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HISTORY COMES TO LIFE

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Jessica Riskin, *The Restless Clock: A History of the Centuries-Long Argument over What Makes Living Things Tick* (Chicago and London: The University of Chicago Press, 2016)

Robert Mitchell, *Experimental Life: Vitalism in Romantic Science and Literature* (Baltimore: Johns Hopkins University Press, 2013)

Benjamin Morgan, *The Outward Mind: Materialist Aesthetics in Victorian Science and Literature* (Chicago and London: The University of Chicago Press, 2017)

"With an anxiety that almost amounted to agony, I collected the instruments of life around me, that I might infuse a spark of being into the lifeless thing that lay at my feet." So recalled Victor Frankenstein, reflecting on the creative act. By its end, however, *Frankenstein* has less to do with the scientist's creativity and more to do with his monster's. This is why Mary Shelley inverts this Promethean moment in the book's final scene, as the monster stands over the lifeless body of his creator. Frankenstein's last words mark the inversion: his "instruments of life," he laments, had given rise to "an instrument of mischief," a creature animated by a desire for human fulfillment. To live may mean behaving instrumentally, but some instruments get the better of you. Frankenstein learns this lesson the hard way; but does his monster? He echoes his creator's words—"Fear not that I shall be the instrument of future mischief"—and promises his own end, when he will "collect my funeral pile and consume to ashes this miserable frame." One's frame is mere matter, but such an act is proof of the life that animates it. On the cusp of death, then, the monster lives. *Frankenstein* reminds us that the question "What is life?" can only be answered by experiment, from the medical horrors that gave the monster life to the fatal act with which he plans to abandon it. At life's end, as at its beginning, creator and creation combine; we become our instruments, or they surpass us.[1]

[1] Mary Wollstonecraft Shelley, *Frankenstein; or, The Modern Prometheus*, 2 vols. (London, 1823), 1: 97, 2: 265, 2: 277, 1: 98.

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Shelley turned the vital matter of life itself into an allegory about human limits. History backs her up. Discovering life in strange places or designing machines that seem alive have long excited us precisely because they are bound up with beliefs about who we are or anxieties about what we might become. Life and its limits invite thinking that is both grand and intimate, poetic and technical. This is what has made the topic so irresistible for artists and scientists, philosophers and doctors. When scholars tackle pieces of this long history, they bring into focus a host of ideas that stretch far beyond the ambitions of individual authors or the development of scientific disciplines. Even when confined to a particular place or period, such studies become *big*; they gather up more than you might think. As these efforts add up, as they unearth past connections and paths not taken, we begin to see what looks increasingly like an intellectual history of life itself.

Three new books, taken together, give us a hint of how such a history might look. The aims of their authors—Jessica Riskin, Robert Mitchell, and Benjamin Morgan—blur not only into one another but also into the aims of the people they portray. That is, their arguments continue, as much as critique, those of the Enlightenment artisans, Romantic poets, and Edwardian phenomenologists on which they are based. Of course, our times are not theirs; today's ideas are different. Each author is careful to specify the situations in which (for example) Gottfried Leibniz's monads or William Morris's wallpapers took the shapes that they did, as objects and ideas. But the fact that each book combines a historical perspective with a philosophical or poetic one lends power—indeed, vitality—to its questions and answers in a way that pushes past analysis alone. The nature of life, not to mention its meaning, is a topic that prods us toward presentism. It does so despite (or perhaps because of) our best efforts to render these ideas in the terms of their own time. There's something special about the intellectual history of life: at times, it seems to take on a life of its own. These were and are vital ideas, and understanding why is part of the project.

