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Chapter 5

Opposing Apollo: Political Resistance to the Moon Landings*

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Abstract

Rising criticisms of the current direction of U.S. human spaceflight, especially the Constellation program, as a star-crossed engineering effort have led defenders of the effort to compare it to the Apollo program. During the question-and-answer period of the American Astronautical Society's von Braun Symposium on 21 October 2008, Ares Project Manager Steve Cook passed off technical criticism of Ares with a reference that such criticism was nothing new, that it had always swirled around NASA. Even the vaunted Apollo program, he insisted, experienced significant criticism both internal and external to the space agency. This response seemed unusual, essentially making the case that criticism of major projects undertaken by NASA, especially in human spaceflight, routinely endured significant criticism from all quarters. How true might that be? Did Apollo engender significant criticism? Where did that criticism originate? How was it manifested and what did it consist of? How does that experience compare to the current critical analyses of NASA's human spaceflight efforts?

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Introduction

Rising criticisms of the Constellation program, especially the Ares I launcher, as a star-crossed engineering effort have led defenders of the effort to compare it to the Apollo program. During the question-and-answer period of the American Astronautical Society's von Braun Symposium on 21 October 2008, for example, Ares Projects Manager Steve Cook passed off technical criticism of Ares with a reference that such criticism was nothing new, that it had always swirled around NASA. Even the vaunted Apollo program, he insisted, experienced significant criticism both internal and external to the space agency.[1] This response seemed unusual, essentially making the case that criticism of major projects undertaken by NASA, especially in human spaceflight, routinely endured significant criticism from all quarters. How true might that be? Did Apollo engender significant criticism? Where did that criticism originate? How was it manifested and what did it consist of? How does that experience compare to the current critical analyses of NASA's Constellation program?

The Dominant Narrative of Apollo

Without question Apollo represented for the majority of observers, and perhaps consistently for the majority of the American public, an epochal event that signaled the opening of a new frontier in which a grand visionary future for Americans might be realized. It represented, most Americans have consistently believed, what set the United States apart from the rest of the nations of the world. American exceptionalism reigned in this context, and Apollo is often depicted as a great event in U.S. history, one that must be revered because it shows how successful Americans could be when they try. At a basic level Apollo offered an exceptionalist perspective that has dominated its public characterizations from the beginning to the present, regardless of the form of those characterizations.[2]

Apollo persistently has represented a feel-good triumph for the nation and its people. Certainly Apollo represented this in the imagery that became iconic in the public consciousness—an astronaut on the Moon saluting the American flag served well as a patriotic symbol of what the nation had accomplished. This self-image of the United States as a successful nation was affirmed in the Apollo program.[3]

At sum, Americans have usually viewed Apollo as a result of a grand visionary concept for human exploration that may be directly traced to the European voyages of discovery beginning in the fifteenth century.[4] Celebrants of

Apollo have long argued that returns on investment in this age of exploration changed Americans' lives.[5] As President Lyndon B. Johnson remarked at the time of the third Gemini flight in August 1965, "Somehow the problems which yesterday seemed large and ominous and insoluble today appear much less foreboding." Why should Americans fear problems on the Earth, he believed, when they had accomplished so much in space?[6] If we can go to the Moon, why can't we solve our other national problems? In this triumphalist narrative, the Moon landings demonstrated that anything we set our minds to we could accomplish. "If we can put a man on the Moon, why can't we..." entered the public consciousness as a statement of unlimited potential.[7] It remains a powerful trope of American exceptionalism.

Opposition to Apollo from the Political Left

A counter narrative to the master account of American triumph, exceptionalism, and success also emerged in the 1960s and argued that Apollo deserved criticism from the left as a "moondoggle" of wasteful expenditures of federal funds that could have been much more effectively used to feed the poor, help the elderly, care for the sick, or otherwise carry out "Great Society" social programs.[8] Left-leaning critics argued that NASA's efforts were, in the words of aerospace historian Roger E. Bilstein, "a cynical mix of public relations and profit-seeking, a massive drain of tax funds away from serious domestic ills of the decade, or a technological high card in international tensions during the cold war."[9] Some of those attacks were sophisticated and involved, others were simplistic and without appeal to all but those with the predilection to believe them.

For example, Vannevar Bush, a leading and well-respected scientist who appreciated the marshaling of the power of the federal government in the furtherance of national objectives, questioned Apollo. He wrote to NASA Administrator James E. Webb in April 1963 voicing his concerns about the cost, versus the benefits of the Moon program. He asserted "that the [Apollo] program, as it has been built up, is not sound." He expressed concern that it would prove "more expensive than the country can now afford," adding that "its results, while interesting, are secondary to our national welfare."[10]

Sociologist Amitai Etzioni was even more critical. In a reasoned, full-length critique of Apollo in 1964, he deplored the "huge pile of resources" spent on space, "not only in dollars and cents, but the best scientific minds—the best engineering minds were dedicated to the space project." Could not those resources have been better spent on improving the lives of people in modern America?[11] Etzioni bemoaned the nation's penchant for embracing both high technol-

ogy and unsustainable materialism: "We seek to uphold humanist concerns and a quest for a nobler life under the mounting swell of commercial, mechanical, and mass-media pressure."[12]

Several of the leaders in the United States, especially those within the Democratic Party, found that support for Apollo clashed with supporting funds for social programs enacted through "Great Society" legislation. They disparaged Apollo both as too closely linked to the military-industrial complex and defense spending and too far removed from the ideals of racial, social, and economic justice at the heart of the positive liberal state the Democrats envisioned. Liberal senators such as J. William Fulbright, Walter Mondale, and William Proxmire challenged the Johnson administration every year over funding for Apollo that they believed could be more effectively used for social programs.

