While *Frankenstein* has long been seen as a birth myth, we have yet to unpack how the place of imagination within obstetrics and embryology shaped Mary Shelley’s thinking about imagination, creation, and science. She explores the act of “conception,” a term that regularly referred to both to acts of imagination and of reproduction, to think about how both are embodied yet too often reduced to a replication, the creation of something or someone that is merely a version of oneself.1 To wit, although critics generally assume biological creation to be something new, theories of the time reduced it to a form of copying, and women’s contributions to generation were minimized.2 In this view, sexual difference did not make a difference. From the time of Aristotle, women’s contribution to generation was limited either to being the nest for the fetus or to providing the dead matter to be activated by the man’s seed. Even under Harvey’s ovism, where everything originates from the egg, the theory of preformation denied or slighted women’s contributions because, while the female is the matrix of life, the male is its source. This was true except in the case of monsters, what we now consider birth defects, which were often thought to be the products of the uncontrollable female imagination alone. Monstrosity, then, is a way of pathologizing difference and women’s contributions to generation.3

This reduction of conception to copying is allegorized within the history of imagination itself, and one of the persistent questions posed about it is, could it do more than combine elements stored in our memories? Alan Bewell has analyzed midwifery manuals of the period and has argued that obstetrics and its insistence upon a mimetic imagination forms the master code of Shelley’s aesthetics and the basis for her critique of the masculine imagination (“Issue” 108). I will
show, by contrast, how obstetrics and embryology shaped the discourse of imagination in ways that Shelley challenges. For her, although framing the imagination as an organically embodied entity responsible for the birth of her “hideous progeny” granted it the powers of development, the metaphor of birth dangerously foreshortens the creative process by separating conception from development and by giving far too much credit to the initial conception while undermining the impact of social relations. Because Victor anticipates worship by his creature for its creation, he doesn’t give a fuss about parenting or development. Why bother when conception is mission accomplished? Shelley also worries that obstetrics and embryology frame creation in such a way that self-replication or narcissism is the only version of autonomy possible, and, to the extent that science is moving in the direction of reproducibility as a scientific standard, she mourns the implications of this for creativity and imagination when she recounts, even as a child, the boredom of being trapped in her own sensations. She insists, “I could people the hours with creatures far more interesting to me at that age than my own sensations” (195). The *Oxford English Dictionary* suggests that “reproducibility” is a Victorian invention and credits its earliest use to J. F. W. Herschel. This has implications even for science and art, since, although scientists and artists could not do without the generativeness of imaginative connections, it was both the moment of creation or discovery that mattered and the kind of work that ensued from it. In so doing, she must confront the ways in which culture tries to map gender onto creation and to make the labor of childbirth something that requires male intervention. She thereby tries to figure out how science can reliably turn to imagination to do its exploratory work, and how the imagination’s creations can move beyond the mere reproduction of ideas. This collapse is further evident within the history of epigenesis, which paradoxically is “a developmental theory without development” (Wellmann 94): the traces of how the theory came into being have been expunged. I construe this absence as the suppression of the imagination’s exploratory work.

Obstetricians were keen to rationalize science at the expense of the female body. Mary Shelley, by contrast, shows that the male gender has no necessary superior powers of rationalization because it is no less embodied, and she does so by making Victor Frankenstein controlled by his imagination instead of controlling it. This maneuver reverses the then-dominant tendency of some men-midwives to conflate female wombs with female imaginations on the grounds that both were irrational and unpredictable. This gendering, in turn, licenses men-midwives and their technology to hijack the birthing process and women’s bodies as well as to define female labor as monstrous to exonerate themselves. At a minimum,
Shelley shows that obstetrics could benefit from a little modesty and not take for
granted its assertion that it alone had mastered science and technology, as if those
forms of mastery would prevent death. From Shelley’s perspective, while ra
tonality had its strengths, it could not anticipate in advance how to solve the major
mysteries of generation but rather had to work organically in cooperation with the
imagination, making “mastery” impossible. For one thing, Shelley herself suffers
from “the greatest misery of authorship . . . the blank incapability of invention”
(195). For another, while the imagination was widely recognized as a source for
generative ideas, the scientific value of those ideas was often questionable, even
more so because what counts as a scientific idea cannot be set in advance. To wit,
Darwinian evolution is not testable in any strict sense, and yet it is perhaps one
of the most important scientific ideas ever. Nor could discovery and invention be
reduced to a method. Third, despite the fact that men-midwives had largely de
bunked the idea that the female imagination was responsible for monsters, they
acknowledged that women’s belief in the power of their imaginations could have
negative effects, and thus the psyche had uncanny powers over bodies that might
be managed but not fully understood. Finally, she insists that scientists and men
midwives need a reflective sensibility, even as she warns that feelings can be ma
nipulated. The bottom line is that Victor’s imagination has no chance of proper
development or improvement, and Shelley wants to show us why.

Shelley underscores the analogy between mental and physical generation in
her 1831 preface to the novel when she stipulates, “Invention, it must humbly be
admitted, does not consist in creating out of a void, but out of chaos; the materials
must, in the first place, be afforded: it can give form to dark, shapeless substances,
but cannot bring into being substance itself” (195). In reframing origins not as a
void but in terms of chaos, she focuses the study of conception on the materials
one has to work with, and how those materials can be modified, even as she won
ders about how far we will ever see into the chaos. The mind and womb were
black boxes, especially since the messiness of wet flesh resisted any transparency.
Victor’s assemblage of the monster from parts of dead bodies therefore allegorizes
both the limits of thinking about imagination as creation/conception, which has
no way to deal with the issue of inheritance (Müller-Wille and Rheinberger 16),
and the problem of how some matter becomes organic. In this view, if what Shel
ley refers to as form without substance is what permits traffic between biological
science and fiction, it runs the danger of making both into science fiction. Per
haps this is why in 1831 she relegates the imagination to a childish pursuit of
“castles in the air” (192).

Yet, in the same way that embryologists like Blumenbach and von Baer began
to realize that the source of organization was a dead end because it raised metaphysical questions unanswerable by science of the time. Shelley’s focus on materiality moved both generation and imagination away from origins and toward examination of organic processes of development. She elaborates, “Invention consists in the capacity of seizing on the capabilities of a subject: and in the power of moulding and fashioning ideas suggested to it” (195). In this way, the imagination spontaneously encounters potentiality rather than imposes upon it already preformed ideas. Generation and monstrosity were shrouded in mystery, but Karl Ernst von Baer found a way forward, and that was to compare development across living forms to see what laws might govern it. By the end of the Romantic period, he was able to proffer laws of development that are credited with making embryology into a real science, and he accomplished this by comparing the development of the embryo to the descent and development of the species. Crucially, he knew neither the outcome nor the range nor even the usefulness of the comparisons in advance.

My claim is that obstetricians and embryologists of the time begin to understand that with so much unknown about generation and embryonic development, the imagination had to provide leads. Blumenbach had noted the existence of at least 262 “vague hypotheses on generation” (Essay 4). The obstetrician Alexander Hamilton acknowledged the numerous hypotheses surrounding conception and praised the “learning and brilliancy of imagination which have extinguished the several combatants” (Outlines 62–63). Here the imagination is used to take down the theories of one’s opponents, and it achieves this by helping to envision the logical consequences of these ideas. The imagination’s leads were all the more necessary once embryology turned away from preformation and toward epigenesis, as it did in the Romantic period. Preformation was all the rage from 1670s until the 1750s, in part because it confirmed Calvinist ideas of predestination and in part because it posited no creation (no competition with God) but rather a simple enlargement of what was already there (McLaren 334–35). With regard to embryology, there was the huge question of what exactly was development. Seeing in terms of development means seeing imaginatively because one must break development into forms of differentiation, but which differences counted? Thus, von Baer distinguished “tubes” from layers and named them “fundamental organs” (Wellmann 303). At the same time, he came up with his principle law of development: “There is nowhere new formation, only transformation,” and this meant that all the differentiations of the body’s tissues and organs were not absolute but relative, and this meant that what was visible was also in process (305).
**EPIGENESIS AND THE FRAME PROBLEM**

Preformation and epigenesis posed a huge problem for the imagination’s role in science. Because the absence of visual evidence could be explained both by theories of preformation and epigenesis, how did one know what was imagined and what wasn’t? As the controversy between Albrecht von Haller and Caspar Friedrich Wolff showed, the absence of empirical evidence could point either to a preexisting form that was there from the beginning or a vitalism that insisted upon the limits of empirical evidence itself.\(^1\) Spallanzani adhered to preformationism, despite the fact that his own evidence was highly ambiguous. Did development entail a coming into being of a form that was always there but being infinitesimally small could not be recognized, or did homogenous matter require something like vitalism to unfold itself?\(^12\) Malebranche, the founder of preformationism, had earlier argued that “one of the main errors we fall into in physics is to imagine that there is more substance in bodies that are perceptible than in those that are hardly perceptible at all” (17). With this, Malebranche opened the door to the existence of highly organized beings that could not be seen and ironically made the correlation of the visible with substance a figment of imagination.\(^13\) In focusing on form without substance, does Shelley align herself with Malebranche, or does she critique him? Wolff seconded Malebranche, insisting that “one cannot well say that what is not accessible to our senses is therefore non-existent” (cited in Gasking 103).\(^14\) Since both sides of the debate pointed to the other side’s overactive imagination along with the failings of human senses, the problem was to figure out how to know which side, if either, was right. The problem was made more intractable because, irrespective of any scientific gains, obstetricians especially literally could not afford to ignore how their contributions helped to make gender more intelligible, as their fees were high. When von Baer claimed that younger embryos were simply coarser in outline than older ones, and therefore miniature forms do not exist, he dealt a fatal blow to preformationism (Churchill 10).

Perhaps because the object of study was so difficult to put into view—the poor state of compound microscopes did not help—and because the meaning of what was unseen was open to debate, men-midwives and embryologists turned to disciplining the imagination and the subject possessing it instead. To discipline the imagination so that its analogical connections might provide useful leads, these writers pit either an overly passive imagination or a much too active one (both gendered female) against a temperate masculine version of it. An imagination that passively reproduced what was given did not really help increase intelligibility, one of the main goals of natural history. What distinguishes the two is the person-
hood behind the imagination, writ in terms of gender. The precise problem behind the feminized version of imagination was that it allowed this faculty to stand in for personhood itself, either by embracing its images as reality or by precipitously taking on board its trains of associations. This reliance upon personhood had downsides, chief among which was the fact that gentlemanly conduct had become more important than scientific achievement to the Royal Society in the seventeenth and eighteenth centuries. Walton might have been impressed with Victor's aristocratic background, but Shelley is unfazed by it. If objectivity would throw the subject out with subjectivity, it did so by turning the subject's habits and practices into (male) epistemic virtues, except that normally virtues presume a subject to embody them. If we peel back what we now tend to see as objectivity, then, we find the Romantic imagination working to generate ideas, but, as science set its sights on verification, the entity that provided the very materials to be verified got ignored. Charles Clarke, Shelley's obstetrician in 1815, denied the value of “hypothetical reasoning” (vii) in the study of obstetric diseases and sought to replace it with knowledge from touch gleaned from practice. Yet this entailed hypothesizing that knowledge from touch was reliable knowledge. We also find science working through various explanatory systems and trying to discover what science really is and does. In brief, Shelley responds by showing that both gender and sensibility have no powers to immunize the imagination. Moreover, she suggests that science would have much to gain from thinking about Victor's mistakes.

Finally, embryologists worried about a gap between the start of life and a meaningful life, and expressed this worry by making distinctions between form and matter, between the production of organic material and its organization, and among the embryo, the fetus, and the person (Maienschein 16–25). Early in the Romantic period, the soonest personhood was believed to begin was forty days from conception when the mother first experienced the movement of the fetus, a moment called quickening. William Lawrence, Percy's eye surgeon, stipulated that the embryo only had “real life . . . when we are first capable of perceiving” its parts (141). Blumenbach not only ridiculed the “imaginary dignity of the animaculæ of the semen of animals” (Essay 9), but he claimed that, in the fourth week, the embryo “enjoys an extremely low and languid degree of life, bordering even on that of a vegetable” (Elements 1: 201). The ambivalence about the status of the embryo can be seen in the possibility of rationalizing infanticide, as Wordsworth does in “The Thorn,” and the perceived need in 1803 to tighten up laws against abortion, which was believed to be widely practiced but was seldom prosecuted. Simply put, if the fetus was without question a person, how could one justify the
failure to prosecute all deliberate abortions? That European Enlightenment science generally considered the embryo to be sexless further highlights a gap between it and personhood (Brooks 41). If preformationists believed that there is a moment when life is already formed and the individual has already begun growing, epigenesists argued that life was a process of continued development, which was why human gestation took so long. Shelley, in fact, denounced both France and England for denying servants “the dignity of a human being” (46), but one question was, exactly when did this dignity begin? When considering forming the female monster, Victor notes that “she . . . in all probability was to become a thinking and reasoning animal” (138), once again separating the creation of life from a meaningful life and ironically undermining his own achievement by highlighting his failed parenting. While his turn to “probability” chalks development up to chance, his imagining of the “horror and suspicion of the peasants” (142) denies them any dignity.