* * *

It's hard to tell when life begins—but a great deal hangs on the answer. This was true long before debates about conception and choice came before the United States Supreme Court. In some ways, inquiry into the nature of life has meant attempting to identify life's starting point for as long as either has been pursued in a systematic way. Such efforts have often aimed at proving or disproving so-called "spontaneous generation," or the emergence of living from non-living matter.[2]

[2] For more on these debates in the nineteenth century see James E. Strick, *Sparks of Life: Darwinism and the Victorian Debates over Spontaneous Generation* (Cambridge, MA,

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It's important to note that identifying when and how life begins has also meant adjudicating who (or what) is capable, in very real terms, of producing living from non-living matter. Like so much in the history of science, then, abstract ideas—in this case, about the essence of life—have turned on our own abilities to effect and control the material world, just as much as on the theories that make such powers possible. Debates about spontaneous generation, in the past and present, have been as much about who might count as a spontaneous *generator* as about what's ostensibly being generated.

Whether something fundamental separates the living from the non-living is a philosophical question that has often boiled down to a debate between rival camps. On one side are the vitalists, who hold some version of the view that to be alive means possessing some vital property: a fluid or an essence, more or less ethereal. The basic idea is that there is some *thing* that makes life special; whatever it is, you either have it or you don't. On the other side are the mechanists, who mock ideas of substantial difference as make-believe—or worse. In their extreme forms, vitalism and mechanism are totalizing: either the world vibrates with a hidden life force or else it buzzes like a vast machine. At issue is whether order, unity, progress, or intelligence exist in the universe at all—and, if they do, what kinds of things they might actually be. The line between vitalism and mechanism marks, for philosophers, a distinction that matters. And they aren't alone. Whatever it is that makes Frankenstein's creative act horrific, to him and to us, taps into the same distinction.

Or at least, that's the idea. But like so many dualisms—indeed, like so many -isms—the ideas contained within "vitalism" and "mechanism" bleed into one another when you take a careful look. This isn't to say that the labels don't latch onto reality, or that they don't do real work in the world. It's just to say that it's often *within* a supposed "side" of a pitched battle that things get interesting (and heated) in the historical record. This is precisely the point that Jessica Riskin sets out to make in her long-awaited book on the subject, *The Restless Clock: A History of the Centuries-Long Argument over What Makes Living Things Tick*. Pushing past "vitalism versus mechanism," Riskin insists that the real action has taken place *within* the mechanist tradition itself, between theorists of what she calls "passive" and "active" mechanism. What divides the two sides, Riskin argues, is not so much an idea about life as one about agency, the "intrinsic capacity to act in the world, to do things in a way that is neither predetermined nor random" (3). Passive mechanists hold that nature is devoid of such agency, while active mechanists think this capacity is what defines nature. For both, life hangs in the balance.

2000). A new overview (still forthcoming) is Daryn Lehoux, *Creatures Born of Mud and Slime: The Wonder and Complexity of Spontaneous Generation* (Baltimore, 2017).

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Riskin tracks this dispute as it unfolded over five centuries, from the Reformation to the present, with a number of allusions to earlier times and gestures toward the future. The result is a big book in every sense: chronology and geography, erudition and ambition. From the automata of the late Middle Ages—what Ellie Truitt has called "medieval robots"—and the philosophies of Leibniz and René Descartes to the evolutionary theories of Jean-Baptiste Lamarck and Charles Darwin and cybernetic visions of the postwar period, Riskin gives us a new genealogy of ideas about life and the mind.[3] As she does so, she reveals a host of wonders from the early modern world. In the book's early pages, courtiers are titillated by secret sprinklers and nefarious fountains; automatic ducks swim in circles while automata play music for their audiences.[4] As Adelheid Voskuhl did in *Androids in the Enlightenment*, Riskin brings matter to life, eliciting fascination much as these objects must have done for their original viewers.[5] As a result, we come to see that the bright lines we try to draw around "life" today didn't animate our predecessors (or at least not in the same ways).

