

Heidegger's Bridge: The Social and Phenomenological Construction of Mars

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I. Introduction

When we talk about “Mars,” we must think critically about what we mean. Does the word “Mars” merely *signify* the “fourth planet from the Sun,” or does it *mean* something more? Does “Mars” invoke twentieth century science-fiction narratives of unfathomable alien civilizations? Does the word “Mars” summon images of a desolate wasteland—perhaps a harbinger of Earth’s future? Or does “Mars” conjure up visions of discovery and nationalist accomplishment, accompanied by stirring speeches, the pomp of fortissimo trumpets, and montages of buzz-cut astronauts and rockets in flight? Mars is much more than a planetary body in space—it is a set of beliefs and ideas.

We *know* the “red planet” today because of, not in spite of, the stories we tell about Mars. I will examine how the power of narrative has been used to convince the public that we should go to Mars. Modernity has phenomenologically shaped Mars and our present discourse of Mars is the result of that metamorphosis. The discourse of Mars is manifest in the phenomena we read, interpret, and share. This discourse also serves to legitimate the goals of those who are now talking about colonizing Mars. In this way, we create Mars discursively; and because of this, an examination of our discourse is integral to understanding the phenomenon we call “Mars.” So, if and when we physically journey to the fourth planetary body in the solar system, we go to a place called “Mars;” however, when we go to “Mars,” we go to a place we have phenomenologically constructed because of the power we possess to create a place.

II. The Power to Make a Place

Since the beginning of Modern colonialism, the nature of place-making has largely been an imperial venture. When voices of authority assign a name to a *space*, this activity transforms it into a meaningful *place*.¹ In this way, Mars has become a real place for us now, in the same way that America and Africa became meaningful places at the beginning of their colonial period—with maps of Latin place-names, the language of apparent scientific austerity. Philosopher V. Y. Mudimbe describes “the opposition of Greek or Roman civility” to that of the ancient “barbarians”

“concretized by being located on a map...[where] the map is a scientific project” meant to identify the other; map-making thus becomes “the technical vision of subjective perceptions.”²

The power of the scientist as *creator of place* is palpable. Henri Lefebvre identifies map-making with creating a conceptualized, conceived space—calling this space “the space of scientists.”³ For example, outside the purview of the naked eye, scientists have used their unique powers of analysis to identify the source of the Mississippi River. When scientists identified the source as one particular lake among many, the area around the lake was designated a park—now flocked to by eager tourists. Yi-Fu Tuan, a scholar of place studies, explains, “Scientists thus appear to have a certain power: they can create a place by pointing their official fingers at one body of water rather than another.”⁴ In this way, place is given official meaning and status.

Science and Place-Making

The ongoing mapping/making of the solar system, and of Mars in particular, has had an amazing history. The first maps of Mars to have any detail at all first appeared in 1840.⁵ When Giovanni Schiaparelli first considered the project of mapping the Martian surface at the end of the 19th century, the scientist dutifully noted that his task was “not an exact science but an effort to register the contours of possibility for further investigation.”⁶

This kind of analysis came at a time when science was gaining ground as a reserved and rational authority, whose efforts were backed by the most painstakingly objective observations. Taxonomical efforts were being put into place for everything from insects to continents to human ‘races’—science was mapping the world. Nineteenth century maps of Africa reveal the way Europeans understood it. The *Dark Continent* was so named for the lack of meaning found on maps of the place—only where Europeans had traveled within Africa was place produced.

For instance, John Hanning Speke is said to have *discovered* the source of the Nile River in 1858—naming it “Lake Victoria” after the British monarch. What is missing from this account of Africa’s largest body of water is that untold numbers of native Africans had known of its existence for many years. So the European maps of Africa bore symbols pertinent to European knowledge—as if to say, “this is what is known so far about the untraveled continent.” Lake Victoria’s placement on the world map thus operated as a symbol of British colonial power, while ignoring the African narratives of place except in such cases as were thought beneficial for Europeans.