Accordingly, Bureau of the Budget Director Charles Schultze worked throughout the middle part of the 1960s to shift funds from Apollo to such programs as the war on poverty. Johnson even tried to defend Apollo as a part of his "Great Society" initiatives, arguing that it helped poor southern communities with an infusion of federal investment in high technology. Nonetheless, this proved a difficult sell and the NASA budget declined precipitously throughout the latter half of the 1960s.[13] Indicative of this concern, even as Apollo 11 was being prepared for launch from the Kennedy Space Center in Florida on 16 July 1969, Rev. Ralph Abernathy led a protest at the gates of the center to call attention to the plight of the poor even as the U.S. government spent lavishly on flights to the Moon.[14]

In contrast to the triumphalist, exceptionalist narrative that celebrates the Apollo Moon landings, this narrative views Apollo as a waste, a missed opportunity to further important and necessary goals in America. Indeed, the triumphalist narrative of Apollo has been so powerful a memory that most people in the United States reflecting on Apollo believe that it enjoyed enthusiastic support during the 1960s and that somehow NASA lost its compass thereafter.[15] Contrarily, at only one point prior to the Apollo 11 mission, October 1965, did more than half of the public favor the program. Americans of the era consistently ranked spaceflight near the top of those programs to be cut in the federal budget. Such a position is reflected in public opinion polls taken in the 1960s when the majority of Americans ranked the space program as the government initiative most deserving of reduction, and its funding redistributed to Social Security, Medicare, and other social programs. While most Americans did not oppose Apollo per se, they certainly questioned spending on it when social problems appeared more pressing.[16]

Opposition to Apollo from the Political Right

Contrarily, during the Apollo era some figures on the American political right criticized the program as an abuse of federal power. In their view, the federal government should not do much of anything, offering a persistently libertarian position that emphasized individual prerogative and freedom over state action. As an example, for this reason Eisenhower believed that empowering NASA to accomplish the Apollo Moon landings of the 1960s was a mistake. He remarked in a 1962 article: "Why the great hurry to get to the moon and the planets? We have already demonstrated that in everything except the power of our booster rockets we are leading the world in scientific space exploration. From here on, I think we should proceed in an orderly, scientific way, building one accomplishment on another."[17] He later cautioned that the Moon race "has diverted a disproportionate share of our brain-power and research facilities from equally significant problems, including education and automation."[18] Likewise, in the 1964 presidential election, Republican candidate Senator Barry Goldwater urged a reduction of the Apollo commitment to pay for national security initiatives.

With the coming of the successful Moon landings, however, the American right largely retreated from high profile criticism of Apollo. That position dominated until the 1980s when a full-scale assault on the "Great Society" efforts of the Democrats in the 1960s emerged in the public realm. Questioning of the Apollo program became part of a conservative strain in American political discourse that increasingly found expression during the Reagan administration of the 1980s. Percolating for many years, it emerged full-blown during the era to reconsider the history and policy of liberal ideology in the United States. In the process, reappraisals have castigated the social upheaval of the 1960s, defeat in Vietnam, and Great Society programs as failures of American politics.[19] There was also a conservative space policy, as well as a conservative space history, that emerged during the same era to criticize Apollo. Historian Walter A. McDougall even hinted that criticism of Apollo was part of a larger assault on what some believed were the "products of the maniacal 1960s."[20]

No one was more successful in a conservative critique of Apollo than Walter A. McDougall, who published a Pulitzer Prize-winning "political history of the space age."[21] His situation of the history of Apollo in the context of the well-documented U.S. political "right turn" may well represent the central thrust of space history and policy since the 1980s, for many have followed in his footsteps.[22] The foundation and growth of this conservative space policy agenda has been well-documented in several historical works. Its linkage to space advocacy groups, conservative futurists such as Gerry Pournelle, and space power advo-

cates such as Pete Worden, ensure that conservative space advocates have been able to manipulate the political system to achieve at least some of their technological goals. These have included a derogation of government programs as wasteful and inefficient, a celebration of private sector space initiatives, a relaxation of the regulatory environment, and a redistribution of federal research and development funds from traditional sources to organizations less tied to Democratic administrations.[23]

Nothing expresses this "right turn" better than the rehabilitation of Dwight D. Eisenhower as president in McDougall's reinterpretation. He emerged as the hero of the early space age, seeking to hold down expenditures, refusing to race the Soviet Union into space, and working to maintain traditional balances in policy, economics, and security. As Alex Roland pointed out:

> Mr. McDougall pictures him as standing alone against the post-Sputnik stampede, unwilling to hock the crown jewels in a race to the moon, confident that America's security could be guaranteed without a raid on the Treasury, and concerned lest a space race with the Russians jeopardize America's values and freedoms and drag us down to the level of the enemy.

