

Myth and the Conquest of Space: Air and Sea

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Abstract

In Jules Verne's story of a sublime undersea journey the submarine *Nautilus* features as a masterpiece of scientific precision and engineering accuracy. On its mission to enlighten the depths of the unknown and gain control of the underwater empire the *Nautilus* covers regions as fantastic as the lost continent of Atlantis, illustrating how modern perceptions of the world did not dispose of popular phantasms but entangled the improbable and the incredible into new accounts. 20,000 leagues under the sea, science and fiction coexist in a space that is factual and imaginative at the same time.

To comprehend the compelling force of narratives of space and spatial conquest the paper suggests employing a concept of myth. The traditional notion of myth is one of stories repeated in ever-new versions to converge cultural self-images and collective memories. By connecting narrative recursivity and variability to ambiguity the paper will explore how narrative constructions derive power and truth from their potential to reconcile controversial positions. Myths of air and sea conquest, so runs the argument, work on the thin line between obscurity and enlightenment, virility and vulnerability, confidence and terror.

The examination of narrative strategies will center on the recurring constituents of spatial conquest: the vehicle, its environment, and its crew. The submarines, warships, airships, and planes at the core of stories of expedition and mission figure as potent self-sustained and human-technologically controlled units of spatial advance. At the same time these vehicles are conceived as displaced, isolated, and fragile entities immersed in threatening or hostile environments. Braving the elements of air and sea requires the elite formation: the outstanding pilot or the basic squad. Captains and crews represent the choice of the few, bold and fierce, heroic and tragic, destined and doomed. Studying how the motifs of self-reliance, dislocation, and selection figure at the heart of stories of spatial conquest will shed light on their ongoing fascination.

Obscurity and Enlightenment: Air and Sea

If there are residues of the strange and mysterious in the modern world we can expect to find them in the vast spaces of the air and the sea. Jules Verne's story of the sublime undersea journey of the *Nautilus*, published in 1870, presents a perfect example of the ambivalence of the known and the alien ocean.¹ A masterpiece of scientific and engineering accuracy, the submarine *Nautilus* navigates the world employing the latest gear of registering instruments and control devices. Throughout the voyage, physical, geographical, and nautical details are specified with scientific exactitude and numerical precision.² To plot the journey of the *Nautilus* Verne embarked on one of the ships laying out the telegraph cables on the Atlantic sea bottom, and he educated himself with the first comprehensive book on physical oceanography, U.S. Navy Lieutenant Matthew Fontaine Maury's *The Physical Geography of the Sea* of 1855.³ Yet, on its "extraordinary voyage" to enlighten the depths of the unknown and gain control of the underwater empire the *Nautilus* passed through regions as fantastic as the lost continent of Atlantis and confronted mythical creatures like giant squids, illustrating how modern perceptions of the world did not dispose of popular phantasms but entangled the improbable and the incredible into new accounts. Twenty thousand leagues under the sea, science and fiction coexist in a space that is factual and imaginative at the same time.

This paper suggests employing a concept of myth to understand the ongoing fascination with space and spatial conquest. Myth does not simply mean fiction; rather, myth stands for narratives collected and shared to substantiate and sustain a culture's self-understanding. Traditionally, a "mythology" refers to a collection of stories preserved and repeated in ever-new versions, focussing cultural self-images and collective memories. I propose to address not only the traditional narrative recursivity and variability of myth but also to concentrate on a myth's ambivalences in order to analyze how narratives about air and sea conquest drew power from their potential to reconcile controversial positions. Ships' voyages, be it spaceship, airship, or submarine, thrive on the "remarkable combination of security and vulnerability."⁴ Myths of air and sea conquest work on the thin line between obscurity and enlightenment, virility and vulnerability, confidence and terror.

In the following, I mean to briefly outline some of the meanings of the ship in Western culture, denoting fragility and transience as well as exploration and expansion. Control is a reappearing issue concerning the power over space and the command over the vessel. Captain Nemo points out to his passenger Aronnax, "I have complete confidence in the *Nautilus*,

since I am her captain, her builder, *and* her engineer!”⁵ Ships are conceived of as self-sustained and human-technologically controlled vehicles of spatial expansion immersed in hostile environments. Themes of enclosure, dislocation, exposure, and selectivity are at the heart of narratives of spatial conquest. Braving the elements of air and sea requires the elite formation, the outstanding pilot or the basic squad. The ships’ crews represent the choice of the valiant few, heroic or tragic, destined or doomed.

