 26:7; b. Nedarim 20a, b; Gittin 58a, b; Bava

that humans owe their origin to a "drop," a reference to male seed.[35] In the most elaborate text we find echoes of Aristotle, but instead of the male seed actively imprinting the female material with form, the only player is God, who works male seed into a fetus that has "his father's form."[36] Besides these few exceptions, Tannaitic texts embed considerations of likeness and variation of offspring into the sources in Niddah and Bekhorot discussed below, which focus far more on the shape and features of the offspring itself.

1.2. Situating science

When situating Niddah and Bekhorot alongside ancient scientific, philosophical and other genres of Greek and Latin thought, and in staking out a rabbinic biology, I do so in light of insights from feminist and critical science studies and history of science.The former have taught us to unpack claims of authority, neutrality and objectivity in modern science. Historians of science, and scholars of ancient Greek and Latin sources among them, have critiqued anachronistic and narrow understandings of science that restrict its domain to what is now considered scientific, and instead expand the field to encompass "the whole industry of ancient knowledge-ordering."[37] Whereas moderns might separate law from medicine, "ancient writers clearly thought about all of these bodies of expertise as part of a spectrum of different fields of knowledge."[38] Thus, rather than aspiring to a

Metsia 84a consider visual impressions on the fetus. See further, Neis, *Sense of Sight*, 129–35, 154–55.

35 These are m. Avot 3:1 (*tipah serukhah*, "a putrid drop"); Midrash Tannaim on Deut 32:2 (*tipah shelzenut,* "a drop of promiscuity"); and Mekhilta deRabbi Ishmael, Beshallah, 8 (*tipah shel mayim,* "a drop of water"). The more common "emission of seed" (*shikhvat zerah*, Lev 15:16) in Tannaitic sources is not explicitly related to reproduction (e. g., m. Niddah 4:1; t. Niddah 2:8–9; t. Zavim 2:4, 6); some sources talk of it being discharged by a woman (e. g., m. Miqvaot 8:4).

36 Mekhilta deRabbi Ishmael, Beshallah, 8; cf. Mekhilta deRabbi Shimon bar Yohai 19 and 20. Not only is the male parent's role taken over by God, but no mother is mentioned (see Kessler, *Conceiving Israel*, 14–16, 78, 82, 104).

37 On "science" across genres, see Emma Gee, "Greece and Rome," in *Routledge Companion to Literature and Science*, ed. Bruce Clarke and Manuela Rossini (London: Routledge: 2011) 409–422. On the mismatch of modern distinctions between science and other subjects for analyzing ancient knowledge-production, the interlacing of "theology" and "science," and interpreting "all those silly monsters" in ancient Roman sources, see Daryn Lehoux, *What Did the Romans Know?* (Chicago: University of Chicago Press, 2014) 8–15.

38 Jason König, "Self-Assertion and Its Alternatives in Ancient Scientific and Technical Writing," in *Authority and Expertise in Ancient Scientific Culture*, ed. Jason König and Greg Woolf (Cambridge, 2017) 3. A similarly expansive approach to knowledge

positivist, evaluative or teleological account of rabbinic "sciences" that seeks either to restore them to a reified canon of ancient science or to reject them as unworthy participants because of their religious nature, I join those who are opening up what can be included in the realm of "science" and various forms of knowledge production.[39]

Historicizing science goes hand in hand with the investigation of the gendered, social and political contexts of knowledge-making. Thus, the encyclopedic genres of knowledge in Pliny's *Natural History* can be understood within the contexts of Roman imperialism.[40] It is possible to similarly approach the political, social and gendered contexts of rabbinic content without simply going to Greco-Roman sources to fill in the gaps in the more laconic Tannaitic sources, or viewing the rabbis as "influenced" rather than as engaged.[41] We may then take seriously the discursive contexts and forms of rabbinic science, even – or especially – if they are rather different from those in Greco-Roman writings. Instead of evaluating rabbinic writings by juxtaposition to "canonical" scientific sources and concluding that the former contain rabbinic rulings (*halakhah*) rather than science (or that the science is incidental rather than significant), we may ask what impact rabbinic forms have on the content itself.[42] Part of answering this question

making, particularly of "natural philosophy," is taken in Lehoux, *Romans*. For nuanced considerations on the difficulties with using modern "science" to write about ancient sources, see Markus Asper, *Writing Science* (Berlin: De Gruyter, 2013) 4–5, and Roger French, *Ancient Natural History* (London: Routledge, 1994) x–xiii.

39 For two among many examples of laudatory or apologetic evaluation of rabbinic science, see Samuel Kottek, "Medicine in the Talmud," in *Encyclopaedia of the History of Science, Technology, and Medicine in Non-Western Cultures*, ed. Helaine Selin (Dordrecht: Kluwer Academic, 1997) 714–17, and Norman Solomon, "Natural Sciences in Judaism," *Encyclopedia of Sciences and Religions*, ed. Anne L. C. Runehov and Lluis Oviedo (Dordrecht: Springer Netherlands, 2013) 1404–1414. For an important corrective to such approaches, alongside a historiographical and methodological reflection, see Annette Reed, "'Ancient Jewish Sciences' and the Historiography of Judaism," in *Ancient Jewish Science and the History of Knowledge in Second Temple Literature*, ed. Jonathan Ben-Dov and Seth Sanders (New York: New York University Press, 2014) 195–254.

40 See Trevor Murphy, *Pliny the Elder's* Natural History (Oxford: Oxford University Press, 2004), and Jason König and Tim Whitmarsh, *Ordering Knowledge in the Roman Empire* (Cambridge: Cambridge University Press, 2007).

41 *Pace* Giuseppe Veltri, "On the Influence of 'Greek Wisdom'," *Jewish Studies Quarterly* 5 (1998) 300–317. Thanks to Peggy McCracken for helping me think through some of these issues.

42 Rabbinic "sciences" are often described as fragmentary, incidental or subordinate to the real purpose of halakhic determinations; see, e. g., Markham Geller, *Akkadian Healing Therapies in the Babylonian Talmud* (Max Planck Institute for the History of Science no. 259; Berlin, 2004) 4; Kottek, "Medicine;" Solomon, "Natural Sciences." The contrast

involves considering the political situation of the rabbis who were making the science of human and animal reproduction their own in both Roman and Jewish social contexts. And considerations of gender are bound up with these contexts, not least when considering the politics of reproductive science.

1.3. Feminist Science Studies

Charlotte Fonrobert has modelled how one might undertake this kind of analysis, in her study of the tractate of Niddah as a "science of blood" alongside Greco-Roman gynecological theories, while attending to the ways in which rabbinic concerns about purity and gender substantively shape this science.[43] She and Gwynn Kessler have shown how the rabbinic "sciences" of menstruation and embryology encode gendered notions of bodies, Jewishness and divinity.[44] My investigation of the science related to uterine contents and reproduction complements their work. Their attention to how rabbis built their authority by inventing a science of blood and gynecology (Fonrobert), and how they elided women in favor of developing fetuses as a theological model (Kessler), moves us here to consider how the rabbis built a science of species on the reproductive materials of women and animals (while maintaining the elision of the female reproductive body).

