The Face of Time between Haeckel and Bergson, or, Toward an Ethics of Impure Vision

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Here as there, pure absolute Being cannot do without the organ of its visibility, the medium by means of which it not only exists but also grasps itself in itself. . . . The return to the pure immediacy of life [is] only possible by a particular act of “seeing,” of the “intuition” of life. And this intuition can never go behind the world of forms per se because it is nothing other than a way of giving form.

Ernst Cassirer, The Philosophy of Symbolic Forms

Introduction

This essay stages an encounter, a speculative tête-à-tête, between two of the more notorious figures from the history of modern evolutionary thought: the ever-controversial German zoologist Ernst Haeckel and the comparatively better-received French philosopher Henri Bergson. Though they hail from relatively distinct—however overlapping—national, intellectual, and historical milieus, Haeckel and Bergson shared many theoretical concerns and radicalized late-nineteenth- and early-twentieth-century evolutionism in surprisingly similar ways. Both were unsatisfied, for instance, with solely mechanistic explanations of evolutionary change, in-
cluding Darwin’s theory of natural selection, which privileged efficient causes between external phenomena in conceptualizing environs as evolutionary sieves. Neither Haeckel nor Bergson rejected the idea of natural selection, but each also sought an immanent cause for the history of life in the form of a generative temporality that would spur life’s movements from within. Moreover, each grounded his idea in an explicitly non-teleological, non-deterministic understanding of repetition. Haeckel’s divisive theory of “re-capitulation” saw evolutionary repetition as generative in and for itself, whereas Bergson thought repetition a largely passive effect of the interplay between matter’s finitude and the infinity of la durée purée, or “pure duration.” Nonetheless, for both thinkers, repetition comprised a diversifying, cumulative movement that served as an autopoietic source for the radiating history of life Darwin described in *On the Origin of Species* (1859).

In addition to misgivings about efficient causalities and mechanical reductionism, Haeckel and Bergson also shared suspicions about purely intellectual methodologies, particularly when it came to treating life’s teeming temporality. They developed kindred modes of inquiry that privileged the affective and felt dimensions of thinking. Bergson called his methodology “intuition.” Haeckel, conversely, did not name his methodology: an unexpected lapse for an author so known for neologisms. Still, the Greek term *aesthesis*, which Haeckel employed throughout his works, seems a likely candidate. For the Greeks, *aesthesis* meant simply “sensation” or “perception.” In Haeckel’s hands, however, *aesthesis* also refers to the intrinsic sensitivity of living things as well as the affectivity that constitutes their relations with environments.

Though both Haeckel and Bergson attempted to imagine evolution in ways that exceeded purely intellectual scientific methodologies, they did so through dissimilar means and media. What I am calling Haeckel’s aesthetic entailed an overt pictorial practice, composed mostly of spectacular drawings rendered by the zoologist’s own hand (fig. 1). Haeckel relished thinking evolution visually, and his pictures envisaged countless homologies among vast varieties of creaturely forms. Bergson’s ontological commitments, meanwhile, were predicated upon a profound distrust of visualist epis-
Bergson was especially critical of earlier evolutionists, such as Herbert Spencer, who used spatialized schemas, including “trees,” “ladders,” and “lines,” to describe the living creativity of time. In Bergson’s view, such schemas were holdovers from an effectively static and hierarchical conception of nature that missed the vital ingenuity Bergson saw in Darwin’s theory of descent. For this reason, he tended to eschew the manifestly visible, opting to intuit evolution through media that touched senses other than sight. Hence while Haeckel and Bergson converged in putting to use the affective and felt aspects of thinking, they diverged around the problematics engendered by sensuous vision.

This divergence awaits elaboration, since Haeckel and Bergson never met—neither in person nor in writing. On several occasions, Haeckel attacked the modern theories of vitalism to which Bergson’s philosophy has often been mistakenly linked, but without ever citing Bergson. For his part, Bergson criticized the spatialized thinking of evolutionists like Spencer but remained silent on Haeckel and the visions for which he was known. Here, I bring them face to face, as it were, to develop an image of evolutionary time that comes into focus in the transit between them. Because Haeckel’s aethetis strives to move its spectators, it offers a pictorial means for imagining Bergsonian intuition. It does so, moreover, through the very visions Bergson rejected in the name of durational purity. Dramatizing this movement here, I offer more than a local resolution to an arcane predicament. Namely, I lay the groundwork for an ethics of seeing dedicated to re-envisaging problematic pasts: what I call an ethics of impure vision.

With this ethics, I mean to redress the intense scorn associated with Haeckel’s oeuvre since the early part of the twentieth century. Neo-Darwinians with an interest in mechanics, genetics, and statistics led the charge against Haeckel’s work, which they deemed epistemologically bankrupt for its antiquated mechanics, unruly visual practices, and less-than-sober speculations. Political rejections came from cultural anthropologists Franz Boas, Alfred Kroeber, and Claude Lévi-Strauss, among notable others. They overturned the recapitulatory assumptions of their Victorian forebears, who nearly founded the comparative method in anthropology on the
Fig. 1. Ernst Haeckel’s image of bats, or Vampyrus. [Art Forms in Nature: The Prints of Ernst Haeckel (New York: Prestel, 1998) Plate 67.]
principle that children of “higher” peoples must pass through and beyond the permanent conditions represented by adults of “lower” groups. As many critics have since demonstrated, such ideas serve as awful reminders of what can happen when an all-determining natural science is deployed to depict distinctly social and political realities. As I will show, however, a closer look at the alleged source of these ideas reveals a less determinate foundation for what has been too hastily dismissed as a homogeneous evolutionary vision.

Meeting previous critiques, I angle the potential of Bergsonian intuition toward the aesthetic and political imbroglios of evolutionary science’s history and counteract the unquestioned antipathies that have long blinded scholars to the promise of Haeckel’s multifaceted oeuvre. The ethical stakes of this gesture are especially pressing in the case of Haeckel’s science, since they concern the still largely defensive posture that characterizes the humanities and social sciences’ rapport with natural science today. Scholars in the history of science and science studies have gone far to problematize entrenched disciplinary divisions by pursuing science without dismissing or taking for granted its complex relations with society and technology. Yet an implacable resistance to Haeckel’s work continues to serve as a static moral foundation for abandonments of natural science across disciplines.2 With this essay I tender a more sympathetic approach. Turning fresh eyes to what is apparently awful in science, I unsettle current epistemological prejudices and invite revivification of still other unsightly views.

**Bergson “Behind the Lines”**

While Bergson realized his philosophy of *la durée pure* over the course of numerous texts, it was primarily his *Creative Evolution* (1907) that responded to the challenges posed by Darwinism and evolutionary science. In that text, Bergson argues that evolutionists such as Spencer fail to recognize the creativity, or “radical becoming,” of time because they rely on perceptual and intellectual schemas that are fundamentally spatial. To Bergson’s mind, Spencer’s evolutionism proceeds by casting the past into the image of a great ladder. The problem with this ladder image is not only its arbitrari-
ness, Bergson submits, but also its presumption of a homogeneous spatial background that alienates evolutionists from the very duration they seek. When Spencer’s theories isolate static views from the “flux of the real,” he actually withdraws those views from the evolving “Whole,” Bergson argues. He may try to rearrange these views in sequence, according to resemblances perceived from the outside, but in so doing, he wholly ignores the original flow. Instead, he merely “imitates” that flow in the form of a “mosaic,” a mimetic vision of time that Bergson sees subtending all of Western philosophy from Plato to Kant. This is what Bergson calls “Spencer’s illusion,” a mosaic illegitimately passing itself off as time (CE, 301).

Such illusions, however, are not merely the epistemological conceits of high-minded philosophers. They also constitute the very design of natural perception and intellection. In order for the human organism to mobilize its sensory-motor and intellectual habits toward survival, Bergson reasons, it must turn time into space. Giving humans the means to map potential lines of action across myriad milieux, this spatialization gets a minimal grip on the real by contracting its infinite temporal oscillations into inert partial views. Though disconnected from the Whole and necessarily illusory, these limited views nevertheless function as pivot points for our actions. Consequently, when Bergson deems mosaic thinking an “illusion,” he means an illusion that is intrinsic to our evolutionary being.