From a current scientific perspective, a gap between form and being is anathema insofar as it would demand a metaphysics that is impervious to scientific investigation. Yet, for Romantic science, this gap was highly generative. For Shelley, the gap was important for several reasons. For one, it suggests that both monstrosity and personhood are largely products of social and not biological development: neither are instantiated with the instantiation of life. Monsters then are not born, notwithstanding Ellen Moers’s influential account of the novel; they are made and developed. Hence the abundance of candidates for monstrosity in the novel: Justine, the Turk, Victor, and even “the barbarity of man” (84). Not only does Victor select the parts for his monster strictly out of his own convenience (originally, he considers them beautiful), but also the gap between the ugly form of the monster in contrast to its claim of a sensitive personhood reminds us that forms offer appearances and that morphology, because it downplays biological function, doesn’t tell the whole story. Imaginative development, then, becomes a surrogate for thinking about how culture shapes human development. And because narrating development raises all kinds of epistemological problems—how to organize it, how to punctuate it in time, and which resemblances to heed—it requires a disciplined imagination at every step of its own development.

**THE PLACE OF IMAGINATION IN OBSTETRICS AND EMBRYOLOGY**

What was the place of imagination within obstetrics and embryology, and how might knowing that contribute to our understanding of *Frankenstein*? In brief,
this knowledge helps us evaluate the kind of scientist that Victor is and, by extension, Mary Shelley’s hopes for science. When Victor announces that he “collected the instruments of life around me” (38), he plays the role of a man-midwife, but he is tone deaf to how obstetrical “instruments” would have been commonly associated with death. It also helps us to understand how the imagination helped science to operationalize and evaluate its goals. Erasmus Darwin admitted, “The process of generation is still involved in impenetrable obscurity; however, conjectures may nevertheless be formed concerning some of its circumstances” (Z:484). Because so much was unknown, something had to be proposed in an effort to fill in the gaps, and this was for better or worse the imagination. On the one hand, ideas and solutions had to be generated by the imagination. On the other hand, while proving that something was not just imagined helped to generate fodder for experiment or, in the case of midwifery, some sense of what a best practice was, these goals could not be known in advance. Men-midwives were called in only on difficult labors, but how did one know when to intervene with instruments and when to wait for nature to take its course? Was there a set time beyond which intervention could result only in death?

Even when excoriated, then, the imagination helped to define how science might improve, sometimes by negation but always by insisting upon thought as a kind of organic process. This means that the imagination has to spontaneously encounter its objects of study, and that the work of science and rationality were never done. Embryology, thus, sheds light on how Shelley considers development, as the novel features three case studies of development—Victor’s, the monster’s, and Walton’s—side by side. Shelley thereby inserts a frame problem of her own, by offering us three unreliable narrators, all of whom are trying to sanitize themselves as they self-narrate. By so insistently highlighting how the frame shapes the meaning of the narrative, Shelley invites readers to consider how each character develops or fails to develop. By making the imaginations of Victor, the monster, and Walton almost intractable to development, she warns us of the social costs of such failures and invites us to develop our own methods of imaginative discipline. We can do so by adopting a comparative method that seeks laws of development. In this view, Shelley’s nested narratives thus allegorize the problem of how to connect empirical particulars to laws. Their nestedness means that the individual cases must somehow be transformed into laws concerning development that enables one to figure out what the signposts of development are. Victor’s crude stitching together of the monster’s parts, by contrast, is the logical outcome of a cut-and-paste epistemology whereby alchemy is unreflectively grafted onto electricity.
SMELLIE AND MIDWIFERY

William Smellie, “the biggest name in midwifery in Britain, and possibly in Europe” (A. Wilson, *Making of Man-Midwifery* 124–25), grudgingly acknowledged the place of imagination within obstetrics. On the one hand, the advertisement to the fifth edition of his *Collection of Preternatural Cases and Observations in Midwifery* promised that the work “contains directions and rules of conduct to be observed in every case that can possibly occur in the exercise of the obstetric art; rules that have not been deduced from the theory of a heated imagination, but founded on solid observation, confirmed by mature reflection, and reiterated experience.” In framing obstetrics as an art and not a science, Smellie was aligning it with careful practice, one where methods and conduct replace a diseased “heated imagination.” Victor Frankenstein, by contrast, proudly declares his imagination to have been “warmed” by Agrippa (23). Nonetheless Smellie’s modifier “heated” reminds us there are unheated imaginations, allowing for positive contributions. Indeed, Smellie turned to the imagination so that he could modify the forceps. As he put it, he “contrived an alteration in their form” (cited in A. Wilson, *Making of Man-Midwifery* 126). The *OED* repeatedly connects “contrive” to “invent,” and the first definition adds that it means “to excogitate with ingenuity or cleverness,” bringing it close to “imagine.” Victor crucially lacks the discipline to make science into an art.

In his influential *Treatise on the Theory and Practice of Midwifery*, Smellie associates the imagination with the undisciplined ancients and unknowing female midwives, thus feminizing it. He castigates a female midwife for her “ignorant imagination” because she wrongly identified the part that had descended (3: 193). Describing an anxious female patient, Smellie argues that her labor will be “retarded by her uneasiness, which we must endeavor to surmount by arguments and gentle persuasive: but if she is not to be satisfied, and strongly impressed with an opinion that certain medicines might be administered to hasten delivery, it will be convenient to prescribe some innocent medicine that she may take between whiles, to beguile the time and please her imagination” (3: 158). Smellie further warns that “passions of mind . . . require particular attention. The patient’s imagination must not be disturbed by the news of any extraordinary accident which may have happened to her family and friends; for such information hath been known to carry off the labour-pains entirely, after they were begun, and the woman has sunk under her dejection of spirits” (3: 293). Smellie considers the female imagination as something to be beguiled, and he thus justifies the male-midwife’s trickery over it. He was not beyond “beguil[ing] the time and pleas[ing]
her imagination” (1: 158). Moreover, he urges that the practitioner must careful
control any input into the mother’s imagination so as to allow her to concentrate
on the labor. To help another patient deal with her pain, Smellie writes, “The
patient was told, and imagined that it was her labour coming on, by which decep-
tion she bore the pain with great fortitude” (3: 115).

When referring to his own imagination, or those of men-midwives, by contrast,
Smellie makes clear that it is disciplined by practice and, more importantly, was
self-correcting. Smellie wrote, “At first when I examined . . . I imagined . . . that
the position retarded delivery, but on a second trial, and introducing my finger
backwards towards the sacrum, I found a large open space” (Treatise 3: 14). In this
instance, Smellie reveals himself to know the difference between his original sup-
position and his later discovery: the temporal gap between the two and the inser-
tion of his finger suggests an experienced practitioner who had learned his craft
or art in the sense of practice. He later “imagines” another mother to have a sec-
ond child to deliver because she is in pain but discovers that she had only coagu-
lated blood to expel (3: 387). In his Introduction to the Theory and Practice of
Midwifery, John Leake likewise feminized the imagination, blaming “the gener-
ality of women” for continuing to perpetuate the idea that the mother’s imagina-
tion was responsible for monsters (34). John Clarke, moreover, warned that “much
will depend upon the skill of the practitioner in regulating the passions of the mind
of his patient, so that their undue influence may not interfere with the regular
process of parturition” (Practical Essays 15–16).24

The manuscript lectures of the man-midwife Thomas Young, circa the 1770s,
substantially enriches our sense of the place of imagination in obstetrics and
further supports the ways in which male midwifery sets up a female imagination
to be disciplined by a male one. On the one hand, Young offers a feminized ver-
sion of the imagination, one that works in ignorance. The lectures open with his
pronouncement that “midwifery lay a long time uncultivated from its being en-
tirely in the hands of women and these the most illiterate, having no education
and no skill of the anatomy of the parts” (1). On the other hand, because the
man-midwife has to work with parts of generation where so much is unseen, the
male midwife must also rely on the imagination, but one supplemented with a
wide array of scientific knowledge across species and lots of hands-on experience.
Hence, he warns of the importance to “soothe the minds of women and dispel
their apprehensions” (169) in difficult labors especially.

As did Smellie, Young also distinguished a feminized imagination from his
more masculine one. First, Young claims that women are unaware of variations
within menstrual cycles, and thus they turn to their imaginations to make sense
of them. He points out that women do not know that menstruation is often irregular and that this irregularity is why so many women “imagine themselves with child having much the same symptoms as if they were” (81). He dismisses the idea of the mother’s imagination imprinting itself on the fetus as a form of female ignorance. Circulation of the body is not controlled by the will, and therefore we cannot “determine greater proportions of blood to one part than another” (141). He adds, “Consequently any support of imagination will never produce a greater luxuriance of growth in any one part than other much less can it add a limb extraordinary” (142). Next, he argues that “if we allow that a woman by the strength of her imagination is capable of producing a third leg we may with equal reason allow that a stronger exertion of the same power will be capable of forming all the parts of the fetus which in reality is allowing a creative power to a woman’s disturbed imagination . . . [N]othing can be more absurd” (142). He continues, “The apprehension of the mother whose imagination may be haunted with the disagreeable idea of some frightful mark being stamped on the child” can have effects (134). Finally, since “deformities are observed in vegetables, they cannot be the effect of imagination” (144). Summing up the dangers of the female imagination, Young writes, “Real evils are often suffered from a foolish apprehension of imaginary ones. This observation is particularly just with regard to a number of pregnant women” (141). Masculine scientific authority came at the expense of women’s imaginations, but the mastery of that authority and even its ability to prevent death were very much in question.

Nonetheless, because so much cannot be seen within midwifery, Young has little choice but to call upon the imagination while simultaneously being modest about its fruits. Young tries to figure out where generation occurs and insists, “I imagine it is oftener in the womb than in any of them [fallopian tubes], otherwise we should have extra-uterine fetuses oftener than what we have” (50). Here imagination acquires legitimacy because it works hand in hand with direct knowledge of anatomy. Young also argues against too much confidence in the fruits of imagination and notes that most causes of menstruation have been “imagined” (83). Thomas Denman, the foremost man-midwife in London after William Hunter’s death and with whom Mary Shelley’s attending obstetricians, the Clarke brothers, had practiced, likewise demanded modesty because men-midwives had too readily invoked the imagination. He argued, “To unsophisticated observation, and to a mere relation of facts, or the inferences plainly deduced to them, men are unwilling to submit, or the powers of the imagination are by such proceeding checked or suppressed, the want to understanding is corrected” (1: 169). Here, understanding depends on the ability to check the imagination. Later, Denham
laments that too often “the imagination hath been indulged with a freedom not very consistent with the dignity of philosophy” (1: 206). The trick was to make imagination commensurate with philosophy’s dignity.

When deciding to have Victor give “birth” to the monster, Shelley would have found in obstetrics much inspiration. One potential instance: the man-midwife James Hamilton theorizes that generation occurs when “the semen masculinena is injected into the uterus, [and] the ovum becomes vivified by a vapour arising from it” (88–89). Hamilton frames the uterus as a kind of dead matter that is brought to life by the aura of the male semen, and he justifies this theory with the analogy to oviparous animals whose eggs must be brought to life by contact with the male. Hamilton underscores how Frankenstein’s monster is the embodiment of patriarchal theories of generation.

A MAN GIVES BIRTH: THOMAS LANE

Shelley may also have been inspired by the case of Thomas Lane, a boy of fifteen years of age, who in 1814 died after his belly swelled. This case also featured an undisciplined imagination against a soberer one, and it achieved wide notoriety. One of Mary Wollstonecraft’s man-midwives, John Clarke, was a subscriber to Nathaniel Highmore’s volume, and John practiced alongside his brother, Charles, who was likely Mary Shelley’s attending midwife in 1815. John Abernethy was another subscriber, and Percy attended his London lectures on anatomy. Lane’s mother claimed that, before he died, he had protested that he had something alive in his body (Highmore 14). Alarmed, the mother sent for a surgeon, Nathaniel Highmore, who prescribed cathartic pills to help him with evacuations. Two days later, Lane died, and Highmore asked for permission to dissect the body, which was granted. Upon dissection, Highmore found a “tumor,” and when he opened it up, he discovered what appeared to be a fetus. Highmore and other experts first thought that Thomas was actually a girl who had a monstrous pregnancy, but, after careful examination by multiple experts, he was determined to be a normal male. Highmore then suggests that Mrs. Lane had had a double conception, with one fetus developing properly into her son and the other accidentally attaching itself within his abdomen.