Enclosure: The Ship in Western Culture

From the early modern voyages of discovery to the Apollo missions ships have served as a reservoir of collective memory and imagination. Symbolizing spatial expansion and exploration of the unknown as well as fragility, transition, and transience, the image of the ship has been at the heart of Western culture’s most powerful narratives. Michel Foucault considered the ship to be the “heterotopia par excellence.” *Heterotopia* was his term for an exceptional site that exists within the world and, at the same time, lies far remote from or beyond it. Heterotopias, according to Foucault, are in relation with all other places and spaces, and yet in opposition to them. The ship he described as a “floating piece of space, a place without a place, that exists by itself, that is closed in on itself and at the same time is given over to the infinity of the sea.”⁶

Roland Barthes portrayed the ship as a symbol of seclusion and refuge from life’s raging storms.⁷ In a very confined space the ship keeps at the traveler’s disposal the utmost number of valued objects; the ship forms a singular universe floating amid the violent tempests of time. Referring to Verne’s novels, in which ships like the *Nautilus* replicate the world on a small scale, Barthes depicted the ship as the vehicle of the encyclopedic project of the nineteenth century, collecting, archiving, and interpreting facts to encompass and conserve *en miniature* all elements of a finite but rapidly proliferating world.⁸

Appropriating and preserving the world by compiling, registering, and neatly arranging the elements within it recalls the primal ship representing the inventory of the world, the biblical ark. This vessel from the Old Testament (Genesis 1: 6-9), furnished with specimens of life on earth, differs in a significant way from Verne’s crammed but comfortable floating interiors: Noah’s ark is the paradigmatic heterotopia, a storm-tossed place of survival and salvation in the face of catastrophe. Peter Sloterdijk has analyzed the ark as the perfect example of the “ontology of enclosed space.”⁹ *Ark*, from the Latin *arca*, is the word for “case” or

“compartment.” To Sloterdijk, the ship denotes an artificial interior space, a “swimming endosphere,” that under certain conditions provides the *only possible* environment for its inhabitants.¹⁰

Dislocation and Exposure

Seafaring has been glorified in countless descriptions of remoteness, isolation, and immersion in environments powerful, awesome, and sublime. Just as often, surroundings were described as jagged, bleak, malicious, and desolate. Faraway worlds have been connected with the violation of domestic conventions. At the edges of the known world sites emerged that permitted retreat, irregularity, and aberration. In the maritime literature of the nineteenth century, descriptions of a homey idyll onboard amid a threatening environment are quite common. Lillian Nayder followed these motifs in Joseph Conrad’s novel fiction that stresses male camaraderie and fraternalism onboard, and a spiritual order that seems to exclude social inequalities and claims to private property.¹¹ In Conrad’s seafaring fiction the ship becomes the real and the imagined space in which social tensions experienced on land could be suppressed and ignored, contributing to the sentimental idealizations of a life of order and solidarity at sea.¹²

Gender is one among the categories to constitute stable social boundaries in the history of seafaring. Across the centuries navigation has been an exclusively male domain. Both historiography and fictional literature tell of the adventures of tough men on rough seas and their fight against the untamed “virgin world.” As the ship formed a contained and endangered space, the community on board formed a fragile union, a special maritime culture that Helen Rozwadowski termed a “small world.”¹³ Equality among men was cultivated while a rigid and hierarchical order of spaces, ranks, and conduct prevailed. Through gender relations, life on board was romanticized, and discipline, supervision, and subordination were legitimized and enforced.¹⁴ Margaret Creighton argued that the strict separation of the sexes in turn facilitated certain gendered structures among the crew. The ship needs to be understood as a heterosocial space that did not support one singular masculine self-image or one particular social style; sailors became “men” in more than one way. It was the absence of women on board, Creighton suggests, that turned gender into a relevant category.¹⁵

Selectivity

The presence of women on board only underlined the need for extraordinary character when cruel environments turned their powers against fragile humans with contempt and inexorability. In Adalbert Stifter's story *The Condor*, published in 1840, a young woman is determined to prove herself by taking part in a balloon ascent with two experienced male scientist-aeronauts. The two practiced men conceive of the balloon as an instrument for meteorological observations in great heights, a vehicle of scientific progress. Aviation to them appears profane. The woman views the balloon as a vehicle of autonomy and liberty. Her flight is a means to declare herself free from arbitrary limits, a way "to break the bands of oppression." To her profound embarrassment, however, the altitude makes her dizzy. She nearly faints from a glance "down perpendicularly through the aerial abyss." The flight is aborted amid angry remarks from the men: "I told you, Richard, that woman cannot endure the sky."¹⁶