Bergson proffers his own philosophy of intuition as a direct challenge to our natural tendency to spatialize time. Intuition, in his conception, is a faculty of immediate apprehending that serves as the affective basis of our sensory-motor and intellectual habits: the very means by which we create particular spatialized worlds and feel out potential lines of action through them. Situated in the interval between perception and motor response, intuition dynamically constitutes links between them. Crucially, however, intuition retains an indeterminacy and freedom that finds its wellspring in what Bergson terms “pure memory,” an ever-growing, inner reserve of durée that exceeds all practical, spatializing ends. If we can develop a way of attuning ourselves to this excess, intuition may free us to explore multiple levels and rhythms of duration that
are excluded from our otherwise static perceptual and intellectual frames. To do so, one must attend to the intervals between such frames and evolve new feelings for the “vague fringe” of multiplicity and difference that borders ordinary perceptions and thoughts (CE, 65). With this, intuition promises not only to momentarily liberate us from the deadening habits of our spatialized worlds but also to bring about an “open morality” characterized by a capacity to unsettle unjust sediments in the social sphere.

To preserve both the ontological and the ethical autonomy of intuition, Bergson not only critiques the spatial schemas that undergird Western epistemology but also tends to cleave intuition from the visible altogether. The corporeal eye, he asserts, sees only mechanized external assemblages, not the organic inner flux of the Whole. “Our eye perceives the features of the living being, merely assembled, not as mutually organized,” he warns in *Matter and Memory* (1896). “The intention of life, the simple movement that runs through the lines, that binds them together and gives them significance, escapes it.” What is more, Bergson persistently appeals to distinctly visual media, such as mosaics, paintings, kaleidoscopes, and even, famously, to cinema, to figure the numbing habits of spatialized perception and intellection. For Bergson, cinema’s animation of static, serialized frames crystallizes the artificial illusionism of our spatialized views of motion. “Such is the contrivance of the cinematograph,” he writes, “and such is also the contrivance of our knowledge. Instead of attaching ourselves to the inner becoming of things, we place ourselves outside them in order to recompose their becoming artificially” (CE, 252).

Pressing further, Bergson makes a critical distinction between what he calls the “eyes of the intellect” and a “spiritual” faculty of seeing he thinks proper to intuition. Writing in the imperative mood, he asserts that only the spiritual eye grants us entry into time’s becoming:

Let us try to see, no longer with the eyes of the intellect alone, which grasps the already made and which looks from the outside, but with the spirit, I mean with that faculty of seeing which is immanent in the faculty of acting and which springs up, somehow, by the twisting of the will on itself, when action is turned
into knowledge, like heat, so to say, into light. To movement, then, everything will be restored and into movement everything will be resolved. (CE, 206)

Bergson’s “spiritual eyes” twist the space-ridden will upon itself to see afresh, “restoring” and “resolving” the human organism’s finitude with the infinite movement of the Whole. As to whether this movement may in any sense pass through corporeal eyes, Bergson remains doubtful. Though he maintains throughout his writings that “perception is, in its very truth, a part of things,” in the case of visual perception, Bergson more often upholds an opposing view (MM, 64). If comported affectively toward matter, nonvisual perception may become intuitive and resolve itself with the movement of the Whole. However, the moment creativity becomes the “already made”—thereby subject to retrospection—it inevitably freezes into a lifeless, “impure” visual perception.

Given this suspicion of the visible, Bergson preferred the verbal images of the poet to the spatialized expressions of the visual artist. “The poet is he with whom feelings develop into images, and the images themselves into words which translate them while obeying the laws of rhythm,” he affirms. “In seeing these images pass before our eyes we in turn experience the feeling which is, so to speak, their emotional equivalent.”7 As the poet’s verbal images “pass before our eyes,” their rhythm moves us, not directly, but through an experience of “emotional equivalence.” Unlike the spatialized image, poetry’s invisible equivalences resonate beyond the rigid abstractions of space, while their heterogeneous affects break up the bad habits of perception and intellection.

Visual art, meanwhile, posed the most difficulty for Bergson’s philosophy of intuition. Consider, for example, the analogy Bergson mobilizes to evaluate Spencer’s piecemeal epistemology:

An artist of genius has painted a figure on his canvas. We can imitate his picture with many colored squares of a mosaic. . . . But an infinity of elements infinitely small, presenting an infinity of shades, would be necessary to obtain the exact equivalent of the future that the artist has conceived as a simple thing, which he has wished to transport as a whole to the canvas, and which
is the more complete the more it strikes us as the projection of an indivisible intuition. (CE, 73)

In this passage, Bergson compares artistic creativity to temporal becoming, and painterly imitation to Spencer’s mosaic thinking. In the process, however, Bergson introduces a strange gap in his thinking. The image of the mosaic-imitator is meant to figure Spencerian and, by implication, natural perception and intellection. But this analogy conspicuously passes over the moment of painting’s perceptual reception—the indeterminate center through which becoming must pass before it can be mimetically mapped. In ignoring this moment, Bergson seems to imply that one can never actually look at a painting in a way that exceeds mere imitation, reducing the aesthetic experience of spectatorship to a process of mimetic mapping. Is the gallery, then, merely a space for adaptation and survival? Such conclusions seem absurd for a thinker so indebted to the creative potency of art.

From time to time, Bergson attempts to counter this absurdity. In *The Creative Mind* (1934), for instance, he seeks to save spectatorship for intuition in a meditation on the romantic painter William Turner and the neoclassicist Jean-Baptiste-Camille Corot:

The great painters are men who possess a certain vision of things which has or will become the vision of all men. A Corot, a Turner—not to mention others—have seen in nature many an aspect that we did not notice. . . . If we reflect deeply upon what we feel as we look at a Turner or a Corot, we shall find that, if we accept them and admire them, it is because we had already perceived something of what they show us. But we had perceived without seeing. It was, for us, a brilliant and vanishing vision, lost in the crowd of those visions, equally brilliant and equally vanishing, which become overcast in our ordinary experience like “dissolving views” and which constitute, by their reciprocal interference, the pale and colorless vision of things that is habitually ours. The painter has isolated it; he has fixed it so well on the canvas that henceforth we shall not be able to help seeing in reality what he himself saw.⁸
Although Bergson allows for the universal human capacity to experience brilliant views, only the painter can deliver visual images to our otherwise dull and dreary world by “isolating” and “fixing” them for all to see. This may be the closest Bergson comes to wedding visual spectatorship to the powers of intuition. Despite this apparent opening, however, the deep suspicion of the visible that pulsates through the rest of his work prompts us to ask the following: Does the aforementioned “seeing in reality” render actual shifts in corporeal vision, or does it entail a pale recollection made available for popular enlightenment? The passage above points us to the former, but on the whole Bergson tips his hat toward the latter.

The problematic crux of Bergson’s fraught relation to the visible shows itself with greatest lucidity when he appeals to Leonardo da Vinci’s distinctly non-optical theory of visual art:

True art aims at portraying the individuality of the model and to that end it will seek behind the lines one sees the movement the eye does not see, behind the movement itself something even more secret, the original intention, the fundamental aspiration of the person: a simple thought equivalent to all the indefinite richness of color and form” (CM, 220; emphasis added).9

Here, Bergson imagines the vitality of visual art, not coursing “through” its lines but breathing mysteriously “behind” them. What can be said of this bizarre prepositional play, except that it aims, in the last instance, to protect painting’s “secret” vitality from corporeal contamination? To salvage visual art for intuition, then, Bergson thinks he must maintain an irreducible gap between visibility and creativity, since visual perception seems to sully intuition’s access to pure memory and duration. For this reason, moreover, creative meetings of image and spectator cannot occur directly. As in his account of poetry, but now once more removed, the visual artist’s “simple intention” reaches us through a strange detour: an inordinately rational-sounding relation that Bergson describes as “emotional equivalence,” rather than what might be a mutually reverberating encounter bent on differentiation and reciprocal becoming.