It is the process by which he arrives at his conclusion that is significant, as well as the fact that Highmore publishes this case “by the desire of promoting a spirit of inquiry” (12). He frames science as an open-ended process, whereby facts are continually adjudicated. Moreover, the tensing of an undeveloped imagination against a more disciplined one allows judgment and progress to be revealed. Be-
fore objectivity is enshrined, then, the continuous disciplining of imagination allows the scientist to display his or her epistemic virtue of judgment at work. Highmore underscores his judgment by insisting that the matter is not firmly settled, and its conclusions are still subject to further evidence. Highmore writes, “I shall not enumerate the different theories which fancy has suggested: but to imagine it to have been the fruits of an unnatural crime; or an impregnated ovum, getting from the liquor amnii into the intestine, would require an assumption of so many material facts, not proved, that it seems unnecessary to enter into the discussion” (30). Having dismissed wild unproven fancies, Highmore suggests viewing it in light of an extrauterine fetus: “By some accident, which it is not very difficult to imagine, the impregnated ova got connected together, the one forming an attachment to the uterus of the mother, and the other, (the foetus in question,) to its twin brother; if, I say, this view of the subject be taken, there seems nothing in the matter which is wholly at variance with the known laws respecting generation” (30). Highmore concludes by distinguishing dissection, the “only means of elucidating the real nature of such cases,” from the “operation of mere conjecture” (30). He suggests that good explanations should not be too difficult to imagine. He implies that if the imagination is working too hard to present a picture, then it is not to be trusted. The corollary is that normally the imagination works rationally to offer images and trains of association that conform to natural laws. Earlier, he wrote, about the position of the fetus, “It would be difficult to imagine, contrary to the influence of gravity, that as the fetus grew it should ascend” (29). The conjectures of imagination should, moreover, be supported whenever possible by evidence from dissection. His very last sentence warns that, without dissection, so much is “left to the operation of mere conjecture” (50). Perhaps his use of “operation” interjects a bit of irony: Highmore is, after all, a surgeon. In any event, the imagination needs evidence to corroborate it.

Although Alan Bewell studies midwifery manuals in terms of how they limited the female imagination to mimesis, many obstetric authors during the period sought to deny women’s imagination even that much power. We have already seen Thomas Young strip the female imagination of any powers to stamp the fetus. James Hamilton, for instance, insisted that “the maternal imagination can possess no power whatsoever over the fetus,” and he argued that if mothers actually had this power, “it would be subversive of all moral ties of society” (122). He continues, “We can explain the appearances of unsightly children upon more rational principles,” especially the fact that “the parts of the foetus . . . depend on accretion for the growth of their parts” (123). “Women’s imagination cannot act on the foetus,”
Hamilton concludes, “because it is not connected with the nervous parts of the mother nor of any vessels” (123).

These refutations of the powers of the mother’s imagination function at several levels. One, the denial of these powers consolidates the male scientist’s authority and the superior power of rationalism over imagination. Obstetrician Alexander Hamilton warned, “There are no nerves in the placenta . . . hence few are now so credulous to imagine, whatever fabulous stories have been related to the contrary” (Treatise 107). Two, the power of the female imagination to make monsters is replaced by the more generally accepted idea of the imagination’s influence over the physical body. Here is the entry from Rees’s Cyclopaedia: “We may be convinced of the error of ascribing the actual changes of structure, which constitute the deformities and monstrosities of infants, to the imagination of the mother; . . . yet we have the most satisfactory evidence of the powerful influence of this faculty over the nervous and vascular system, and of the effects resulting from this influence.” One might explain this shift by the fact that male midwives had to increasingly show their abilities to empathize with their wealthy female patients (Cody 146–47), and thus scapegoating the mother’s imagination was not wise. William Hunter, after all, charged ten guineas per visit! The challenge then became to harness the mother’s imagination so as to not make an already difficult labor worse. When refuting the powers of a mother’s imaginative longings to imprint themselves upon the fetus, Thomas Denman asks, “Was it thought necessary to adopt and to support the opinion of the power of the imagination, in order to secure pregnant women that tenderness of treatment which their situation requires?” (282). Although rationality certainly tempered the offerings of imagination, it could not explain the imagination’s psychosomatic powers, though it could try to manage them.

If Shelley is to critique in fiction the relation of the gendered imagination to science, she perforce has to engage the two major manifestations of this relation in British scientific culture: the male midwives and the embryologists. Let me now turn to embryology, because its practitioners had to figure out what to do with the imagination. Experimental embryologists like Spallanzani chopped up animals, especially lizards and their tails, to study regeneration, in hopes that the regeneration of such appendages would tell them something useful about the process of generation. Victor’s decision to chop up body parts and sew them together is perhaps an oblique reference to these efforts. In May 1815, Shelley began a new journal “with our regeneration” (Journals 79), which ostensibly referred to the starting of a new household without Claire Clairmont, but successful regeneration would require more than her exile.
In 1831, Shelley remarks in her new preface that “everything must have a begin-
ing. Invention . . . cannot bring into being the substance itself” (195). She con-
tinues, “In all matters of discovery and invention, even those that appertain to the im-
agination, we are continually reminded of the story of Columbus and his egg” (ibid.). When confronted with the charge that anyone could have discovered the Indies, Columbus allegedly challenged his audience to stand an egg on its end. When all failed, Columbus smashed the end of the egg and successfully an-
swered his own challenge. Although this is ostensibly a story of creativity, might this egg obliquely allude to the literal 1827 discovery of the mammalian egg, espe-
cially since the death of so many mothers in the novel erases beginnings, and the egg assists in bringing into being the fetus?20 Recounting this most important discovery, Karl Ernst von Baer described the first time he saw “a small yellow spot in a little sac” (“Ovum” 120), which he initially thought quite “strange.” After putting it under a microscope, he recognized “a minuscule and well developed yellow sphere of yolk” in a bitch. Von Baer writes, “Before I found courage to look at it a second time, I had to recover, since I was afraid of having been deluded by a phantom” (Autobiography 218). In the original German, von Baer wrote, “Ein Phantom habe mich betrogen,” and his reflexive verb underscores his own self-deception. Betrogen means “to be duped.” His syntax, which places the object of the sentence in the place where the subject belongs, further renders himself passive. He added, “Is it not strange that a sign which is expected, and indeed hoped for, should be frightening when it eventually materializes?” (ibid.). As did Smellie, von Baer shows his eye has learned from practiced passive observation, and his prompt to improve his powers of seeing stem from his wariness of imagi-
nation. Moreover, his frank admission of his emotions—his fear of being deluded by confirmation bias—prompts a skeptical testing of his initial observation that gives us a sense of confirmation. Thinking about his finding as a “phantom” of his imagination prompts him better to ground and defend his observations.

Von Baer’s published paper announcing his scientific discovery was more muted. He comments, “Led on more by inquisitiveness than by the hope of see-
ing the ovules in the ovaries with the naked eye through all the coverings of the Graafian vesicles, I opened a vesicle, of which, as I said, I had raised the top with the edge of a scalpel—so clearly did I see it distinguished from the surrounding mucus—and placed it under the microscope. I was astounded when I saw an ovule, already recognized from the tubes, so plainly that a blind man could scarcely deny it” (“Ovum” 132). When he insists that his observations have been
motivated more by inquisitiveness than hope, he staves off an accusation that he is imagining the ovum. Inquisitiveness implies an open mind rather than a fixated imagination, and, by comparison, Victor Frankenstein is once again found wanting as a scientist. Though he does not here cop to his vulnerability to phantoms, von Baer’s much more detailed descriptions of observation in the scientific paper better supports the actuality of his finding. Moreover, the fact that he repeats his observations again and again and across different species increases the likelihood that what he sees is not a phantom. Haunted by phantoms, von Baer adduces more and more evidence so that the ovum moves from a theoretical entity to an actuality. With this discovery of the female ovum, von Baer makes the significance of women’s material contributions to generation more difficult to deny.

Von Baer praises his teacher Döllinger for his “critical mind and well-controlled imagination” (Autobiography 131), perhaps because he recognized that analogies did not just entail similarities. While he thought that development proceeds from lower to higher forms, von Baer demonstrated that there was no exact correspondence between the embryos of higher animals and the adults of lower animals. In fact, he insisted that “those forms in which animality is most highly developed should be furthest removed from the fundamental type” (cited in Gasking 154). Higher organisms did not copy the developmental stages of lower ones. Whereas early embryologists assumed a linear conception of development based on a strictly hierarchical chain of being so that phylogeny straightforwardly recapitulated ontogeny, von Baer stressed different paths of descent based on common archetypes within a class of animals. Imagination here must work spontaneously with observation to know what features of the analogy to push. He also demonstrates control over his imagination when he explains why he does not know which comes first, the mammalian ovule or the Graafian vesicle. He insists, “If one is permitted to substitute a hypothesis for the lack of observations, I believe the ovule precedes” (“Ovum” 137). By consciously turning to hypothesis in the place of observation, von Baer shows he knows the difference between the two and he is aware of the hierarchy of evidence over hypothesis, even as he has no choice here but to run with hypothesis.30 He adds this excuse: “I have not seen them in the smallest vesicles, but this investigation is impeded by such great difficulties that I have sometimes sought them in vain even in the larger” (ibid.). In his Entwickelungsgeschichte, he took care to separate his “Scholia and Corollaries,” offering generalizations about development separately from his descriptive observations, perhaps modeling himself on Newton’s separation of his calculations and observations from his queries. The distance between them acts formally as a barrier preventing the one from becoming the other.
ERASMUS DARWIN, IMAGINATION, AND STRICTER ANALOGIES

I have thus far argued that within obstetrics gender begins to function as a container for the imagination, not to mention an engine for hierarchy. The female imagination is regarded as something to be disciplined, the display of which licenses the male obstetrician’s imagination. If the female imagination was considered entirely subjective, and ignorant of the science of anatomy as well as the technical knowledge of instruments, the delayed discovery of the female ovum made it easier to minimize the significance of women’s contributions to generation, a minimization whose consequences Shelley underscores with the death of each mother. Yet the imagination was immune to strict protocols of method, in part because organicism gave it its own purpose. Von Baer’s solution was to display his powers of observations triumphing over a feminized imagination. As we shall see, Erasmus Darwin considered the degree to which the imagination’s ability to suggest comparisons would help. And yet if he thought that “stricter analogies” in science would solve the problem of how to discipline the imagination, what counted as stricter had first to be imagined.

Mary Shelley’s 1831 preface to the novel pokes fun at Erasmus Darwin: “vermicelli” is a kind of pasta but figuratively alludes to his experiments on microscopic worms. This allusion once again correlates males with being responsible for life, as it is likened to a spermatic worm. Darwin had written in the advertisement to The Botanic Garden that his goal was “to enlist Imagination under the banner of science; and to lead her votaries from the looser analogies which dress out the imagery of poetry, to the stricter ones which form the ratiocination of philosophy.” Erasmus was Charles Darwin’s grandfather. “Science” here is a branch of knowledge akin to natural philosophy, and Darwin’s sense of the way to get there is to harness the imagination’s powers of comparison and association, but to apply those comparisons according to stricter standards of ratiocination, which meant that one had to be careful not to assume that a resemblance signified identity. This was ostensibly to work against such occult ways of knowing as interpolating the organization of the body’s interior by analogy to the cosmos. Right away we can see that analogy proffers common ground for literature and science; both require the imagination’s capacity for figurative forms like “analogy” to make things intelligible, and intelligibility often required an empirical narrative. With regard to generation, analogy provided one of its main tools, since the process had to be observed across a range of living things.

Darwin’s own criterion of strictness could not be determined in advance because analogy requires a deft handling of similarity and difference. Methods to
combat a problem can happen only once the problem has been identified, and thus anything approaching a monolithic scientific method is an idealism. Hence, there could be no one protocol for analogy, and it was the operationalization of his criterion for strictness that could be helpful to science. In his *Observations on Man*, David Hartley had insisted, “In science analogy leads on perpetually to new propositions; and being itself some presumption of truth, is a guide much preferable to mere imagination,” but Darwin was warier of what such presumption might do to science. And yet, since the indiscriminate use of analogy hardly redounds to the credit of art, what we are dealing with are differing ways of measuring and operationalizing strictness. To claim that science uses analogies more strictly, then, is to ignore the kinds of precision that art requires with analogies, such as a building up to unity.