Unlike Fonrobert and Kessler, I do not focus solely on human cases: my argument is precisely about the strong links – and potential overlaps – between human and animal reproductive biology (of which uterine entities in Niddah are only a part). While the rabbis undo species separatism in their consideration of cross-species possibilities – a move that feminist science studies and queer and transgender studies scholars such as Donna Haraway, Myra Hird and Eva Hayward might embrace – the rabbis' linking of women's uterine contents to animal reproduction does not, of course,

Geller and others draw between science in rabbinic literature as "purely coincidental and serendipitous" and the "full medical text" in Greco-Roman sources oversimplifies tractates like Niddah, Bekhorot and Kil'ayim, in which gynecology, embryology, and zoology are purposefully germane. The concerns of purity law, temple offerings, farming and dietary laws framing such material are important but not oppositional.

43 See Charlotte Fonrobert, *Menstrual Purity* (Stanford: Stanford University Press, 2000) 103–127.

44 Fonrobert, *Menstrual Purity*; Gwynn Kessler, *Conceiving Israel* (Philadelphia: University of Pennsylvania Press, 2009). On Greco-Roman medicine, authority and gender, see, e. g., Helen King, *Hippocrates' Woman* (London: Routledge, 1998), and Rebecca Flemming, *Medicine and the Making of Roman Women* (Oxford: Oxford University Press, 2001).

mean that considerations of gender and other political contexts must fall away.[45] Part of our considering the social, racial and political shaping of rabbinic knowledge formation about humanness, bodily variation, animality and reproduction, entails understanding how gender structures and is structured by these same enterprises.[46] Making a rabbinic science of generation through the ritual filters of *niddah* (menstruation) and *bekhorot* (firstborns) is not a neutral or casual intellectual project. Reproductive knowledge of humans and animals would have been particularly vital to the minority Jewish population; claiming its mastery is a bold move for the Tannaim.

In the case of uterine emissions and potential fetuses, the reproductive capacity of women's bodies, or failures thereof, become an occasion to formulate not only a human reproductive science but also a broader biology. The gendered, rhetorical framing that the rabbis use to "produce" humans in Niddah preserves woman as a grammatical subject ("she who expels") but tends to elide her in favor of scrutinizing her emissions. There is thus a gendered division of "labor" at the heart of the rabbinic concept of human generation: "she who expels" versus the rabbis who scrutinize the uterine product.[47] Paralleling this is the way that the reproductive science of animals

45 "Species, like the body, are internally oxymoronic, full of their own others, full of messmates, of companions. Every species is a multi-species crowd. Human exceptionalism is what companion species cannot abide"; Haraway, *When Species*, 165. For different ideas about generation, regeneration, contagion and interspecies possibilities, see also Haraway, *Companion Species Manifesto* (Chicago: Chicago University Press, 2003); Myra Hird, "Animal Transex," *Australian Feminist Studies* 21,49 (2006) 35–50; Eva Hayward, "Lessons from a Starfish," in *Queering the Non/Human*, ed. Noreen Giffney and Myra J. Hird (Burlington: Ashgate, 2008) 249–263.

46 On race and bodily variation, see Maja Kominko, "Monsters and Barbarians in Late Antiquity," in *Routledge Handbook of Identity and the Environment in the Classical and Medieval Worlds*, ed. Rebecca Futo Kennedy and Molly Jones-Lewis (London: Routledge, 2016) 373–389; also Robert Garland, "Invention and Application of Racial Deformity," in Kennedy and Jones-Lewis, *Identity and the Environment*, 45–61. On the imperial (bio)politics of scientific knowledge, see Susan Mattern, *Prince of Medicine* (New York: Oxford University Press, 2013) 30 (child mortality), 120–6 (Roman demographics). Fonrobert shows how uterine blood science operates beyond gender, to further rabbinic conceptions of Jewish (e. g., rabbinic, Samaritan), para-Jewish (e. g., Samaritan) and non-Jewish identity; "Blood and Law," *Henoch* 30 (2008) 243–266.

47 There are exceptions: m. Niddah 3:2 and t. Niddah 4:2 describe a female subject who submerges or crushes what she has expelled. However, t. Niddah 4:1 has plural masculine subjects tearing a fleshy mass, and t. Niddah 4:11 has masculine plural subjects immersing a fetal sac in oil, not water, by the light of the sun or tearing it (t. Niddah 4:12). In t. Niddah 4:3–4 two case reports describe rabbis referring women who expel small items to doctors in (who then affirm the Tosefta's general diagnosis – a curious case of cross-confirming expertise).

in Bekhorot arises in the context of the consumptive economies of both the Temple and humans. In other words, analyses of gender and animality come together in terms of rabbinic conceptualizations of the death (miscarriages, slaughter) and life of different kinds of uterine material.

2. Reproducing Species in Niddah and Bekhorot

In Niddah and Bekhorot considerations about reproduction are posed both in terms of creaturely classification and resemblance and in terms of cross-species deliveries.

> *m. Niddah 3:2b:* One who expels (*hamapelet*)[48] something like a kind of (*ke-min*) domesticated animal, wild animal or bird, whether pure or impure – if it is male she should sit [out the days of impurity] for a male, and if female she should sit for a female: the words of R. Meir. And the sages say: Anything that does not have something of human form is not a valid delivery.

> *m. Bekhorot 1:2a:* A cow that delivers (*sheyaldah*) something like a kind of (*ke-min*) donkey or a donkey that delivers something like a kind of (*ke-min*) horse – it is exempt from the laws of firstborn. For it is written *firstborn donkey* (Exod 34:20) and *firstborn donkey* (Exod 13:13). [This means that both] the one birthing must be a donkey, and the one born must be a donkey.

These two scenarios each envision one kind (*min*) expelling or delivering an entity that looks like another kind (whether non-living, as in the human scenario of Niddah, or living, as in the animal scenario of Bekhorot: *hamapelet* vs. *sheyaldah*).

The Niddah source is situated in a list of a variety of materials that are expelled from a woman's uterus (m. Niddah 3:1–7). Following the initial determination of whether or not some of these entities are menstrual products (per earlier chapters in tractate and m. Niddah 3:1–2a), the task here is to determine whether or not certain non-living, organic materials constitute a *valad* (a valid delivery, or offspring).[49] M. Niddah 3:2b assesses these non-living materials as possible miscarriages (i. e., non-living humans). The concern is the contraction of childbirth-related impurity by the parturient; elsewhere in Tannaitic sources, the consequences of classifying these assemblages as a non-living human relate to concerns about redemption of the firstborn, inheritance law, postpartum sacrifices or corpse-related

48 One could translate *hamapelet as* "aborts" (as in involuntary abortion).

49 *Valad* may be translated as fetus, embryo or offspring. The term can designate humans or animals. Given the context, I tend to translate as valid birth or delivery.

impurity.[50] Thus, the humanness or not of a uterine entity has ramified consequences in various realms of ritual, personal and family law.