Tuan explains, “Objects that are held in awe by one people can easily be overlooked by another. Culture affects perception.”⁷ The reality of place-making is just as true today for Mars as it was years ago for Africa. The importance of local interpretation, local in the sense of both place and time, is integral to the understanding of place. As European interest in Africa’s resources increased,

the maps became more complex. This is the 19th century legacy of map/place-making that we have inherited in the 21st century. All maps contain historical and political functions informed by the interests of the map-maker, the presupposed use of the colonist, and the level of technology available at the time the map was made. Martin Heidegger famously contends, “Our ordinary perceptual awareness of things is itself interpretive.”⁸ This contradicts the usual view of modern science—namely, that all knowledge is acquired by *objective* observation. However, empirical, scientific data has a long history of necessary, and sometimes unfortunate, *subjective* interpretation. One such case is the hapless tale of the *Martian canals*.

III. The Social and Phenomenological Construction of Mars

The Martian Canals

In 1878, the exceptional planetary observer Giovanni Schiaparelli published his observations of a network of *canali* on the surface of the planet Mars—the word “canali” being the Italian word for “channels.”⁹ Robert Markley, author of *Dying Planet*, finds that Schiaparelli remained “agnostic” and dutifully “uncertain” regarding the nature of what his *canali* might be—though for years he was pressed for an explanation.¹⁰ “The great liberty of possible supposition,” warned Schiaparelli, “renders arbitrary all explanations.”¹¹ His scientific successors would not share his careful skepticism.

News of Schiaparelli’s Martian *canali* soon came to America, where “canali” was sensationally translated “canals.” An affluent globetrotter named Percival Lowell took a romantic interest in the exotic canals. Lowell’s subsequent interest in Mars would resemble more a practice of divination than objective empiricism. Lowell studied, sketched, and compiled detailed maps of these canals, creating, as Markley puts it, an “implicit narrative [of] a race’s heroic efforts against the forces of nature.”¹² Lowell reported, via what he referred to as his “chain of reasoning,” that it was “probable that upon the surface of Mars we see the effects of local intelligence.”¹³

Science advocate Carl Sagan explains that Lowell believed he found evidence of a “dying race,” “older and wiser” than our own, who had created “a globe-girdling network of great irrigation canals carrying water from the melting polar caps to the thirsty inhabitants of the equatorial cities.”¹⁴ Lowell theorized, based on these observations, that as the climate on Mars changed, “the precious water was trickling away into space.”¹⁵ When Lowell observed the regular advancing and receding of large dark areas on the surface, he interpreted the phenomenon as “seasonal changes” caused by “the growth and decay of vegetation.”¹⁶

By 1900, it was a common misconception that Mars was, at a minimum, a world dying from drought; this atmosphere of uncritical thinking availed Lowell the opportunity to impress many scientists with his erroneous *canal theory*.¹⁷ Well into the twentieth century, Lowell had ardent canal theory supporters in the scientific community. In a 1928 *New York Times* interview, Dr. William Pickering of Harvard College explained that the apparent canals “are so straight and regular that they cannot be accounted for as accidental occurrences of nature and we can only explain them as the result of intelligent beings.”¹⁸ Pickering went so far as to suggest that the Martians were attempting to visually signal Earth.¹⁹

In 1962, Earl Slipher made the last, best argument for Lowell’s canals in his *A Photographic History of Mars*, written under a grant from the United States Air Force. Slipher defends Lowell’s canal theory by juxtaposing photographs of the distant Martian surface with canal sketches by himself, Lowell, and other canal theory supporters, explaining that a combination of observations, sketches, and photographs are necessary to have an accurate perception of the Martian canals because “no single observation can be exactly repeated by the same observer.”²⁰ Thus, an aggregate of documented observations were required to achieve a true picture of Mars. The result of Slipher’s research for the Air Force could be seen at NASA during the *Mariner 4* mission of 1965. Marked on the official NASA map, used by scientists to plot the actual course of the *Mariner 4* satellite, were Lowell’s fictive canals.²¹ Carl Sagan, who believed in 1966 that the apparent canals might have been “ridge systems or mountain chains,” a decade later, admonished canal theorists saying, “When we have strong emotions, we’re liable to fool ourselves.”²²