To get to the unknown, Darwin relies on arguments via analogy to the known: the “embryon is secreted or produced by the male, and not by the conjunction of fluids from both the male and female appears from the analogy of vegetable seeds” (*Z* 1: 489). In turning to vegetables to think about animal generation, Darwin relies upon what he considers a strong analogy between animals and plants, both being animated beings. In this instance, “stricter” invokes larger principles. Haller had warned that the signal cause of error within physiology was that “physicians have made use of few experiments, or even none at all, but have substituted analogy instead of experiments” (cited in Roe 92). Under “experiment” he included observation, and, since those observations were to confirm or to consider the probability of rational arguments, the validity of the analogy could be confirmed by appropriate observations. This may be why Darwin, however, stresses the verb “appears,” which reminds readers that analogies hang on appearances, but those appearances may offer similarities that turn out to be deceptive. One way to move the appearance more firmly into the camp of knowledge is to consider the extent to which the analogy represents a natural law. As I will show below, Darwin faults Buffon’s concept of interior molds in part because Buffon neglected natural laws. By contrast, Darwin offers a range of examples from different species, suggesting that the male secretion or production of the embryon is a law. When Shelley makes Victor Frankenstein the monster’s sole parent, she draws upon a history of arguments going back to Aristotle and forward to Darwin within the study of obstetrics and generation that credit the male with producing the stuff that truly matters, if only to register her skepticism and explore the consequences of such patriarchal fantasies such as Victor’s imagining of the creature’s obeisance.

Early on in his chapter on generation, Darwin offers key clues to how he understands the limits of analogy. He writes, “Thus the uterus during pregnancy is
greatly enlarged in thickness and solidity as well as in capacity, and hence must have acquired this additional size by accretion of new parts, not by an extension of old ones; the familiar act of blowing up the bladder of animals recently slaughtered has led our imaginations to apply this idea of distention to the increase of size from natural growth; which however must be owing to the apposition of new parts; as is evinced from the increase of weight along with the increase of dimension” (Z 1:495). The analogy of generation to the inflated bladder assumes a similarity based on mere appearance and thereby allows the imagination to usurp reason and the mind that would contain it. While the analogy accounts for an increase in size, it cannot account for an increase in weight. One takeaway: beware of superficial comparisons, and know how to check whether the comparison is merely a surface one. The rise of morphology complicated matters with the argument that, in the words of von Baer, “all the differences of any organ whatsoever . . . exist within the limits of strong similarity” (“Ovum” 142), thus taking issues of function off the table and by grouping objects of study by their similarities of form and structure.31

Darwin’s concept of “intuitive analogy” also helps to chart a course of further development even as it recognizes the value of intuition. Science is thereby again modeled on organic process. He writes, “In our waking hours whenever an idea of imagination occurs, which is incongruous to our former experience, we feel another kind of surprise, and instantly dissever the train of imagination by the power of volition, and compare the incongruous idea with our previous knowledge of nature, and reject it by an act of reasoning, of which we are unconscious, termed in Zoonomia, intuitive analogy” (TN 214). Here, surprise interrupts the train of associations and opens the door for volition to enter the picture. Did this feeling of incongruity equate to ratiocination? Nonetheless, the path forward is tricky because, although Darwin aligns intuition with reasoning, he also aligns it with the unconscious. The question is, can reason become more conscious of its analogies, and if so, how? Without conscious awareness, it was difficult to see how the imagination might chart a clear course of progress. And yet the absence of conscious awareness meant that invention was not beholden to any single framework, enabling thinking outside of the box, but only perhaps because one was unconscious of the box.32 Darwin’s insistence upon ratiocination thus demands that analogy be continually subjected to validation, especially since new knowledge might render a previously useful analogy moribund.

Darwin develops what he means by “stricter analogies” when he discusses his theory of monsters. Here, his primary concern is that the theory conform to intelligibility and logic. One of the dangers of intelligibility as a criterion for natural
science, however, is that the intelligibility provided by cultural assumptions about gender and sex might outweigh scientific evidence. Darwin argues that monstrosity is largely a disease involving nutrition, and although he does not come right out and blame women for monstrosity, the fact that he thinks women are responsible for nutrition of the child means that they are. Crucially, Shelley portrays Victor’s generative ambitions during the creature’s construction as masculine desires for glory, not feminine anxieties about childbirth.

Buffon’s theory of moules intérieur, translated as “interior molds,” which Buffon introduced in his Histoire Naturelle in 1749, further allows Darwin to figure out what he means by “stricter.” Mary Shelley records having read Histoire Naturelle in June and July 1817 (Journals 174–75). Charles Bonnet had in 1762 argued that “philosophically having understood the impossibility of explaining mechanically the Formation of Organized Beings, it imagined, happily, [a imaginé heureusement] that they existed already in small dimensions, under the form of germs or organic corpuscles. That idea produced two hypotheses, which greatly pleased reason” (Considerations 1: 1). Two points. One, the goal is philosophical understanding. Two, the imagined analogy prompts two hypotheses. Buffon ascribed the agency of this moule to “penetrating forces” that were based on an analogy to gravity and magnetic attraction. Buffon had turned to this plastic living organic power to try to explain both the basis of reproduction and the power behind the development of the embryo. And yet what irked Darwin most was Buffon’s claim to have found an analogy that would in its ability to generate more analogies conform more to truth. Buffon had written, “Elle deviendra d’autant plus vraisemblable que le nombre des analogies sera plus grand, & pour nous faire mieux entendres” (2: 37). As the number of analogies increased based on this original analogy, Buffon thought it would allow us better to hear nature. This generative-ness of Buffon’s analogy flew in the face of Darwin’s desired strictness. Furthermore, Buffon had deliberately chosen a strange term because the idea of contradiction that it might present through its very novelty could interrupt trains of thought. Here, figurative language startles the mind into attention. Darwin concentrated his objections to Buffon on how these entities seemed simultaneously mechanical and vital, and therefore did not make sense: “Mr Buffon has with great ingenuity imagined the existence of certain organic particles, which are supposed to be partly alive, and partly mechanic springs . . . These organic particles he supposes to exist in the spermatic fluid of both sexes, and that they are derived thither from every part of the body, and must therefore resemble, as he supposes, the parts from whence they are derived” (Z 1: 495). Darwin is so concerned to place Buffon at arm’s length that he thrice insists upon the great naturalist’s sup-
positions, implying that there is no actual basis for them. His imagination wanton only builds castles in the air, much in the same way that Shelley describes the pleasures of her following the imaginative dreams of her girlhood (1831 preface 194) so that she can show herself as having outgrown them. “Stricter application” then does not rely expediently upon convenient suppositions, and certainly it would hardly pile supposition upon supposition. Moreover, from Darwin’s perspective, the analogy of interior forces to gravity cannot provide an ontology for Buffon’s penetrating forces.

Darwin elaborates: “Many objections might be adduced to this fanciful theory, I shall only mention two. First, that it is analogous to no known animal laws. And secondly, that as these fluids, replete with organic particles derived from the male and female organs, are supposed to be similar; there is no reason why the mother should not produce a female embryon without the assistance of the male, and realize the *Lucina sine concubitu*” (Z 1: 496). Although Darwin here associates the imagination with “ingenuity,” that initial praise slides into blame as Buffon’s idea becomes a “fanciful theory.” By implication, fancy so undermines the claim that Darwin can be bothered to muster only two of the many arguments he could against it. Perhaps this is also because the ease of ingenuity rubs against the hard work of collecting data and pursuing confirmations. The man of science comes into being with practices of observation that count as labor, and the mere suggestion of being ruled by “fancy” cancels out that image. In any event, Darwin applies his distinction between strict and loose analogies, using the absence of a natural law as a key criterion. Darwin’s second problem with Buffon’s idea is that it provides two possible causes for generation, when, strictly speaking, only one is necessary. More upsetting is the fact that Buffon’s *moules* make it possible for women to compete with men as the cause of generation; two causes violate the rule of explanatory parsimony: one should never generate more explanations than are absolutely necessary.

**John Hill and Imaginary Projectors**

Darwin’s earlier allusion to *Lucina sine concubitu* is deliberately provocative and hints at the much larger stakes behind the imagination and a complex genealogy behind strict analogies. The phrase refers to a satire written by John Hill to the members of the Royal Society upon his rejection for admission to it. Lucina is a mythological goddess who conceives without a man, and Hill here recalls Joseph Tuberville Needham’s dismissal of preformationism on the grounds that the newborn cannot possibly spring from eggs in which the newborn is fully formed (G. Rousseau, *Notorious Hill* 67). Hill had published a number of important and
respected botanical studies and an analysis of fossils, along with a study of the nerves, all of which the great Albrecht von Haller had deemed important enough to have read. Many members of the Royal Society had published significantly less. Yet, according to his biographer, Hill’s prickly and ambitious personality doomed his candidacy. Hill would later become the first person to name tobacco as a cause of cancer (G. Rousseau, *Letters* ix). In his letter, Hill poses as a midwife and argues that immaculate conception was possible because male animaculae were everywhere, blown by the wind. This theory is known as panspermism. Twice, Hill praises naturalists for their reliance upon “the great Analogy and Similitude in the Generation of all animals” (*Lucina* 12). Anticipating Darwin, Hill complains of the “looseness of poetic description” (24). Finally, he chides those who, in their ignorance of real causes, “assign imaginary ones” (25), as if floating embryos weren’t imaginary. Behind Darwin’s call for stricter analogies is Hill’s mocking letter.

Hill’s parody of the Royal Society’s methods was disturbing: he used the scientific language of the Royal Society against itself to lend credibility to his work. Hill thus refuses to rely on the authority of great names (*Lucina* 12), cites articles in the Royal Society’s *Philosophical Transactions*, offers “light and confirmation of [his] hypothesis” (24), and chides Newton for indulging in speculation, while he claims to have extended his ideas into “practice” (20). Hill further explicitly instrumentalizes his findings. Historian of science Peter Dear has called attention to how “science” turned to instrumentality during this period as one of its defining goals. Immaculate conception does away not only with venereal disease but with the invention of his machine to catch the airborne embryos; Hill obviates male sterility along with the need for marriage itself. When Hill describes the airborne animacule under the glass, his language recalls those skeptical of Leeuwenhoek’s microscopic observations: “Oftentimes, when I was viewing them through my glass, my Imagination would turn Romantic and represent to me the great variety of fortune they go through” (13). As historian Lisa Cody argues, microscopists like Leeuwenhoek were accused of misusing their imagination (113) when they analogized animalcules into beings.

Hill’s letter, thus, serves as an intriguing counterpoint to *Frankenstein*, as its opening premise is the novel’s precise opposite. If the novel considers what happens when men give birth, Hill argues that women don’t need men in order to conceive. Hill further invents a machine to catch these floating embryos, which he had “electrified according to the nicest laws of electricity” (*Lucina* 13), and thereby brought them to life. Is this what inspires Shelley to use the battery to “birth” the monster? Both texts dwell on role of analogy and imagination. Hill takes for granted the “great Analogy and Similitude in the generation of all ani-
mals” (11). Hill highlights the imagination’s tendency to romanticize, and Shelley agrees. And if Victor relies too much on his imagination, Hill’s protagonist finds a passage in the work of someone else that strikes his imagination so forcefully that he simply appropriates this work as the “foundation and groundwork” of his own system (7). Hill also warns of the dangers of too strict analogies: the imagination might become too constricted. In his review of the Royal Society’s Philosophical Transactions, Hill quotes from the Tatler: “There is no study more becoming a rational creature, than Natural Philosophy; but as several of our modern Virtuoso’s manage it, their speculations do not so much tend to open and enlarge the mind, as to contract and fix it on trifles” (viii). Perhaps it is telling that Hill’s midwife persona makes decisions with more self-awareness than Victor Frankenstein can muster. Shelley further echoes Hill when she claims Clerval’s imagination “was too vivid for the minutiae of science” (49), and when Victor declares his distaste for modern natural philosophy on the grounds that “the ambition of the enquirer seemed to limit itself to the annihilation of those visions on which my interest in science was chiefly founded” (29). Not only does Hill remind us of how much science was finding its way during this period—it was far more fluid than we tend to assume—but he also shows how easily science could look like fiction and vice versa. However, to base one’s interest in science on visions is beyond the pale.

Even more to the point, both Hill and Victor also protest too much that they are not projectors, Jonathan Swift’s version of Royal Society scientists who devote their lives to useless projects. Hill’s protagonist asks to be “redeemed from the reproachful name of projector” (Lucina 25); likewise, Victor claims, “I could not rank myself with the herd of common projectors” (180). Like Swift’s projectors, who waste their time converting shit into food and harvesting sunshine from cucumbers, Victor spends his time creating a monster and then running away from its consequences. And like those projectors who think themselves useful, Victor trumpets his “daily usefulness, without which no man is fit for society” (70), even as the dead bodies pile up all around him. Shelley’s point is that at least Swift’s projectors cause no direct harm. In sum, Hill’s work and its ambiguous status between science and parody threw the gauntlet down to the Royal Society to do more to help distinguish between science and fiction. Hill is important to Frankenstein because he calls into question the powers of science to deliver modernity and reminds us of the costs of science’s proximity to literature, not always to the benefit of either.

