

# Configurations

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## Additional Information

## Mysterious Delicacies and Ambiguous Agents:

Lennart Nilsson in *National Geographic*

[Lochlann Jain](#) – [\(bio\)](#)

Sumptuous in detail, mysterious in content, Lennart Nilsson's photomicrography is perhaps best known in North America for the revolutionary pictures of fetuses that have been published in *Life* magazine since the 1960s.<sup>1</sup> Nilsson's images disrupt discursive boundaries between science and popular media; they slide among genres of science fiction, modernism, biological illustration, and surrealism. Each image is in itself stunning, glistening with unabashed magnificence and visual excess as a modernist principle of balance fends off an eruption of the grotesque.

Nilsson has worked directly with German and Japanese engineers to produce electron photomicrographic equipment and has collaborated on numerous popular scientific books.<sup>2</sup> He claims to be a journalist, [End Page 373] reporting on the state of the body. This modesty is not trivial: through its gesture of transcending subjectivity we are asked to take a leap of faith and accept facts presented to us that have no counterpart in our normal scale of vision. Indeed, for all their splendor, Nilsson's images remain in themselves nearly incomprehensible—"recognizable" only through the captions, as Emily Martin demonstrated in her ethnographic research on lay viewing of electron micrographs.<sup>3</sup> The framing of the images illustrates Roland Barthes's classic argument that "text constitutes a parasitic message designed to connote the image . . . [loading] the image, burdening it with culture, a moral, an imagination."<sup>4</sup> Essentially, these fantastic images [End Page 374] have no denotative power for a popular audience, no appreciable visible correlate outside the textual explanations. Because the images appear in so many venues and circulate in so many discourses, they demand to be read in the context of powerful framing devices.<sup>5</sup>

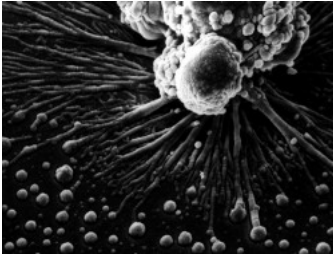
To examine these problematics in detail, I offer a close reading of several photomicrographs that appear in the final chapter of the *National Geographic* official centenary history, *The National Geographic Society: One Hundred Years of Adventure and Discovery*.<sup>6</sup> The "inner space" chapter of this volume contains three of Nilsson's extraordinary images: a page-and-a-third spread of a cross-section of an endoplasmic reticulum, a full-page embryo image, and a 10,000x magnification of a macrophage engulfing a white blood cell.

My argument proceeds as follows. After a short description of the "inner space" chapter, I examine the ways in which a scenario of discovery is constructed around Nilsson's images through a rhetoric of presence. I suggest that *National Geographic* interpolates the inner-space images into its collection of stories in a mode of geographical representation that implies that a viewer has actually taken a fantastic voyage to the throbbing, dangerous wilds of inner space and has witnessed the frontiers and the exotic struggles of everyday life. The geographical metaphor of presence contains the very conditions of possibility for the legibility of these images and authoritatively establishes [End Page 375] the body as a spatial location—one perspectively legible and ripe for geographic exploration. I shall argue, furthermore, that this legibility is embedded in a set of liberal individualist assumptions and discourses that allow for the pictured body fragments to stand in for all bodies, and that persuade the reader that technology has improved "the quality of our lives in ways we almost take for granted."<sup>7</sup> Looking to David Nye's recent explication of the American technological sublime and Stephen Greenblatt's analysis of wonder and discovery, I understand *National Geographic's* cultivation of a particular mode of aesthetic experience in class, nationalist, and gendered terms that attempt to stabilize bodies as natural phenomena, and to reify the interests that maintain the desirability of high-technology imaging and diagnostic equipment.

*National Geographic's* history is narrated in magisterial splendor in the centenary volume. The introduction to the book explains the founding of this great and ever-popular magazine, emphasizing its egalitarian ideal and the nineteenth century's zeal for science:

With annual receipts in excess of \$350 million, with nearly eleven million members in 170 out of the 174 nations that now exist, the National Geographic Society is the largest non-profit scientific and educational membership institution in the world. Why has the *National Geographic* been so successful? . . . Editor Wilbur E. Garrett . . . [says] “I believe it is primarily because we still fill that same need . . . to address the insatiable human curiosity to know what makes the world tick.”<sup>8</sup>

With *National Geographic* in hand, everyone becomes an explorer, an adventurer, and, perhaps, even a scientist.<sup>9</sup>



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**Figure 1.**

Macrophage. C. D. B. Bryan, *The National Geographic Society: One Hundred Years of Adventure and Discovery* (Washington, D.C.: National Geographic Society, 1987), pp. 454–455. Reproduced with the permission of Boehringer Ingelheim.

Chapters divide the magazine’s history into seven-to-fifteen-year periods, punctuated with theme chapters on such subjects as photography, natural disasters, and conservation. The cover spread of the inner-space chapter illustrates a macrophage—the “death cell”— [End Page 376] magnified 18,000x (Fig. 1). Arachnoid tentacles stream from a bulbous pink mass filling the page in a mutant sunrise. An epigraph exclaims: “The Stuff of Stars Has Come Alive.”<sup>10</sup> Space matter—the stuff of stars—in its ringing stillness, emptiness, and lifelessness, is shockingly contradicted by the proclamation of animation in the second part of the phrase, as well as in the mirroring of the visual composition of the inner- and outer-space chapters’ title spreads.<sup>11</sup> The inner-space chapter opens with a quote from Victor Hugo: “Where the telescope ends, the microscope begins. Which of the two [End Page 377] has the grander view?”<sup>12</sup> Aesthetic rhetoric lingers on the sheer mystery of life itself—on the bizarreness of simply being human, raptly living on the borders of infinity, composed of the very elements that constitute stars.

The next two images of the chapter illustrate photographic machinery. One is a full-page black-and-white photograph that shows “David Fairchild and his wife” preparing a twelve-foot camera “with which he photographed his 1913 ‘monster’ pictures,” insects of the backyard enlarged twenty times.<sup>13</sup> The other is a small inset, featuring a man turning a knob at the screen of a scanning electron microscope.<sup>14</sup> We are then treated to a wonderful black-and-white 1977 image—taken “64 years after Fairchild’s long-lensed experiment”—of an 80x magnification of a hairy, extraterrestrial-looking ant caught in the act of cleaning an antenna with a foot.<sup>15</sup> But we are informed that the real breakthrough in microscopic and photographic technologies was the development of the electron microscope, which takes “us into the Alice-in-Wonderland world of inner space.”<sup>16</sup> “Inner space,” then, refers to that place in which the inanimate is personified and often lunatic, and the rational coordinates of time and space no longer exist.