To cut to the core of Bergson’s fraught relation to visibility will
necessitate situating it in terms of his well-known distinction between the “actual” and the “virtual,” a conceptual couplet most fully worked out in *Matter and Memory*. The actual, according to Bergson, refers to the “extensive”—that is, the extended forms of matter and spatialized instantiations of time that render becoming homogeneous, illusory, quantifiable, and actionable. The virtual, by contrast, entails what Bergson deems the “intensive,” the immanent power of the not-yet-extended and the contracted temporal oscillations that can be felt within the qualities of extended forms. Whereas the actual implies the category of the “possible”—the “could” or “might” that drives pollsters and statisticians—the virtual signals the true flux of the real, including human intuition’s capacity to install itself therein. But the actual and virtual do not form a simple opposition in Bergson’s philosophy. As both Bergson and his followers stipulate, the two concepts form an inseparable pair. “The virtual is only real in so far as it is actualized,” remarks Keith Ansell Pearson.\(^{10}\) Joined in an immanent and mutually conditioning rapport that Gilles Deleuze names “reciprocal determination,” the actual and virtual thus catalyze life’s creations in tandem.

Cast in the light of the actual and the virtual’s reciprocal determination, the problematic status of visibility in Bergson’s texts comes into sharper view. Now, his overwhelming suspicion of visibility seems to preclude the virtual’s realization as actual, in effect short-circuiting what Bergson otherwise conceives as an immanent reciprocal determination. Cutting off the virtual from the actual in this way introduces a tension in Bergson’s philosophy between an immanent vision of creation and a hierarchical, even transcendent one that sees virtuality as redemption and actuality as fall. Bergson’s distrust of visual art, therefore, marks a conspicuous betrayal of his commitment to immanence. And with this, his insistence upon imagining the aspirations of the visible “behind the lines” of its forms, not “in” and “through” them, becomes a symptom of that betrayal. If verbal images can move us anew, why bar the visible from becoming flesh, too?

In a recent effort to salvage visual appearance for Bergsonian thought, philosopher John Mullarkey has also linked it to a pertur-
bation in the actual-virtual conjunction, though without wrestling with the aforesaid tension in Bergson’s own writings. Mullarkey takes issue with contemporary Bergsonians such as Pearson who write in the wake of Deleuze’s virtualist rereadings of Bergson’s oeuvre. They follow Deleuze’s lead, he argues, but without his openness about “the biases he brings to his reading.”11 Their tacit affirmations of reciprocal determination notwithstanding, contemporary authors are criticized in Mullarkey’s work for giving undue ontological and ethical weight to virtuality. Texts such as Pearson’s Philosophy and the Adventure of the Virtual (2001), Manuel De Landa’s Intensive Science and Virtual Philosophy (2002), Brian Masumi’s Parables for the Virtual (2002), and James Williams’s Gilles Deleuze’s “Difference and Repetition” (2003) offer one-sided, exaggerated valuations of virtuality, which too often construe actuality as a fall into the homogenizing illusions of identity. “James Williams begins impartially enough,” writes Mullarkey, “before returning to a general thrust that remains anti-Actualist, ‘actual objects’ being dissociated from ‘the processes that bring us about’ such that our maxim should be ‘leave all actual things behind (forget everything)’” (“FV,” 470–71).

A contrario, Mullarkey sketches out his own “actualist” reading of Bergson, which turns the prevailing hierarchy on its head. For Mullarkey, the Whole is not virtual, but immanently actual. “If durée is fundamental change, then, it needs no support,” he surmises. “Actuality is a creativity neither ex nihilo nor ex potential; it is its own ground” (“FV,” 473). Reversing the figure-ground relation conventionally ascribed to the actual and the virtual, Mullarkey recasts the former as the true immanent field of becoming and the latter as a psychologically necessary but ultimately perspectival projection of actuality’s radical multiplicities. Laboring to “save the appearances” from the virtualist’s wastebin, Mullarkey develops a theory of intuition that turns on the optically oriented conception of “refraction.” Refraction is a term Bergson deploys “nearly as often as the virtual,” notes Mullarkey, but has hitherto received none of the latter’s attention (“FV,” 483). Refraction, in Mullarkey’s view, imagines the distortions of light not as falls into illusionism, but as immanent affective media. No longer mere il-
lusions, the torsions of luminosity become key sites for off-scene oscillations to be visibly felt. In place of the virtualists’ ethos of “pure” becoming, Mullarkey proffers an actualist’s ethics of refraction, devoted to affective openness and grappling with the tensions that constitute their quasi-static fields. “Bergson offers us hope in the form of a refraction that is aware of its own distorting effects and as such partly undoes them,” he writes. “This affective openness and acceptance toward actuality, in all its proper need for temporary stasis, becomes a form of movement, too: a devirtualization that saves appearances by mobilizing our regard for them” (“FV,” 488).

In Mullarkey’s analysis, the term refraction is given a creative, positive meaning. His hermeneutic gesture, however, passes too easily over the constitutive tensions in Bergson’s conceptual edifice. Closer inspection reveals that Bergson himself utilizes the term refraction to describe the passive, illusory products of actualization in contrast to the immanent powers of the virtual. Discussing the problems of retrospection for thinking freedom in Time and Free Will (1889), for instance, he explicitly figures refraction as fall. “The self, infallible when it affirms its immediate experiences, feels itself free and says so,” writes Bergson; “but as soon as it tries to explain its freedom to itself, it no longer perceives except by a kind of refraction through space” (TFW, 183). However ingenious, Mullarkey’s recuperation of refraction ignores such pejorative uses of the term, consequently overlooking Bergson’s own virtualist leanings and the fraught rapport between intuition and visibility that indicate them. To answer the Manichaean investments Bergson’s virtualist suspicion of visibility have spawned, I return to Haeckel’s multifaceted evolutionary aesthetics, which not only revel in the creative capacities of the corporeal eye but also disclose becoming within and through their pictorial forms.

Haeckel’s Impure Vision

Ernst Heinrich Philipp August Haeckel (1834–1919) was a renowned but controversial zoologist and illustrator who spent the majority of his professional life at the University of Jena in Ger-
many. He was the great popularizer of Darwinism in the late nineteenth and early twentieth centuries. A self-styled proselytizer with a reputation for bombast, Haeckel exceeded both Thomas Henry Huxley and Darwin himself in spreading the gospel of evolutionism to academic and popular audiences alike. Known variously as the “German Darwin” or, more pejoratively, “Jena’s Dali Llama.” Haeckel had a passion for the popular that made his work dubious in the eyes of fellow scientists, especially in his native Germany. More than anything, it was his visual thinking that upset his critics.

While Darwin was hesitant about using drawings and diagrammatic aids, at least when introducing the sensitive topic of descent, Haeckel exploited pictorial thinking with unprecedented zeal. Indeed, he turned his version of Darwinismus into a full-blown spectacle. In dozens of texts, popular lectures, and even a phyletic museum, Haeckel’s drawings made his universe of evolutionary repetitions exquisitely visible. As such, Haeckel’s texts invited spectatorship as much as, if not more than, mere readership—especially in a number of illustrated collections and monographs he called “art forms in nature” (figs. 2 and 3). Encompassing creatures from land, air, and sea, such drawings made the invisible visible, rendered the microscopic macroscopic, and traversed recursions across vast spatiotemporal scales. As in his well-known monographs on radiolaria—unicellular sea creatures who generate intricate and wildly diverse skeletal patterns out of silica from the ocean floor—his pictures often took the form of serial arrangements that revealed countless symmetries and minute differentiations never before seen (fig. 4).