In the text from Bekhorot, which regulates the donation of firstborn animals to the Temple, the principles are drawn from biblical conceptions of idealized, able-bodied animals, free of blemishes, as laid out in Deut 15:21–22 and Lev 22:18–25. Amidst its regulation of these animals, the tractate considers cross-species resembling births (*de novo,* rather than genuine hybrid products of interspecies breeding).[51] Its formulations about these deliveries are strongly reminiscent of those in Mishnah Niddah. The question in m. Bekhorot 1:2a is whether the delivered entity is suitable for the Temple.

The Tannaitic considerations of uterine material in Niddah do not engage with the notions of liveness and value that are often posed in contemporary discussions. The particular occasion for scrutiny – uterine material that has been miscarried – short-circuits familiar contemporary reflexes around personhood, life (or viability) or sanctity. The scenario in Niddah allows for a profoundly materialist gaze on various permutations of non-living organic substance, in order to contemplate what makes a human. This situates uterine material (as putatively human) along a continuum of other emissions, products and waste.[52] By contrast, the animal offspring discussed in Bekhorot are living, and their liveness becomes the opportunity to consider the termination of life. Thereby the animal body is naturalized as a resource, a substance that can be converted into flesh.

50 Post-partum impurity is derived from Lev 12:2. M. Bekhorot 8:1 weighs in on which uterine entities count as a firstborn for the Temple and for inheritance law. In m. Keritot 1:1–5, 8, the question is whether a woman who delivers one of various uterine entities must offer (and consume) the childbirth sacrifice. M. Oholot 7:4, 7:6 and t. Ahilot 8:1 consider the precise moment at which a live or dead fetus conveys impurity (see also t. Yevamot 9:4 and 9:9).

51 Both this tractate and Kilʿayim distinguish between interspecies offspring–offspring born of two different kinds (*kilʿayim*) – and cross-species offspring, the *de novo* delivery which resembles another kind, but is not the result of interbreeding. T. Kilʿayim 5:3 distinguishes between interspecies births that are the result of a forbidden *kilʿayim* union and cross-species offspring. On the use of *kilʿayim* offspring as *bekhor* see m. Bekhorot 1:5 and t. Bekhorot 1:13.

52 I owe this felicitous formulation to Mira Balberg.

2.1. Creaturely nomenclature and kinds

The cases in both Niddah and Bekhorot posit one species giving birth to an entity that resembles another. I argue that one must take the conceptual terminology of creaturely nomenclature and kinds in both tractates seriously and literally. Both m. Niddah 3:2 and m. Bekhorot 1:2 (and related sources) focus on creaturely classification and the naming of nonhuman animals. In the human case, a woman delivers "something like a kind of (*ke-min*) domesticated animal, wild animal or bird (*behemah, hayah, ʿof*) "whether pure or impure" (*ben tahor ben tame*). The language here draws on rabbinic zoological terminology. The Mishnah enumerates not only its tripartite categories of animal kinds, but also pure or impure animal kinds, the latter of which is shorthand for more narrowly defined "species" (within the three higher registers of classes).

Just before our text in Niddah 3, other material entities are enumerated:

> *Niddah 3:* (1) One who expels a piece, if there is blood with it, she is impure (as a menstruant), and if not she is pure. Rabbi Judah says: either way she is impure. (2a) One who expels something like a kind of (*ke-min*) peel, like a kind of (*ke-min*) barley,[53] like a kind of (*ke-min*) dust, like a kind of (*ke-min*) red flies,[54] let her put them into water. If they dissolve, she is impure, and if not she is pure. (2b) One who expels something like a kind of (*ke-min*) fish and locusts, forbidden creatures and creeping creatures, if there is blood with them she is impure, and if not she is pure.

These sets of solid material follow a discussion of liquid uterine materials of various color, hue and texture in m. Niddah 2:6–7. The passage's progression of solid uterine materials goes from smaller organic materials and entities (e. g., red flies) to larger creatures (e. g., birds), and moves along classificatory lines related to kind or species. Creaturely entities become increasingly prominent as these materials coagulate into larger forms. The attention to the materiality of uterine products – their solidity, solubility and shape – is reinforced by this progression. This attention continues into the remainder of the chapter, with its variety of materials from textured fetal

53 The word is vocalized as *seʾorah* (barley) in MS Kaufmann and MS Parma. The expression *ke-seʾorah* (like a [grain of] barley) is used to quantify a minimal volume of bone or limb that could potentially convey corpse impurity (e. g., m. Keritot 3:8, m. Ohalot 2:3).

54 Hebrew *yavkhush*. Albeck describes this as a type of water insect; Even-Shoshan defines it as a species of the mosquito family; Jastrow translates as gnat or red insect found in liquids. Lieberman does not translate; noting its obscure etymology, he glosses it "a general term for insects generated in liquids" (Saul Lieberman, "Light on the Cave Scrolls from Rabbinic Sources," *Proceedings of the American Academy for Jewish Research* 20 [1951] 396).

sacs to flattened fetuses, from placentae to variant bodies and body parts. It is further reflected and elaborated in Tosefta Niddah and other Tannaitic parallels.

The descriptions of uterine materials in m. Niddah 3:1–2 deploy standard nomenclature for non-human species that is indebted to broader rabbinic classificatory systems. For example, the pairing "fish and locusts" (*dagim ve-hagavim*) is a stereotypical rabbinic exemplum of species of a smaller size that are pure and potentially permitted for consumption.[55] Conversely the pairing, "forbidden creatures and creeping creatures" (*sheqatsim u-remasim*) functions as a Tannaitic exemplar of stereotypically impure entities whose ingestion is forbidden.[56] Also typical are the binary pairing wild animal versus domesticated animal and the ternary grouping of wild animal, domesticated animal and bird (*hayah, behemah, ʿof* – land creatures). These classes not only refer to larger creatures, but also operate on a higher classificatory register than more specific designations like red flies. Finally, m. Niddah 3:2b elaborates that the domesticated animal, wild animal or bird may be "pure or impure," which is shorthand for particular species designations. In the Bekhorot excerpt above we have three very specific animals named: cow, donkey, and horse. The tractate not only names many other particular kinds, but also considers other registers (e. g., pure and impure kinds, smaller and larger domesticated land animals). Many of these rabbinic terms for creatures and classes adopt and adapt similar terminology in the priestly portions of Genesis 1 and Leviticus 11.[57]

55 Lev 11:22 marks permitted locusts with the tag *lemineihu*, "of its kind." The rabbis often fish and locusts as a pair (e. g., t. Terumot 9:6, m. Oktsin 3:9; m. Hullin 8:1; t. Hullin 8:2; t. Nedarim 3:5; and m. Keritot 5:1) and also often contrast them with other classes of animals. For various pairings and contrasts, such as fish and locusts versus fowl and wild animals, see t. Sotah 6:8.