Discourse and the Media

With the end of the Cold War and the American-Soviet race to the Moon long at a close, the rationale for continuing NASA’s space programs has necessarily evolved. Currently, the most prominent rationale for Martian exploration by NASA is the *quest for life*. The 1997 *Pathfinder* mission marked the first lander to visit the Martian surface in two decades. NASA released its *Pathfinder Press Kit* in order to promote the mission to the paying American public. Markley points out that the longest section of this Press Kit extols a powerful narrative about the search for extraterrestrial life, while failing to mention the actual *Pathfinder* mission, which was primarily a geological survey, not proving or disproving the existence of life on Mars.²³ This use of the *quest for life* narrative is a financial boon for NASA in the same way that the Hollywood films *Red Planet* and *Mission to Mars* attracted their millions just three years after the *Pathfinder* mission. Central to the plot of these two films, as NASA’s message to the press in 1997, is the question of life on Mars—a message that sells.

So powerful is the message of the quest for life on Mars, that Dan McCleese, the chief scientist for NASA's Mars Program at the JPL, recently blamed the *quest for life* for the twenty-year lull in missions to Mars.²⁴ The reason he gives for this respite is Viking's 1970s photographs, detailing a surface apparently devoid of life. McCleese says in an interview for a PBS documentary, "The search for life dominated all of the public and governmental interest in the mission. And when life was not found by Viking, then it was a disappointment and we had no Mars missions for 20 years as a consequence."²⁵

Several notable narratives of Mars have recently occurred on television in the form of *documentary*. PBS has recently produced a number of documentaries concerning Mars. In 1998, the PBS series *Scientific American Frontiers* featured such an episode called "Journey to Mars." The host, actor Alan Alda, describes the project of Martian colonization, another American frontier to be discovered and conquered, as commencing as early as the next twenty years. The 2004 PBS documentary *MARS: Dead or Alive* first aired hours after the rover *Spirit* landed on Mars and examines the construction and launch of the rovers *Spirit* and *Opportunity*. The documentary explains that two rovers were "designed to unravel the secrets of Mars." An excellent example of using the personification of machines to promote interest in NASA's narrative, the documentary opens with a vivid description of the "explorer on a one way trip to Mars."²⁶

His partner and identical twin followed soon after. They were born in California, endowed by a loving family with all the intelligence and skill humanly possible. But the explorers themselves are not human. They're robots designed to go places and do things that humans cannot. To their creators though, they're much more than machines.²⁷

The parent company responsible for TLC, The Science Channel, and The Discovery Channel, Discovery Communications Inc., continues to invest efforts into television programming about Mars. *Destination Mars* was a 1996 Discovery Channel special about the necessary preparation for Mars. The Science Channel series *Megascience* featured an episode in August 2006 called "Martian Mission," which surveys possible technologies that could take humans to Mars, without really engaging any questions of an ethical or philosophical nature. These televised narratives relate fact to fiction using vivid imagery and symbols. The rovers are portrayed as pioneers, exploring the vast wilderness of Mars. Documentaries seize upon the narratives of colonialism and exploration that were promoted by the narratives of the past and perpetuate them in the symbolism portrayed on film.

Print media such as the *The New York Times* also uses colonial rhetoric when it describes the Mars Reconnaissance Orbiter in August 2005 as a "multifunctional Swiss Army Knife of a spacecraft," which investigates "the secrets of Mars" waiting for us to discover.²⁸ A year later, another *New York Times* article describes the rovers as "stoic, plodding and reliable," like early

pioneers who “muscle across the planet’s rugged terrain” to achieve their goals.²⁹ The anthropomorphizing of the rovers, even in print, shows the powerful symbolism available through these machines. When humankind cannot be there, the next best thing available is to humanize the tools, so that their victory is a human victory.