The inner-space chapter of the centenary volume continually references another of the National Geographic Society’s publications, *The Incredible Machine*, in which Nilsson’s photographs illustrate a book-length exploration of the human body,<sup>17</sup> and both books curiously and relentlessly bounce between the search for the origin of life in inner space and the search for the origin of the universe. An aura of amazement pervades the chapter as the universe and “life itself” are continually cross-referenced with the sheer wonder at the “greatest puzzle of all”: the haphazard homogeneity of all life, starting [End Page 378] with that singular bacterial cell 3.5 billion years ago “whose progeny gave rise to what we now call the natural world.”<sup>18</sup>

The narrative whisks readers through a textbook history of microscopes, nuclear physics, the atom, and the origin of the universe, and back to the origin of life and DNA; the second half of the chapter then focuses on the human body’s “enemies”: bacteria, viruses, and AIDS. The clearest section is the last, a discussion of diagnostic imaging technologies that can help “us” on our way to overcoming the “wars within” (quoting the subheading of a 1986 story).<sup>19</sup> An MRI image is described thus: “Ghostly in the dark, a normal face seems otherworldly when viewed by an MRI scanner,”<sup>20</sup> absorbing the reader into a description that blurs image techniques with uncanny ghost stories. Despite the different sorts of visualization required for and by the other technologies mentioned—digital subtraction angiography, positron emission tomography, and single-photon-emission computed tomography—each of these high-tech medical images is illustrated as if it were a natural continuation of microscopy in the sense of seeing more, seeing deeper, and seeing better.

A barely secularized creation story ends the chapter:

the striking advances made in the fields of physics, chemistry, biology, and medicine . . . have already improved the quality of our lives in ways we almost take for granted . . . there is now an additional benefit. . . . If these new scientific tools, techniques, and understandings cannot save us, there is some comfort to be gained from knowing it is not ashes to ashes but stars to stars. <sup>21</sup>

The finale to the chapter and to the book is a double-page spread of magnificent pink streaks of interstellar dust of the Trifid Nebula.

Sparse segues link the sections of the impeccably designed inner-space chapter, as it guides the reader through close-up photography, electron photomicrography, and medical imaging technologies. Nilsson's three photomicrographs serve to yoke photography and digital imaging in diagnostic medicine. The images moderate crude past and boundless future. They also serve to anchor the spatialized **[End Page 379]** body in such a way that it can become the proper subject of a geographic magazine. This spatialization not only creates coordinates for the body, but also allows entrance into the space: scenic scapes to see, and, as importantly, aerated spaces *from* which to view. The geographic space of the body is potently paralleled to outer space, and both spaces are presented as simultaneously mappable and incomprehensible—crucial, infinite, and irresistible.

Thus the overriding trope of the chapter is “The Fantastic Journey.” The body and the adventure encourage the reader's inference that someone has undertaken a major scientific expedition to the Torrid and Frigid Zones of a place in real space. The chapter conveys—or perhaps more accurately, cultivates—a sense of intense wonder at the world portrayed as inseparably natural and technological: the world that is so amazing, so beautiful, so unbelievable, and yet so undeniably, so truly represented by the photographs of *National Geographic*. The use of the discovery trope does crucial work: it makes inner space legible as a *space to be seen*, equivalent to other places in the world; and it legitimates inner space as a locale of exploration. As critical geographers have argued, space is never a neutral surface or volume, but is conjured as such. <sup>22</sup> The inner-space images give us a particularly intriguing opportunity to examine this maneuver precisely because without *National Geographic's* guidance they would be (or at least would have been in 1988) so opaque. I do not wish to argue here that there is one particular genre of colonial vision into which the *National Geographic* volume inserts Nilsson's images. Rather, I suggest that the inner-space exhibition in the collection of *National Geographic* frames these images within the particular tropes of the *National Geographic* collection.

The history of discovery has been much more than a tale of finding things and reporting them to agencies and to the public. Indeed, Mary Louise Pratt convincingly argues that discovery follows a particularly well developed script: the critical procedure of making the geographic hero requires the transformation of a circumstance into something momentarily significant. Discovery consists in the conversion of local knowledges into knowledges associated with European forms and relations of power; it thus requires the “overcoming of all the geographic, material, logistical, and political barriers.” <sup>23</sup> **[End Page 380]** Equally, discovery implicitly celebrates exploration technologies while modestly backgrounding them as merely the means in the making of a singular national hero. <sup>24</sup>

Although Pratt analyzes nineteenth-century explorers, I suggest that this technology-hero relationship has been cultivated throughout the hundred years of *National Geographic*. Lisa Bloom, in her admirable historical work on the National Geographic Society and polar exploration, writes that from the beginning the Society “advocated exploits that would celebrate the nation's technological achievements” through the apotheosis of the male explorer. <sup>25</sup> If some of the specifics are different—in the inner-space chapter no one hero immediately emerges—the rhetorical and pictorial constructions of the event of discovery are not, and these constitutive features of discovery serve as an anchoring feature of the chapter. Indeed, the legibility of Nilsson's images depends upon the classification scheme patterned over the one hundred years of images curated in *National Geographic* magazine.

During the nineteenth century, geographic discoveries were consolidated for England, argues Pratt, through three rhetorical conventions that comprise the distinctive genre of “monarch-of-all-I-survey.” <sup>26</sup> First, the discovery must be brought “*into being* through texts: a name on a map, a report to the Royal Geographical Society . . . a diary, a lecture, a travel book.” <sup>27</sup> Second, *density of meaning* is sought: the “landscape is represented as extremely rich in material and semantic substance.” <sup>28</sup> The third strategy predicates a *relation of mastery* between seer and seen: the viewer has the power, if not to possess, then to interpret. The landscape is presented as if it were, like a painting, intended to be viewed from the place at which the explorer emerged to view it. *National Geographic* clearly puts these three strategies to use in the framing of Nilsson's images. First, inner **[End Page 381]** space comes into being as a space through the juxtaposition of Nilsson's images and *National Geographic's* text. In accordance with Pratt's second discovery-hypothesis, the inner-space landscape is portrayed both by the images and by the text of the chapter as semiotically dense. The third strategy—the relation of mastery—is more complex. It is true that the text presumes to have the power to interpret. However, because the idea of these images is not so clearly the making of a single geographic hero as in the history of exploration that Pratt is analyzing, and because (as I shall demonstrate) the inner-space chapter does not claim to explore specific discoveries, a relationship of mastery is not as clearly distinguishable.