56 These terms are not used in the same way in the Bible, nor are they paired. Leviticus describes *sheqetsim* as forbidden for consumption but not *tame* (whereas *sherets* designates eight forbidden and *tame* species), yet *sheqets* is applied to *sherets* in Lev 11:41 and also to other creatures in Lev 11:10, 20, 23, 41–42). S; see Jacob Milgrom, "Two Biblical Priestly Terms," *MAARAV* 6 (1992) 107–16. *Remes* is the general term for creeping things or reptiles. *Sheqatsim u-remasim* appear as a pair in Tannaitic literature (e. g., m. Shabbat 14:1). The joining of these four entities together in Tannaitic sources occurs only once outside of the uterine context (Mekhilta de-Rabbi Ishmael Bahodesh 6, all mss). M. Niddah 3:2 is the only place in which this set is considered as potential menstrual material. The Tosefta makes no mention of this set, and in other parallels (m. Keritot 1:5; m. Bekhorot 8:1) these entities are ruled out as *veladot*. Sifra Tazria, Parashah 1:7 excludes these entities from transmitting childbirth impurity because they "do not have something of human form," per MS. Vatican and the other mss).

57 The rabbis' primary distinctions between wild versus domesticated animals, and sometimes also fowl, do not map onto priestly ones (land-water-heavens trinary). See,

In addition to animal classificatory nomenclature, we find the iterated use of a term that is in itself about classification: *min* (kind). The association of *min* with various registers of creaturely nomenclature is also found in the organization of animal life of Genesis 1 and Leviticus 11,[58] where it refers on the one hand to members of a group, and on the other hand to the variety or specificity of members within this group.[59] *Min* operates at various registers of generality and specificity: as with Aristotle's use of *genos* and *eidos*, *min* is logical rather than taxonomical in the modern sense.[60] The rabbis also follow this flexible usage of *min*. They regularly designate creatures within a broader class, such as a domesticated-animal kind or a wild-animal kind (*min behemah*, *min hayah*),[61] but may further specify by designating a creature as a pure or impure kind (m. Niddah 3:2b, m. Bekhorot 1:2). *Min* also features in even narrower designations, such as "fish-and-locust kind" (*min dagim ve-hagavim*, m. Niddah 3:2b) or "donkey kind" (*min hamor*, m. Bekhorot 1:2a).[62]

e. g., the trinaries in Gen 1:28 and in Gen 1:26; the usages of *hayah* and *ʿof* in Gen 1:20–21. Sometimes *behemah* is a sub-category of the broader class of *hayot* (e. g., Gen 1:24) or vice versa (e. g., Lev 1:2). See Naphtali Meshel, "Food for Thought," *Harvard Theological Review* 101 (2008) 203–229, and Beth Berkowitz, "Animal," in *Late Ancient Knowing*, ed. Catherine M. Chin and Moulie Vidas (Oakland: University of California Press, 2015) 41.

58 See Gen 1:11–25; 6:19–20; 7:14; Lev 11:14–29; Deut 14:13–18. The term *min* is used also for plant-life e. g. Genesis 1:11–12 (in Tannaitic literature see, m. Bikkurim 1:3; m. Bikkurim 3:9; Sifra Emor, 12, 17; m. Hallah 1:1, 2; m. Kilʿayim 2:1).

59 E. g., Gen 1:24–25 refers to the living creature brought forth from the land "according to its kind," and goes on to enumerate the *behemah*, the *hayah* and the *remes* "according to their kinds." A greater degree of particularity is found in Leviticus 11, in which falcon, raven, hawk, heron, locusts and more, are described as "according to their kinds" (e. g., Lev 11:14–16, 19, 22, 29).

60 See Pierre Pellegrin, "Aristotle," trans. Anthony Preuss, in *Aristotle on Nature and Living Things*, ed. Allan Gotthelf (Bristol: Bristol Classical Press, 1985) 95, in which *genos* and *eidos*, "far from being prefigurations of our notions of genus and species, do not have a *biological* sense: to understand their biological *use*, we must not lose sight of the rules which regulate their *logical* functioning." Modern taxonomists carefully use graduated terms such as order, family, genus, going all the way down to species, which are further inflected with modern notions of evolution and heredity. However, when I use the term "species" instead of "kind" in discussing rabbinic texts, I mean it in the flexible sense of *min*.

61 See, e. g., m. Kilʿayim 8:6: "the wild ox is a domesticated animal kind *(min behemah)*. Rabbi Yosi says, a wild animal kind (*min hayah*)."

62 See, e. g., m. Bava Kamma 4:2, "If an ox was an attested danger to its own kind *(mino)* but not to any other kind *(mino)*." For *min* as designating variety within kinds (what we might call subspecies or varieties), e. g., two kinds of wheat, see m. Peah 2:5.

2.2. X delivers/expels something like a kind of Y

The descriptive tissue of creaturely nomenclature and kind, found in both Niddah and Bekhorot and just examined, is not merely convenient metaphor. Rather, its use is deliberate because of the tractates' concerns to classify kinds in the context of ambiguous expelled entities. This is obvious in m. Bekhorot 1:2 and similar cases across Bekhorot, where, as we will see, the determination of such entities has material consequences:

> *m. Bekhorot 1:* (2a) A cow that delivers something like the donkey kind (*ke-min hamor*) or a donkey that delivers something like the horse kind (*ke-min sus*)– it is exempt from the laws of the firstborn. (2b) But what about eating them? If a pure animal delivers something like an impure kind (*ke-min temeʿah)*, it is permissible to eat (the offspring). If an impure animal delivers something that is like a pure kind (*min tehorah)*, it is forbidden to eat. For that which emerges from the impure is impure, and that which emerges from the pure is pure.[63]

The obligation of the firstborn pertains to (male) firstborns of pure kinds (and the donkey, which is redeemed with a pure animal).[64] As mentioned, the classification of animals as pure or impure functions as a kind of species designation in and of itself (following Leviticus 11). Impure creatures are those kinds that transmit impurity to humans upon ingestion and are therefore forbidden.[65] Both divine altar and human table can only accept properly slaughtered pure animals, but the Temple has narrower standards, excluding those with "blemishes" (*mumim*). It is on these grounds that m. Bekhorot 1:2a disqualifies a creature resembling a donkey-kind that is delivered by a cow from being offered as a firstborn.[66]

However, the ultimate test for this creature's species designation is not its eligibility for the Temple, but rather kind as signaled by its (im)purity and eligibility for human ingestion. The reproductive principle is that it is the maternal uterus from which an animal emerges that determines its species identity, even in cases of dissemblance. Thus, a donkey-like creature born of a cow can be slaughtered and consumed, despite the fact that donkeys are

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63 M. Bekhorot 1:2, parallels in t. Bekhorot 1:6 and 1:9.

64 On the donkey firstborn, see t. Bekhorot 1:2.

65 See Christine Hayes, "Dietary Laws," in *Encyclopedia Judaica*, ed. Michael Berenbaum and Fred Skolnik (Detroit: Macmillan Reference USA, 2007) 650–659.

66 T. Kilʿayim 5:3 lists four cases of offspring that resemble a kind different to the birthing parent, using similar language: "x that delivered a kind of y." In each case the Tosefta differentiates interspecies offspring (where the male parent is different to the female and matches the appearance of the offspring) and cross-species offspring (where both parents are species X and offspring looks like species Y). In the former case, the *kilʿayim* prohibition against mating the offspring with the maternal species applies, but in the latter case it does not (cf. m. Kilʿayim 8:4).

impure kinds.[67] If, in the case of Niddah, the designation of non-living flesh emitted from a human uterus affects its disposal and status (potentially as a corpse), then, in the case of Bekhorot, the assessment of bodily variant offspring triggers or prevents such once-living material's ingestion by humans. Both vividly illustrate the physical literalism with which the rabbis think through species nonconformity. Thus kind X delivering/expelling kind Y (X *sheyaldah/hamaplet ke-min* Y) is a very concrete way through which to think mimetic dissemblance and species nonconformity.