Nonetheless, this proximity could offer substantial resources. In his pursuit of stricter analogies, Darwin misses the point of Buffon’s deliberate paradox. Buffon argued that “moules intérieur” joins two terms that appear contradictory: “parois-
sent contradictoires” (*Histoire Naturelle* 2: 36). One, the idea of form, applied only to surfaces. The other, inner, was usually applied to mass (Reill 47). Hans Peter Reill argues that for Buffon “a language of nature must be able to capture [nature’s] opposing, merging and balancing forces, without destroying any of them linguistically by reducing them to a false unity” (47). To get at organicism, then, Buffon resorts to a paradox that calls into question whether the strictness of analogy is even desirable. Paradox relies upon a dialectical force between opposites that questions how much precision is possible. Moreover, since Buffon believed that natural history was about discerning relations between entities, and not causes or essences, analogy for him bespoke the language of nature (Reill 52). For Buffon, analogy is evidence, not method. The upshot here is that, where Darwin wanted analogy to foster ratiocination and limited strictness to that idea of it, Buffon was interested in how the formal properties of analogy actively performed the organic powers that could not be otherwise named. Buffon’s generative analogies thus sought to take advantage of the aesthetic properties of language for the benefit of biological science. Only those aesthetic properties could capture the idea of structures in formation.

Like Buffon, Victor Frankenstein repeatedly separates external form and interiority, but, whereas Buffon had a larger point to make, Victor’s use of the concept remains at the level of contradiction without his knowing so. Victor, of course, praises Buffon, “read[ing] him with delight” (25). He repeatedly claims a distinction between form and being, but offers no coherent rationale for the split. He refers to the monster as “a being whom I myself had formed, and endued with life” (57). Yet can one be considered a being without life, and if so, what does it mean to have formed a being? Since he has combined the parts of a dead being, Shelley further chalks up his inflated sense of his own contributions to the needs of his masculine ego. If Buffon’s *moule intérieur* points to a performative active organic synthesis between morphology and interiority, Victor’s terms amount to a juxtaposition of opposites that don’t quite make sense. Fittingly, the monster has an exteriority that he cannot reconcile with his interiority: he is a walking *moule intérieur*, but one whose parts don’t add up to an organic whole, and how could they? They were dead.

However, no sooner than Darwin upbraids Buffon does he venture his own speculations, and any clear path forward toward stricter analogies seems in jeopardy: “I conceive the primordium, or rudiment of the embryon, as secreted from the blood of the parent, to consist of a simple living filament as a muscular fibre; which I suppose to be an extremity of a nerve of locomotion, as a fibre of the retina is an extremity of a nerve of sensation; I suppose the living filament, of whatever
form it may be, whether sphere, cube, or cylinder, to be endued with the capability of being excited into action by certain kinds of stimulus” (Z: 496).38 Darwin offers two leads. One, he frames his analogies as similes and thus reminds us of their figurative status. Second, he makes explicit the basis of his analogy so that the strictness of its comparison of a rudiment to a muscular fiber can be evaluated. His physiology nonetheless relies upon blood being the source of the rudiment. Once again, the imagination’s ability to generate analogies cannot be dispensed with, but how, and on what terms, could what was generated be trusted? In sum, because larger philosophical positions could always be brought in to justify the choice of analogy, the best one could do would be to, on the one hand, be extremely modest in one’s use of them and, on the other hand, offer examples of consilience that make clear the analogy is not just about surface similarities.

Mary Shelley’s own attending obstetrician in 1815, Charles Clarke, worried about how the field’s overreliance upon imagined conjectures—he called it “hypothetical reasoning” (1)—and mistaken analogies.39 To counter these, he came up with his own taxonomy of diseases associated with discharges of the female organs of generation, precisely because obstetricians had in his view mistakenly lumped women’s diseases together under their unifying symptoms, which were only superficial similarities. Clarke urged further that these diseases be named according to their underlying causes and not their common symptoms so that diseases could be grouped under their proper treatments. Once again analogy threatens to find the superficial similarities or symptoms instead of the deeper underlying causes. For Clarke, analogies among symptoms threaten the very possibility of a useful nosology.

Darwin’s and Clarke’s calls for the imagination to use stricter analogies shapes Shelley’s understanding of the relation of life to electricity. While electricity offers a possible analogy to life, analogy does not mean identity. Their friend and surgeon William Lawrence had insisted that “there was no analogy between electricity and life: the two orders of phenomena are completely distinct” (Introduction 170). Any similarity, he claimed, “is only in appearance” (171). To highlight her skepticism of the analogy, Shelley does three things. One, she frames the relation of galvanism to life as a “token” of identity. In her 1831 preface, Shelley argues, “Perhaps a corpse would be reanimated; galvanism had given a token of such things” (195). Two, she considers the fact that Victor, an alleged expert on generation, does not seem to have a sense of the difference between life itself and the appearance of life.40 Hence, he thanks Clerval for restoring him to life when all he did was restore his signs of life. Likewise, he thanks Walton for having “benevolently restored me to life” (14), while Clerval’s letter later “recalled me to life”
Without a distinction between life and signs of life, or between life and its symptoms, all Victor can do is to put together superficial analogies, analogies that speak only to the surfaces or symptoms of things that can come to life only in fiction. Third, even the monster knows better than to conflate signs of life with life. He describes his rescue of a drowning girl thusly: “She was senseless; and I endeavoured, by every means in my power, to restore animation” (115). His terms are “senseless,” which makes sense, and “animation,” both of which indicate signs of life rather than life itself. Victor, after all, takes for granted that “to examine the causes of life, we must first have recourse to death” (33), but how could the study of life’s opposite show its causes? Mary Shelley indirectly questions whether there is an analogy of life to death or whether those are fundamentally different categories.41 Percy owned Gregory’s The Economy of Nature, and, in a section labelled “Analogy between this Influence [Galvanism] and Electricity,” Gregory noted similarities and differences between the two, claiming “animal electricity is produced by two metals, which are both conductors” (1: 379). If animal electricity is produced by two metals, then there is nothing “animal” about it. He explains further that galvanism is not “nervous energy” because it is not stopped by cutting the nerve or a tight ligature (1: 381).

**VICTOR FRANKENSTEIN AS IMAGINATIVE SCIENTIST**

I have shown how the man-midwife actively feminized the imagination as a faculty to be mistrusted so that it can be manipulated and placed under masculine authority.42 Even better: making the female imagination the root of error took off the table any mistakes the man-midwife might have made with his instruments in the assistance of delivery. Early on in the eighteenth century, the belief in women’s imaginations as being responsible for monsters facilitated reading blemishes and injuries from overuse of instruments like the forceps as the mother’s fault.43 The monster adopts the idiom of the male midwife when he tries to “assist the labours” of the peasants, but one question was, did those labors require assistance? (88). And, in fact, the peasants were doing okay before he appeared. Shelley’s treatment of Victor’s imagination shows that masculinity will not inoculate it. Because the imagination was embodied—Victor’s scientific efforts always lead to his nervous exhaustion—science relies upon an imagination that cannot provide the autonomy and mastery it is sometimes accused of having. As Shelley knew, development is not just an effect of the passage of time, and the mind was not autonomous from the body (Yousef). Yet, because it is subject to the contingencies of bodily experience, the imagination has every potential to grow from social interactions. Unfortunately, Victor Frankenstein repeatedly allows his imagination to control
him and does not recognize that, without a subject capable of disciplining the imagination, he could not hope to make valuable contributions to science or to society. If the comparison of the imagination to generation suggested it was organic, and thus subject to processes of development and growth—Darwin insisted it guided the development of the embryo, thus increasingly the stakes of its development—Victor’s imagination is arrested, isolated, and diseased. His hard work “deprives him of rest and health” (39), and he must be revived by the care of others. His exhaustion of his imagination aligns it with disease as opposed to health, and this is one of Shelley’s strongest arguments against Victor. Indeed, his imagination is diseased by nostalgia, which Shelley refers to as his “maladie du pays.”

Shelley recognizes that big breakthroughs require the leaps of imagination, and thus she shows that dreams, because they are freed from the obligation to mirror reality, can lend important insights. In his first dream after the monster comes to life, for instance, Victor kisses his future wife, Elizabeth, only to have her instantly perish (39). What he subconsciously recognizes is that he will be responsible for her death. Likewise, Darwin thought that analogies originated in unconscious intuition, but their scientific value needed to be tested by ratiocination, if not by observation and experiment. When it becomes regularized by habit, however, its ability to offer anything radically innovative can be lost. The author of the entry on imagination in Rees’s Cyclopedia framed this worry thusly: “It is highly probable, that whatever is regular and rational in a train of thought, which presents itself spontaneously to a man’s fancy, without any study, is a copy of what had been before composed, by his own rational powers, or those of some other person.” To the extent that conscious thought modeled itself on previous thought, it threatened merely to reproduce what was already known or copy previously held thoughts.

Shelley acknowledges the stakes and challenges of being able to control the imagination clearly when she has Elizabeth weigh the influence of reason against imagination just after the death of Justine. She has Elizabeth comment, “Before, I looked upon the accounts of vice and injustice, that I read in books or heard from others, as tales of ancient days, or imaginary evils; at least they were remote, and more familiar to reason than to the imagination; but now misery has come home, and men appear to me as monsters thirsting for each other’s blood” (71). When vice and injustice were just theoretical and abstract entities, they were familiar to her reason. But, after “misery has come home,” imagination takes over and grants evils a vividness and immediacy that prompts her to see humankind as “monsters thirsting for each other’s blood.” This tendency to believe the vividness of the imagination’s images can have devastatingly unjust effects. Justine’s jurors, for in-
stance, neglect all testimony regarding Justine’s kindness, “by the imagination of the enormity she was supposed to have committed” (61). And yet, unlike Victor, Elizabeth reflects upon the difference between imagination and reason, and her use of “appears” indicates that she knows what her imagination has told her is an exaggeration. Shelley thereby challenges the version of the female imagination men-midwives offered by having Elizabeth have a kind of control over her imagination that Victor does not.

Like the man-midwife’s version of pregnant women, Victor’s problem is that his imagination is a virtual homunculus that takes the place of his subjectivity. He repeatedly delegates sovereignty over his imagination to many others: “Agrippa, Magnus, and Paracelsus, who had for so long reigned the lords of [his] imagination” (25). And, once “warmed,” his imagination acquires an agency of its own and does not turn back. Despite the fact that he recognizes that these writers indulge in “wild fancies” (25), he uses no caution. Even after his experiences with the monster, Victor blames his father for not having explained why Agrippa had been superseded. Indeed, he argues, “It is even possible, that the train of my ideas would never have received the fatal impulse that led to my ruin” (23). Here, Shelley exploits Darwin’s linking of imagination to the building of trains of association, and, by reading the catalyst to these trains as “fatal,” he takes no responsibility for them. More importantly, he views his own mind as an automated machine: by assigning a fatal impulse that starts the train of thought and continues it to its end, Victor does not have to think about his own role in his thoughts. His flirtation with the third person when speaking of his imagination is also telling, and this allows the homunculus of Victor’s imagination to be seen as a kind of rhetorical double to the male midwife’s offloading of ethical responsibility onto the maternal imagination. Victor claims, “My imagination was too much exalted by my first success to permit me to doubt of my ability to give life to an animal as complex and wonderful as man” (35). He adds, “My imagination was busy in scenes of evil and despair” (57), as if it is doing things all on its own. Shelley here begs the meaning of the pronoun “my.” Later, after he destroys the female monster, Victor comments that “my imagination conjured up a thousand images to torment and sting me” (141). Although the imagination’s powers to conjure images was widely accepted in sleep during dreams, Victor is here wide awake and does not even recognize the absence of his will as a problem.

When Walton’s crew is about to be crushed by ice, Victor tries to goad them into persevering: “Now behold, with the first imagination of danger, or, if you will, the first mighty and terrific trial of your courage, you shrink away” (183). Victor’s ability to equivocate “imagination” and “trial”—he pivots these terms around an
“or”—underscores the untrustworthiness of his imagination. Victor later proudly declares that his situation was “one in which all voluntary thought was swallowed up and lost” (170). Displaced from this sentence is Victor’s own personhood, and it has been replaced by a “situation” that usurps the place of the subject. All of these substitutions allow Victor to find himself blameless, as he does. Another worry about his inflated imagination: when it is too exalted, the imagination becomes incapable of doubt, and science is impossible without it. Once again his imagination usurps his personhood. His monster follows suit. Referring to revenge, the monster states, “I think on the heart in which the imagination of it was conceived” (190). My immediate point here is that the monster turns to his heart as a surrogate for the self and imagination, but should the heart be the locus of the imagination, and in what sense is a heart capable of conception? This is potentially a throwback to Haller, who thought the heart was the center of proper internal organization, not the brain. Unlike the case of Thomas Lane, where even the extraordinary circumstance of a male having a fetus within him did not do away with the need to impose known laws, neither Victor nor the monster feels any such compulsion.