Riskin's heroes are the active mechanists, who see the material world—even machines—as shot through with agentic force. Her title comes from Leibniz, whose rumination on the "unrest" (*Unruhe*) of clocks she's chosen for an epigraph. The word has a double meaning: it registers anxiety or disquiet, but is also the name for the balance in a clock mechanism. For Leibniz, "clockwork" didn't carry today's connotation of predictability. Rather, clocks were "forceful, restless, purposeful, sentient, perceptive" (6). And Leibniz wasn't alone. When Descartes or John Locke analogized life to clockwork, neither meant that "the phenomenon in question resembled a clock." Rather, they thought that "the comprehension to be achieved was comparable to a clockmaker's understanding of a clock" (55). The analogy, in other words, was aimed at the artisan, not his artifact; it was about knowledge, not existence. Darwin was after something similar, Riskin argues, when he built an evolutionary answer to the famous theological parable of stumbling upon a watch in a field and assuming it had a creator. By extending rather than killing the image of the clockwork universe, Darwin seemed to achieve a startling compromise between teleology and mechanism. But according to Riskin, we shouldn't be surprised at all: the two were together from the start.

The book's biggest argument, the one most likely to upset practicing scientists and early modern historians (note: I'm neither), centers on an absence. Passive

3 See E. R. Truitt, *Medieval Robots: Mechanism, Magic, Nature, and Art* (Philadelphia, 2015).

4 For an overview of the period and its wonders see Lorraine Daston and Katharine Park, *Wonders and the Order of Nature, 1150–1750* (New York, 1998).

5 See Adelheid Voskuhl, *Androids in the Enlightenment: Mechanics, Artisans, and Cultures of the Self* (Chicago, 2013).

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mechanism, the view that nature is devoid of agency, "had relied upon a teleology, indeed a theology, from the start: the divine Clockmaker" (243). The clock strikes again. Agency stemmed from without, for passive mechanists, which meant they had to have a source for it. Initially, that source was divine. According to Riskin, however, a long history of secularization and specialization left passive mechanism without a way of accounting for agency. This problem came to a head after World War II, when passive mechanism triumphed in the form of new fields like cybernetics and artificial intelligence, animated by the behaviorist assumption that "any appearance of purposeful action in living beings was simply an appearance" (313). Beyond being alienating, passive mechanism's apotheosis was also ironic. Today, Riskin argues that passive mechanists like Daniel Dennett and Richard Dawkins espouse a militant atheism without an awareness that their view's "original justification was as much theological as scientific" (347).

Life isn't agency, but it can't do without it. Denying natural agency was originally an act of deference to divine power; gradually, however, that power lost its grip on scientific arguments, at least as they appeared in print. It's that loss of agency, Riskin argues, that's left us conflating passive mechanism with mechanism itself and, as a result, finding less than we're looking for when we set out to study nature. Max Weber was right, Riskin says: religious transformations in the relationship between piety and productivity helped promote this "antihumanist mechanism" (257) over one that vibrated with human feeling. When the instruments of life lose their liveliness, something crucial in the world is lost, too. To anyone who has spent time in a biology laboratory or a psychology lecture, this should sound familiar. Everyday work in the sciences of life and mind feels so distant from their living, thinking subjects that it's hard to deny that the fields have changed. Whether secularization, specialization, or something else is to blame (if blame is what we want) is beyond the scope of a single book, of course—even one as capacious as Riskin's. Indeed, how to recover life for the scientists who study it might be a shared goal for the intellectual history of life as a whole.

* * *

The question of when life begins depends on another, deeper question: whether and when it exists at all. Michel Foucault famously argued that, before 1800, it did not. For Foucault, there was no life in the sense we mean it now—and thus no history of life—until Lamarck coined *biologie* in 1802 and set the study of life apart from natural history. Of course, Foucault's claim is more than terminological. If, he added, "biology was unknown, there was a very simple

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reason for it: that life itself did not exist."[6] Living beings, not life, were the subject of natural histories. It wasn't just that "life itself" hadn't been separated from its particular instantiations, though that was part of it. It also meant that, up through the Enlightenment, naturalists might group things that counted as alive with objects of entirely different sorts: fossils alongside gems, human tools beside beautiful plants.[7] The difference, so the thinking goes, was between the observational practices of natural historians, on the one hand, and the experimental interventions of natural philosophers, on the other. Life in the vitalistic sense—a special quality that inheres in some things and not in others—couldn't exist until these two traditions came together sometime in the nineteenth century. As they did, a range of fields and figures converged on the redefinition of life in science, philosophy, and the arts.