Haeckel’s pictures have historically worried scientists and historians. Particularly problematic in their eyes are his evolutionary “stem trees,” or Stammbäume, which appear to envision descent as a linear, hierarchical, and progressive march toward the human (fig. 5). Such pictures have been criticized most famously by Stephen J. Gould and Peter Bowler for their apparent anthropocentrism and teleological bias. Equally controversial for science is how far Haeckel’s visualizations exceed their merely explanatory function. Not only are they designed to rouse the senses, but they also
Fig. 2. Original cover art from German Edition of Haeckel’s *Art Forms in Nature* (1899). [*Art Forms in Nature* Plate 67.]
Fig. 3. Image of spiders, or *Eperia*. [Art Forms in Nature Plate 66.]
Fig. 4. Image of radiolaria. [Art Forms from the Ocean Plate 24.]
frequently appeal to salacious subject matter that offended Victorian sensibilities with visions of unborn life. For these reasons, Haeckel’s pictures function as spectacles in two senses of the word: first, as optical instruments designed to bring certain details of nature into focus; and second, as sensations meant to excite and sometimes even agitate their beholders. That is, Haeckel’s pictures not only show recursive generation but also move spectators to feel it.

Even in the light of such spectacles, what prevents Haeckel’s sensational science, preoccupied as it is with spatialized resemblances, from simply confirming Bergson’s critique of the visual as essentially static? After all, if Spencer erred in deploying spatialized language to describe evolutionary time, wouldn’t Haeckel’s manifestly visual spatializations only compound this problem? The key to understanding the resolution Haeckel’s spectacles offer to the visual quandaries of Bergsonian intuition lies in the aesthetic foundations of the former’s oft-misunderstood theory of evolutionary repetition.

Haeckel’s theory of evolutionary repetition finds its source in an original, if contentious, insight that he first introduced in the mid-1860s: the “fundamental biogenetic law,” or theory of “recapitulation.” According to Haeckel’s theory, “ontogeny recapitulates phylogeny,” or in less specialized terms, the individual organism repeats its evolutionary, or “phylum,” history in the course of its development. More than just a theory of recursive generation, Haeckel conceived the biogenetic law as an aesthetic opening onto evolutionary time: a way of seeing life’s largely imperceptible histories in the phenomenality of the living present:

All changes in organic forms, all metamorphoses of animal and plant forms, appear to us all the more remarkable and all the more wonderful in proportion as they occur more rapidly. When, therefore, our opponents pronounce that the past development of the human race from lower animal forms is incredible, they must regard the embryonic development of the human individual from the simple egg-cell as far more wonderful in comparison. This latter process—the ontogenetic modification—which takes place before our eyes, must appear more wonderful than the phylogenetic modification, in proportion as the duration of the tribal history exceeds that of the germ-history.
Fig. 5. One of Haeckel’s more famous stem trees. [Anthropogenie, Fourth German Edition (Leipzig: Wilhelm Engelmann, 1891) Plate 15.]
Haeckel’s theory of recapitulation brought an intrinsically invisible, even “incredible” evolutionary historicity to the scales of human perception, a vast, “wonderful” temporality made visible “before our eyes.”

Yet Haeckel never claimed exact or precise repetitions when theorizing the biogenetic law. Instead, he argued, recapitulations are almost always minimally “distorted.” Recapitulations are not only contracted; they are riddled with displacements, variations, and gaps. More than merely repeating the past, then, ontogenies also contract, expand, reverse, speed up, slow down, displace, and refigure phylogenies in every recapitulation. Haeckel named the contractions and dilations of morphological space “heterotopy” and named the accelerations and retardations of developmental time “heterochrony,” and suggested that such dynamics may affect every aspect of the evolving body:

“Displacement in position,” or “heterotopy,” especially affects the cells or elementary parts which compose the organs, but it also affects the organs themselves. . . . “Heterochronisms” are equally significant. . . . By heterotopy the sequence in position is vitiated; similarly, by heterochrony the sequence of time is vitiated. This vitiation may affect either an acceleration or a retardation in the appearance of organs. (EM, 13)

According to Haeckel, the torsions of space and time that occur among the recapitulations of cells, organs, and entire bodies must be seen alongside recapitulation, not—as critics have claimed—as evidence against it. Haeckel’s writings often describe these heterogeneous torsions as exceptions to the biogenetic law, but his drawings suggest a more sophisticated vision: that the metamorphoses, if not anamorphoses, created by time are the spatial rebuses through which evolutionary recapitulations are refracted.

Disregarding the complexities of Haeckel’s heterochronic view of recapitulation, most scientists and historians have accused Haeckel of upholding a retrograde and distinctly pre-Darwinian vision of nature. The pre-Darwinian recapitulation theory of natural historians such as Charles Bonnet, Lorenz Oken, Friedrich Meckel, and Étienne Serres imagined all of nature rehearsed in
the microcosmos of human development. Such a theory depended upon ancient equivalences between microcosm and macrocosm, as well as Aristotle’s distinctly hierarchical “Chain of Being,” not the differentiating movements of evolutionary time. For these recapitulationists, what repeats in the time of human development is an essentially linear, static, and hierarchical scale of nature, often pictured as a great ladder, for which each organism constitutes a single rung. As humans climb the scale of nature, they pass through these “rungs” or “steps” that—and this is crucial—correspond to mature fish, chickens, and dogs before reaching their own “perfect” and “adult” forms at the top. In this way, becoming human means passing through and extending beyond the adulthoods of creatures that lie “below.”

More dangerous, however, are the ways that Haeckel’s theory of recapitulation came to describe psychic, social, and political relations in late-nineteenth- and twentieth-century science and culture. Although the biogenetic law began as a theory about vertebrates and described embryological development alone, it quickly found broader application in extra-embryological theories of race and class. As Gould explains in *Ontogeny and Phylogeny* (1977), numerous anthropologists, developmental psychologists, education theorists, and psychoanalysts took up the biogenetic law to claim, in some form or another, that the childhoods of Europeans—thought to be the most highly developed stock of human beings—passed through “lower” stages of mind and culture belonging to non-European, essentially still “primitive,” adults. After the rise of cultural anthropology in the early twentieth century, and especially since UNESCO’s 1950 statement, *The Race Question*, which officially sanctioned the dismantling of scientific racism, critiques like Gould’s have become the dominant way of framing Haeckel’s work. Whether in discussions of overtly racist temporal hierarchies in Victorian anthropology, in critical analyses of the “naturalizing” Darwinian foundations of late-nineteenth-century developmental psychology, or more recently, in postcolonial analyses of Freud’s phylogenetic speculations, the biogenetic law stands as an unproblematized foundation for critiques of so-called biological determinism in science. As a result, most encounters with Haeckel’s work
advance as unreflective negations, the purported certitude of which continues to serve as moral ground for critical studies of science and its political dangers.

It should be said that Haeckel did frequently tack his vision of evolution to bogus racialized hierarchies, even though he did not ultimately settle on a final valuation. For this reason, he was forever shifting their ranks, generating modified racial hierarchies in almost every new edition of his texts. An evolutionary tree in the first edition of *Natürliche Schöpfungsgeschichte* (*The History of Creation*, 1868), for example, features “Papuan” and “Hottentot” peoples among the “lowest” branches, “Indo-German” and “Semitic” groups among the “highest,” and “Mongolians” trailing just behind. The tree’s second edition revision of 1870, meanwhile, boosts “Native Americans” to higher branches, demotes “Mongolians” from their previous privilege, while unsurprisingly maintaining “Indo-German” and “Semitic” at the pinnacle. But as we will soon see, Haeckel’s science exceeds these pernicious views and cannot be contained by the monolithic image of “social Darwinism” to which it has been reduced.

Without dismissing or, worse, excusing such problems, I want to shift the focus of previous debates to consider the nuances of Haeckel’s vision of recursive temporality—particularly the creative, heterochronic dimensions that, as I have already suggested, are largely ignored.¹⁹ Specifically, I offer the biogenetic law as an aesthetic solution to the problems of seeing evolutionary time raised by Bergson. In order to elaborate these connections, however, I must meet Haeckel’s biogenesis within the minefield of its historical becoming. It is only by tarrying with impure pasts that we can hope to defamiliarize our relationship to natural science and develop more imaginative engagements with it than is practiced in the humanities and social sciences today.