When he does try to connect his observations with laws, Victor indulges in complete absurdity: “Alas!” he exclaims. “Why does man boast of sensibilities superior to those apparent in the brute; it renders them more necessary beings. If our impulses were confined to hunger, thirst, and desire, we might be nearly free; but now we are moved by every wind that blows” (75). What Victor sees as freedom would amount to its direct opposite: a complete indebtedness to necessity. Also, having feelings does not mandate being completely controlled by them, but, characteristically, Victor equates having feelings with complete indulgence in them.

Once we see that Victor repeatedly gives over anything like personhood to his imagination and emotions, we are better positioned to evaluate his scientific choices. For one, he simply assumes that life is a principle, as if there were no debate about what relying upon a metaphysics means for science. Shelley shows her contempt for this by reminding readers of alchemy’s misguided search for the “elixir of life” (30), but what made the search for vitality as a principle different? Although Victor denies that he is a projector, Shelley does not agree, insofar as merely being useless would be an improvement over the devastation that Victor causes. To develop its powers so that the imagination can be productive for science and art, judgment is required. Unsurprisingly, the only judgment Victor has exercised has occurred in the past tense: “When younger... I possessed a coolness of judgment that fitted me for illustrious achievements” (179). The fact that he sees himself like Satan “chained in an eternal hell” shows his complete loss of judgment, as
he fails to recognize Milton’s irony. He also does not see the irony in his claim that “in a fit of enthusiastic madness I created a rational creature” (185). If he was in such a fit, how could he know what was rational, let alone create a rational creature? And if to be rational is to think for oneself, is it possible to create a rational creature at all? In his rush to pat himself on the back, Victor neglects the fact that rationality must be developed. The fact that Victor blacks out, overcome by events at several critical points in the novel, only further undermines his scientific pretensions, as does the fact that he never once misses his laboratory notes, from which the monster gleans his origins.

Because of his passive reliance upon his imagination, Victor Frankenstein makes for a poor scientist. Although many have read the novel as an indictment of male science—most famously Anne Mellor—comparing Victor to the scientists of his time puts the blame where it properly belongs: at the doorstep of Victor’s undisciplined imagination. When he fantasizes about the adulation he will receive—“no father could claim the gratitude of his child so completely as I should deserve theirs” (36)—Victor mistakenly categorizes his imagination as his “reflection” (36). By implication then, the problem is not so much science itself but rather how to do better science. Because his imagination has no corrective, he adopts outdated and superseded models like alchemy and magic, and mistakes narcissism for autonomy. As a result, he cannot even grasp the significance of such scientific terms as “boron” or “sulphates” or “potassium,” because he could “affix no idea” to them (25). Victor ascribes his own blindness to the possibility that the monster had been “possessed of magic powers” (161). As he undergoes the trials of the Arctic, he also “may not doubt that it (his repast) was set there by spirits that I had invoked to aid me” (173). Indeed, he calls upon the spirits of the dead to aid in his plans of vengeance. Very near to his last breath, Victor is startled by the realization that “all my speculations and hopes are as nothing” (180). The problem is that they are nothing and thus require some kind of confirmation. Even at this late date Victor tries to stave off the nothingness of speculation with the simile “as.”

There is a deeper irony here, given that proponents of the imagination had celebrated its physiological powers over the body as a triumph over the very magic and superstition Victor embraces. The author of the encyclopedia entry on imagination in Rees’s Cyclopaedia, Percy Shelley’s eye surgeon, William Lawrence, writes, “in such a state of the human mind, when natural philosophy, meagre as it was, was disguised with the name, and clothed with all the supposed agencies of magic.” The author cites the commission on mesmerism, which disproved magical animal magnetism and replaced it with the imagination as explanation. Even worse for Victor, when Mr. Waldman explains the difference between ancient and
modern chemists, he deliberately aligns himself with the ancients over the moderns. The passage is worth close examination: “‘The ancient teachers of this science,’ said he, ‘promised impossibilities, and performed nothing. The modern masters promise very little; they know that metals cannot be transmuted, and that the elixir of life is a chimera. But these philosophers, whose hands seem only made to dabble in dirt, and their eyes to pore over the microscope or crucible, have indeed performed miracles. They penetrate into the recesses of nature, and shew how she works in her hiding places’” (30). With this passage, Shelley underscores that Victor’s choice of the ancients over the moderns aligns him with the performance of nothing. Moreover, where Waldman frames close observation and having dirty hands as performing miracles, Victor will regard this work as beneath him and as without ambition. Now Waldman does frame nature as a female body that hides and therefore must be penetrated, and perhaps this explains why Victor departs “highly pleased with the professor” (31).

In addition to magic, alchemy, and spirits, Victor flirts with another theory that no longer made sense: preformationism. Preformationists were by the Romantic period satirized for their ample imaginations: the idea that every single being was already preformed within the ovaries of Eve may now seem preposterous, but, without cell theory, there was no lower limit on organic size (Gould in Pinto-Correia xv). Bonnet countered this by defining the germ as not a fully preformed creature but rather as a loose sum of all the fundamental parts of the future individual (Pinto-Correia 58). He thus made preformationism easier to swallow. Victor forms his monster by sewing together preformed parts. Victor also speaks as if he endorses the idea that form precedes life: he writes, “A being whom I myself had formed, and endued with life, had met me at midnight” (57). Here, form precedes life, but, instead of God having done the preformation, Victor egotistically inserts himself. In contrast, William Lawrence had argued, “Living beings . . . always have a form characterizing the species to which they belong” (Introduction 126).

From Lawrence’s perspective, the biology of living forms mandated the inextricability of form from life. Shelley’s plotline counters Lawrence’s materialism by separating animation from structure, and thus Victor pronounces, “Although I possessed the capacity of bestowing animation, yet to prepare a frame for the reception of it . . . still remained work of inconceivable difficulty and labor” (35). Not only are the monster’s parts preformed, but their physical growth and development is taken off the table because they are fully formed. When he considers making the female monster, he assumes that form entails predispositions: “I was now about to form another being, of whose dispositions I was alike ignorant” (138). Like the midwife who turns to preformationism to absolve himself of any
defects caused by his instruments, Victor does not recognize the need to parent the monster. And just as preformation hinted that development was the progressive unfolding of a divine plan, Victor sees himself repeatedly as fated. Very early in the novel, Shelley even shows us Victor’s imagination at work. She writes, “The picture appeared a vast and dim scene of evil, and I foresaw obscurely that I was destined to become the most wretched of human beings” (55). As soon as the picture appears, Victor believes in it.

In fact, Victor’s imagination is what prevents him from doing science that might prove useful. It excuses him from hard work. When Victor first imagines that the monster has killed William, he comments, “No sooner did that idea cross my imagination, than I became convinced of its truth; my teeth chattered . . . The mere presence of the idea was an irresistible proof of the fact” (56). He defines the presence of the idea itself as its proof, and, whatever Shelley thought of the imagination, she did not think thoughts could be their own proof. His imagination does nothing less than short-circuit the very possibility of science and in so doing mistakes his own narcissism for autonomy. Because he sees science as the path to grandeur, he frames its empirical concerns as beneath him and thus deprives science of an other that would challenge it to improve. To wit, he claims that Clerval was “no natural philosopher” on the grounds that “his imagination was too vivid for the minutiae of science” (49). This coming from the man who turned to the parts of an eight-foot giant to make his work easier is rich indeed, suggesting the degree to which Shelley wishes her readers to find him disagreeable. Seeing the experimental work as minutiae makes it difficult to motivate oneself to do it. When coupled with his sense of his thoughts as proof, verificationalism goes out the window, and the problem is that imagination has nothing to rub up against and nothing that will help it correct itself.

Shelley insinuates that Victor’s overreliance upon his imagination makes him especially vulnerable to seduction by dogma. Whereas the scientist needs to subject his or her conjectures to some kind of confirmation, dogma provides blanket rules before any contingencies can be considered. Dogma takes all contingencies off the table and offloads the thought process onto preconceived ideas. Indeed, Victor relies on entities like “destiny” so that he does not have to think about the meaning of his actions and choices. Even worse, his susceptibility to dogma not only makes him untrainable, but it also violates any potential benefit of thinking about one’s thoughts in terms of organic development, as the comparisons of imagination to generation encourage. In the course of the novel, Victor holds onto the following dogmas: all knowledge is dangerous and therefore should not be sought; change is painful to the human mind, so don’t expose it to change. Early on, Victor
tries to convince Walton to “learn from me, if not by my precepts, at least by my example, how dangerous is the acquirement of knowledge” (35). Not only does this premise drain the novel of everything that is of interest, but it also means that Victor’s knowledge that all knowledge is dangerous is also dangerous. He does not consider that there might be a gap between knowledge and the use of it. Near the end, Victor pronounces, “Nothing is so painful to the human mind as great and sudden change” (167). All this belief does is encourage insulation from change, as if that were possible. As we might expect, the changes surrounding Victor cause him to “be incapable of any exertion” (167).

Victor’s overreliance upon his imagination even distorts how he understands the scientific process. Shelley asks us to see how the analogy of scientific discovery to birth misrepresents how science should work. Victor forgets all the painful labors that precede his discovery, making it seem like it was a miraculous and instantaneous conception. Moreover, the excitement of the discovery was so great that it completely overshadowed the preparatory work to get there. Victor describes the moment thusly: “The astonishment which I had at first experienced on this discovery soon gave place to delight and rapture. After so much time spent in painful labour, to arrive at once at the summit of my desires, was the most gratifying consummation of my toils. But this discovery was so great and overwhelming that all the steps which I had progressively led to it were obliterated, and I beheld only the result” (34). In the same way that men-midwives tended to ascribe all the good that happened to their expertise and intervention, Victor gives himself nothing but accolades and finds himself blameless. Jo-Murphy Lawless comments that “obstetricians tended to see what they had accomplished, exclusive of other factors which lay outside their control” (192). Although the metaphor conflating scientific discovery with birth would seem to highlight process, Victor truncates the process and in fact erases the signs of process and labor. Fittingly, the monster somehow makes off with Victor’s laboratory notebook, the only record of that process and labor. All he beholds is the result, and the danger of this foreshortening is that science looks like it has methods that can be known in advance. This version of his discovery contradicts his later claim that he had united the qualities of imagination and application equally (180). Moreover, Victor subscribes completely to the idea that “the labours of men of genius, however erroneously directed, scarcely ever fail in turning to the solid advantage of mankind” (31). This theory of the generative labors of genius provides incentives neither to find nor to learn from error and thus no methodological corrective. And this theory leads to catastrophe. Part of Shelley’s solution is thus to insist that theories need testing, and those that originate under the banner of genius need all the more testing. To
the extent that Victor’s bringing the monster to life is an experimentum crucis, Shelley argues that such a thing is a myth because no single experiment could resolve the issues involved. Finally, Victor rejects all efforts at falsification on the grounds that they do not satisfy ambition: “The ambition of the inquirer seemed to limit itself to the annihilation of those visions on which my interest in science was chiefly founded” (29–30). Although there was little glory in falsification, that was an important part of science.

There is one small ray of hope, one glimmer that Victor has not entirely lost his judgment. When Victor offers his deposition so that the magistrate will help him pursue the monster, he comments, “It is indeed a tale so strange, that I should fear you would not credit it, were there not something in truth which, however wonderful, forces conviction. The story is too connected to be mistaken for a dream, and I have no motive for falsehood” (169). In the same way that Darwin turns to the strictness of analogy to validate it, Victor insists that the connectedness of his story indexes its truth and that has the power to compel belief. In this rare moment, he provides a standard by which to evaluate the claim. Given that the success of embryology depended upon the ability to identify meaningful patterns within the evidence, having this criterion begins to suggest the possibility of distinguishing between surface similarities and deeper ones.

Darwin’s thinking about analogy encourages Shelley to consider the limitations of the analogy between birth and imagination, and to see the limits of forming another in one’s own image, as so many theorists of generation assumed. Must the generation of children and ideas be doomed to reprint clichés? If thoughts and art are the progeny of the imagination, does that mean an economy of replication and mimesis necessarily follows? Midwives often credited the imagination for the likeness between children and their parents (Sharp 77), and Darwin importantly viewed the embryo as a branch of the male parent, which meant that it could never be entirely its own cause and that female creativity could not even aspire beyond male mimesis. Victor buys into this kind of thinking when he imagines that all his progeny will do is worship him. So does the monster, who proclaims, “My vices are the children of a forced solitude that I abhor” (121). To what extent does “children” absolve him of responsibility, since they function as a screen with which he can distance himself from his own actions? My point here is that if Darwin teaches Shelley that analogy should neither be mistaken for identity nor stand in for absolute difference, then the generation of children and ideas should not be limited to replication. Simply put, children should not be forms of autobiography. She thus proffers three stories instead of one—Walton’s, the monster’s, and Victor’s—to encourage the play of similarity and difference.
The novel thus operationalizes science with a standard of reproducible results, even as it worries about how the imagination’s creativity will be overshadowed by verification. Moreover, insofar as men-midwives had very carefully to separate women’s difficult labors from masculine intervention so as not to have to take the blame if something went wrong, the metaphor of imagination as birth runs the danger of making the parturition the culminating event. Indeed, once Victor has “given birth” he thinks he is done with his creature, even going so far as to clap his hands once the monster has disappeared.