Evidence of exploration is an essential component of bringing a discovery into being. In the business of sustaining adventure and discovery, *National Geographic* magazine has developed the display of evidence into a fine art. <sup>29</sup> Since 1905, the preferred technology of illustration has been photography, and three of the twenty chapters in the protracted history are devoted to it. The photograph, in its modernist insistence on tangible space, is the ideal document for the purpose of validating the discovery. <sup>30</sup> Edward Weston describes the modernist theory of the photograph in terms of the “authenticity” of the photograph; that is, the spectator's belief in the *authority* of the photograph through which the spectator “perforce believes he would have seen the scene exactly so if he had been there.” <sup>31</sup> It is that belief that enables the spectator to participate in the artist's experience. This armchair participation—both experiencing the photograph *and* reconstructing places in one's imagination—sells the magazine.

Thus this mode of photographic experience necessitates a relationship by which the viewer bears witness to an event. Critical visual theorist Lucy Lippard admits to this phenomenon: “Despite years of critical analysis, seeing is still believing to some extent . . . and we have the illusion of seeing for ourselves, the way we never **[End Page 382]** would see for ourselves.” <sup>32</sup> But in another deep sense, bearing witness has been crucial to the development

of scientific fact-making. The self-invisible, objective spectator legitimated and authorized scientific practice as it became a part of the material practice of experimental philosophy—science—in the seventeenth century.<sup>33</sup> The “modest witness” bears witness to experiments and vouches for their efficacy and truth, translating nature while claiming a transparent role for himself.<sup>34</sup> As the author of categories, the modest witness is himself unmarked and carries no burden of culture; the modest witness is male, European, and virtuous.<sup>35</sup>

As truth-bearing evidence from all manner of discovery, then, the photography of *National Geographic* magazine operates within taxonomies that have developed over the years of production of the magazine. Central to any collection is a classification scheme that must form a set of equivalences through which the world is accounted for. The economy of the collection is self-sufficient and self-generating with regard to its own meanings and principles of exchange; thus the collection entails the separation of objects from their original contexts and their recontextualization through careful manipulation in the new organizing principles.<sup>36</sup>

*National Geographic* magazine is enmeshed in several registers of collection: each issue works with others to fill a shelf in the middle-class home—coexisting with other magazines in the home, perhaps *Scientific American* or the *New Yorker*. The collection of stories and images [End Page 383] contained in each issue, and over several hundred issues in the full run, indicates the National Geographic Society’s identification and naming of the significant features of the world. In the creation of these geographical stories, people and landscapes are isolated from their contexts such that the Society reifies its own role in creating universalized stories that are always already compatible. Indeed, the universalizing humanitarianism of *National Geographic*’s stories, shorn of historical, economic, and political context, is pivotal to the sense-making work that sustains the legibility of *National Geographic*’s world and allows Nilsson’s images to join the society.

The National Geographic Society introduces its vision of what constitutes the significant and representative features of the world in the set of seven images that appear in *One Hundred Years of Adventure and Discovery* before the table of contents: a looming elephant family portrait, an aerial view of the still-smoking Mt. St. Helens, a close-up shot of a Papua New Guinean “mudman” and his mudmask, an image of a bat with its mouth elegantly poised over a frog’s head, a pack of Afghan horsemen racing toward the camera playing “a wild version of polo,” a spectacular panorama of the Nepalese Himalayas, and an underwater shot of “four large mullet” calmly swimming under the tumultuous seas of Japan’s Izu Oceanic park. Each of these tasty appetizers becomes a representative moment—a synecdoche of the world—as the reader imagines an ocean around the fish, a history around the Afghan horsemen, or a culture around the mudmask.

Nilsson’s luminous macrophage works well in this taxonomy as another destination and another shiny image in a world that is not a flux of political and social trauma and jubilation, but is preeminently “the natural habitat of the great explorers.”<sup>37</sup> The purification of the body that allows Nilsson’s images to join the *National Geographic* collection makes evident two points that are crucial corollaries to the ways in which the body is presented. First, *National Geographic* stories tend to minimize narratives of encounter, the technologies of travel, and the subjectivity of photography and editing that constitute the material conditions of the collection. This is not to say that the technology itself is elided; on the contrary, it is often presented as magnificent, astonishing, and dazzling, as shown by the two chapters on photography in the centenary volume. But it is to say that the disembodied body fragments presented in the inner-space chapter—the body that stands in for all bodies, and the fetus that [End Page 384] stands in for all fetuses in the overriding “we”—are ideally situated to join the liberal discourse that structures the magazine’s rhetoric.

Second, the positioning of Nilsson’s images in the inner-space chapter serves as a clue to the material assuaging of the problematic of cultural-material anxieties of the body.<sup>38</sup> The highly political and problematic issues of diagnostic imaging techniques seem to be naturalized through the strategy for making visible—spatializing the body in a liberal tradition of geographic discovery—that I have been tracing. The PET and MRI scans that appear in the latter part of the chapter are digitized images that lend themselves to the same sort of spatial interpretation as electron micrographs. Yet as the chapter turns from a geographic exploration of the body using electron micrography to the fields of immunology and diagnostic imaging techniques, a strong implication is made that the latter technologies are a natural progression from the former. Thus two further points: First, aestheticization becomes a process by which any anxieties about the “natural” body are displaced in the elegance of inner space.<sup>39</sup> Second, medicine is hailed into the program of exploration and assumed to join the humanist project of improving all of our lives.