2.3. Like or unlike the kind: resemblance and variation

This argument about taking creaturely nomenclature and kind language seriously and literally allows us to see the substantive ways in which Niddah and Bekhorot treat resemblance and dissemblance as central to questions about generation, recalling Greco-Roman discussions of the same. This is also an argument for taking the "like" in the recurring "like the kind" (*ke-min*) seriously as well. In m. Niddah 3:2b, the scrutiny of the possible fetus's features is very close. Alongside the classificatory terminology of *min,* the Mishnah not only enumerates its tripartite categories of animal kinds, but also refers to species (pure or impure kinds). This last detail has no ultimate impact on the ruling, but serves to conjure a scanning for split hooves or other signs of a particular "kind" or species of animal.[68] These details thus undo the metaphorical force of the modifier "like" attached to "kind" (e. g., *ke-min behemah*, like a wild-animal kind), weighting the meaning of "like" toward one of likeness and resemblance.

The scrutiny is further sharpened according to Rabbi Meir, for whom one must assign a sex to the entity, in order to calculate the period of postpartum impurity. Together these two details of species and gender make for a vivid sense of the corporeality and animality of this putative non-living fetus. They substantiate the argument that we must take the formula "*ke-min* + creature" as far more than a rhetorical convenience, and instead as earnest formal criteria by which material is assessed. This argument

67 Mary Douglas makes the point that dietary laws pose fundamental questions of creaturely classification; M. Douglas, *Purity and Danger* (London: Routledge, 2010).

68 On signs (*simanim*) and the purity of species, see m. Hullin 3:7, t. Hullin 3:25–26. Throughout the Mishnah the term *simanim* (calque of Greek *semeia*) means distinctive marks or visible means of identification across a range of entities, from objects, to determinations of gendered human adulthood, to species determinations (particularly pure versus impure kinds).

is enhanced when we take into account the many instances of the same language in the tractate of Bekhorot that describe cross-species deliveries.[69]

2.3.1. Human form

The mimetic dissemblances in Niddah and Bekhorot are departures from a normative theory of reproduction that would limit it to one kind expelling a like kind (per Pseudo-Aristotle, *Problems*). The resemblance-based notion of reproduction as mimesis is partially expressed in the sages' view that "anything that does not have something of human form (*mi-tsurat ha-adam*) is not a valid delivery" (m. Niddah 3:2b). Here the kind is human (*adam*), with the concept of form (*tsurah*; cf. *eidos*) infusing the notion of reproduction as mimesis with strains of both biblical and Aristotelian accounts of generation. However, the notion of human form expressed here lacks both the patrilineal mimesis of Gen 5:3 and Aristotle, and the divine resemblance of Gen 1:26.[70] Instead it is a species marker akin to minimal requirements for mimetic resemblance with respect to animal kinds elsewhere (e. g., t. Bekhorot 1:9, "its head and the majority of it resemble its mother").

As important as their conceptual apparatus, is the substance of the sages' ruling in m. Niddah: they do, after all, concede that an entity that largely looks like a non-human creature (of the domesticated animal, wild animal or bird register) delivered by a human may be categorized as a valid delivery, as long as it also has "some of" (*mi-*) the features of a human.

2.3.2. Partial and radical dissemblance

These apparently technical disagreements on what variations of flesh constitute a valid delivery reflect differing theories of reproduction and resemblance. For Rabbi Meir, an entity that is utterly species nonconforming falls within the category of a valid human delivery. He agrees with Aristotle (though not with the author of *Problems*), allowing radically variant, even species-nonconforming, entities to count as offspring. This is also the view

69 See m. Bekhorot 2:5; t. Bekhorot 2:6; t. Bekhorot 1:5, 6, 9 (also t. Kil'ayim 5:3).

70 See Gen 5:3's patrilineal account of generation, and *Generation,* 767b–769b for Aristotle's notion of male seed as contributing form. In both Aristotle and Mekhilta de Rabbi Ishmael, Beshallah, 8, this patrilineal theory of reproductive mimesis is enhanced by the use of artisanal language: the agentive male seed is likened to a carpenter, painter and sculptor shaping his material (*Generation,* 724a 20, 30, 725a 25, 729b 15, 730b 10–30, 735a 5), and the Mekhilta likens God to an icon painter who shapes the offspring into the "form of his father."

expressed in the reproductive principle of m. Bekhorot 1:2b. The sages in Niddah 3:2b do not accept such an entity as human, but they do accept what is effectively a hybrid, i. e. an entity that resembles one of the tripartite classes of animal that also bears human elements.[71]

Where the sages draw the line is with the completely species-nonconforming: for them, neither menstrual nor fetal, a body that looks like an animal is effectively an unclassified fleshy mass, invisible under the halakhic radar (perhaps similar to *Problems*).[72] We may contrast this exclusion in the case of such an entity expelled from a human, with the rather different result in the animal case of m. Bekhorot 1:2 in which an entity delivered by a radically unlike kind (e. g., a donkey-like kind born of a cow) is classed according to its parent's kind. We can speculate that the difference between the two cases – in Niddah the species nonconforming entity is produced by a human, in Bekhorot, by an animal – points to a somewhat more restrictive view of the human in these cross-species phenomena in the Mishnah. However, as we will see in the final section, the Tosefta softens these restrictions (both the sages' requirement for "something of human form" and the reproductive principle).

Regardless of the subtle difference between majority rulings on human and animal cross-species deliveries, that the Tannaim lived in a world in which degrees of species nonconformity (and thus hybridity) obtained is evident in some of the "blemishes" noted in Bekhorot.[73] Priests with animal-like features are disqualified from service,[74] and animals whose mouths look like pigs' or whose eyes look human are excluded from the

71 E. g., the *adneh ha-sadeh* (masters or men of the field) are categorized as *hayah*, but convey corpse impurity according to one sage (m. Kilayim 8:5).

72 This nonliving body thus transmits no impurity: a curious result for a ritual legal system that seeks to include the entire material world under its aegis. In many ways this accords with Balberg's characterization of the inverse relationship of flesh to body/person in the case of corpse material (Balberg, *Purity,* 96–121, especially p. 110 in which Balberg discusses the relationships between human form, the corpse, and the fetus), except that here it is not a quantitative issue but a formal one: we have a body, but of the "wrong" "kind." And of course the temporal context differs: this is not a body that was once capable of entering the circuit of im/purity that has fragmented or decomposed. In a sense it was always already outside of that material economy.

73 For other examples of interspecies births among non-human animals, see Aelian, *Historical Miscellany,*1:29 and Josephus, *Jewish War*, 6.5.3.

74 Those with eyes "as big as a calf, or as small as a goose" (m. Bekhorot 7:4, t. Bekhorot 5:3); soles "as wide as a goose" (m. Bekhorot 7:6), breasts that hang "like a woman's" or an overbite "like a pig's" (m. Bekorot 7:5). The language here is more ambiguous, being marked as simile.

altar[75] (though even in these cases the priests and animals maintain their species identities).