**Recapitulation “Within and through the Lines”**

What makes Haeckel’s heterochronic vision especially inventive is that it annuls an antagonism between two seemingly irreconcilable perspectives that compose the history of recapitulatory thought.
As English philosopher Iain Hamilton Grant has recently shown, the history of recapitulation has been largely split between two varieties or, as he puts it, two “usages” of the theory.20 Calling the recapitulation of Bonnet, Oken, Meckel, and Serres a “linear usage,” Grant also points to a “non-linear usage” that nature philosopher Friedrich Schelling inherited and developed from naturalist Carl Friedrich Kielmeyer.21 For the linear thinkers, Grant explains, ideal types repeat in recapitulation. Such an atomistic conception of repetition, he argues, leads these thinkers to imagine neat symmetrical equivalences between the microcosm of human development and the macrocosm of the Scala naturae. For nonlinear recapitulationists like Kielmeyer and Schelling, however, what repeats is not a static, ideal type but rather, imperceptible, creative, and diversifying powers. Thus for Kielmeyer and Schelling, recapitulation represents the non-phenomenal repetitions we find in Bergson, creative inner powers that are, by necessity, never directly visible to the eye.

Haeckel’s biogenetic law is innovative because it offers a resolution to the rift between the linear and nonlinear traditions of recapitulation. That is to say, Haeckel’s pictures of recapitulation make the latter’s heterogeneous powers perceptible through the former’s visible bodies. In particular, pictures such as Haeckel’s well-known embryo diagrams offer complex, nonlinear visions that enfold heterochrony into their formal logic. Grossly misread by previous commentators, these embryos are the matter to which I now turn.

Haeckel’s embryo diagrams compare the ontogenies of several distinct vertebrate species in order to reveal deep evolutionary affinities between them. The series, which began as relatively simple comparisons of six embryos (three animals, each in two stages of development) later became complex arrays of twenty-four embryos featuring eight species in three stages each. Though the diagrams evolved over the course of many texts, each organized its embryos according to a similar rectilinear framework, laying out distinctly temporal phenomena like the grid for a modern city. Consider one of the most elaborate versions of the grid, featured in the first edition of one of Haeckel’s popular scientific texts, Anthropogenie: Keimes-und Stammesgeschicte des Menschen (1874), published in
English as *The Evolution of Man: A Popular Exposition of the Principal Points of Human Ontogeny and Phylogeny* (1905) (fig. 6). Scanning the two-page diagram—which actually folds out in certain editions—one discovers eight species in three stages of development. All of the figures are rendered in profile, facing in the same direction. Each is strange; many are strangely similar. Although static, they seem pregnant with movement and time. Acting as sensuous spectacle just as much as logical argument, the grid beckons the spectator to animate it. Traversing the series, we witness creatures uncannily “become” and “unbecome” themselves, converging and diverging to register a vast, recursive, and heterogeneous temporality formerly invisible to the human eye.22

In addition to their uncanny sensational effects, there are two crucial aspects of this grid’s logic that previous commentators have ignored. First, Haeckel’s embryos are not identical. While certainly similar, even the figures in the top row are still heterogeneous, suggesting that the recapitulations they make visible are decidedly heterochronic—not static and ideal. Unlike Haeckel’s evolutionary trees, his embryo drawings do not picture hierarchical climbs up a ladder of nature; instead, they show individual ontogenies as differentiating falls that both repeat and diverge from fundamental embryonic affinities. The human embryo, therefore, does not pass through adult stages of other creatures, as a linear recapitulationist might imagine; rather, it transforms into increasingly different, not “higher,” shapes. Second, with such heterochronic differentiations in view, the spaces between the embryos become just as important as the figures themselves, if not more important. These intervals, while deceptively equidistant, contract enormous, heterogeneous histories into the space of a centimeter and indirectly express evolutionary repetitions. Indeed, the grid both holds and withholds contracted infinities in the interstices of its surface. Working together, figure and interval sustain this infinity in a precarious mutual grasp and enjoin spectators to descend into their inner beyond. Thus the anamorphic differences among and between the embryos must themselves be seen as recapitulatory inflections: not “behind the lines” of the picture, as Bergson would claim, but *within* and *through* them.23
Fig. 6. Two of Haeckel's best-known embryonic drawings. [Anthropogenie, Third German Edition (Leipzig: Wilhelm Engelmann, 1877) Plates 6-7.]
Of course, Haeckel’s drawings still risk the problems of spatialization decried by Bergson. Even as they figure heterogeneous, invisible recapitulations, they rely upon essentially static bodies, cut out from the flux of life, endlessly manipulated and abstractly arranged in the form of a diagram. Indeed, Haeckel’s passion for visible lines and sensuous bodies prevents him from embracing the purely non-phenomenal vision of creation championed by philosophers such as Bergson. However, because Haeckel’s lines and bodies provide not only sensuous but also, as we shall see, sensational and affective solutions to Bergson’s problems, I see more sympathies between their methodologies than might otherwise be presumed. Moreover, I find such sympathies in the very excesses for which Haeckel’s pictures have been dismissed.

Among the excesses of Haeckel’s visual science to which critics inevitably point are the seemingly paradoxical means by which it combines rigid figuration, extreme systematicity, and sensual excitation in zealous pursuit of aesthetic order. Indeed, as many of his pictures demonstrate, Haeckel primarily sought regularities in nature, revealing differentiating symmetries and recursive shapes in some of the least likely places. In addition to his embryo drawings, consider, for instance, the picture of frogs featured in his *Art Forms of Nature* (fig. 7). Notice how the repetition and variation of sharp angles and circular bulbs bring into extreme relief all sorts of homologies between frogs as well as among the body parts of individual frogs. With these proliferating regularities in view, Haeckel could then systematize their varieties in the form of orderly tables and trees. Critics such as philosopher and biologist Olaf Breidbach, however, warn that Haeckel’s methodology exaggerates symmetries and is far too systematic, problems he deems incompatible with a Darwinian point of view that privileges heterogeneity and historical difference.24

Though I follow Breidbach in his description of Haeckel’s approach, I take issue with his severe evaluation. For my part, I see Haeckel’s passion for order as paradoxically that which leads him to disclose multiplicity and difference. Whether Haeckel is drawing embryos, jellyfish, insects, or frogs, his affection for regularity always seems to spill into its opposite. His desire for symmetries
Fig. 7. Image of frogs, or Hyla. [Art Forms in Nature Plate 68.]
and recursive patterns, his systematicity and taxonomic mania, also function as turbines of heterogeneity. One finds this no more clearly expressed than in Haeckel’s illustrated atlases on radiolarians. These atlases include hundreds of varieties of radiolarians, systematically cataloged and displayed as Jugendstil spectacles. As Breidbach explains: “The diversity of forms that he assembled, identified, described, and systematized is immeasurable.” With such “immeasurable” forms, Haeckel’s visual science turns quantity into quality, giving visible expression to the seemingly infinite heterogeneity of evolutionary time and the “intensive” refractions of its infinite repetitions.

In addition to the explosive dimension of Haeckel’s visual taxonomies, his pictures are also excessive in that they were expressly designed to titillate and sometimes even shock. To ignore this dimension is to fundamentally misread what made them inventive. Consider his embryonic grids. They turned Darwin’s carefully measured pronouncements about embryonic resemblance in the *Origin* into a defamiliarizing spectacle that previous commentators have noted for its salaciousness. Indeed, the very fact of making the embryonic visible carried an air of scandal in the nineteenth century. Historian Nick Hopwood, who has written extensively about Haeckel’s embryos—though not in connection with the biogenetic law—explains that “embryology belonged to medical institutions, sex advice books, and popular anatomy museums” during the nineteenth century (“PE,” 268). No doubt because of their associations with reproduction and sex, but also due to the ethically questionable and often grisly means by which they were obtained, such pictures were usually found in the desk drawer of the specialist and in the exploitationist’s cabinet of curiosities, not in the pages of respectable scientific texts. Embryology “was not taught at school and not really polite, and it is not generally . . . prominent in German popular-science writing that took off following 1848,” Hopwood adds (“PE,” 268). Haeckel’s grids thus not only revealed heterochronic recursions of evolution but also did so by exciting and often agitating their academic and popular audiences.