Although claiming to be the truth about its subject, the extraordinary aestheticization of the Nilsson/*National Geographic* body rewrites the body and its needs as culture and as property, civilizing it and supervising any threatening or bizarre fragments. A corresponding conversion process occurs in the still life—the bowl of fruit on the middle-class dining table, or its representation on the wall. The pleasure gleaned from the fruit bowl is in part the acculturation of the natural, the aestheticization of the body and its needs. Any uncertainty about the body’s bloody masses, full intestines, and gendered viscera is thus—as is aestheticized food—“converted into a reaffirmation of the body and its representations as possessions, as the agents of the possessive individual whose agency is neither separable from, nor reducible to natural bodies and material possessions.”<sup>40</sup>



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**Figure 2.**

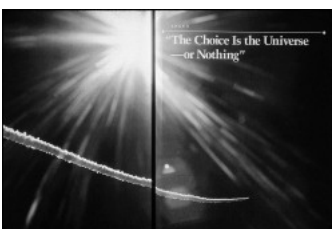
Human fetus. C. D. B. Bryan, *The National Geographic Society: One Hundred Years of Adventure and Discovery* (Washington, D.C.: National Geographic Society, 1987), p. 463. Reproduced with the permission of Lennart Nilsson/Albert Bonnier Förlag AB.

If the above paragraph reifies strict boundaries between nature [End Page 385] and culture, it also provides a succinct explication of the stakes in such a division. As with the bowl of fruit, the spectator can refigure “The Body,” as presented by Nilsson and *National Geographic*, in accordance with social injunctions. The “natural” body—wild, savage—is rewritten as desolate, exquisite, and knowable. The aestheticized and purified Body, with access to the kinds of medical technologies that have “already improved the quality of our lives in ways we almost take for granted,”<sup>41</sup> can join the collection of *National Geographic* places that have similarly been shorn of political, economic, and social inequities. But it is not only *National Geographic*’s curation of the images that makes them work so well in its history: the materiality and composition of Nilsson’s work lends itself to particular readings. For example, his better-known works, the fetus images, meticulously center the fetus, highlight pinks and golds, and efface the uterus or the “mother” in ways that invite readings of the autonomous fetus or of the man-child (Fig. 2).<sup>42</sup> I do not think it is an accident that the antichoice movement has found these images so useful in their exhibits, protests, and marches.<sup>43</sup>

*National Geographic* works out the equivalence among discoveries; it does not simply unearth parity. It perfects the work of equivalence in bringing the discovery of the human body into being through Nilsson’s images. The clearest place to see this mechanism at work is in the relationship of the North Pole and the inner- and outer-space chapters. In the outer-space chapter, the financial cost of space exploration is justified by a quote from an 1899 elegy on the polar expedition:

We may have differences of opinion as to the value of reaching the Pole. If we apply the utilitarian test, it is of small moment; but so is a poem. And what is polar exploration but an epic of endeavour, in which all sordidness is left behind, and in which a . . . man . . . ventures his life and his all in combat against the forces of ignorance? For I deem it beneath the dignity of man, having once set out to reach that mathematical point which marks the northern [End Page 386] termination of the axis of our earth, which stands as a sign of his failure to dominate those millions of square miles of unknown country, to give it up. . . . The polar explorer typifies that outdoor spirit of the race which has led conquering man across all seas and through all lands, of that thirst for knowing all that is to be known, which has led him to the depths of the ocean, to the tops of mountains, to dig in musty caves, to analyze the rays of light from distant worlds, to delve in the geologic records of past times.<sup>44</sup> [End Page 387]

A totalizing project animates the text, an epic itself, orchestrated by the infinitely expansive mind and relentlessly curious soul in a rhetoric that easily slides from seeing to knowing. A persistent ideal of technological and personal progress structures “nature” as the place through which man can come to know the “truth” about himself, his “race,” and his “environment” and, in so doing, to “conquer” and “dominate” it. This quote indicates *National Geographic*’s history of sustaining the fantasy of the progress of the race in not only the traversal of space but also the arrival at a prized destination — North Pole or moon.<sup>45</sup>



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**Figure 3.**

The point here is not so much that outer or inner spaces are colonized in the violent style of the nineteenth century. Rather, I am arguing that the continual displacements between nineteenth-century polar expeditions and 1960s space exploration saturate the photomicrographic images in the rhetoric of discovery, exploration, and adventure. Furthermore, not only do the layouts of the outer- and inner-space chapters mirror each other, but if the chapter heading “The Choice Is the Universe or Nothing” (Fig. 3) is analogous to the other chapter heading, “The Stuff of Stars Has Come Alive,” then the “choice” appears to be one of “life or nothing” rather than political-economic decisions on the expenditure of public monies for health care and research (which are never discussed, only assumed, as I mentioned above). With the slippage among pole, outer space, and inner space in the ideology of discovery, the epic of endeavor in which conquering man ventures his life in combat against the forces of ignorance implicitly hails the practice of medicine into this adventure.

The lack of size, the implicit high-tech photographic apparatus, and the truly conspicuous Otherness of the discovered beings and landscapes of the inner-space chapter also demand to be examined in their specificity—they are, after all, more than just one more space in the collection. What is discovered in inner space? How is the microscope different from the technologies of more traditional geographic exploration? To what effect is the density of meaning in *National Geographic* so excessive as to curb the relation of mastery and instigate, rather, a relation of wonder? I believe that ultimately the chapter is not about creating the body as a place or peopling it with strange beings, although it does use the tropes of discovery that have resulted in precisely that sort of spatialization. Rather, the implicit [End Page 388] celebration of the body that the chapter presents to the reader is a medium by which to commemorate the trace of progress itself.