The masculine nature of air conquest becomes manifest in the aeronauts' practice of concentrated scientific observation, in their engagement with their instruments, and in their "monotonous murmur [...] as one dictated and the other wrote."¹⁷ The freedom of the skies, noble and majestic, is reserved to the men proving immune to the impressions and temptations of elevation. From the scientific mission the woman is excluded as well. The sky that the men confront with their instruments appears to her cold and pitch-black. To Stifter, the feminine serves as a means to point to a vast and perhaps monstrous void behind the disciplined secular sky – an outlook on the hubris of scientific and technical advance on nature in the second half of the nineteenth century.

Myth: Not Made Up but Made

Narratives of autarkic vehicles, hostile environments, and selected crews are not fictitious stories, and they do not stand in opposition to reality. Mythical narratives are not simply "made up" but "made," to borrow from Donna Haraway's thoughts on the ambivalence of fiction, construction, and reality.¹⁸ Hans Blumenberg has stressed the longevity and variability of myth as a consistent narrative.¹⁹ According to Blumenberg, the power of mythical narrative lies in its combination of traditional elements and time-specific variations of a story. In ever-changing versions, a myth's core elements are combined and intertwined with specific situations. In myths of air and sea conquest the much older motif of the ship as

the “greatest reserve of the imagination”²⁰ was expanded to the modern image of human scientific and technological supremacy exploring the earth’s vast spatial resources.

Furthermore, a myth’s power lies in its capability to reconcile controversial arguments: science and fiction, enlightenment and imagination. Air and sea seem to offer a resort for either standpoint. Pursuing the semiological foundations of myth construction Roland Barthes stated that “Myth hides nothing and flaunts nothing: it distorts; myth is neither a lie nor a confession: it is an inflexion. Placed before the dilemma [...], myth finds a third way out.”²¹ Barthes discusses the “third way out” as naturalization: driven either to unveil or to liquidate the concept it presents, myth will “naturalize” it.²² I would like to gauge the discursive practices of naturalization by studying how the process of scientific spatialization itself, that is, the transformation of mysterious and opaque into transparent, three-dimensional spaces, involved “recursive layers of stories and metaphors.”²³ Examples from the sciences of oceanography and aerology in the nineteenth century show how spatial exploration did not leave popular phantasms behind but entangled the unknown, the fantastic, the ambiguous, and the obscure into new accounts.

Transforming Spaces

Ships themselves have been described as “instruments”: as technologies of remote investigation they figured prominently in the archival construction of national territorial power.²⁴ Following a thought by Bruno Latour, Richard Sorrensen envisioned the ship as part of a larger instrumental entity operating out of a metropolitan capital and reaching across the globe.²⁵ Rozwadowski put forth a similar argument concerning technology’s mediating role in shaping the image of the mid-nineteenth-century deep-sea floor. Exploring deep-sea research in the context of the Atlantic telegraph cable projects in the 1850s and 1860s she argues that the “ocean-scape” took shape only within a complex interaction of instruments, methods, interpretations, and motivations for depth measurement.²⁶ Leaving tracks, marks, and inscriptions on maps, the ship itself became a device of spatial perception, linking, in the words of Thomas Richards, “the control of territory with a hermeneutics of information.”²⁷

In 1858 Lieutenant Maury, the founding father of oceanography, asserted that until the middle of the nineteenth century “the bottom of what sailors call ‘blue water’ was as unknown to us as is the interior of any of the planets of our system.”²⁸ Deep-sea research could not rely on direct observations. Depth-sounding meant lowering a piece of heavy

sounding lead fastened to strong twine into the sea to penetrate the pitch-black body of the oceans of which only the surface and the continental margins had been known.²⁹

Single data points gained in the slow process of depth sounding were arranged into bathymetrical charts in the tradition of the isoline technique that Alexander von Humboldt had developed by the turn to the nineteenth century to represent meteorological phenomena synoptically in a graphical form. By means of scaling and shading the data assemblages met the eye as coherent pictures. What became familiar as authentic “sections” or “profiles” of the ocean floor, strictly speaking reproduced mathematical relations or functions, relating measured numbers to the distance between two geographical locations.³⁰ Following Latour, the technique of collecting and arranging measurements in charts served as “a new way of accumulating time and space” in transportable and stable forms.³¹ The new views of the oceans did not exist independently from scientific definitions, technologies, and instruments. Still they suggested a mimetic relationship between data and nature. Reconciling fabrication and reality of ocean space myth presents a naturalized texture consisting of instrumental measurements and their graphic representations.