To recapitulate: there are two views of species-nonconforming entities that emerge from animals and humans. First: per Rabbi Meir in m. Niddah 3:2b and the reproductive principle of m. Bekhorot 1:2 ("pure emerges from pure"), the species from which the entity derives is determinative.[76] Second, according to the sages in Niddah, there must be some degree of likeness to the parent species, meaning that species hybridity is tolerated. What to make of these apparently contradictory positions: a relative openness to accommodating radically species-nonconforming deliveries as offspring versus more inflexibility with entities emitted by humans? And is it a coincidence that the somewhat more restrictive position arises in the human case?

3. Distinguishing the human in reproductive biology

How does the human fall into the broader scheme of reproduction, resemblance and species variation? This section demonstrates that ultimately even efforts to distinguish the human apply the same reproductive principles that govern non-human kinds, thereby implicating the human as one of many creatures and undoing some of its vaunted uniqueness or superiority (of the sort based on the image of God). A variation of m. Bekhorot 1:2's reproductive principle in Tosefta Bekhorot, which may on first blush seem to distinguish the human, actually fully implicates it in rabbinic biology, and Tosefta Niddah makes a dual move of supporting human distinctiveness, while undermining it at the same time.

3.1. "Not a human from any of them, nor any of them from a human"

Does the view that refuses to allow radical species-nonconformity for entities delivered by humans indicate that humans are exceptions in the broader biological scheme (as expressed by the reproductive principle)?

75 While simile (*ke,* "like") is used in some of the animal examples, we also find "the tail of a goat that resembles (*domeh*) that of a pig" (m. Bekhorot 6:9). I thank Clara Bosak-Schroeder for her insight that there is a difference between saying that a creature has eyes "as big as" a calf and saying it has a mouth "like" a pig's. I think that the human cases (such as eyes "as big as a calf's") are more attenuated for being marked as similes.

76 Earlier parts of m. Niddah require that the delivery be of a certain mass or size; a creature that looks like a fish is probably not a *valad* even for Rabbi Meir.

This issue surfaces in t. Bekhorot 1:9, following the introduction of a third theory about resemblance, variation, and reproduction by Rabbi Simon, who (surprisingly) ventures to classify the cross-species delivery as being of the kind that it resembles:

> R. Simon says: what does (Scripture) come to teach you by having *camel* (Lev 11:4) *camel* (Deut 14:7) twice? To include the camel that is born of a cow as if it were born of a camel. And if its head and majority resemble its mother's, it is permitted for eating.

Invoking two biblical prohibitions against consuming camels, Rabbi Simon uses this duplication to derive that, contrary to the reproductive principle of m. Bekhorot 1:2, a camel-like entity is a camel regardless of whence it came (and may not be consumed, since camels are not pure kinds). However, according to the second clause (perhaps added?), the camel-like creature born to a cow may be consumed if its head and most of it are bovine. This view is still stricter than m. Bekhorot 1:2, given that it requires partial resemblance for the animal to be fit for consumption. Its threshold of likeness to parent species ("its head and majority") is higher than the more minimal unspecified requirement by the sages for the purposes of the *bekhor* ("some of its signs").

This view is immediately opposed by an iteration of the reproductive principle that declares that pure kinds emerge from pure kinds (m. Bekhorot 1:2). But this version introduces the human into the equation:

> And the sages say: that which emerges from the impure is impure, and that which emerges from the pure is pure, for an impure animal is not born of the pure, neither is a pure animal born of the impure. And not a large one from a small one, nor a small one from a large one, and not a human from any of them, nor any of them from a human.[77]

It seems that Rabbi Simon's declaration motivated the Tosefta to counter with a repetition of the sages' reproductive principle (already cited in t. Bekhorot 1:6) in not just positive and but also negative formulations ("an impure animal is not born of the pure"). This version of the rule contains two significant extensions to both m. Bekhorot 1:2 and to the earlier version in t. Bekhorot 1:6: further distinctions among animals and specifying the human. It is not only that a genuine camel cannot emerge from a cow (i. e., an impure kind coming out of a pure kind), but also that genuine larger kinds (e. g., cows) may not be born from smaller kinds (e. g., sheep) and vice versa. The phenomenon of kinds delivering offspring that look like different

77 T. Bekhorot 1:9 (parallels t. Kil'ayim 8:5 and b. Bekhorot 7a).

kinds is not in itself negated; this principle simply confirms (contra Rabbi Simon) that such offspring are not genuinely of other species.

The attention to the human (*adam*) here is crucial: it is seemingly set apart from "any of them" (*kulan*) – all the classes of non-human animals (pure and impure, large and small). Yet, here too, the sages are not disputing the fact that human-animal deliveries may appear to occur; rather, they disagree that such cross-species-appearing births are classified separately from their parents. In this respect, we have a direct contradiction to the sages' demand for minimal human form in m. Niddah 3:2.

The Tosefta goes so far as to undermine another explanation for species-nonconforming deliveries: that they are products of interbreeding. It does this by offering an account of the different gestational periods and modes across various kinds:

> "A pure small domestic animal gives birth at five months; a large pure domestic animal at nine months, an impure large animal at twelve months; a dog at 50 days; a cat at 52 days; a pig at 60 days; a fox and creeping creatures at six months; the wolf, lion, bear, panther, leopard, elephant, baboon and ape at three years; the snake at seven years. Dolphins give birth and grow (offspring) like the human; impure fish spawn; pure fish lay eggs."[78] (t. Bekhorot 1:10–11)

This conspicuous display of knowledge about modes of reproduction and gestation periods of a variety of creatures, right after the expanded reproductive principle, serves as a justifying explanation for why interbreeding is not actually possible.

The sequence of reasoning from cross-species resemblances to reproductive modes and gestational periods echoes both the content and the form of Aristotle's musings in *Generation*.[79] After discussing species nonconformity in human and animal cases (including hybrid entities) and dubbing them "resemblances only," Aristotle notes that interbreeding cannot occur, due to "widely different" gestation periods, listing those of humans, sheep, dogs and oxen.[80] The presence in rabbinic texts not only of ideas, but also of

78 Aristotle grouped kinds according to their "modes of reproduction," from viviparous to oviparous to larviparous (see, e. g., *Generation,* 732b 15–36). Like the rabbis, he believed that certain species could successfully inter-breed (*Generation,* 738b 28; 746a 30). For ancient ideas about the affinities between humans and dolphins, including reproductive habits and parental affections, see Pliny, *Natural History* 10, 7–9.

79 Saul Lieberman, "Natural Science of the Rabbis," in *Hellenism in Jewish Palestine* (New York: Jewish Theological Seminary, 1962) 181–193, notes parallels between rabbinic "natural science" and Aristotle (among other Greek philosophers), some of which he ascribes to contact among peoples in the "Hellenistic Mediterranean world," and others of which he ascribes to local knowledge or observation.

80 Aristotle, *GA,* 769b 23–26.

sequences of ideas deployed in Aristotle's writing may indicate something about the bodies of knowledge circulating in early Roman Palestine. But more interesting is the way these ideas about reproduction and variation are embedded and transformed amid the broader concerns of Bekhorot.