This is not, however, to argue that elements of the minute are not ascribed with their own curious agency and tethered to a tradition of primitivism and exotic Othering. For example, Donna Haraway observes that, in Nilsson’s work, “we see non-humanoid strangers who are supposed to be the means by which our bodies sustain our integrity and individuality, indeed, our humanity in the face of a world of others. We seem invaded not just by the threatening ‘non-selves’ that the immune system guards against, but more fundamentally by our own strange parts.”<sup>46</sup> Indeed, as others have noted, these strange parts are only too familiar in their synecdochal mirroring of a version of “nature” that plays out propriodescriptive [cold] war stories of Western history.<sup>47</sup> In this sense, the body’s interior is posed [End Page 389] not as a machine to be analyzed and separated out into distinct systems, as it would have been through practices of anatomy, but rather as a container for infinite circuits of tinier and tinier nonhumanoid strangers.<sup>48</sup>

The warring body of everyday life is an allegory that competes with the allegory of the progress of technology writ into the spatialized body. On the general theory of micrographia, Susan Stewart writes:

That the world of things can open itself to reveal a secret life—indeed, to reveal a set of actions and hence a narrativity and history outside the given field of perceptions is a constant daydream that the miniaure presents. This is the daydream of the microscope: the daydream of life inside life, of significance multiplied infinitely within significance.<sup>49</sup>

Compare this “daydream” to the *National Geographic* chapter on inner space:

Amazement . . . is in no way diminished as we develop devices and technologies with which to see yet deeper, to peel back layers of the mystery, only to discover greater mysteries still. We are at the edge of a frontier of discovery that boggles the mind; we are peering at the threshold of creation itself. How can we not approach it with wonder?<sup>50</sup>

Meandering among discovery, technology, and creation itself, the reader is coached to the appropriate response—wonder and amazement—as the inner layers of life are successively uncovered like so many Russian dolls, revealing others within. Cells and bacteria are translated by the *National Geographic* narrative into thresholds that promise the solution to the mysteries of creation and defer the relation of mastery that some “final” discovery will surely unveil.<sup>51</sup> [End Page 390]

The *National Geographic* text poses visualizing technology as precisely a neutral, isolated, and uncluttered prosthetic advancement on our existing perceptual apparatus; it allows one to see more, to see deeper, and finally—it is promised, presumed—to see the secret life of life itself. But one might also understand visualizing technology as a mode of transportation, for the dream of micrography suggests a fantasy of unfettered movement through space, as fresh vistas continually unfold for the spectator, in a mode reminiscent of early fantasies of the car on the autobahn.<sup>52</sup> Frontier ideology is thus central to the promise of the infinite sophistication of visual technologies. The rhetorical effect of image and text sets the microscope up as a powerful allegory for continuity and progression, a historical teleology and vision of the future projected and etched into the body itself. If these travels have no precise destination, the technology—displayed through its products, its images—is represented as the means by which to attain any apt revelation. The deferral of that final destination transfigures into the wonder of the journey itself, the pleasure of progress.

But this notion of wonder requires further scrutiny. In his study of the descriptions of the New World by Spanish explorers, Stephen Greenblatt describes the feeling associated with “wonder”:

thrilling, potentially dangerous, momentarily immobilizing, charged at once with desire, ignorance and fear—is the quintessential human response to what Descartes calls a “first encounter.” Wonder is an almost inevitable component of the discourse of discovery, for by definition wonder is an instinctive recognition of difference, the sign of a heightened attention . . . in the face of the new. The expression of wonder stands for all that cannot be understood, that can scarcely be believed. It calls attention to the problem of credibility and at the same time insists upon the undeniability, the exigency of the experience.<sup>53</sup>

Greenblatt argues that wonder and marvel were central features in a whole complex system of representation that arose in early colonialism. In a similar way the rhetoric of discovery is summoned by *National Geographic*. Wonder is not necessarily a universal human affect, and Spanish exploration is not just *coincidentally* similar to inner space as presented by the magazine. Rather, the affects of amazement and wonder, established principles in colonial representation, [End Page 391] are conjured, summoned, beseeched.<sup>54</sup> There is nothing inevitable about the first encounter cultivated by *National Geographic*.

David Nye employs the trope of the sublime to show how European discourses of natural wonders were transposed onto the sensory experience of technology in America.<sup>55</sup> The American technological sublime, he argues, is an emotional state that resonates with Edmund Burke’s sublime state of astonishment and horror, but is instigated by technologies such as trains, skyscrapers, and electricity. Burke located the core of sublime experience in a passion of astonishment provoked by nature: “Astonishment . . . is that state of the soul, in which all its motions are suspended, with some degree of horror. In this case the mind is so entirely filled with its object, that it cannot entertain any other, nor by consequence reason on that object which employs it.”<sup>56</sup> The technological sublime described by Nye maintains the general framework of emotions outlined by Burke, though it is less a self-conscious and clearly articulated categorical aesthetic experience than a general cultural practice.

Nye delineates a basic structure of the sublime: an “object, natural or man-made, disrupts ordinary perception and astonishes the senses, forcing the observer to grapple mentally with its immensity and power. . . . The test for determining what is sublime is to observe whether or not an object strikes people dumb with amazement.”<sup>57</sup> In U.S. culture, the sublime is not experienced as a purely solitary, contemplative moment; rather, the crowd experiences the American sublime, often enough organized through tourist trips to specific natural wonders such as the Grand Canyon and Niagara Falls. The American sublime is particularly oriented toward the social needs of the nation, argues Nye.<sup>58</sup> In a country whose allegiance was originally [End Page 392] to rigorous debate rather than automatic patriotism, sights of national acclaim served to unite the citizenry. While sights of the natural sublime were thought to “purify and uplift the mind,” the completion of an important engineering feat was understood in the moment of technological sublime to be the collective product of democracy.<sup>59</sup> The American sublime transformed the individual’s experience of immensity and awe into a belief in national greatness.<sup>60</sup> (A cynical reading of the Burke/Nye American technological sublime might conclude that the practice of technology reaches the height of the sublime precisely when “it” has evacuated the audience’s will, desire, and/or ability to reason on the technology in question.)<sup>61</sup>

In this context, the inner-space chapter seems formulaic in its use of the rhetoric of amazement to contrive the response of a technological sublime. *National Geographic’s* rhetoric describes the experience of inner space as inexplicable: it exceeds mystery, it is just beyond consciousness. If Nye’s formulation accurately describes the technological sublime of inner-space exploration, it could be argued that *National Geographic* takes up this rhetoric in a posture of creating an experience of the sublime. It is both the pivotal role of technology and the ways in which it enables us to understand the nature of our bodies—as amazing *natural* phenomena—that *National Geographic* uses to evoke the sublime experience for the reader. The contemplation of the enchanting natural body, available through the engineering feat of electron micrography, may indeed transform into a belief in national greatness—particularly when medical miracles are at stake.