This convergence was embodied in the Romantic movement and is the subject of another recent book on the power of vitalism, Robert Mitchell's *Experimental Life: Vitalism in Romantic Science and Literature*. As a literary critic, Mitchell's methods differ in key ways from Riskin's historical approach. Relative to *The Restless Clock*, Mitchell's work abounds with close readings and neologisms. His title, unlike Riskin's, is an analytical category, alluding more to past scholarship in science studies than to a principle by which his actors organized the world. Where Riskin sought to recover tensions between passive and active mechanism as a way to abandon the baggage of the vitalists, Mitchell argues that what he calls "experimental vitalism" was central to the Romantic movement as well as to the modernist turn a century later, and, indeed, to new developments in the sciences today. Like Riskin, Mitchell means to undo a troublesome binary—or, rather, to reveal how it was undone from the start. William Wordsworth, Samuel Taylor Coleridge, and Percy and Mary Shelley pursued science's experimental ideal with the tools of literature and poetry. They did not, Mitchell insists, "simply *apply* an existing scientific concept of experiment to their poetry but rather *experimented* with the concept and practice of experimentation itself" (34, original emphasis). These Romantics were philosophers, if not scientists, and they saw themselves as such.

As Wordsworth put it in 1802, poets were "carrying sensation into the midst of the objects of the Science itself." The mission, he added, was clear: "If the time should ever come when what is now called Science, thus familiarized to men, shall be ready to put on, as it were, a form of flesh and blood, the Poet will lend his divine spirit to aid the transfiguration" (37). The poet accomplishes this,

6 Michael Foucault, *The Order of Things: An Archaeology of the Human Sciences* (New York, 1973), 127–8.

7 For an overview of these collecting practices see Paula Findlen, *Possessing Nature: Museums, Collecting, and Scientific Culture in Early Modern Italy* (Berkeley, 1994).

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according to Mitchell, by both explicit and implicit means. Irregular rhyming in Shelley's "Mont Blanc," for example, exposes a "vital tension" (58) in the universe by lulling readers into a trance. In an essay on scrofula, Coleridge inaugurated a new genre that Mitchell calls a "life-manual," a text "by means of which an individual allowed Life to transform a life" (93). Wordsworth, Coleridge, Shelley, and other Romantics were avowed "experimenters," and part of Mitchell's point is that they saw any experiment as a living, breathing, human activity, one that set the experimenter in the world and that drew from that world its realness and vivacity. Literary and scientific experimentation were as alike as they were dissimilar; neither was primary, in a simple sense, for the actors involved. As Mitchell concludes, "Romantic literary experimentation functioned as a sur-science that created a vital medium around the sciences, drawing off their methods and results for other ends" (228).

Here, Mitchell has done for literature what Riskin does for philosophy: restore its messy, reactive relationship with the sciences of its day. Like Riskin, too, Mitchell is deeply attuned to the resonances of these debates in our own period, including advances and anxieties connected to the synthesis and suspension of living matter.[8] This work—not to mention the prospect of life on other planets and the specter of Lamarck that hangs over epigenetics—have been fodder for science fiction since the days of Mary Shelley (whom Mitchell discusses) and Edgar Allen Poe (whom he does not). But Mitchell is after something more than shared content. The "experimental vitalism" he tracks is itself experimental, formally and thematically, in ways only the tools of literary analysis can recover. What's more, Mitchell's own analysis is experimental, and it is here that he parts ways with Riskin (and most historians). Every chapter of *Experimental Life* introduces a new concept—from "poetic suspension" and "collapsurgence" to "chylopoietic discourse" and "trance-plantation"—and does so, it seems to me, experimentally. Such terms aren't to everyone's taste—their hybridization, at times, is almost Frankensteinian—but Mitchell's use of them mirrors the methods of his actors.