To return to the question about the place of the human in reproductive resemblance and dissemblance: m. Bekhorot 1:2 and m. Niddah 3:2 offer seemingly contradictory answers to questions about human implication in species nonconformity. While the possibility of nonconforming-species deliveries is imagined in both tractates, their classification differs. In m. Niddah 3:2, the majority view accepts part-human, part-animal entities as human, but not radically nonconforming ones (which are considered simply fleshly material, neither human nor animal). This contradicts not only Rabbi Meir in the same mishnah, but also the majority view in m. Bekhorot 1:2, in which the reproductive principle establishes that classification of kind looks to (birth) parent. However, even the more restrictive majority view of m. Niddah 3:2 does not entail a purist notion of strict identity in its understanding of reproduction. Partially resembling entities can still make for kind and thus kin.

Looking to Tosefta Bekhorot we find two developments: a third, surprising, minority view (t. Bekhorot 1:9) that radically species-nonconforming deliveries are classed as the kind that they resemble (rather than as the kind from which they emerge); and a reiteration of the reproductive principle that explicitly marks the human as subject to its purview. Between the Mishnah and the Tosefta of these two tractates of Niddah and Bekhorot, the human founders between being marked as a special case (though only somewhat) and as one among other creatures in which reproductive outcomes are not always mimetic.

3.2. *Secunda Facie*

What follows is another example of the Tosefta softening human distinctiveness, this time in its presentation of the dispute between Rabbi Meir and the sages:

> *t. Niddah 4:* (5) One who expels something like a kind of domesticated animal, a wild animal or bird (is impure) – the words of R. Meir.[81] And the sages say: as long

81 Presenting the Mishnah's case in truncated form, t. Niddah 4:5 does not distinguish between pure and impure kinds or present the Mishnah's version of Rabbi Meir, which distinguishes impurity between male and female abortuses.

> as it has human form.[82] R. Hanina son of Gamliel said: the words of Rabban Meir are fitting with respect to an animal because the eyeballs of an animal resemble human eyeballs, and the words of the sages with respect to a bird, because it does not have something of human form.
>
> (6) There was a case of a woman from Sidon who gave birth to a likeness of a raven three times, and the case came before the sages, and they said: anything that does not have something of human form is not a valid delivery. (7) The facial form[83] of which they spoke[84] can be one of any facial forms, except the ears …

Rabbi Hanina's harmonistic intervention shifts the terms of the debate between Rabbi Meir and the sages by softening the differences between them and between animals and humans. It finds common ground between them by declaring that domesticated and wild animals are already inherently of (sufficient) human form because their eyeballs resemble (*domin*) human eyeballs. The requirement for human form is thereby upheld via the logic of resemblance – but in such a fashion as to simultaneously undermine its species-formal uniqueness.[85] The logics of dissemblance and resemblance are thus intertwined.

Rabbi Hanina's reading effectively narrows the earlier dispute to only bird-like cases, out of the original three kinds (domesticated animal, wild animal or bird). The case that follows about a habitual (three-time) aborter affirms his compromise reading of the dispute, with a ruling in which the uterine entity is described as "a likeness of a raven" (*demut ʿorev*).[86] Instead of having a human form, this is "like a kind of bird" (*ke-min ʿof*) and is not deemed to have human status.

If Rabbi Hanina highlighted the eyes, t. Niddah 4:7 explicitly declares that the focus is the face and its features (*tsurat panim*). Like "something of human form" (*mi-tsurat ha-adam*) or "its head and majority" (*rosho ve-rubo*, t. Bekhorot 1:9), the Tosefta's stipulation envisions partial resemblance, i. e.,

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82 Following MS Vienna. Editio princeps has עד שיהא בה מצורת אדם.

83 To my knowledge this term does not appear elsewhere in Tannaitic literature. It appears in Leviticus Rabbah 33:5 (Margulies ed., 763) as a gloss on m. Yevamot 16:3 (cf. t. Yevamot 14:7).

84 The Tosefta refers to "the facial form of which they spoke," as if citing a parallel *mishnah*, but we have no version of the Mishnah with this phrase. It is conceivable that the Tosefta elides human form with facial form. It is also possible that it cites a tradition that did not find its way into our current version of the Mishnah; on such instances, see Judith Hauptman, *Rereading the Mishnah* (Tübingen: Mohr Siebeck, 2005), 37.

85 Compare to the exclusion of an animal from the firstborn obligation for having an eye that "is round like that of a human" (m. Bekhorot 6:8; t. Bekhorot 4:11); this contradiction is taken up in b. Niddah 23a. See Genesis Rabbah 8:11, where the difference between human and animal vision is discussed.

86 Note the mimetic language of *demut*.

a cross-species hybrid with a human-like face and an animal-like body.[87] This focus on the face is ostensibly a human-centric move, which is echoed in laws regarding corpse identification. For example, m. Yevamot 16:3 stipulates that the testimony about a man's corpse that allows his wife to remarry must be "on the basis of the facial features (*partsuf panim*), including the nose, even if there are (other) signs on his body and his clothes."[88] The concern is not whether the corpse is human, but to identify it as a particular person.[89] Despite their different aims, these two contexts share a focus on the face. Thus the face signifies humanness both generically (as a kind) and in particular (as a person). In fact, these two are potentially related notions, blended in the idea that humans are the only creatures that possess a face or a countenance that is uniquely varied.[90]

However, Rabbi Hanina's harmonistic move renders even the focus on facial features meaningless. The claim is that animals and humans already effectively share facial features (eyes). It is precisely in the requirement for a distinction between humans and larger animals (though not birds) that their commonality is drawn into relief. The effort to draw humans apart ends up folding them in with other kinds.

87 Human form is also a minimal requirement elsewhere: in t. Niddah 4:7 contd. (for a kind of flattened fetal entity called *sandal*); Sifra Tazria, Parashah 1:7 (for a creature of undefined head or body, or one of two backs or two spines). A notion of human form shapes the *ekphrasis* of the textured sac in t. Niddah 4:10 and of the requirement that deliveries of certain body parts are "incised" versus "stumped" in t. Niddah 4:11.

88 Cf. the more relaxed requirements in m. Yevamot 16:6 and t. Yevamot 14:7.

89 On the relationship between nonliving corpse material, its identification as a person and the potency of its impurity, see Balberg, *Purity,* 96–121. Tracing through the graded impurity of various amounts and types of corpse material, Balberg argues that it takes certain amounts and types of material to symbolize a (living) person and so express the highest kinds of corpse impurity.

90 Herein may lie the significance of m. Sanhedrin 4:5, which claims that despite having the same adamic/human seal, individual people do not resemble one another, and perhaps also of t. Berakhot 6:5 where the sight of a large crowd elicits a blessing to "the wise one of secrets, for their faces do not resemble (*domin*) one another, and neither do their minds resemble one another." Compare to Pliny, *Natural History* 7:8: "though our physiognomy (*facie*) contains ten features or only a few more, to think that among all the thousands of human beings there exist no two countenances (*effigies*) that are not distinct – a thing that no art could supply by counterfeit in so small a number of specimens;" trans. Harris Rackham (Cambridge: Harvard University Press, 1999) 510–11. See also *Natural History* 11.138 and Beagon, *Elder Pliny,* 43–46.