Three predominant motifs emerge from my reading of the intersection of visibility, geography, technology, and the *National Geographic* body. First, the precise object of discovery in inner space—over and above a landscape inhabited by primitive others—remains continually under interrogation as *National Geographic* promises that the ultimate secret to life itself will be unveiled through ongoing exploration. [End Page 393] Thus Mary Louise Pratt’s formulation of the third element of discovery, the relation of mastery, is forestalled; it is both the witness effect of the photograph and the uncertainty of the secret of life that grounds the state of amazement. Second, the body has undergone a purification process: it is adulterated with neither the personal anxieties of needs and carnal filth nor the messy contingencies of access to the high-tech technologies that the chapter is purportedly about. The liberal disembodied body that emerges in this narrative—and that Nilsson’s images can sustain through their own aesthetic qualities—allows the universalizing to take place. The disembodied body stands in for all bodies, the disembodied fetus for all fetuses. Third, *National Geographic’s* curation of wonder and amazement at the natural body draws attention to the magazine itself as the purveyor of this fine experience. *National Geographic*—the magazine, the corporation, the adventure—brings you the thrill, the danger, the desire. The magazine is as wondrous as the technology and as the body. This paper has been about the business of unraveling the ways in which the *National Geographic*/Nilsson rehearsal of the human body is infused with the excitement of exploration, the promise of technology, and the fruits of a teleological idea of progress—in short, with the project of geography.

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## Footnotes

**1.** See his cover feature photoessay "Drama of Life before Birth." This "strangely beautiful and scientifically unique color essay" is featured also in the editor's note, with a picture of Nilsson, who points out that what makes his photographs "scientifically valid" is the fact that they are taken "in their natural environment" (*Life*, 58:17 [April 1965]: 7). Nilsson had previously been featured in *Life* for his images of polar bears, African jungles, the film director Ingmar Bergman, and ants. His fetus images were featured again in a *Life* cover story in 1990: see "The First Days of Creation," *Life* 13:10 (August 1990).

**2.** In 1980 Nilsson was the first recipient of the annual Hasselblad award, which has been awarded to such luminaries as Anselm Adams, Henri Cartier-Bresson, Manuel Alvarez Bravo, and Sebastio Salgado: see *Hasselblad Awards, 1980–1995* (Stockholm: Hasselblad Centre, 1996). As this book points out, despite his international fame, Nilsson has gone virtually unnoticed in various recent histories of photography.

Nilsson did the biophotography for the following publications: David H. Ingvar, Stig Nordfeldt, and Rune Pettersson, *Behold Man: A Photograph Journey Of Discovery Inside the Body*, trans. Ilona Munck (New York: Little, Brown, 1974), photography by Lennart Nilsson in collaboration with Jan Lindberg; S. Lawrence, *How Was I Born? A Story in Pictures* (New York: Delacorte Press, 1975); Mirjam Furuhejm, Axel Ingelman-Sundberg, and Claes Wirsen, *A Child Is Born: New Photographs of Life before Birth and Up-to-date Advice for Expectant Parents* (New York: Delacorte Press, 1977; also a CD-I adaptation, Philips); Hans Krook, *Nature Magnified: Over One Hundred Extraordinary Photographs by One of the World's Greatest Photographers* (London: Macdonald, 1984); Sheila Kitzinger, *Being Born* (New York: Grosset and Dunlap, 1986); *The Miracle of Life* (New York: Swedish Television and WGBH Boston TV Recording, 1986), directors and producers Bo G. Erikson and Carl O. Lofman, written and produced by Bebe Nixon; Kjell Lindquist and Stig Nordfeldt, *The Body Victorious: The Illustrated Story of Our Immune System and Other Defenses of the Human Body* (New York: Delacorte Press, 1987), photography by Lennart Nilsson in collaboration with Jan Lindberg.

In addition, between 1987 and 1989 Nilsson prepared six films and two books for the National Geographic Society, and a composite of his images is engraved on the back of the current 100-kroner bill. See Joelle Bentley, "Photographing the Miracle of Life: The Work of Lennart Nilsson," *Technology Review* 95:8 (1992): 58.

Nilsson was well-known as a landscape photographer and portraitist before he started work on photographing the interiors of bodies. A photograph of his taken in the Belgian Congo is included in Edward Steichen's *Family of Man* (New York: Museum of Modern Art, 1955), and the year before that he was featured in Gustaf Nasstrom, *Sweden in Profiles: Photographs by Lennart Nilsson* (Stockholm: Swedish Institute, 1954). In 1964 he collaborated with Gostar Jagersten to produce *Life in the Sea* (New York: Basic Books, 1964).

**3.** Finding that electron micrographs were invoked in university lectures on immunology as visual evidence to clinch an argument, Martin collected the reactions of a number of people to several electron micrographs: they found landscapes, seascapes, puff pastry, plants, satellites, leeches, and much more in images very similar to the ones I examine here. As Martin notes, in popular culture the images lead to anything but closure. Her project is importantly different from mine in that I analyze the images as framed within a particular context, while she was showing individual photographs to viewers. See Emily Martin, "Interpreting Electron Micrographs," in idem, *Flexible Bodies: Tracking Immunity in American Culture—From the Days of Polio to the Age of AIDS* (Boston: Beacon Press, 1994), pp. 167–182.

**4.** Roland Barthes, *Image Music Text*, trans. Steven Heath (New York: Noonday Press, 1977), pp. 25–26.

**5.** See Donna Haraway, *Modest Witness@Second Millennium.FemaleMan@ Meets OncoMouse*(TM) (New York/London: Routledge, 1997).

**6.** C. D. B. Bryan, *The National Geographic Society: One Hundred Years of Adventure and Discovery* (Washington, D.C.: National Geographic Society, 1987). In this 500-page history the loading and burdening to which I refer is not necessarily a purposeful collusion, but a result of various discursive practices, institutional arrangements, systems of value, and semiotic mechanisms. In addition to Nilsson, there are the multiple layers of *National Geographic* editors and technicians as well as the limits to the form of the magazine and book, issues of finance, mandate, and so on, which all influence the final product. And, of course, there is the author of the book, who has collaged thousands of *National Geographic* stories and photographs. I use *collage* here in the literal sense, as theorized by Margorie Perloff, who writes that collage must be considered both as a juxtaposition of fragments and as an organizational system in which its signification is dependent on the juxtaposition of parts. Thus, each element in the collage has a dual function: it refers to an external reality, even as its compositional thrust undercuts the very referentiality it seems to assert. See Margorie Perloff, *The Futurist Movement: Avant-Garde, Avant-Guerre, and the Language of Rupture* (Chicago: University of Chicago Press, 1986), p. 51. I will be arguing in this paper that Nilsson's images are similarly framed within the taxonomy of collection, purporting to systematically account for the world at the same time that the form of the collection undercuts their very ability to do so. The resulting para-intentionality of effect is what makes the images in their ineluctable contexts fascinating actors in a spectacular and potentially ideological economy. In this essay I use *National Geographic* to stand in for these complex relations and forces that have created the volume.