Victor eventually comes to espouse what will become scientific objectivity, but Shelley warns that objectivity comes at too high a price because it denies that feelings have epistemological value. In a rare moment, when he concedes some blame for what has happened, Victor comments that “a human being in perfection ought always to preserve a calm and peaceful mind, and never to allow passion or a transitory desire to disturb his tranquility. I do not think that the pursuit of knowledge is an exception to this rule. If the study to which you apply yourself has a tendency to weaken your affections, and to destroy your taste for those simple pleasures in which no alloy can possibly mix, then that study is certainly unlawful, that is to say, not befitting the human mind” (37). There are several problems with this claim. First, Victor has never been able to obey it. Second, Victor blames the specific area of study for the weakening of the affections, but why should a particular area of study cause such a weakening? Once again Victor has no judgment from which to evaluate his thoughts. Third, to make any study “unlawful” because it disturbs the passions would divest human beings of their best accomplishments and would certainly remove anything of interest from the novel. One thing novels cannot sustain is homeostasis. If Victor makes a plea for objectivity, he simultaneously denies the emotional motivations that make the pursuit of knowledge feel worthwhile. Thus, Victor Frankenstein helps Shelley work out the ways in which the fruits of imagination can be evaluated so that the development of the imagination is possible.

**THE TEMPLE OF NATURE AND FRANKENSTEIN**

We have only scratched the surface of the connections between obstetrics and embryology and the novel, and Erasmus Darwin helps us deepen those connections.48 Darwin’s *Temple of Nature*, the source of Shelley’s musings on the piece of vermicelli that miraculously began to move, had a much more powerful influence on *Frankenstein* than has been acknowledged. Darwin’s larger project in the *Temple of Nature* is to illustrate analogies among reproduction, the progress of mind, and the progress of society.49 As Darwin tries to show, development in the
womb recapitulates the history of the development of the earth: the origin of life in the sea is repeated in the womb and the fetus’s surroundings by amniotic fluid. In his preface, Darwin claims to eschew “deep researches of reasoning; its aim is simply to amuse by bringing distinctly to imagination the beautiful and sublime images of the operations of nature” (preface). As Noel Jackson has perceptively remarked, for Darwin the imagination provides the catalyst for the researches of science, “pointing out the truths that science only later confirms” (“Rhyme and Reason” 183). I would add that in the same way that the generation and conception of ideas cannot be reduced to a method or formula, any confirmation is only temporary, and we should not forget that science is in the business of confirmation and refutation. The sublime wonders of the natural world and amusement are what attracts the human mind to the study of science in the first place. Darwin’s underlying premise is that all these processes share a common organic development, and the uses of that assumption need testing. These sublime analogies, in turn, help Shelley connect microcosm to macrocosm and thereby relate the development of the individual, through perspectives of both body and mind, to societal development writ large. The comparisons between these forms of development suggest a common causality that demands further investigation.

Darwin relies on deism to offer a rational basis for faith that eschews the miracles of revelation, and thus he highlights the rational workings of the operations of nature from the embryo to the imagination through to the universe. While his version of God does not intervene in earthly affairs, his God works through rational, scientific processes, which Darwin documents. Shelley, by contrast, not only substitutes an electrical scientist in the place of God—Kant had called Benjamin Franklin the modern Prometheus—but also empties out Darwin’s readings of natural cycles in terms of necessary progress and worries whether the emotions can be mastered by rationalism and whether they should be so mastered. Where Darwin considers pleasure to be “the ground of knowledge and the end of human action” (Jackson, “Rhyme and Reason” 176), Shelley highlights how vengeance corrupts pleasure by transforming social interaction into sadism and pleasure’s vulnerability to narcissism. Shelley not only does not assume that imagination is a form of reasoning—it can be so only under certain conditions—but she also warns that Victor’s arrested imagination will cut itself off from the world and thereby prompt only death and devolution. The abortion that is Victor’s arrested imagination is also the monster of an arrested science that threatens the very extinction of society. What hope the novel offers is based on having learned from Victor’s errors. Both authors combine mythology with science, with Darwin fo-
cusing on the Eleusinian mysteries and Shelley highlighting Prometheus, and they do so to bring empirical particulars together with universal narratives that help make sense of them. If both mythology and science are ways of making mysteries intelligible, science might benefit from mythology’s ability to frame intelligibility in terms of patterns, and the presence of the divine might encourage human beings to aspire to better themselves.

Darwin analogizes generation, imagination, and society, and he hopes that his sublime images will prompt further scientific study to add to any intelligibility mythology proffered. The implication here is enormous: if the development of the imagination parallels the development of the embryo, nature would unfold in a way that mirrors our rational conceptions, and if this were true, there would be no necessary gap between nature and our understanding of it. He argues that imagination functions in both generation and intelligence. In a note to The Botanic Garden, Darwin commented that “philosophers of all ages seem to have imagined that the great world itself likewise had its infancy and its gradual progress to maturity” (1: 1 notes to lines 101–06), and in this view the world is a kind of embryo. Darwin solidifies the gist of these connections at the very outset of Temple of Nature:

    God the First Cause—in his terrene abode
    Young nature lisps, she is the child of God.
    From embryon births her changeful forms improve,
    Grow, as they live, and strengthen as they move.
    Ere time began, from flaming Chaos hurl’d,
    Rose the bright spheres, which form the circling world

(67 canto 1: 223–28)

Note Darwin’s framing of chaos’s presence at the beginning of time, which informs Shelley’s turn to chaos at the moment of invention.

Darwin also helps license Shelley’s myth of a man giving birth without women. Yet, if his theory of generation continually downplays women’s contributions, it defines creation recursively so that the act of creation cannot be wholly new. This is perhaps because he wants human creation to work with God’s and not supplant it. Canto 2 concerns the reproduction of life, and crucially reproduction is framed as a form of mimesis. Darwin writes, “But, reproduction, when the perfect Elf/Forms from fine glands another like itself” (TN 57 canto 2: 27–28). Here, the male seminal worm becomes spontaneously vital and unwittingly becomes a false figure for autonomy because the semen alone can’t create all by itself. The process
by which it is produced, moreover, is a form of copying, which further under-
mines any potential autonomy. Darwin then gives imagination center stage:

The potent wish in the productive hour,
Calls to its aid Imagination’s power,
O’er embryon throngs with mystic charm presides,
And sex from sex the nascent world divides  

(67 canto 2: 117–20)

The embryo here is shaped by the imagination’s power. Darwin goes on to ex-
plain how the similarity of progeny to the parent is limited to the power of the
male imagination, adding in a footnote, “It is not to be understood, that the first
living fibres, which are to form an animal, are produced by imagination, with any
similarity of form to the future animal; but with appetencies or propensities,
which shall produce by accretion of parts, the similarity of form and feature, or of
sex, corresponding with the imagination of the father” (ibid.). Darwin’s language
here anticipates Shelley’s insistence that invention cannot produce substance.
Imagination does not produce the similarity of form; rather, through “accretion
of the parts” the embryo acquires appetencies of its own. But how exactly does
it do that? Once again, at the very instance when autonomy or the creation of
something new becomes possible, Darwin limits it. He argues, “There hence ap-
ppears to be an analogy between generation and nutrition, as one is the production
of new organization, and the other is the restoration of that which previously ex-
isted; and which may therefore be supposed to require materials somewhat simi-
lar” (additional notes 9). Underwriting the analogy is the supposition that both
nutrition and generation work with similar materials. The net effect of this theory,
however, was that women again would be blamed for monsters, since women
were thought to be responsible for the nutrition of the fetus. Because “appen-
tencies” are somewhere between a mechanical drive and a form of desire, recalling
Buffon’s interior molds, the issue of autonomy once again rears its head, and Dar-
win tries to finesse the problem by making generation like a form of restoration.
Analogy then confirms the rationality of the universe, even as it papers over the
moment of creation. Because of Darwin’s deism, he cannot offer a version of
creation that makes God dispensable.

Darwin is also helpful for understanding why the imagination has such prom-
inence in *Frankenstein*. He makes the imagination responsible for assembling
trains of thought, but this is once again to make new thoughts into combinations
of old ones. Not only does Darwin make pleasure a central engine of brain
development—he writes that
First the new actions of the excited sense,
Urged by appulses from without, commence;
With these exertions pain or pleasure springs,
And forms perceptions of external things.
Thus, when illumined by the solar beams,
Yon waving woods, green lawns, and sparkling streams,
In one bright point by rays converging, lie
Planned on the moving tablet of the eye;
The mind obeys the silver goads of light,
And irritation moves the nerves of sight.

These acts repeated, rise from joys or pains,
And swell Imagination’s flowing trains;
So in dread dreams, amid the silent night,
Grim spectre-forms the shuddering sense affright

(105–06 canto 3: 55–68)

As Darwin recounts it, the brain is stimulated by external stimuli. It associates those stimuli with pleasure or pain, and thus begins to create ideas and sensations out of what were mere irritations. Darwin explains in a footnote: “Sensation is an exertion or change of the central parts of the sensorium, or of the whole of it, beginning at some of those extreme parts of it, which reside in the muscles or the organs of sense. Sensitive ideas are those which are preceded by the sensation of pleasure or pain, [and] are termed Imagination, and constitute our dreams and reveries” (TN 107n). Once again, the question is, how does the imagination create something new if it takes its cues from the following of our pleasures?

Darwin again insists upon the formative role of the imagination in the development of the mind:

Call’d by thy voice, Resemblance next describes,
Her sister-thoughts, in lucid trains or tribes;
Whence pleas’d Imagination, oft combines,
By loose analogies, her fair designs

(181 canto 4: 305–08)

Yet, in another footnote, Darwin cites Hume’s distinctions between associations of contiguity, causation, and resemblance. What begins then as loose analogy should ideally through ratiocination be defined into either a mere temporal overlap, or a relationship of causality, or one of mere similarity. Darwin thus helps Shelley to see the stakes of making meaning out of resemblances.

Darwin’s descriptions of the evolution of the mind from irritation to sensation
parallel Shelley’s description of the monster’s birth into consciousness. That she underscores this parallel makes the monster one of us, and not its own species:

Several changes of day and night passed, and the orb of night had greatly lessened when I began to distinguish my sensations from each other. I gradually saw plainly the clear stream that supplied me with drink, and the trees that shaded me with their foliage. I was delighted when I first discovered that a pleasant sound, which often saluted my ears, proceeded from the throats of the little winged animals who had often intercepted the light from my eyes. I began also to observe, with greater accuracy, the forms that surrounded me, and to perceive the boundaries of the radiant roof of light which canopied me.

(Frankenstein 81)

Not only do pleasure and pain have formative force, but also the monster moves from indistinct sensations to distinct sensations and then to ideas. He claims, “My sensations had, by this time, become distinct, and my mind received every day additional ideas” (81). As the mind develops, it shifts from irritation to sensation, and the door opens to the voluntary when the mind is no longer just passively taking things in. Delight has formative force, but crucially from Shelley’s perspective it is not enough to sustain either virtue or progress. Where Darwin underscores the imagination’s role in dreams, Shelley worries about its connections to the will. Though the monster claims that if he is made happy again, he will return to virtue, the problem is that in this view virtue becomes a product of external circumstance, with nothing to do with the will. “O my creator,” he implores, “make me happy, let me feel gratitude towards you for one benefit!” (120). When virtue becomes contingent upon happiness, it is no longer self-generated but rather relies upon contingency.