Author Ray Bradbury wrote an Op-Ed piece “Where is the Madman Who’ll Take Us to Mars?” which was published in *The Wall Street Journal* in November 2004. In this article, Bradbury questions what it will take for humans to get to Mars. Harkening back to explorations of the past, some of which led to colonization attempts, Bradbury recalls the competition surrounding Spain, England, and France sending Columbus, Cabot, and Verranzo to the New World and the inspiration of Jules Verne on Admiral Byrd who journeyed to the North Pole. Bradbury comically suggests that engaging in healthy competition with Russia, Germany, Japan, Canada, or even the Vatican would be beneficial to the American space program. In his conclusion, Bradbury asserts:

The final reward on Mars might well be not spices or gold, but the squashing of egos and a promise of immortality. In any event, time is running out...That footprint on the moon is being filled with eternal dust and Mars still waits to have its canals filled with our dreams.³⁰

A 2006 special issue of *Astronomy* magazine features several articles about Mars. “So Where Are the Martians?” examines the continuing search for life in the form of bacteria, possibly by deep drilling. “Mars or Bust” profiles the future exploration of Mars in the form of NASA’s planned August 2007 Phoenix lander, October 2010 Mars Science Laboratory, and more proposed missions. The editor, Richard Talcott, explains the reason for this Mars special issue, “eventually, humans will go to Mars—life seeking life in the rusty deserts of an alien world.”³¹ The planet Mars is thus brought to our attention, not because of any worth of its own but because the land may yet have some means worth discovering for humanity’s ends.

Articles within the collector’s edition of *Astronomy* echo the themes of finding value in Martian land. Space researcher and journalist Frank Sietzen, Jr. explains that after we have tapped Mars as a source of information on extraterrestrial life, humanity’s next destinations may be to the moons of Saturn or Jupiter that are “possibly harboring past or present life.”³² This turn of phrase is particularly interesting in that it recalls the action of a person *harboring* a fugitive, or *harboring* a sense of guilt—thus presenting the negative connotation that what Saturn or Jupiter has must rightfully be expressed to or taken away by human beings.

IV. Social Constructions and Discursive Knowledge

The Legitimation of Discursive Knowledge

The tenuous relationship between the empirical and the fictive lends science the availability to use other forms of knowledge, like *narrative knowledge*, to legitimate its activities. This narrative knowledge is often the kind of knowledge that scientists are believed to shun—ostensibly, scientists don't tell stories, they present facts. Thus, *empirical knowledge* is the proclaimed mandate of the scientist. Yet it is often a narrative, and not empirical knowledge, that is used to advocate and legitimate the activities of the scientific community and the authoritative presence of their government structures.

Today, scientists studying Mars use the tools of the narrative of colonialism—with the enthusiasm of nationalism, the promises of corporate success, and the desire to dominate new frontiers—all to *legitimate* the project of going to Mars. When one legitimates an activity, they are promoting said activity as authorized, validated, or normative.³³ Both scientific and governmental discourses are legitimated by narrative, and yet scientific discourse tends to push narrative aside as an inferior method of conveying knowledge.

There also exists a vague correlation between legitimation and truth. Jean-François Lyotard explains, “The language game of science desires its statements to be true but does not have the resources to legitimate their truth on its own.”³⁴ The state tends to render science “understandable” by relating “scientific knowledge to ‘popular’ knowledge,” doing so by “spend[ing] large amounts of money to enable science to pass itself off as an epic.”³⁵ Scientific documentaries like *MARS: Dead or Alive* are saturated with narratives, from the anthropomorphic rovers to the “hostile” land, because “scientific knowledge cannot know and make known that it is the true knowledge without resorting to the other, narrative, kind of knowledge, which from its point of view is no knowledge at all.”³⁶

This paradoxical viewpoint of scientific narratives threatens to render scientific accounts of Mars unchallengeable. Scientists attempt to explain what Mars is like, but then use colonialist narratives, modernist narratives, and Hegelian narratives of progress to induce the public into funding scientific projects. Thus, it becomes cumbersome to engage in dialogue concerning the legitimacy of Martian endeavors when scientists utilize narrative to legitimate what they do, while dismissing narrative as non-science. Instead, the scientific discourse of Mars should be seen for what it is—a changing, subjective, and complex exchange of the narrative and the empirical, influenced by historical context, bureaucratic powers, and the technological drive toward efficiency.