This is true in another way, too. Neologism can be ungenerous, but Mitchell never is. His book is dense with deference, to literary critics as well as philosophers, historians, and scholars of science studies. Drawing out all these debts enables Mitchell to enact the connections he celebrates. That is, Mitchell's academic generosity is a methodological mirror of the philosophies he describes. Take Bergson's *Creative Evolution*, which Mitchell cites admiringly. Bergson's universe shimmers with *élan vital*, a creative force that explains natural organization and human creativity alike. Mitchell says that some Romantics saw this too, and that

[8] See, for example, Joanna Radin, *Life on Ice: A History of New Uses for Cold Blood* (Chicago, 2017); and Sophia Roosth, *Synthetic: How Life Got Made* (Chicago, 2017).

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the view is still alive today. While he isn't positing an invisible force behind the history of ideas, I think Mitchell offers an academic analogue to Bergson's *élan vital*. This is embodied in "collapsurgence," a "textual strategy that emerges between aesthetics and science, and depends upon exploiting tensions immanent within both" (143). Collapsurgence is a feeling as much as a technique, eliciting thrill and revulsion as its readers navigate the convergence of discursive modes. Mitchell's text, like Bergson's, evokes similar feelings—and I think he intends it to. There's something vital in these ideas; they are instruments of life and living instruments, helping us see the history of life and the scholarship devoted to it in new, sometimes disquieting, ways.

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"What do these experiments want?" Benjamin Morgan asks in the first pages of *The Outward Mind: Materialist Aesthetics in Victorian Science and Literature*, and the idea behind the question links his book to Riskin's focus on unrest and Mitchell's attention to experiment. Just as they do, Morgan builds a new history of life out of past efforts. *The Outward Mind* explores the Victorian heyday of what he calls "materialist aesthetics," through which "the plane of meaning recurrently collapses into the plane of materiality" (212). Riskin's mechanists and Mitchell's vitalists are matched by Morgan's aesthetes, whose theories "affected an *outward turn*: an exteriorization of mind, consciousness, and the self into networks of matter, sensations, and objects" (6, original emphasis). His subjects are both major Victorian literary figures—Walter Pater, Thomas Hardy, Oscar Wilde—and contemporary scientific authors such as Alexander Bain and Herbert Spencer, each of whom brought the science of sense perception to bear on the philosophy of art in some form or another. The results of their efforts grounded the affective experience of beauty in the material realities of the world. Like Riskin, Morgan is drawn to the ideas he's unearthed; like Mitchell, he's found a way to mirror their spirit in his methodology.

On the surface, *The Outward Mind* isn't a book about vitalism. The texts Morgan analyzes are less concerned with the nature and possibility of life itself than with making art and knowledge in a world of lived experience, especially given the limits of our minds and bodies. But on closer inspection, William Morris's design principles and Vernon Lee's literary psychology are engaged in the same pursuits as Descartes's skepticism and Shelley's "Mont Blanc." Each, in its way, grapples with how the limits imposed on our study of the world *open* our eyes as much as preventing us from seeing. Art may imitate life, but the reverse is also true. Learning anything about life *or* art amounts to facing the facts about our own abilities and limits, our bodies and our habits. Literature, like nature, comes to seem temperamental, embodied; style, as Morgan says (quoting Lee), is "a kind

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of gesture or gait" (239). The point is that even the highest products of human minds are embedded in a world of things—and that this world of things vibrates with human significance. On this view, even a solipsist like Walter Pater sounds like a post-humanist, one whose characters "regularly find companionship in their relationships with earthly stuff of the world" (172). Materialist aesthetics broke down the autonomous individual and human exceptionalism, setting in their place a vision of nature and society, of bodies and beliefs, as phenomena subject to a shared mode of inquiry.