In this sense, evolution means nothing but excess for Haeckel’s aesthetic science: not only excess of form and order, but also ex-
cess of sensation, the excitement of which cannot be excised from its specimens. Darwin shied from using pictures in the *Origin*. He relied primarily on linguistic descriptions for fear of scandalizing an audience whose respect he craved. But Haeckel’s keen eye and supple hand turned the history of life into a series of increasingly fraught spectacles, the affective dimensions of which await further consideration.

**Evolution’s Affective Aesthetics**

To further draw out the affective dimensions of Haeckel’s aesthetic methodology, I turn to a related yet far less discussed pair of pictures that make the logic I see in so many of Haeckel’s visualizations more manifest. The first picture served as frontispiece for early editions of Haeckel’s *Anthropogenie* (fig. 8). Less properly “scientific” than other pictures I have examined, the drawing features recapitulations among four distinct vertebrate species in three stages of development. The caption below announces them in counterclockwise fashion: “man,” “bat,” “sheep,” and “cat.” The picture also depicts mature, or “adult,” creatures along with their embryonic forms. But what interests me most about this picture is the extreme frontality of its perspective and the heterogeneous styles it encompasses. Such formal techniques afford important clues for understanding the aesthetic functions of Haeckel’s evolutionary vision.

With its extreme frontality, the frontispiece imagines evolutionary repetitions of the face. As such, the picture functions as a mirror, but one that demands a different mode of recognition and reflection. In this mirror, the human occupies a distinctly decentered position that, like a mosaic, splits and refracts a spectator’s imago among twelve diverse *Gestalten* from different times. Looking at the adults, one finds more or less familiar faces, except, perhaps, in the case of the bat, whose frightening visage is often obscured in illustrations. But the embryos in the picture are far more strange. They are rather oddly shaped and even more alien than in Haeckel’s other grids. In this frontispiece, the embryo’s acute frontal orientation makes them even more startling. Not only are such views
Fig. 8. The development of the face. [Ernst Haeckel, *Anthropogenie*, Third German Edition (Leipzig: Wilhelm Engelmann, 1877) Frontispiece.]
rare in the popular imagination—in the late nineteenth century as well as today—but they become especially terrifying at the front of a fashionable scientific text. What is more, the extraordinary creatures seem to stare back. Their vacant eyes suggest a vision that lies beyond our own, as if that “vague fringe” about which Bergson writes somehow began to return the gaze.

In addition to its mirror-like frontality, the frontispiece mobilizes two distinct styles in its presentation of evolutionary repetition. On one hand, the mature figures clearly suggest classical archetypes. The “man,” in particular, embodies the ideals of Greco-Roman antiquity—almost to the point of caricature. His compact whorls of hair recall the Olympian Jove: divine patriarch, archetype of Western masculinity and, perhaps, most conspicuously, son of Chronos, God of time. Moreover, excessive facial features signify a kind of classicism in all of the adults. Most wear beards of some kind, while the cat’s whiskers suggest a mustache. Even the sheep’s spiraling horns frame its face as the man’s locks do. On the other hand, the embryos are depicted in a much colder and analytical manner, as in an anatomical preparation or diagram. Their representation encompasses less ornamentation, with the exception of the lines and lowercase letters that index invisible differentiations of the face. Juxtaposed with the classical representations of the adults, they appear out of place. Not only do the embryos’ frightening faces reveal the alterity that haunts any ideal maturation, but their very shapes playfully belie the ineptitude of idealist or typological aesthetics to account for the temporality of the human—or any species, for that matter.

What this frontispiece brings forth, then, is recapitulation as a fraught sensuous experience figured both through its odd faces and the intervals between them. At the same time, the intervals proliferate. They traverse reciprocal, heterochronic connections between not only human and sheep, bat and cat, but also between the classical and the modern, the visible and the invisible, picture and spectator, and, above all, seer and seen. These are the intervals that make this frontispiece so moving. And if, as I have suggested, such a picture also functions as a mirror, its vanishing points are the temporal intervals that lend it form.
We find similar vanishing points in a second picture that underscores and intensifies the strange reflections we found in the first (fig. 9). This second picture replaced the previous frontispiece in later editions of *Anthropogenie* and offers itself as a kind of puzzle. In lieu of a grid, its faces are arranged in the approximate shape of an oval. Immediately offered to the eye, due to its relative size and central placement on the page, is the head of a woman. Facing outward, she stares back pensively. Her stylistic treatment connotes antiquity but is rendered with a naturalism that is missing in her masculine counterpart. Nevertheless, she is still, in many senses, an archetype of Western beauty, with big eyes, full lips, flowing hair, a soft expression, and a slight twist of the neck that suggests corporeal grace. Focusing on her ideality lends the surrounding figures a veil of indistinctness and indeterminacy. As frontispiece, she, too, functions as a kind of mirror: a beautiful face by which to imagine a universal *humanitas*. “I am you,” she seems to whisper, effortlessly receiving the spectator’s gaze. But a saccadic, if not metaphysical, restlessness quickly impels her beholder’s look to the periphery.

Turning to what lies beyond, beauty slowly gives way to the sublime. A quick survey of the rest of the page reveals seven other figures. Each is assigned an ordinal number, yet once again, they are not arranged in a strictly linear manner. The woman in the center, one discovers, is numbered figure 7, making her placement less “central” than we might have initially assumed. Two at the bottom of the page, figures 6 and 8, are immediately recognizable as the faces of a young child and an older woman. Though they lack the central figure’s signs of “perfection,” they seem kindred spirits. One may imagine that they represent the same woman in childhood and old age. The mirror thus extends into a life, figured here as a quasi-linear constellation. Above and to the side, surrounding the central figure like a halo—or perhaps a crown of thorns—are five very different figures. Like the embryonic faces in the previous picture, they are alien and rather shocking to the eye. Figure 5 wears an eerie smile, and worse, the rest have their mouths open to varying degrees. Figure 4’s tongue even protrudes like a lizard’s or panting dog’s. Animating the series forward in time, one finds that facial
Fig. 9. The embryonic development of the face. [Ernst Haeckel, *The Evolution of Man*, Vol. 1, Fifth English Edition (New York: G. P. Putnam’s Sons, 1910) Frontispiece.]
features—particularly the relative size, shape, and placement of the sense organs—migrate and transform. Tracing backward, the creatures’ eyes recede to the sides of their heads and nearly disappear; noses reduce to mere pairs of nostrils and vanish altogether; and necks turn unrecognizable as they involute into series of folds.

To make sense of this picture puzzle is no easy endeavor. Even with a clear conceptual sense of its biogenetic logic, it remains difficult to perceptually avow. As the central figure’s “I am you” echoes among all eight faces, a feeling of repulsion haunts the spectator, sending her back and forth between mind and eye. Just when she finds the courage to apperceive her onto- and phylogenetic historicity, figure 1 swallows the very sense organs this apperception requires. Suspended between sense and nonsense, Haeckel’s frontispiece leaves her in a rather anxious position.

The primary source of this anxiety is the distribution of different sensibilities and intensities expressed by the figures. Figures 6, 7, and 8 are pensive and warm with a tinge of melancholy. Shading and line give them relatively relaxed complexions—particularly noticeable in the brow ridges in figures 6 and 7 and the cheeks of figure 8—that make their gazes soft, open, and inviting. But all of the faces stare back at us—even those seemingly lacking the proper organs of sight. Indeed, with its bilateral symmetry, frontal orientation, and strangely contracted visage, figure 1 retains an inner intensity that seems to look out from between its folds. Though this look appears vacant, all the embryos’ complexions are more concentrated and intense, if not “intensive,” than their recognizably human counterparts. Particularly anxiety-inducing, however, are the serial and polar relations between the divergent sensibilities and intensities that these faces express. For it is the very openness and unguardedness of the postnatal figures that makes the intensive looks of the prenatal faces so unsettling.