Martian Phenomenology

Thus, the *meaning* of Mars comes to us, not empirically from a telescope, but first and foremost hermeneutically through its discourse. This *interpretive* process means that there is no absolutely *objective* knowledge—only the changing *interpretation* of phenomena. Geneticist Richard Lewontin maintains that

Even agreed-on, widely practiced methodologies are culturally and historically situated...scientific truth-claims have complex internal structures and complicated networks of external affiliations that cannot be explained solely by reference to internal standards of legitimation.³⁷

Though humankind has never set foot on Mars—somehow we seem to *know* when the movies have it right; somehow we seem to *know* when the author has grabbed hold of some kernel of truth about the “red planet.” This is because we are both audience and actor in an unending exchange of signifiers—movies, stories, pictures, and articles that share with us a *phenomenon* we call “Mars.” Edmund Husserl explains that we study phenomena by “grasp[ing] the corresponding subjective experiences in which we become ‘conscious’ of them, in which (in the broadest sense) they ‘appear.’”³⁸ As narratives of Mars appear in the public discourse, we read and interpret them, utilizing the sum of our experiences and perspectives.

There exists the notion in science that Mars is a kind of unmarked, “empty slate” for us to write upon. In fact, Mars comes to us not only containing a rich heritage of stories and representations, but our own personal influences and interpretations as well. Percival Lowell’s ideas were not born in a vacuum. The romance of exotic places, the popularity of Darwinian evolution, and the political and religious climate of the day all played a significant part in Lowell’s interpretation of Mars.

Lowell’s romantic wanderlust was emblematic of his generation. From Lake Victoria to the North Pole, the exploits of gallant European explorers were all the rage. This view of place-experience was born of the taxonomical age of Darwin—when observation was the primary theoretical basis for knowledge. In the 1930s, Martin Heidegger eschews this privileging of proximity by asking the question, “Can a *distant* person be more aware of a place?”

V. Heidegger's Bridge

Using the double-entendre example of a *bridge*, Martin Heidegger examines the proximity of phenomenological distance. Heidegger implores his reader to think of “the old bridge” in distant Heidelberg, though for our purposes the place to consider could very well be Mars.³⁹ Heidegger instructs, “This thinking toward that location is not a mere experience inside the person’s present here; rather, it belongs to the nature of our thinking *of* that bridge that *in itself* thinking gets through, persists through, the distance to that location.”⁴⁰ From where we are, we are also at that bridge in Heidelberg—or on Mars for that matter. Heidegger informs us, “we are by no means at some representational content in our consciousness. From right here we may even be much nearer to that [bridge, city, or planet]...than someone who uses it daily as an indifferent river crossing.”⁴¹ When we pause to consider critically a place of great physical distance, we can become conscious of it in a far more powerful way than someone near it who casually takes for granted the existence of that place. This notion only further legitimizes the relevance of our phenomenological knowledge of Mars. We not only construct Mars socially and phenomenologically, we may even bridge the very distance cognitively.

Technology as Revealer

Martin Heidegger also claims that people in the 20th century falsely view technology as a Kantian “means to an end”—when in reality, Heidegger maintains, technology is not a means but rather “a mode,” or “a way of revealing.”⁴² This *revealing* that modern technology is responsible for is a *challenge*, a “demand” to nature “that it supply energy that can be extracted and stored as such.”⁴³ Heidegger uses the river Rhine as an example of the demands of modern technology. The Rhine has been dammed up in order to provide hydraulic pressure for a hydroelectric power plant. This use of technology changes our phenomenological perception of the Rhine. A vast ecological system, the ancient source of legends and songs, the home of lush forests and breathtaking castles, has been relegated to a “water power supplier.”⁴⁴

This modern ability to take nature out of its original context of being and reassign it within a use-value technological context is known as *enframing*. In the modern age, we have begun to reorganize everything around us into technological *frames* of reference and usage; Heidegger warns that the river Rhine is now a power source, the once mystical German soil is now a mineral deposit, and the refreshing mountain air is simply a supply of nitrogen.⁴⁵ The *objects* that make up our world have become resources—*subjects* for us to master, purchase, and own.

We have alienated ourselves from all things and placed them into a *standing reserve*, a standby mode in which “whatever stands by...no longer stands over us as object.”⁴⁶ Our general disregard for the meaningfulness of the world is precisely what causes objects to lose any coherent status for us. Heidegger finds that the consequence of *enframing*, whereby the entire natural world inevitably becomes “orderable as standing reserve,” is that “man in the midst of objectlessness is nothing but the orderer of the standing-reserve... [who inevitably] comes to the point where he himself will have to be taken as standing-reserve.”⁴⁷ We may shape the world, but the world inevitably shapes us.