The products of this point of view are diverse, to say the least. Practices range from reading poems and painting pictures to the way Wilhelm Wundt discovered "how his own sensations of pleasure, tension, and excitement varied with the tempo of a metronome" (160). For Morgan, all such efforts were oriented toward resolving tensions between how we experience the world as willing agents and what we know about the inescapable laws of the material universe. One extreme example was the "hylo-idealism" of Constance Naden and Robert Lewins that Morgan analyzes about halfway through the book. "In the gray cells of the cerebral cortex," they wrote, "are generated not only the visible heaven . . . but the poetic sense of its beauty and harmony" (147). Aesthetics, for them, were material inside and out—but that didn't alter the reality of pleasure or even of rapture. Rather, it seemed to provide a common framework in which to understand what goes on when the sun sets and when we respond affectively to the sight of it doing so. If we're made of the same stuff, the thinking goes, then we needn't feel the tension we so often do between our spiritual experience of the world and our knowledge of its molecular makeup. In whatever sense molecules are "mindless," Morgan's actors argue (and so, one gets the sense, does Morgan), we are too.

One result of materialist aesthetics is what Morgan calls "a physiology of political life" (190). It should be possible, he suggests, to study things on the macro scale of society ("political life") with tools built for studying the micro scale of bodies ("physiology"). Read creatively, this idea licenses a new approach to literature. Literary criticism is physiological, in this sense—close reading cuts into a textual body—but those same tools can help us recover broader historical patterns, and not just when we do a sociology of readership or a visualization of corpora. Close reading itself, in other words, reveals a world beyond the text. In a section on "Distant Reading in 1887," alluding to a recent movement to rethink criticism on a grand (digital) scale, Morgan makes this point clear.[9] By identifying Victorian antecedents to recent methodological polemics, Morgan exposes "hidden connections between forms of interpretation that are normally perceived as taking place at widely divergent scales" (237). I read him as proposing

[9] The most straightforward statement of this research program is Franco Moretti, *Distant Reading* (London, 2013).

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that we don't need to throw out close reading in order to gain access to the broad sweep of literary history. Rather, a close reading of that history itself reveals strategies with which we might link the bodies of texts to the societies of authors, readers, and beyond.

Building from the "physiology" of close reading to a broader "political life" is one way to do this. But one can also work the other way, from politics to poetry. Think of the critic Frederic Jameson, whose idea of "the semantic raw materials of social life" (206) Morgan cites approvingly. It might be that *The Outward Mind* offers a prehistory of what Jameson famously diagnosed as "the waning of affect" under postmodernism.[10] Morgan suggests as much when he paraphrases the claim that our "seemingly individual aesthetic preferences are in fact governed by an extraindividual logic of nature" (39). If our "raw materials" share a logic with the outside world, then so do our ideas and identities. Both, you could say, are instruments of life. If the aesthetic individual is always social and the lives of the mind and the world share a logic, then these instruments are both private and public, tools for our use and agents of their own. Morgan's actors thought this was true, and in recovering the power of their theories he seems to as well. Ideas about art were (and are) ideas about life. Victorian aesthetes—and, now, their historians—see the potential in this way of viewing their objects, not least for rethinking ongoing disputes over the purpose of art in a utilitarian world and the value of different ways of engaging with it. What Morgan has done, like Riskin and Mitchell, is to recover a history that can help us reimagine the terms of these debates.

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Two books published fifty years after Morgan's story ends can help us make sense of how we got from there to here: Erwin Schrödinger's *What Is Life?* (1944) and Georges Canguilhem's *Knowledge of Life* (1952). Both books brought recent scientific theories to bear on the nature of living beings and both are now milestones in the intellectual history of life. On the surface, the two seem remarkably different. The philosopher–physicist Schrödinger translated the issue into the language of matter and energy, while the philosopher–physician Canguilhem opposed reducing life to physical processes. This basic opposition has led to a divided reception, with Schrödinger cast (for the most part) as a harbinger of molecular biology while Canguilhem is mainly remembered as a mentor for Michel Foucault, who wrote a famous introduction for the English

[10] Fredric Jameson, "Postmodernism, or the Cultural Logic of Late Capitalism," *New Left Review* 1/146 (1984), 53–92, esp. 61–2. See also Jameson, *Postmodernism, Or, The Cultural Logic of Late Capitalism* (Durham, NC, 1991).