Modern Travel Narratives

The prose of the surprising wealth and diversity of the ocean-scapes of isolines and contours proved no less poetical than fictional descriptions of abysmal and obscure seas. The modern travel narratives came not only in the form of journals, drawings and tales, but they were also written in the formalized and standardized languages of biology, physics, and geography: they were structured by graphs and maps, inscribed by precision instruments, and counted and labeled in units of numbers and specimens, representations that enabled synoptic views of both sea and air.³²

In analogy to Humboldt’s program of a “terrestrial physics,” according to which the order of nature would emerge from a vast number of observations across the surface of the earth, aeronauts around 1900 cultivated a “physics of the atmosphere” aiming at temporally and spatially comprehensive aerial surveys and the application of physical theory to atmospheric processes.³³ As Stifter had described it in his novella, complying with the requirements of objective observation required the trained and tireless scientist, and also the patient and precise strategist, the skilled and swift athlete, and the rigorous and righteous soldier,

showing no trace of emotion of any kind to the experience of altitude, and armed to resist the temptation of merely contemplating the sublime wonders of the skies.

Conclusion: Reconciling Contradictions

This representation of scientific practice, of the voluntarily enlisting for exile in the name of science, stands also in the tradition of Humboldt's research expeditions and the associated narratives about self-restraint rewarded by the mastery of the space under inspection. The accounts of spatial conquest may have changed, but their crucial elements of selectivity, enclosure, dislocation, exposure, and enlightenment persist. Heroically conquering distance, penetrating dangerous wilderness, dispassionately distancing themselves from their surroundings with their instruments, bringing home scars as inscriptions on their bodies, and trophies in the form of data collections, scientists-aeronauts created a new foundation to synthesize discrete observations into a new overview. The sciences of the earth did not replace but they reclaimed former romantic views on nature. At the turn of the twentieth century the vast spaces of air and sea were no longer sealed volumes opaque to direct human observation. They had become transparent by refined measurement techniques and precise and consistent data. In at least one way, however, these spaces remained impenetrable, as they were reserved to expert knowledge.

Notes

- 1 Verne, Jules, *20,000 Leagues Under the Sea*, New York, Penguin Books/Signet Classics 2001 [orig. French *Vingt Mille Lieues Sous Les Mers*, 1870]. See Adamowsky, Natascha, "Annäherungen an eine Ästhetik des Geheimnisvollen – Beispiele aus der Meeresforschung des 19. Jahrhunderts," in: Krohn, Wolfgang (Ed.), *Ästhetik in der Wissenschaft: Interdisziplinärer Diskurs über das Gestalten und Darstellen von Wissen (Zeitschrift für Ästhetik und Allgemeine Kunstwissenschaft, Special Issue No. 7)*, Hamburg, Meiner 2006, pp. 219-232; Helmreich, Stefan, *Alien Ocean: Anthropological Voyages in Microbial Seas*, Berkeley, CA, University of California Press 2009.
- 2 "The Atlantic! A vast expanse of water whose surface covers 25 million square miles, 9,000 miles long, with an average width of 2,700." Verne, *20,000 Leagues Under the Sea*, p. 284, pp. 87-88, p. 99.
- 3 Maury, Matthew Fontaine, *The Physical Geography of the Sea*, New York/London, Harper/Sampson Low 1859 [1855]. See Kylstra, Peter H., Meerburg, Arend, "Jules Verne, Maury and the Ocean," in: *Challenger Expedition Centenary: Proceedings of the Second International Congress on the History of Oceanography, Edinburgh, September 12-20, 1972, Proceedings of the Royal Society of Edinburgh, Section B (Biology), 2 Vols. (Vol. 72 and 73), 1971-1972, Edinburgh, Royal Society 1972, Vol. 1, pp. 243-251.*
- 4 Ward, Barbara, *Spaceship Earth*, New York, Columbia University Press 1966, p. 15.