**7.** Bryan, *One Hundred Years*, p. 471. When I say "liberal" here, I mean to impute a tradition of politics that takes the individual to be central to human organization. A basic belief in progress, competition, and utilitarianism underpins the paradigm in which the individual is the basic unit of political analysis and the reason-for-being of social and political organization. Liberals believe that liberty is a private good secured by each individual acting alone, and that civil society and family are reflective of human nature. For an excellent critique of liberalism, see Wendy Brown, *States of Injury: Power and Freedom in Late Modernity* (Princeton: Princeton University Press, 1995).

**8.** Bryan, *One Hundred Years*, p. 21.

**9.** Philip Pauly, "The World and All That Is in It: The National Geographic Society, 1888–1918," *American Quarterly* 4 (Fall 1979): 530.

**10.** Bryan, *One Hundred Years*, p. 455.

**11.** The epigraph from the outer-space chapter reads: "There is no way back into the past: the choice, as [H. G.] Wells once said, is the Universe—or nothing. . . . The challenge of the great spaces between the worlds is a stupendous one, but if we fail to meet it, the story of our race will be drawing to a close. Humanity will have turned its back upon the still untrodden heights and will be descending again the long slope that stretches, across a thousand million years of time, down the shores of the primeval sea" (Bryan, *One Hundred Years*, p. 355, quoting from Carl Sagan in his *National Geographic* article "Mars: A New World to Explore" [December 1967]). Outer space has been a major feature of *National Geographic*, the subject of articles in October 1934, May 1959, September 1961, June 1962, October 1966, December 1967, February 1969, May 1969 (2), December 1969, January 1980, July 1981, and June 1985.



- 12.** Bryan, *One Hundred Years*, p. 457. In *National Geographic's* TV special "Man: The Incredible Machine" (1975) there is an easy and continuous slippage between the discourses of science and literature; the narrative resorts to aesthetic explanation when rationale fails.
- 13.** Bryan, *One Hundred Years*, p. 456 (image) and p. 457 (explanatory information). While Fairchild fiddles with the camera in the foreground, the unnamed wife, rendered small by the perspective, is crouched in the back upper corner of the image watching him.
- 14.** *Ibid.*, p. 457.
- 15.** *Ibid.*, pp. 458–459.
- 16.** *Ibid.*, p. 459.
- 17.** *The Incredible Machine* (Washington, D.C.: National Geographic Society, 1986).
- 18.** Bryan, *One Hundred Years*, pp. 457–459. Five out of the nine full-page images are photomicrographs (including the double-page title spread), and of those at least three are Nilsson's. The other images include an insect magnified eighty times; an MRI scan image; a particle-track pyrotechnics detector on a screen at the CERN laboratory; and a close-up image of a child undergoing treatment.
- 19.** *Ibid.*, p. 466.
- 20.** *Ibid.*
- 21.** *Ibid.*, p. 471.
- 22.** See Timothy Mitchell, *Colonizing Egypt* (Berkeley: University of California Press, 1988); or Henri Lefebvre, *The Production of Space*, trans. Donald Nicholson-Smith (Cambridge: Blackwell, 1974, 1984).
- 23.** Mary Louise Pratt, *Imperial Eyes: Travel Writing and Transculturation* (New York/London: Routledge, 1992), p. 202.
- 24.** Although Nilsson himself is featured in *The Incredible Machine* book, he is mentioned only in the photo credits at the back of the Bryan volume.
- 25.** Lisa Bloom, *Gender on Ice: American Ideologies of Polar Expeditions* (Minneapolis/London: University of Minnesota Press, 1993), p. 4.
- 26.** Pratt, *Imperial Eyes* (above, n. 23), pp. 201–208. Other authors suggest similar colonial tropes of visibility—for example, Haraway's "land ho," or the various commentaries of Baudelaire's flâneur figure. For an interesting analysis of medical technologies used in the discourses and practices of endometriosis, see Ella Shohat, "'Lasers for Ladies': Endo Discourse and the Inscriptions of Science (The Realization of Endometriosis as a Real Disease)," *Camera Obscura* 29 (1992): 56–89.
- 27.** Pratt, *Imperial Eyes*, p. 204 (emphasis added).
- 28.** *Ibid.*, pp. 204–205.
- 29.** For more on discovery, evidence, and visual display, see Bruno Latour's essay "Drawing Things Together," in which he argues that the objects of evidence with which the explorer returns have to be "mobile but also immutable, presentable, readable, and combinable with one another" (in *Representations in Scientific Practice*, ed. Steve Woolgar and Michael Lynch [Cambridge, Mass.: MIT Press, 1991], p. 26).
- 30.** I am not arguing here that "inner space" is immutable (quite the opposite), but that the photographs are presented as if they were scientific documents, and that the media of inner-space exploration—the science and the technology of the microscope—are constructed as immutable.
- 31.** Edward Weston, "Techniques of Photographic Art," quoted in Hollis Frampton, "Impromptu on Edward Weston: Everything in Its Place," *October* 5 (Summer 1978): 64.
- 32.** Lucy R. Lippard, "Introduction," in *Partial Recall: Photographs of Native North Americans*, ed. idem (New York: New Press, 1992), p. 43.
- 33.** See Steven Shapin and Simon Schaffer, *Leviathan and the Air-Pump* (Princeton: Princeton University Press, 1985).
- 34.** Haraway, *Modest\_Witness* (above, n. 5), pp. 23–45.
- 35.** The fact that Fairchild's wife is left nameless in the second image of the chapter is therefore no accident: the projects of science and exploration have been constituted by her exclusion as woman and as technician. As David Noble argues, the "cult of science has not simply excluded women, it has been defined in defiance of women and their absence" (*A World Without Women: The Christian Clerical Culture of Western Science* [New York: Oxford University Press, 1992], p. xiv; quoted in Haraway, *Modest\_Witness*, p. 29). Similarly, geographic exploration has been constitutive of a masculinity based on the exclusion of women and in opposition to qualities ineluctably feminized: domesticity, nurturance, daintiness. I shall be arguing that the *National Geographic* construction of inner-space images coincides with these readings of science and exploration. I also hypothesize that in the absence of a virtuous embodied observer, technology and progress emerge as masculinized heroes that tell the story of bearing witness, and that additionally constitute the *National Geographic* reader as modest witness.
- 36.** Susan Stewart, *On Longing: Narratives of the Miniature, the Gigantic, the Souvenir, the Collection* (Durham/London: Duke University Press, 1993), pp. 151–165.
- 37.** Bloom, *Gender on Ice* (above, n. 25), p. 89, quoting a National Geographic special film on Africa.
- 38.** I use "cultural-material" here as a way to juggle both the cultural inscriptions on material and the specificity of materials.
- 39.** The only "close-up" image—that is, an image that looks closely at the exterior of a body—is that of an ant. When I think of close-up images of the body I think of surgical images, or the body fragments that the surrealists used as illustrations. These images could not be used to stand in for all bodies in the way that inner-space images can, or in the way that an ant can stand in for all ants.
- 40.** Mark Seltzer, *Bodies and Machines* (New York: Routledge, 1992), p. 139.
- 41.** Bryan, *One Hundred Years* (above, n. 6), p. 471.