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translation of *The Normal and the Pathological* (1978; first published 1943).[11] But on inspection, the two men arrived at startlingly similar conclusions, in the form of a shared lesson about what grounds living processes and how we study them. Neither author is central to these three books (though Riskin treats Schrödinger at length), but their lesson about life applies just as well today—including to the histories we're writing.

That lesson, as expressed by Schrödinger, is that life is a peculiar combination of stability (in the form of heredity) and dynamism (in the form of mutations). This dynamism was enough for Riskin to credit Schrödinger with carrying on the active-mechanist tradition despite its travails in the early twentieth century. Schrödinger emphasized the *surprising* nature of mutations, which seemed to violate the (classical) laws of physics. Life, he concluded, must depend on "'other laws of physics,' hitherto unknown," and is thus (when properly understood) a spur to new knowledge—in this case, the further development of quantum theory.[12] Canguilhem defined life using similar terms:

> The use of concepts and intellectual tools forged by that living scientist, the biologist, in order to understand the experience of life proper to the organism is thus at once both inevitable and artificial. We will not conclude from this that experimentation in biology is useless or impossible. Instead, keeping in mind Bernard's formula that "life is creation," we will say that the knowledge of life must take place through unpredictable conversions, as it strives to grasp a becoming whose meaning is never so clearly revealed to our understanding as when it disconcerts it.[13]

Canguilhem's "unpredictable conversions" echo Schrödinger's crucial mutations. For both, life's central quality is that it is disconcerting—or, as Riskin (or Leibniz) might say, disquieting.

Which brings us back to Frankenstein. Expressing surprise at his horror upon creating life, the scientist explained it away: "The different accidents of life are not so changeable as the feelings of human nature."[14] Encountering—or rather, causing—just such an accident, Frankenstein experienced a disquiet he hadn't predicted. Such is life, we might say. The twinned subjectivity of creator and creation, the way Frankenstein's consciousness changes once the monster

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[11] One exception to this binary is a recent analysis of Schrödinger's impact across both the sciences and the humanities. See Hans Ulrich Gumbrecht, Robert Pogue Harrison, Michael R. Hendrickson, and Robert B. Laughlin, *What Is Life? The Intellectual Pertinence of Erwin Schrodinger* (Stanford, 2011).

[12] Erwin Schrödinger, *What Is Life? The Physical Aspect of the Living Cell* (New York, 1945), 68.

[13] Georges Canguilhem, *Knowledge of Life*, ed. Paola Marrati and Todd Meyers, trans. Stefanos Geroulanos and Daniela Ginsburg (New York, 2008), 22.

[14] Shelley, *Frankenstein*, 1: 98.

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gains his own, grounds the novel. Indeed, it has contributed to an irony of the book's reception: the name of the horrified creator became his creation's, too; Frankenstein and his monster are one. There's a lesson in this elision. From medieval automata to artificial intelligence, the instruments of life have taken on lives of their own. Perhaps this explains *Frankenstein*'s continued appeal: not anxieties about synthetic biology or "Frankenfoods," but rather recognition of the reason of things. Living in the twenty-first century, in turn, means reckoning with the lives of our own instruments. They delight us by adapting to our wishes—even as they adapt us to others', if not their own.

Ours is still the world Shelley imagined. Our fascination with life itself is matched only by our unease with all the objects that such fascination reveals and creates. These three books point the way toward a historical reckoning with that uneasiness, if not with our relationships with the forms of life around us. They also remind us, implicitly, that history itself is a creative act. We historians don't simply recover the past, nor can we predict what will happen to the histories we write. Our histories, like our instruments, take on lives of their own, from their power over collective memory to their invocation in political arguments. The intellectual history of life binds this creative potential together with its subject; histories of life recount the ambitions—if not the hubris—of past creators, even as they suggest and abet new paths for science, medicine, and the law. This is how history comes to life: by linking today's ideas to earlier ones, grounding new efforts in accounts of the old. What remains to be seen is what new monsters might be created as these histories are put to work.

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