- 5 Verne, *20,000 Leagues Under the Sea*, p. 99, emphasis in the original.
- 6 Foucault, Michel, "Of Other Spaces," *Diacritics* 16 (1986) 1, pp. 22-27, quote p. 27 [orig. French "Des Espaces Autres," 1967].
- 7 Barthes, Roland, "The *Nautilus* and the Drunken Boat," in: Barthes, Roland, *Mythologies*, London, Jonathan Cape 1972 [orig. French *Mythologies*, Paris 1957], pp. 65-67.
- 8 Verne had described in great detail how the *Nautilus* includes a library fitted with dark rosewood shelves, inlaid with brass, that hold 12,000 treasured volumes. The *Nautilus* contained a valuable collection of art and music and a magnificent museum whose cases display the varieties, rarities, and curiosities of nature. Verne, *20,000 Leagues Under the Sea*, p. 79-86.
Literary scholar Thomas Richards elaborated on how nineteenth-century activities were geared towards conservation through libraries, museums, and archives, in a veritable "obsession with gathering and ordering information" against the chaos and confusion of time, or rather, against the increasing thermodynamic entropy. According to Richards, the *Nautilus* was an ordering device, an archive. Richards, Thomas, *The Imperial Archive: Knowledge and the Fantasy of Empire*, London/New York, Verso 1993, quote p. 9; on the *Nautilus* see p. 115-123. See also Foucault, "Of Other Spaces," p. 22: "The great obsession of the nineteenth century was, as we know, history."
- 9 Sloterdijk, Peter, *Sphären*, Frankfurt a. M., Suhrkamp 1998-2004, Vol. 2: *Globen (Makrosphärologie)* (1999), Chapter 3, "Archen. Zur Ontologie des ummauerten Raumes," pp. 251 ff. (translation is mine).
- 10 *Ibid.*, p. 251 f., "schwimmende Endosphäre," "schwimmende Innenwelt" (translations are mine).
- 11 Nayder, Lillian, "Sailing Ships and Steamers, Angels and Whores: History and Gender in Joseph Conrad's Maritime Fiction," in: Creighton, Margaret S., Norling, Lisa (Eds.), *Iron Men, Wooden Women: Gender and Seafaring in the Atlantic World, 1700-1920*, Baltimore/London, Johns Hopkins University Press 1996, pp. 189-203, see p. 200.
- 12 *Ibid.*, p. 191.
- 13 Rozwadowski, Helen M., "Small World: Forging a Scientific Maritime Culture for Oceanography," *Isis* 87 (1996) 3, pp. 409-429, particularly p. 410.
- 14 Nayder, "Sailing Ships and Steamers, Angels and Whores," p. 191. Nayder analyzes how the solidarity of men constituted itself in relation to a ship that was imagined as female. A polyandrous community of men shared the ship as a common possession (p. 201). In Conrad's novels the relation of the captain to his ship mirrors the relation to a woman that could – in accordance with Victorian images – be either angel or whore. The ship represented a servile asexual figure, an angelic bride or a good soul on the one hand, and a rebellious, demonic female body on the other; nevertheless, it was always seen as in the hands of the male crew. Nayder also argues that the ship was seen as a manmade technology and thus in another way liberated from the image of destructive natural forces (p. 197).
- 15 Creighton, Margaret S., "Davy Jones' Locker Room: Gender and the American Whaleman, 1830-1870," in: Creighton/Norling, *Iron Men, Wooden Women*, pp. 118-137, see p. 125, 121.
- 16 Stifter, Adalbert, "The Condor," *The United States Democratic Review* 27 (1850) 147, pp. 231-243. <http://cdl.library.cornell.edu/cgi-bin/moa/sgml/moa-idx?notisid=AGD1642-0027-72> [orig. German "Der Condor," 1840], quotes p. 234, 235, 237.
- 17 *Ibid.*, quote p. 236. On the role of instruments in scientific spatialization see Höhler, Sabine, "Psychrometer, Variometer, Barograph – Instrumente der Inszenierung von Luftfahrtwissenschaftlern um 1900," in: Meinel, Christoph (Ed.), *Instrument – Experiment: Historische Studien*, Berlin/Diepholz, Verlag für Geschichte der Naturwissenschaften und der Technik 2000, pp. 325-335.
- 18 Haraway, Donna J., *Modest_Witness@Second_Millennium.FemaleMan©_Meets_OncoMouse™: Feminism and Technoscience*, New York/London, Routledge 1997. Remarkable in Haraway's work is the thought that to "be 'made' is not to be 'made up'"; rather, to be made is "about contingency and specificity but not epistemological relativism"; p. 99. Similar ideas are essential to Judith Butler's work on representation through performative action, to which my work is also indebted. Butler's work also stresses repetition and repeated citing in processes of "materialization" of norms. Butler, Judith, *Bodies that Matter: On the Discursive Limits of "Sex,"* New York/London, Routledge 1993. On myth as culturally shared recurring narrative whose motifs describe collective human realities meaningfully, presented, performed, and sustained through stories, traditions, rituals, images, objects, and consolidated in institutional settings, reaching stability through repetition, through being performed by retelling or re-practicing, and whose messages may be not univocal but ambivalent, see Höhler, Sabine, *Luftfahrtforschung und Luftfahrtmythos: Wissenschaftliche Ballonfahrt in Deutschland, 1880-1910*, Frankfurt a. M., Campus