**42.** Rosalind Pollack Petchesky argues that the notion of the fetus as an autonomous atomized space-explorer infuses popular culture: the image of the astronaut “has not supplanted the one of the fetus as a tiny, helpless, suffering creature but rather merged with it” (“Fetal Images: The Power of Visual Culture in the Politics of Reproduction,” *Feminist Studies* 13:2 [1987]: 271).

**43.** These images are so ineluctably intertwined with the pro-life side of the abortion debate that when I went to the Santa Cruz public library to pick up a book for this paper I found a collection of similar embryo and fetus images that stood alone, without explanation, as a self-explanatory pro-life exhibit.

**44.** Bryan, *One Hundred Years*, p. 374. This “most cherished of geographical prizes” (p. 374) was not only to have *reached* the Pole, but to have been the first white male to do so. Robert Peary, who controversially laid claim to this prize, led an expedition that was fraught with personal and scientific problems; the *National Geographic* had a quite a task to maintain his stakes after funding the expedition. See Bloom, *Gender on Ice* (above, n. 25).

**45.** For example, Mary Louis Pratt writes on the history of travel literature: “The (lettered, male, European) eye that held the system could familiarize (‘naturalize’) new sites/sights immediately upon contact, by incorporating them into the language of the system” (*Imperial Eyes* [above, n. 23], p. 31).

**46.** Donna Haraway, “The Biopolitics of Postmodern Bodies: Constitutions of Self in Immune System Discourse,” in idem, *Simians, Cyborgs and Women* (New York/London: Routledge, 1989), p. 22.

**47.** War is a common theme in histories of the body and health. The inner-space chapter is pockmarked with quotes such as “The instruments that made surveillance of these wars *within us possible*” (Bryan, *One Hundred Years*, p. 466; italics his). See also Emily Martin, “The Body at War: Media Views of the Immune System,” in *Flexible Bodies* (above, n. 3), pp. 49–63; Marita Sturkin, “Bodies of Commemoration: The Immune System and HIV,” in idem, *Tangled Memories: The Vietnam War, the AIDS Epidemic, and the Politics of Remembering* (Berkeley/Los Angeles/London: University of California Press, 1997), pp. 220–254. These authors discuss war imagery in popular media depictions of inner space.

**48.** On the metaphors of the body as machine through this century, see Anson Rabinbach, *The Human Motor: Energy, Fatigue, and the Origins of Modernity* (Berkeley/Los Angeles/London: University of California Press, 1992).

**49.** Stewart, *On Longing* (above, n. 36), p. 54.

**50.** Bryan, *One Hundred Years*, p. 459.

**51.** See Barbara Maria Stafford, *Body Criticism: Imagining the Unseen in Enlightenment Art and Medicine* (Cambridge, Mass.: MIT Press, 1991).

**52.** See Edward Dimenber, “The Will to Motorization: Cinema, Highways, and Modernity,” *October* 73 (Summer 1995): 90–137. See also Jeffrey Schnapp, “Crash” (forthcoming, on file with author), which examines the fantasies of speed, danger, and individualism that have imbued transportation technologies from cabriolets to cars.

**53.** Stephen Jay Greenblatt, *Marvelous Possessions* (Oxford: Clarendon Press, 1991), p. 20.

**54.** By the term *affect* I want to suggest the psychoanalytic usage of the “expression or instigation of a general mood,” a “psychical energy attached to an idea or group of ideas”; see Jean LaPlanche and J.-B. Pontalis, *The Language of Psycho-Analysis*, trans. Donald Nicholson-Smith (New York: Norton, 1973). In a related concept, David Nye writes of the liminal space as one created by corporations by their use of technology: “By simulating magic, . . . corporations pushed the audience over the line from ordinary reality toward a simulated dream world in which everything seemed possible. At the same time, the magical presentation of science made it seem to have a life of its own” (David Nye, *The American Technological Sublime* [Cambridge, Mass.: MIT Press, 1994], p. 216).

**55.** There are many interesting and important accounts of the technological sublime. I limit my discussion here to Nye’s account.

**56.** Edmund Burke, *Philosophical Inquiry into the Origin of Our Ideas of the Sublime and Beautiful* (1756), quoted in Nye, *Technological Sublime*, p. 9.

**57.** Nye, *Technological Sublime*, pp. 15–16.

**58.** *Ibid.*, p. 40.

**59.** *Ibid.*, p. 35.

**60.** *Ibid.*, p. 43.

**61.** Just as women could not be modest witnesses in endeavors of science, neither were women to have a relationship to the sublime. Kant insisted that women were, if not incapable, certainly reproachable for attempting to experience the sublime. Tamer emotions, such as beauty, were the province of women and the effeminate. Nye writes: “Works of the technological sublime were decidedly male creations” (*Technological Sublime*, pp. 30–33). Furthermore, he argues that the contemplation of the sublime was thought to be best experienced without the company of women, who were unable to fully appreciate it.

## Additional Information

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