Haeckel’s frontispieces thus demonstrate an aesthetic fondness for heterochronic play, as they turn recapitulatory time into a sublime spectacle. Moreover, such play works equally through its figures as through the intensive intervals between them. What stands out most in such pictures are the sensitivities that their creatures unexpectedly express and which seem to give them lives of their own.
While Haeckel's frontispieces are especially attuned to the sensitivities and intensities of their figures, I find these qualities in many of his pictures, from the famous embryonic grids to the apparently inanimate radiolaria skeletons he envisioned so often. Consider a single skeleton featured in one of his later texts titled *Kristallseelen* (*Crystal Souls*), published in 1917 (fig. 10). The skeleton itself is, of course, an inanimate thing, abstracted from the organic tissue that once endowed it with form. Indeed, with its radial symmetries and sharp angles and lines, it seems far too rigid for life. Inside its crystal cage, however, there lies a circular disc whose differentiated parts suggest an optical opening. Staring back, the lifeless skeleton turns creaturely. Traversing the figure's intricate latticework, its jagged angles appear to jut in and out. The tassels that adorn its extremities, meanwhile, take on a strange sensitivity of their own. Here, Haeckel turns his evolutionary aesthetics to fundamentally inhuman ends.

Though Haeckel never explicitly designated the sensitivities and intensities to which his pictures gave life, his conception of aesthesis can help us connect the unspoken epistemology of his visions to the ontology of the creatures they encounter. In *Crystal Souls* he describes aesthesis as an intrinsic feeling or unconscious psyche that subtends all matter. This conception of aesthesis as affective relation moves the concept beyond its original Greek association as “sensation” or “perception.” Aesthesis, he explains, describes the inner orientation of matter, the “feelings” that constitute a substance—any substance—as “subject.” As one can sense in his frontispieces, these feelings may be “positive” and “attractive,” which he also describes as “pleasurable,” or “negative” and “repellent,” which he links, conversely, to “pain.” Such feelings, he declares, not only individuate the substance-cum-subject as distinct from its milieu but also generate the inner conditions and limits for its externalized movements in that environment. Haeckel explains:

> Feeling or unconscious sensitivity is the real inner working of substance, in contrast to energy which is the manifestation. Feeling distinguishes the subject from the surroundings of the external world (the object), while the energy as force acts on
it (manifests itself). In aesthesis two alternating original states stand opposite each other, the positive pleasure feeling as inclination or attraction, the negative, pain feeling as opposition or repulsion. (CS, 107–8)

For Haeckel, then, we could say that aesthesis functions as the inner condition of substance that precedes and conditions any external or causal manifestations through space.

As one might expect, aesthesis includes a temporal dimension. It serves, in Haeckel’s view, as a kind of “unconscious memory” or “conservation of feeling,” which grounds life’s movements and its changes over generations. This aesthetic ground is what re-

Fig. 10. Image of a radiolarian. [Kristallseelen: Studien über das Anorganische Leben (Leipzig: Alfred Kröner, 1917) 82.]
peats in recapitulation. It is the aesthetic itself that heterochronically remembers and re-creates phylogeny in every differentiated ontogeny.\textsuperscript{27}

As I mentioned at the outset, Haeckel’s visual epistemology constitutes an extension of his theory of aesthesis. Though Haeckel never fleshed out an explicit theoretical connection between his pictures and the aesthetic histories they embody, I wish to make such a connection by following a lead from the last chapter of \textit{Crystal Souls.} The hint arises in a section of the book devoted to the study of chemistry, or what Haeckel playfully calls “elementary psychology” (\textit{CS}, 114–15). With a knowing wink to Goethe, he discusses the “inner temperaments” of and “elective affinities” between chemical elements:

Both the affinities of the present permanent and indivisible elements, the internal parts of the atoms, and their “elective affinities,” will become much more intelligible when we pursue their movements of atoms and molecules in causal connection with their “sensitivity” and “feeling” in each chemical process. The many levels of temperament and passion in our human emotional lives, the numerous levels of intensity of our personal affections (feelings of pleasure) and dislikes (pains) let us guess from a distance at what important roles the eternal exchange of attraction and repulsion may play in the chemically combining lives of the elements. (\textit{CS}, 114–15)

It is our own affections and disaffections, Haeckel insists, our own sensitivities and intensities, that must guide our search for chemical “causes.” Hence his elementary psychology, and by extension his theory of aesthesis, has two aspects, or better, two faces: an ontological face, which finds sensitivity and intensity in all things, and an epistemological face, which requires humankind’s own powers of affection to make the former affection sensible. Only in this way can we make sense of the causes of evolutionary repetition as well as the multifarious bonds that hold radiolaria skeletons together. Thus by picturing and showing such phenomena as brief glimpses of a vast aesthetic history, Haeckel’s visual science forges its own bonds with the very lives that it studies.
Conclusion

In moving through these representatives of Haeckel’s evolutionary aesthetics, we can return to a fuller articulation of the resolution they offer to the quagmires of Bergsonian intuition. While Bergson develops an affective mode of creative intuiting that promises to remake rigid habits and worlds, his virtualist leanings and commitments to purity cause him to turn his back on actualized visions and the impure powers inherent in their histories. Haeckelian aesthesis offers a resolution to this aporia, however, because its pictures present evolution in and through affectively fraught sensations that connect scientists and spectators to the myriad creatures they bring into view.

To this rereading of Haeckel, I add a philosophical postscript, which hinges, and impinges, upon Deleuze’s work on cinema and its own answer to the snags in Bergson’s thought. Embracing the visual medium that Bergson himself dismissed, Deleuze’s Cinema Book 1 (1983) and Book 2 (1985) develop a distinctly Bergsonian theory of film by finding temporality and affectivity in the immobile, spatialized cuts that Creative Evolution dismissed as mosaic. Though Deleuze retains some of Bergson’s suspicions of the optical, he nevertheless rethinks the history of cinema as an aesthetic instantiation of Bergsonian intuition by counterintuitively re conceiving intuition as mosaic.

Rather like Haeckel’s giant tomes, Deleuze’s writings on the cinema comprise a taxonomic explosion. Describing scores of images throughout film history, Cinema Book 1 and Book 2 similarly turn quantity into quality and extreme systematicity into creative pandemonium. For Deleuze, the cinematic image is at base temporal, but the two primary types of images that arise in film history open more or less directly onto time. On one hand, the “movement image” is relatively closed off to time. Dominating the so-called classical cinema before World War II, the movement image subordinates duration to the habituated sensory-motor links of psychobiological individuals and their finite spatial horizons. That is why, Deleuze argues, the movement image belongs to an “organic” and essentially “rational” order, where familiar actions and defined
territories offer only oblique glimpses of the oscillating temporalities that ground and surround them. The “time image,” on the other hand, signals a direct opening onto time. Made possible by the devastation wrought by militarized industrial capitalism in the wake of World War II, the time image not only bears witness to the disintegration of sensory-motor adaptations and stable spatial horizons but also catalyzes cinema’s leap into the creative indeterminacies of the virtual Whole. With the time image, the realm of the finite, rational, and organic merges with the infinite, irrational, and circuitous mode of what Deleuze calls the “crystal.” In the “crystalline circuit,” he explains, past and present, mind and matter, nature and artifice interfuse and, in the process, render distinctions between the actual and virtual utterly indiscernible (TI, 71).

Of the many types of movement images Deleuze treats, one type in particular grounds them all: the “close-up,” the image of the face, or what he will also call, thinking of Bergsonian intuition, the “affection image.” Deleuze defines the affection image as the power of the close-up to give facial qualities, or “faceicity” (visageité), to anything (MI, 88). Everything may be “faceified” regardless of whether or not we conventionally conceive of it as a face: the moon, a grain of sand, the human body, a mass of bodies, a landscape, or a clock. In Cinema Book 1, Deleuze characterizes faceicity in two primary ways. First, it is a cinematographic—and, I want to claim, pictorial—mode which contracts time into a delimited spatial field and, like an actual face, actualizes a duration that largely remains offscreen. Second, though actualized, the image retains its immanent, creative connection to time by way of affection—that is, by way of the sensitivities and intensities that comprise it. A center of habituation as well as indeterminate creation, the affection image is essential for Deleuze’s philosophy of cinema because it conceives the space-ridden movement image as an oscillating interval of time.