- 2001, chapter 2, "Mythos und Moderne," pp. 36-57. Comparable ideas of reality formation through repetition, although with a closer focus on the narrative coherence of stories, are expressed in recent theories of myths. See, for example, Greiner-Kemptner, Ulrike, Riesinger, Robert F. (Eds.), *Neue Mythographien: Gegenwartsmythen in der interdisziplinären Debatte*, Wien/Köln/Weimar, Böhlau 1995; Schlesier, Renate (Ed.), *Faszination des Mythos: Studien zu antiken und modernen Interpretationen*, Basel/Frankfurt a. M., Stroemfeld/Roter Stern 1991; Völker-Rasor, Anette, Schmale, Wolfgang (Eds.), *MythenMächte — Mythen als Argument*, Berlin, Berlin Verlag Arno Spitz 1998.
- 19 Barthes, Roland, "Myth Today," in: Barthes, *Mythologies*, pp. 109-159. Blumenberg, Hans, *Arbeit am Mythos*, Frankfurt a. M., Suhrkamp 1979.
 - 20 Foucault, "Of Other Spaces," p. 27.
 - 21 Barthes, "Myth Today," p. 129. "Le mythe ne cache rien et il n'affiche rien: il déforme [...]. Placé devant l'alternative [...], le mythe trouve une troisième issue." *Mythologies*, Paris, Éditions du Seuil 1957, p. 215.
 - 22 Barthes, "Myth Today," p. 129.
 - 23 Haraway, *Modest_Witness*, pp. 135-141, with reference to the works of David Harvey and David Turnbull on the construction of space through the cultural practices of mapping.
 - 24 Thomas Richards elaborated on the archival construction of territorial power based on technologies of remote investigation, operating in great distance from the centers. In his Foucauldian reading of empire building, the archive stands for the attempt to organize all knowledge into a coherent and comprehensive whole. The "imperial archive" became his term for the "fantasy of knowledge collected and united in the service of state and Empire." Richards, *The Imperial Archive*, p. 6.
 - 25 Sorrenson, Richard, "The Ship as a Scientific Instrument in the Eighteenth Century," in: Kuklick, Henrika, Kohler, Robert E. (Eds.), *Science in the Field (Osiris, II. Series, Vol. 11)*, 1996, pp. 221-236, note p. 229.
 - 26 Rozwadowski, Helen M., *Fathoming the Ocean: The Discovery and Exploration of the Deep Sea*, Cambridge/London, Belknap Press of Harvard University Press 2005.
 - 27 Richards, *The Imperial Archive*, p. 113.
 - 28 Maury, Matthew Fontaine, *Explanations and Sailing Directions to Accompany the Wind and Current Charts (2 Vols.)*, Washington 1858-1859 [8. enlarged edition], Vol. 1, p. 114.
 - 29 The British *Challenger* expedition in 1872, the first expedition equipped solely for the purpose of deep-sea research, is said to have marked a historical break in scientific ocean surveying with the sheer number of data collected. On its route around the globe the *Challenger* drew the broad outline of the earth's deep seas. Deacon, Margaret, *Scientists and the Sea 1650-1900: A Study of Marine Science*, London/New York, Academic Press 1971, pp. 333 ff.
 - 30 Höhler, Sabine, "Depth Records and Ocean Volumes: Ocean Profiling by Sounding Technology, 1850-1930," *History and Technology* 18 (2002) 2, pp. 119-154.
 - 31 On the techniques of "accumulating time and space" by way of "immutable mobiles," by using transportable and stable charts and maps, see Latour, Bruno, "Drawing Things Together," in: Lynch, Michael, Woolgar, Steve (Eds.), *Representation in Scientific Practice*, Cambridge, Mass./London, The MIT Press 1990, pp. 19-68, see pp. 31 ff. Arguing that stability in transport and translation of an abstract concept matters more than its unity and integrity Latour also elaborated the notion of "optical consistency"; see Latour, Bruno, "Visualization and Cognition: Thinking with Eyes and Hands," *Knowledge and Society: Studies in the Sociology of Culture Past and Present* 6 (1986), pp. 1-40, particularly pp. 7-9.
 - 32 The new empirically grounded and instrumentally based science of the earth has been termed Humboldtian Science. See Cannon, Susan Faye, *Science in Culture: The Early Victorian Period*, New York, Dawson 1978; Dettelbach, Michael, "Humboldtian Science," in: Jardine, Nicholas, Secord, James A., Spary, Emma C. (Eds.), *Cultures of Natural History*, Cambridge, Cambridge University Press 1996, pp. 287-304. See also Daston, Lorraine, "Objectivity and the Escape from Perspective," in: Biagioli, Mario (Ed.), *The Science Studies Reader*, New York/London, Routledge 1999, pp. 110-123.
 - 33 "Aerology" from 1906 onwards. Höhler, *Luftfahrtforschung und Luftfahrtmythos*, chapter 4.2: "Die aeronautische Erforschung der freien Atmosphäre," pp. 207-236; Nebeker, Frederik, *Calculating the Weather: Meteorology in the 20th Century*, San Diego, Academic Press 1995, p. 44.