But Darwin is left with an even larger problem. Although he recognizes that sexual reproduction allows the embryo to benefit from both parents, his framing of sexual reproduction still elevates the male over the female even as it limits the male imagination to mimesis. Only the male imagination has the power to stamp sex onto the child. How then does anything like sympathy arise, which requires identification with another across the chasm of difference? Darwin offers no explanation and has sympathy descend from the heavens in canto 3:

The Seraph, Sympathy, from Heaven descends,
And bright o’er the earth his beaming forehead bends;
On man’s cold heart celestial ardour flings,
And showers affection from his sparkling wings (147 canto 3: 467–70)
Against Darwin’s overflowing optimism about the progress of mankind and his “pleas’d imagination,” Shelley offers a much starker vision. For Darwin, progress necessarily happens at three levels: the act of generation, the development of mind, and the progress of society. Shelley takes each level and evacuates it of progress, explaining the lack of progress by the recursive nature of creation. In the novel’s nested narratives, these levels arise formally in the creation of the body by analogy in Victor’s arrested science; the monster as abortion; and Walter’s exploration, which is literally arrested in the polar ice. Against an inevitable teleology of progress, Shelley warns that there is hard work to be done if change is to be had. Moreover, it is precisely when the imagination is pleased that danger is afoot.

The male embryon, the monster, represents disaster. The fact that his reproduction is asexual prevents the monster from being able to take advantage of the contributions from both parents. In describing the evolution of life forms, for instance, Darwin made it clear that sexual reproduction trumps asexual reproduction. Of the former, he comments, “The Reproduction of the living Ens/From sires to sons, unknown to sex, commence” (61 canto 2: 63–64). He adds, “no seed-born offspring lives by female love” (62 canto 2: 74). As if that were not enough: “In these lone births no tender mothers blend /Their genial powers to nourish or defend; no nutrient streams from Beauty’s orbs improve /These orphan babes of solitary love” (65 canto 2: 104–06). In this view, the reproduction of the monster is a solitary love that, because it cannot be nourished by both parents, is inherently more primitive. Even worse, “birth after birth the line unchanging runs, /And fathers live transmitted in their sons” (65 canto 2: 107–08). If, on the one hand, Darwin insists upon the superiority of sexual reproduction to asexual reproduction on the grounds that sexual reproduction allows for the blending of characteristics from both parents while asexual reproduction offers no possibility of change, he nonetheless models even sexual reproduction on asexual reproduction insofar as the male embryon is a “branch” of the male parent. For Shelley, this raises the issue of why theories of generation regress into reproductions of versions of the self, and why those theories, with the partial exception of Darwin, did not account for the value of the different materials that each sex brought to generation. Why, in other words, did sexual difference not make a difference? Shelley underscores this failure with the untimely demise of her main female characters, and she couples their deaths with the fact that their femininity does little more than perpetuate patriarchy.

The monster refers to himself as “an abortion, to be spurned at, and kicked, and trampled on” (189). As a monster, he is an abortion in the sense that his development has gone awry, but the term literally refers to an embryo that cannot
sustain itself outside the womb. Though the monster can physically sustain himself, he cannot do so emotionally, and promises to end himself. The logic connecting these ideas starts with the premise that nature will not permit monstrous deviations and thus spontaneously aborts them. For Shelley, “abortion” suggests her awareness of the gaps between the embryo and personhood. The monster’s self-identification in terms of an abortion then is ironic in ways we have yet to grapple with. At a simple level, the monster seems blithely unaware that his status as an abortion logically cancels out whatever sympathy one might have for him. Because embryologists, especially after epigenesis, considered personhood not to be innate but to be a product of both biological and cultural development, the monster as abortion has no standing from which to ask for sympathy. The fact that the monster decides for himself to abort himself points to a world where free will exists but providence does not. Yet free will or autonomy is limited to self-cancellation. Walton looks upon Victor as an abortion: he refers to his death as an “untimely extinction of [his] glorious spirit” (187), but this is to ignore Victor’s own responsibility for his failures, thereby recalling how the maternal imagination papered over the failures of male midwives.

The monster is also an abortion in the sense that his imagination and his emotions have yet to be properly developed. Percy Shelley thought the imagination was crucial to sympathy, but what was the origin of sympathy? Darwin has no other explanation than to have sympathy descend from the heavens. Although Victor has been raised in a loving family, that history does not inoculate Victor’s sensibility from damage. Victor, we recall, deliberately hardens himself so he can study death. “My attention,” he reports, “was fixed on every object the most insupportable to the delicacy of the human feelings” (34). Shelley’s placement of the indefinite article “the” in front of feelings dramatizes Victor’s talent for distancing himself from feeling. She underscores his perversity when he admits that he had “tortured the living animal to animate the lifeless clay” (36). Thus, although pleasure and pain shape the meaning of our experiences, they do not necessarily do so for good. When we bear in mind Jessica Riskin’s study of how important sensibility was to Enlightenment science because it encouraged a blending of emotion and experience, Victor once again comes up short as a scientist.

Insofar as emotional education is presented as a form of mimesis, Shelley’s point is that merely imaginatively copying the emotions of others is insufficient. The monster is yet to be developed because he holds onto theories like the mimesis of emotions, which prevent the possibility of his own development. Like Victor, the monster substitutes imagination for personhood, and thus essentializes his identity, which prevents him from wanting to develop either his imagination or
his self. In this view, the imagination can only reproduce what it is given, and it is thus limited to asexual reproduction. After he finds the cottagers, he “dared to fancy amiable and lovely creatures sympathizing with [his] feelings” (106). After reading about patriarchy, the monster submits, “The patriarchal lives of my protectors caused these impressions to take a firm hold on my mind; perhaps, if my first introduction to humanity had been made by a young soldier, burning for glory and slaughter, I should have been imbued with different sensations” (104). Here, the monster understands his own mind and imagination as a block of Lockean wax, to be inscribed upon. And, not surprisingly, after he reads Werther, he identifies with his diseased imagination. If all one can do as a human being is to replicate the emotions of others, how does autonomy happen? And, given that sensibility leads to both personhood and monstrosity, how does one develop feelings in such a way so as to prevent monstrosity?

If we press the metaphor of abortion further, we must ask why Shelley has the monster come to life in the form of an adult and completely sidestep embryonic development while at the same time making Victor’s gestation of the monster last nine months. Nancy Yousef has traced the discourse of autonomy in the eighteenth century and asks why this discourse ignores the fact that human beings come into the world completely dependent upon others, and largely dependent upon maternal care. Where she argues that Shelley finds autonomy an unnatural place to begin development, I show how the problem begins even earlier in the discourse of generation. Victor at times denies his creature autonomy. At other times, he labels the monster a separate species, granting him an independence but also complete isolation. And yet, by doing so, does his development have anything to say about human development? Blumenbach, we recall, had insisted that the astonishing uniformity among the different kinds of monsters meant that the causes of their deviations were regulated by the same fixed laws that pertained over normal births (Essay 82), and thus he insisted that monsters exemplified natural laws and were not exceptions to them. In the same way that her mother had argued that women were really children because their intellects had been neglected, the tension between the adult form of the monster and its emotional adolescence comments on how autonomy is at present culturally unworkable because it will not deal with the realities of human dependence, because it foists the development and maintenance of social bonds solely onto women, and because it insists on generation as a reproduction of the self. In an important way, then, women were also abortions, though not of nature but by culture.

The development of the mind does not take place when the imagination is arrested. In this view, Darwin’s continuum of the imagination from looser to
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strict analogies at least imposes the possibility of improvement. As the bodies pile up in *Frankenstein*, society has not progressed but rather is in peril. Thus, for Shelley, the progress of human society could not be the barometer against which nature’s progress could be understood. As a corollary: science is no necessary march of progress and no necessary form of mastery. As with the macrocosm, so to with the microcosm. To make this clear, Shelley has the monster refer to himself as an abortion and acknowledge the future extinction of his spark, and this in turn casts dark shadows on the progress of society and science. So much for the lasting legacy of the modern electrical Prometheus. At a local level, then, how fitting that *Einbildungskraft* does not lead to much education even as Victor’s science, for all its proclaimed modernity, keeps circling back to alchemy and the idea that women’s imaginations are responsible for monsters. Victor grants his imagination too much autonomy. As men-midwives admit, although the idea that the female imagination could produce monsters had no scientific standing, that did not put an end to the damaging consequences of the maternal belief that it could do so. And yet the novel is not a condemnation of science but rather a condemnation of a version of science as mastery because mastery does not allow for development. Although conception may be an organic process, it needed ways beyond happenstance for improvements to occur and had to get rid of theories like genius that would prevent the very possibility of improvements.

Finally, society in *Frankenstein* is brought to the brink of collapse. Mothers and wives are killed, and, since they maintain the social bonds, their absence does not bode well for society. One way Darwin finesses his teleology of progress is by insisting that death leads to reanimation. “Hence, when a Monarch or a mushroom dies, / Awhile extinct the organic matter lies; / But, as a few short hours or years revolve, / Alchemic powers the changing mass dissolve” (188 canto 4: 383–86). He thus views “the wrecks of death are but a change of forms” (189 canto 4: 398). When Shelley compares the monster to a phoenix rising from the ashes, she once again revises Darwin. Darwin wrote, “A filial phoenix from his ashes springs, / Crown’d with a star, on renovated wings” (191 canto 4: 413–14). It “Ascends exulting from his funeral flame, / And soars and shines, another and the same” (415–16). The monster by comparison “ascends [his] funeral pile triumphantly, exult[ing] in the agony of the torturing flames” (191), except that he is an aborted phoenix and his triumph is in torture. With this revision, Shelley accomplishes two things: she questions whether pleasure can be a necessary instrument of progress, and she moves our attention to Walton and his crew who survives. If there is to be progress, it must come from readers who have been impacted by the horrific vision she presents. In a further irony, the monster renounces Darwin’s theory of necessary progress:
“When I call over the frightful catalogue of my deeds, I cannot believe I am he whose thoughts were once filled with sublime and transcendent visions of the beauty of the world. But it is even so. The fallen angel becomes a malignant devil” (189).

I have shown how both obstetrics and embryology absolutely relied upon comparative analysis of development across species and across the mind and body divide. Crucially, the uses of those comparisons and their extent cannot be known in advance, making the science not about mastery. If science eludes mastery, so does human development. The midwife Jane Sharp stipulates that the child does not “live” until around forty-five days (90). Because Victor does not see a gap between the “birth” of the monster and his personhood, he thinks that the giving of life is the compass of his responsibility and that monstrosity is only a morphology. Tellingly, both the monster and Victor refuse to think beyond their own individual development, each preferring instead to see himself as the most deserving of a pity party. Even worse, after having heard the monster’s story of his abandonment, Victor insists, “No creature had ever been so miserable as I was; so frightful an event is single in the history of man” (167). His inability to draw comparisons between the two of them is what blinds him to the meaning of the monster’s promise that “I will be with you on your wedding night.” In the same way that the monster has been deprived of all friends and companions, he seeks to make Victor truly alone. By encouraging some sympathy for the monster, Shelley argues that he should not be othered, and she reinforces relationality by making Victor the monster’s doppelgänger and by narrativizing parallel courses of development.

Shelley, of course, frames her novel so that readers have no choice but to compare the development of the characters. Hence, the monster and Victor are locked into a mutual competition, one whereby they each claim autonomy but cannot see their interdependence. Walton thus provides a hint of hope when he allows the crew to convince him to turn back and thereby to think of the needs of community over individual ambition. While Darwin had argued that pleasure was an engine of improvement, Shelley shows how vengeance can become a kind of perverse pleasure that can only imagine mutual destruction as its object. As the monster recounts, “A frightful selfishness hurried me on, while my heart was poisoned with remorse” (188). Even at the end, he is unable to claim responsibility for his own feelings.

To the extent that personhood is a product of development, so too must monsters be made and not born. Shelley describes the monster’s early days, but, instead of the development of physical features, she describes the growing distinctiveness of his five senses in a way that recapitulates the development of his features becoming distinct. The monster is at this time an emotional embryo becoming a
fetus, even if he is eight feet tall. Because generation is limited to the contributions of a single parent and because emotions are learned by replication, there is no outcome where autonomy is realistic and healthy. Hence, Mary Shelley does not share Erasmus Darwin’s optimism.

What then does all this mean for both the Romantic imagination and science? For Mary Shelley, the imagination generates ideas and analogies, but that does not mean its fruits are necessarily valuable. In thinking about imagination as an engine of creativity, she recognizes the degree to which its very strengths—its ability to think outside the box—comes only from its weaknesses—the connections it suggests are intuitive, dreamlike, and unconscious and therefore outside the box but not necessarily helpful. Likewise, in his specification that the imagination pursue “stricter analogies,” Erasmus Darwin helped to realize the value of thinking about science as an organic process that enabled the spontaneous encounter with objects of study. Because it produced work that could be evaluated, the operationalization of the goal of stricter analogies, not the goal itself, made the goal useful. When evaluated against other scientists, Victor Frankenstein comes up very short, but that does not mean that Shelley gives up on either science or the imagination. Instead, she focuses on what might encourage their development, and, since what that development was could not be defined in advance, she considers how theories of genius, a lack of discipline, and dogmatism likely foster abortions since they encourage the status quo. Setting criteria against which to evaluate the imagination’s contributions becomes the requisite for the possibility of its development and, through it, the development of science.