Failure to See Our Own Constructions

This is a central point of concern I have over the issue of colonization. When Modernity’s gaze upon the world calls forth the project of colonization, this causes the process of enframing to begin, whereupon we mark the world for our own usage until the day comes when humanity itself may be commodified as a standing-reserve. Heidegger explains, “Man becomes that being upon which all that is, is grounded as regards the manner of its Being and its truth. Man becomes the relational center of that which is as such.”⁴⁸ As objects in nature are relegated to standing-reserve, Heidegger explains, “everything man encounters exists only insofar as it has his construct.”⁴⁹ Since nothing exists outside of humanity’s construction, we end up only ever encountering ourselves. Yet because we do not realize that the phenomena before us are of our own construction, a distortion caused by enframing, Heidegger contends that we fail to grasp an important existential truth—we can never truly encounter ourselves, our world, or Mars for that matter.⁵⁰ When humanity gazes out at the world, “he fails to see himself as the one spoken to.”⁵¹

The dizzying rise in modern technology has precipitated a fundamental change in our perception of objects and, inevitably, in ourselves. By turning the world into technology, humankind turns itself into the world’s technicians. We reassemble and reconfigure the natural world for our own use, playing the part of the self-made, frontier-forging individual—the *modern* man. Technology unlocks the energy in nature, transforming the rushing water of the Rhine into energy, storing up that energy, distributing it to German power outlets, and thus *revealing* the concealed power in nature. This challenge to nature, to stop *being* and to become a *resource/commodity* for modern human beings, is how modern technology serves as *revealer*.

The Problem of Enframing

For Mars, the prospect of enframing is extremely problematic, given its phenomenological nature. As interpretive discourse directs the narratives of Mars (scientific and otherwise), enframing

comes rather easily and often appears as a benign force in the media and public discourse, asking, “What can Mars do for us?” Because the interpretation of Mars precedes any objective knowledge, as illustrated by Lowell’s once popular canal theories, we must proceed in the awareness that Mars is, in the public mind, what is said of it. Heidegger warns, “The rule of Enframing threatens man with the possibility that it could be denied to him to enter into a more original revealing,” adding his somewhat romantic call to modernity, “and hence to experience the call of a more primal truth.”⁵² Heidegger’s point is well-taken—what is damaging to our participation in the world is the exclusivity technology brings to bear as a form of modern revelation.

Heidegger explains that when technological enframing takes place, “it drives out every other possibility of revealing.”⁵³ When technological ordering comes to be the only way we perceive the world, then the world becomes revealed to us only through the banal act of securing natural resources, no longer allowing what Heidegger calls the “fundamental characteristics” of our resources to appear to us.⁵⁴ The Earth becomes minerals, the sky becomes gases, and the Martian surface becomes whatever those with means will it to be. When we gaze at Mars with an eye toward technologically enframing it, we deny ourselves the possibility of other forms of revelation which, given the great passage of time, may come to make our generation appear quite near-sided and audacious—or worse, cause permanent damage to a planet we are far from grasping in its sublime entirety. Heidegger describes the enframing of a tract of earth as “a coal-mining district”; can the enframing of Mars as a natural resource be far from Heideggerian thought?⁵⁵ To appreciate fully the meaning in this world and of the “red planet,” we must come to terms with our modern predilection for technological enframing and be accepting of other, more long-term, open-minded and inclusive perspectives of place-making.