Literature

- Adamowsky, Natascha, "Annäherungen an eine Ästhetik des Geheimnisvollen – Beispiele aus der Meeresforschung des 19. Jahrhunderts," in: Krohn, Wolfgang (Ed.), *Ästhetik in der Wissenschaft: Interdisziplinärer Diskurs über das Gestalten und Darstellen von Wissen (Zeitschrift für Ästhetik und Allgemeine Kunstwissenschaft, Special Issue No. 7)*, Hamburg, Meiner 2006, pp. 219-232.
- Barthes, Roland, "The *Nautilus* and the Drunken Boat," in: Barthes, Roland, *Mythologies*, London, Jonathan Cape 1972 [orig. French *Mythologies*, Paris, Éditions du Seuil 1957], pp. 65-67.
- Barthes, Roland, "Myth Today," in: Barthes, Roland, *Mythologies*, London, Jonathan Cape 1972 [orig. French *Mythologies*, Paris, Éditions du Seuil 1957], pp. 109-159.
- Blumenberg, Hans, *Arbeit am Mythos*, Frankfurt a. M., Suhrkamp 1979.
- Butler, Judith, *Bodies that Matter: On the Discursive Limits of "Sex,"* New York/London, Routledge 1993.
- Cannon, Susan Faye, *Science in Culture: The Early Victorian Period*, New York, Dawson 1978.
- Creighton, Margaret S., "Davy Jones' Locker Room: Gender and the American Whaleman, 1830-1870," in: Creighton, Margaret S., Norling, Lisa (Eds.), *Iron Men, Wooden Women: Gender and Seafaring in the Atlantic World, 1700-1920*, Baltimore/London, Johns Hopkins University Press 1996, pp. 118-137.
- Daston, Lorraine, "Objectivity and the Escape from Perspective," in: Biagioli, Mario (Ed.), *The Science Studies Reader*, New York/London, Routledge 1999, pp. 110-123.
- Deacon, Margaret, *Scientists and the Sea 1650-1900: A Study of Marine Science*, London/New York, Academic Press 1971.
- Dettelbach, Michael, "Humboldtian Science," in: Jardine, Nicholas, Secord, James A., Spary, Emma C. (Eds.), *Cultures of Natural History*, Cambridge, Cambridge University Press 1996, pp. 287-304.
- Foucault, Michel, "Of Other Spaces," *Diacritics* 16 (1986) 1, pp. 22-27 [orig. French "Des Espaces Autres," 1967].
- Greiner-Kemptoner, Ulrike, Riesinger, Robert F. (Eds.), *Neue Mythographien: Gegenwartsmythen in der interdisziplinären Debatte*, Wien/Köln/Weimar, Böhlau 1995.
- Haraway, Donna J., *Modest_Witness@Second_Millennium.FemaleMan©_Meets_OncoMouse™: Feminism and Technoscience*, New York/London, Routledge 1997.
- Helmreich, Stefan, *Alien Ocean: Anthropological Voyages in Microbial Seas*, Berkeley, CA, University of California Press 2009.
- Höhler, Sabine, *Luftfahrtforschung und Luftfahrtmythos: Wissenschaftliche Ballonfahrt in Deutschland, 1880-1910*, Frankfurt a. M., Campus 2001.
- Höhler, Sabine, "Depth Records and Ocean Volumes: Ocean Profiling by Sounding Technology, 1850-1930," *History and Technology* 18 (2002) 2, pp. 119-154.
- Höhler, Sabine, "Psychrometer, Variometer, Barograph – Instrumente der Inszenierung von Luftfahrtwissenschaftlern um 1900," in: Meinel, Christoph (Ed.), *Instrument – Experiment: Historische Studien*, Berlin/Diepholz, Verlag für Geschichte der Naturwissenschaften und der Technik 2000, pp. 325-335.
- Kylstra, Peter H., Meerburg, Arend, "Jules Verne, Maury and the Ocean," in: *Challenger Expedition Centenary: Proceedings of the Second International Congress on the History of Oceanography, Edinburgh, September 12-20, 1972, Proceedings of the Royal Society of Edinburgh, Section B (Biology)*, 2 Vols. (Vol. 72 and 73), 1971-1972, Edinburgh, Royal Society 1972, Vol. 1, pp. 243-251.
- Latour, Bruno, "Drawing Things Together," in: Lynch, Michael, Woolgar, Steve (Eds.), *Representation in Scientific Practice*, Cambridge, Mass./London, The MIT Press 1990, pp. 19-68.
- Latour, Bruno, "Visualization and Cognition: Thinking with Eyes and Hands," *Knowledge and Society: Studies in the Sociology of Culture Past and Present* 6 (1986), pp. 1-40.
- Maury, Matthew Fontaine, *Explanations and Sailing Directions to Accompany the Wind and Current Charts* (2 Vols.), Washington 1858-1859 [8. enlarged edition].
- Maury, Matthew Fontaine, *The Physical Geography of the Sea*, New York/London, Harper/Sampson Low 1859 [1855].
- Nayder, Lillian, "Sailing Ships and Steamers, Angels and Whores: History and Gender in Joseph Conrad's Maritime Fiction," in: Creighton, Margaret S., Norling, Lisa (Eds.), *Iron Men, Wooden Women: Gender and Seafaring in the Atlantic World, 1700-1920*, Baltimore/London, Johns Hopkins University Press 1996, pp. 189-203.
- Nebeker, Frederik, *Calculating the Weather: Meteorology in the 20th Century*, San Diego, Academic Press 1995.