With faceicity, Deleuze yields a fitting descriptor for that excess we feel and sense in Haeckel’s “art forms in nature,” both in his actual faces and in his embryos, bats, and radiolaria. By making recapitulation spatial, and facial, by cutting out aesthetic intervals from the living flux of time, Haeckel’s methodology thus answers
Bergsonian intuition, giving the latter a spatialized but deeply felt sensibility that it never quite discovered. In Haeckel’s aesthesis we see Bergsonian intuition in the flesh, staring back at us as spatialized intervals and centers of indeterminacy. Some stare with beautiful faces, others agitate and excite with visages that seem otherworldly. Haeckel’s most gripping pictures combine several such countenances into one. Above all, then, Haeckel’s aesthesis seeks to move us, as it thrives on uncertain complexions that vacillate between contemplation and terror, beauty and the sublime. Re-injecting “heat” into the apparent abstractions of “light,” Haeckel offers a pictorial means for thinking Bergsonian intuition that proceeds in and through the spatialized visions the latter famously rejected.

In Haeckel’s hands, moreover, the affection image outstrips the organic horizon in which Deleuze inscribes it and converges with the time image’s circuits. Seen from this vantage point, Haeckel’s pictures usher forth the splintered shards of an immense, ever-evolving crystal, transforming the mirror of nature into the non-representational “reflections” Deleuze finds prismatically refracted through the circuits of the time image. In each facet of this crystal, Deleuze tells us, matter and mind, nature and artifice, radically coincide. Here, a microscopic skeleton swells with sense and intention. There, an organic countenance transmutes into supernatural filigree. Soul becomes crystal, crystal becomes soul, as Haeckel’s intuitions give way to the Whole.

Whether called “actual” or “virtual,” these intuitions and the Whole they render should be thought neither “pure” nor wholly liberating. Intuitions take shape under the pressure of the finite, and eternity’s movement requires matter as ballast. To such conclusions, Mullarkey’s actualism draws close. Championing “refraction,” he ignores the tensions in Bergson’s work. But by pointing to the limits of virtualism’s predilection for the “indifferent flows[s] of the pure,” Mullarkey edges us toward a greater truth: not even the freest spirit, traditionally given the name God, becomes without matter’s stubborn blessing (“FV,” 488).

Reconsidering Bergson and Haeckel in concert, this essay has aimed to disentangle the former’s intuition from virtualist suspi-
cions of the visible and to fashion imaginative openings within the latter’s maligned vision. With this, it has disclosed the constitutive obduracy in duration—the “dur,” so to speak, in durée—and released the hitherto unseen creativity in aesthesis. I proffer the foregoing labor as an alternative mode of approaching natural science and its troubled attempts to give face to evolutionary time—an effort I designated in my introduction as an ethics of impure vision. Committed not to imperceptible purities or generic calls for becoming, this vision seeks to save scientific phenomena by resourcefully retrospecting matter’s impure past.

Inaugurating such an ethics, this essay redresses the conventional critique of Haeckel’s science, a critique that has long reduced his oeuvre to the static, hierarchical vision depicted in his problematic stem trees. Though politically urgent, this critique’s own homogenizing impulses persist as the blind spots of contemporary attitudes toward science in the humanities and social sciences. Left unremarked, these blind spots have turned cataract-like, rendering our critical gaze as lifeless, static, and hierarchical as the views we wish to trouble. As Bruno Latour has increasingly demonstrated, such one-sided negations are no longer adequate to the task of critically reckoning with the possibilities and injustices of the complex natural and technoscientific worlds we inhabit. Their strategy is one of unmasking, writes Latour, and is essentially “subtractive.” Conspiring only to reveal what lies behind scientific claims, they “add” nothing to reality. To breathe new life into our environs, it will be necessary to envisage unforeseen futures in and through the pasts that we share.

Notes

1. Haeckel coined hundreds of new terms over the course of his career. Not only did he name hundreds of previously unknown biological and environmental phenomena and processes, but he also developed words to describe new areas of study. “Stem cell” and “ecology” rank among the best-known of his coinages still in use today.

2. The work of contemporary historian of science Robert J. Richards offers the sole exception to the prevailing critical rejection of Haeckel. In his recent intellectual biography of Haeckel, Richards paints a more
historically nuanced portrait of Haeckel’s life and influence, which he frames as humanist tragedy. Though indebted to Richards’s work, the philosophical and aesthetic investigations pursued here depart from its humanist narrative and the positivist assumptions that support it. See *The Tragic Sense of Life: Ernst Haeckel and the Struggle over Evolutionary Thought* (Chicago: University of Chicago Press, 2008).


14. In addition to salacious content, many of Haeckel’s visions borrowed from and contributed to the sensuous eroticism of Jugendstil and art nouveau, evident both in his *Art Forms in Nature* and in his atlases on radiolaria. Many of his creatures also entered into the very fabric of fin de siècle culture, including a jellyfish-shaped chandelier by Constant Roux and René Binet’s fashionable *esquisses décoratives*. For examples of Haeckel’s larger cultural influence see Olaf Breidbach’s introductions to *Art Forms in Nature* and *Art Forms from the Ocean*.


19. For a thorough critique of the prevailing view, which sees Haeckel as the father of modern biological racism, see Richards, *The Tragic Sense of Life* (2008).


21. Grant also finds hints of nonlinear usages of recapitulation in the works of Gotthilf Heinrich von Schubert and Johann Wilhelm Ritter, who develop it in their theories of metals in the organic kingdom.

22. Previous commentators fail to acknowledge the intricate logic of such grids. Like many of Haeckel’s other contributions, they have evoked an embattled, sometimes even paradoxical, historical reception. In Haeckel’s own time, scientists such as Carl Semper dismissed them as outright “forgeries,” while both he and others argued that such images deliberately “exaggerated” similarities to force “ideal” orders onto the vagaries of nature—a criticism that continues to inform their reception today. Other critics treat the grids as mere “illustrations,” conceived as simple confirmations of the hierarchical theory they extract from Haeckel’s words. For more on the reception of Haeckel’s embryonic grids, see Nick Hopwood, “Pictures of Evolution and Charges of Fraud: Ernst Haeckel’s Embryological Illustrations,” *Isis* 97 (2006): 260–301; hereafter cited as “PE.” Perhaps even stranger are the creationists and advocates of “intelligent design,” who have mobilized Haeckel’s embryos as counterevidence to the theory of descent. Citing science’s own accusations of forgery, authors like Jonathan Wells have sought to reject evolutionary science tout court. See Wells, *Icons of Evolution: Science or Myth* (Washington, DC: Regnery, 2000).

23. Efforts to “disprove” Haeckel’s theory of recapitulation have historically pointed to greater differences between vertebrate ontogenies than his grids suggest. Confusing identity with resemblance, such efforts reveal non-identities between vertebrate ontogenies, while ignoring the resemblances that index their heterochronic affinities. Recently, evolutionary-developmental biologist Michael K. Richardson contributed to this literature by creating an even more elaborate series of embryonic grids that underscore the non-identities of vertebrate development. To truly unseat Haeckel’s position, however, one would have to demonstrate an utter lack of resemblance between vertebrate embryos. See Richardson, “There Is No Highly Conserved Embryonic Stage in the Vertebrates: Implications for Current Theories of Evolution and Development,” *Anatomy and Embryology* 196, no. 2 (1997): 91–106.


27. Haeckel’s notion of “habit” is associated with the thinking of early-nineteenth-century biologist Jean-Baptiste de Lamarck, who argued that living species can modify their evolution through the use and disuse of their parts. Since modern genetic science has revealed this thinking as incorrect, Haeckel’s work has often been dismissed for its “Lamarckian” influences. It may be possible, however, to develop Haeckel’s theory of aesthetic memory in a manner that embraces modern adjustments but does not lose sight of its sense for the “inner feeling” of life.