Notes

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- ¹ Tim Cresswell, *Place: A Short Introduction* (Carlton: Blackwell, 2004) 9.
- ² V. Y. Mudimbe, *The Idea of Africa* (Bloomington: Indiana UP, 1994) 80.
- ³ Henri Lefebvre, *The Production of Space*, trans. Donald Nicholson-Smith (Oxford: Blackwell, 1991) 38.
- ⁴ Yi-Fu Tuan, *Space and Place: The Perspective of Experience* (Minneapolis: U of Minneapolis P, 1977) 162.
- ⁵ Robert Markley, *Dying Planet* (Durham: Duke UP, 2005) 50.
- ⁶ Markley 56.
- ⁷ Tuan 162.
- ⁸ Taylor Carmen, *Heidegger's Analytic: Interpretation, Discourse, and Authenticity in Being and Time* (Cambridge: Cambridge UP, 2003) 209.
- ⁹ Markley 55.
- ¹⁰ Markley 55, 57.
- ¹¹ Quoted in Markley 57.
- ¹² Markley 71.
- ¹³ Quoted in Markley 70.
- ¹⁴ *Cosmos*, dir. Adrian Malone, perf. Carl Sagan, DVD, Carl Sagan Productions, 1980.
- ¹⁵ *Cosmos*.
- ¹⁶ *Cosmos*.
- ¹⁷ Markley 77.
- ¹⁸ Quoted in H. Gordon Garbedian, "Mars Poses Its Riddle of Life," *New York Times Magazine*, Dec. 1928: SM22.
- ¹⁹ Garbedian, "Mars Poses Its Riddle of Life," SM22.
- ²⁰ Quoted in Markley 175-76.
- ²¹ Markley 174.
- ²² Quoted in Markley 180 and *Cosmos*.
- ²³ Markley 310-11.
- ²⁴ *MARS: Dead or Alive*, PBS, 2004.
- ²⁵ *MARS: Dead or Alive*.
- ²⁶ *MARS: Dead or Alive*.
- ²⁷ *MARS: Dead or Alive*.
- ²⁸ Leary, "A Jack-of-Many-Trades Is Ready to Examine Mars at a New Level of Detail," *The New York Times*, 9 Aug. 2005.

²⁹ Svoboda, "Astronomers Planning Close-Ups of Mars from (of All Things) a Balloon," *The New York Times*, 13 June 2006.

³⁰ Bradbury, "Where Is the Madman Who'll Take Us to Mars?" *The Wall Street Journal*, 18 Nov. 2004: A18.

³¹ Richard Talcott, ed., *Astronomy: Mars Special Issue* (2006): 4.

³² Sietzen, "Mars or Bust," *Astronomy: Mars Special Issue* (2006): 107.

³³ Jean-François Lyotard, *The Postmodern Condition: A Report on Knowledge*, trans. Geoff Bennington and Brian Massumi (Minneapolis: U of Minnesota P, 1984) 8.

³⁴ Lyotard 28.

³⁵ Lyotard 28.

³⁶ Lyotard 29.

³⁷ Markley 9.

³⁸ Edmund Husserl, "Phenomenology," *Encyclopaedia Britannica* (1927). Available online at: <http://www.hfu.edu.tw/~huangkm/phenom/husserl-britanica.htm>.

³⁹ Martin Heidegger, "Building Dwelling Thinking," *Poetry, Language, Thought*, trans. Albert Hofstadter (New York: Harper Collins, 1971) 154.

⁴⁰ Martin Heidegger, "Building Dwelling Thinking," 154.

⁴¹ Martin Heidegger, "Building Dwelling Thinking," 154.

⁴² Martin Heidegger, "The Question Concerning Technology," *The Question Concerning Technology and Other Essays*, trans. William Lovitt (New York: Harper & Row, 1977) 5, 13, 12.

⁴³ Martin Heidegger, "The Question Concerning Technology," 14.

⁴⁴ Martin Heidegger, "The Question Concerning Technology," 16.

⁴⁵ Martin Heidegger, "The Question Concerning Technology," 14, 15.

⁴⁶ Martin Heidegger, "The Question Concerning Technology," 17.

⁴⁷ Martin Heidegger, "The Question Concerning Technology," 23, 27.

⁴⁸ Martin Heidegger, "The Age of the World Picture," *The Question Concerning Technology and Other Essays*, trans. William Lovitt (New York: Harper & Row, 1977) 128.

⁴⁹ Heidegger, "The Question Concerning Technology," 27.

⁵⁰ Heidegger, "The Question Concerning Technology," 27.

⁵¹ Heidegger, "The Question Concerning Technology," 27.

⁵² Heidegger, "The Question Concerning Technology," 28.

⁵³ Heidegger, "The Question Concerning Technology," 27.

⁵⁴ Heidegger, "The Question Concerning Technology," 27.

⁵⁵ Heidegger, "The Question Concerning Technology," 14.

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