- Schlesier, Renate (Ed.), *Faszination des Mythos: Studien zu antiken und modernen Interpretationen*, Basel/Frankfurt a. M., Stroemfeld/Roter Stern 1991.
- Sloterdijk, Peter, *Sphären*, Frankfurt a. M., Suhrkamp 1998-2004, Vol. 1: *Blasen (Mikrosphärologie)* (1998), Vol. 2: *Globen (Makrosphärologie)* (1999), Vol. 3: *Schäume (Plurale Sphärologie)* (2004).
- Sorrenson, Richard, "The Ship as a Scientific Instrument in the Eighteenth Century," in: Kuklick, Henrika, Kohler, Robert E. (Eds.), *Science in the Field (Osiris, II. Series, Vol. 11)*, 1996, pp. 221-236.
- Stifter, Adalbert, "The Condor," *The United States Democratic Review* 27 (1850) 147, pp. 231-243 [orig. German "Der Condor," 1840], <http://cdl.library.cornell.edu/cgi-bin/moa/sgml/moa-idx?notisid=AGD1642-0027-72>.
- Richards, Thomas, *The Imperial Archive: Knowledge and the Fantasy of Empire*, London/New York, Verso 1993.
- Rozwadowski, Helen M., *Fathoming the Ocean: The Discovery and Exploration of the Deep Sea*, Cambridge/London, Belknap Press of Harvard University Press 2005.
- Rozwadowski, Helen M., "Small World: Forging a Scientific Maritime Culture for Oceanography," *Isis* 87 (1996) 3, pp. 409-429.
- Verne, Jules, *20,000 Leagues Under the Sea*, New York, Penguin Books/Signet Classics 2001 [orig. French *Vingt Mille Lieues Sous Les Mers*, 1870].
- Völker-Rasor, Anette, Schmale, Wolfgang (Eds.), *MythenMächte — Mythen als Argument*, Berlin, Berlin Verlag Arno Spitz 1998.
- Ward, Barbara, *Spaceship Earth*, New York, Columbia University Press 1966.