Conclusion: Reproduction of kinds

> I always knew that if I turned up pregnant, I wanted the being in my womb to be a member of another species; maybe that turns out to be the general condition.[91]

I have argued that descriptions of entities expelled by humans as "like the kind" of creature X or Y are not merely fanciful similes or descriptive conveniences. Rather, they relate to a robust engagement, in Tannaitic sources and in ancient thought more broadly, with the extent to which kinds produce like or variant kinds. In the language of mimesis or dissemblance, creaturely nomenclature and classificatory terminology, these engagements coalesce into a full-bodied theory of generation and mold the tissue of organic substance into legible kinds and materials: whether human offspring, animal kinds, menstrual material or assemblages of flesh that are none of these. These designations make for very different outcomes for the living or nonliving body concerned. The most glaring difference is the impact on a body's life, death and disposal if classified as nonhuman, particularly in its potentially sanctioned ingestion by humans.[92] Designation of a body as human or nonhuman *min* or kind carries with it very different ritual and legal entailments (not to mention material and affective ones). This undeniably speaks to the ways that the rabbinic human claims power over lives and bodies of nonhuman beings.

At the same time, the admission of variant bodies as kin and kind weakens the project of mimetic resemblance underwritten by the reproductive mechanics of *tselem elohim*. After all, like other animals, the human is capable of conceiving entities that bear likeness to other kinds. The Tannaitic gynecological and zoological sources do not espouse a purist notion of reproduction that rejects any such variant entity as nonhuman. They fail to exhibit a strong commitment to the notion that reproduction must always entail complete likeness: the partial or radically unlike can also be kind and kin.

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91 Haraway, *Companion,* 96.

92 One noticeable difference between the human cross-species births in M. Niddah and the animal ones in M. Bekhorot is the fact the human-delivered uterine materials are nonliving and the animal offspring are live. This makes the materiality of the species-nonconforming entity emitted by a human much more prominent, set as it is among the menstrual and other uterine matter. This attention to materiality is part and parcel of the first few chapters of Niddah, which scrutinize women's excreta; it is only in later, Amoraic sources that living cross-species deliveries are discussed.

Another significant, more direct counter to the claim of human uniqueness as *tselem elohim* is in the undermining of "human form" – itself a requirement that could be taken to be a vestigial trace of the *tselem elohim*. This is apparent in the Tosefta in which human-animal distinctions are undermined by viewing human-animal features (eyes) as alike. Human distinctiveness, mapped onto the face (the vaunted singular zone of humanity), is thereby mitigated. It turns out that humans and animals are always already in hybrid form. This conception of humanness, traced in the lineaments of non-living uterine material, is not a matter of sanctity, potentiality, soul or even life. And it may involve the matter of animality.

For the ancient rabbis, the material that is human may produce material that looks like the non-human. Their careful patterning of the signification of uterine material as governed by various kinds of impurity, their deliberations over cross-species animal offspring in terms of Temple ritual and dietary rules, their reproductive principle that admits deliveries that appear as cross-species – all these allow for a biology that is both recognizably of its time and yet curiously idiosyncratic. Rather than reading these idiosyncrasies as merely localizing, provincializing or "rabbinizing" inflexions of a grand imperial science, I have sought to elaborate their substantive conceptual implications.

The significance of embedding human embryology into zoology, or bypassing a mechanics of generation based on replicating the image of God, can be highlighted by contrast. Unlike the later Amoraim,[93] the Tannaim in this strain of interrelated texts paradoxically wrest the human fetus away both from the divine artisan/creator and from its tight linkage to the divine image. Perhaps they similarly wrest it away from the idealized Greco-Roman human that underpins the negatively marked, sometimes racialized, "monster" that is the hybrid or cross-species offspring.[94] While it is "rabbinized" (that is, discussed directly by the rabbis), it is the occasion to consider the making of kinds (human and otherwise) rather than Jewishness per se.

The work of Gwynn Kessler and Charlotte Fonrobert has illuminated the various gendered, political and theological ramifications of rabbinic embryological and menstrual sciences. Here, I have treated a related area in which the rabbis assume a posture of expertise as they trace the very lineaments of the human and other kinds as they come into being. Unlike

93 See Kessler, *Conceiving Israel*.

94 Kominko, "Monsters," 373–389, and Garland, "Invention," 45–61, show how individual cases of reproductive variation (or deviation) were discursively linked to non-Romanness, "barbarians," or even the mythical, geographically distant "monstrous races."

Galenic and Plinian reworkings of Aristotle and Hippocrates, the rabbis' way of knowing gynecology and embryology marks certain women and their uterine products as Jewish, through mattering them as *niddah* or *valad*. So, too, the imbrication of animals and humans and the specter of cross-species offspring, while not uniquely Jewish, become so (and enter Jewish bodies) through the prism of dietary rules. Neither rejectionist nor assimilationist, this embryology, gynecology and zoology coalesce into a distinctly rabbinic science.

Feminist science studies and animal studies scholar Haraway invokes a species-queer fantasy in her work. She does this by implicating – by incorporating – the nonhuman into the belly of human generation. The liberatory potential of this gesture lies in its rejection of the kinds of mimesis upheld by the *imago dei* (what Haraway calls "the sacred image of the same"[95]) and its interruption of the sexed dualism that founds "the female-defining function called reproduction."[96] Haraway's battle is with "the law of the father"[97] as a particularly Enlightenment and modernist project, and it is in the name of feminist, queer and anti-racist struggle that she embraces the subversive human-animal potentials in the technoscientific present.

It is hardly my aim to claim the Tannaim as proto-feminist, or utopian posthumanist thinkers. There are surely crucial differences between Haraway's feminist fantasy and the cross-species kinds conjured by the Tannaim through their comparison and overlap of women's and animals' uterine contents. And yet, as I have shown, this early Jewish approach to the human is as much an approach to the nonhuman, and ends up short-circuiting some of the kinds of species separatism (and the variously related problems and contradictions discussed in the Introduction) implied in *tselem elohim*. In their theory of generation, the Tannaim actively engage human and nonhuman kinds and their overlaps, and they (like Haraway) incorporate the nonhuman into the human, imagining the gestatory entanglement of both.

95 This is another recurring trope in Haraway, see, e. g., "Promises of Monsters," in *Cultural Studies*, ed. L. Grossberg, J. Ratway and J. M. Wise (New York; Routledge, 1992) 324.

96 Haraway, *When Species*, 292. For a critical assessment of Haraway's hybrid vision, especially with respect to histories of racist, classist and imperial animalization, see Susan Squier, "Interspecies Reproduction," *Cultural Studies* 12 (1998) 360–381. Squier asks, "While the hybrid is achieving a voice, are women losing ours?" (377) Drawing attention to the hybrid's implicit heterosexuality, the legacies of race/species separatism from which it draws, and its historical and current coercive properties (e. g., with assisted reproductive technology), she proposes alternative reproductive mechanisms (such as contagion).

97 Haraway, "Monsters," 324.