Conversely, the Democrats—especially Kennedy and Johnson—were the villains in this drama, ever seeking to enhance the power of big government to reshape the landscape of the United States to support their schemes of social revolution. Indeed, as NASA Administrator James E. Webb asked, if we can accomplish Apollo "why can't we do something for grandma with Medicare?"[24] The linkage of space policy and social policy may seem tenuous at first, but in the view of Apollo critiques both celebrated the power of the federal government and the state system to "intrude" in individual lives.

Critiques from the right also noted that the mandate to complete Apollo on President John F. Kennedy's schedule prompted the space program to become identified almost exclusively with high-profile, expensive, human spaceflight projects. This was because Apollo became a race against the Soviet Union for recognition as the world leader in science and technology and by extension in other fields. For example, McDougall juxtaposed the American effort of Apollo with the Soviet space program and the dreams of such designers as Sergei P. Korolev to land a Soviet cosmonaut on the Moon. While he recognized Apollo as a significant engineering achievement, he concluded that it was also enormously costly both in terms of resources and the direction to be taken in state support of science and technology. In the end, NASA had to stress engineering over science, competition over cooperation, and international prestige over practical applications.

Most important, McDougall argued that the space age gave birth to a state of "perpetual technological revolution" because of the technocracy that arose to support this incredibly complex set of machines. In essence, driven to respond to the Soviet challenge the United States recreated the same type of command technocracy that the Soviets had instituted. McDougall concluded that the space race led to nothing less than "the institutionalization of technological change for state purposes, that is, the state-funded and -managed R&D explosion of our time."[25]

As McDougall wrote:

> In these years the fundamental relationship between the government and new technology changed as never before in history. No longer did state and society react to new tools and methods, adjusting, regulating, or encouraging their spontaneous development. Rather, states took upon themselves the primary responsibility for generating new technology. This has meant that to the extent revolutionary technologies have profound second order consequences in the domestic life of societies, by forcing new technologies, all governments have become revolutionary, whatever their reasons or ideological pretensions.[26]

And once institutionalized, technocracy has not gone away. McDougall concluded that it was enormously costly to the nation, and not just in public treasure. Emphasizing the effect of the Moon race upon American society, this critique focused on the role of the state as a promoter of technological progress—to the detriment of the nation.

The Apollo critique from the right bemoaned fundamentally what one observer called so much nostalgia for "the lost world of Thomas Jefferson and Adam Smith, its seeming faith in the untrammeled operation of the marketplace, its occasionally strident anticommunism, or its neo-orthodox assertions about humanity's sinful nature."[27] Whether or not such a world ever actually existed was problematic, but in reality the criticism of Apollo from the right revolved around how much activity by the federal government is appropriate. Conservatives questioned an activist government and Apollo clearly demonstrated activism in a most significant manner. While most Americans accepted at face value the benign nature of that power, conservatives tended to challenge its legitimacy.[28]

Though distinctive in many respects, critics from the right also asserted that the power accrued by those overseeing Apollo sometimes corrupted them, making them exploitative of others and engendering in them cynicism toward those they dominated. They may have tried to conceal that fact by laying claim to the dominant myths and symbols of the American frontier, invoking heroes from American folklore, positivist images of "manifest destiny," and happy visions of

white-topped wagon trains traveling across the prairies, but conservative critics declared that only a ruse.

Through Apollo the federal government enhanced its power and gained virtually total control of spaceflight as an activity. While many Americans celebrated this use of federal power, conservatives bemoaned its intrusion into their vision of individual liberty for the future. That concern has enjoyed a persistent presence in the American spaceflight community since the 1980s.

Conclusion

While it is impossible for many to take these criticisms seriously, for those raised in the postmodern world of the latter twentieth century where the nature of truth is so thoroughly questioned it is more likely to gain a footing. Indeed, postmodernism suggests that reality is more a suggestion of meaning rather than an absolute. It blurs the line between fact and fiction, between realism and poetry, between the unrecoverable past and our memory of it.[29]

This raising of the inexact character of historical "truth," as well as its relationship to myth and memory and the reality of the dim and unrecoverable past, has foreshadowed deep fissures in the landscape of identity and what it means to be American. Truth, it seems, has differed from time to time and place to place with reckless abandon and enormous variety. Choice between them is present everywhere both in the past and the present; my truth dissolves into your myth and your truth into my myth almost as soon as it is articulated. We see this reinforced everywhere about us today, and mostly we shake our heads and misunderstand the versions of truth espoused by various groups about themselves and about those excluded from their fellowship. They have given and continue to give meaning and value to individual human lives and to create a focal point for explaining the sufferings and triumphs of the group.

At some level there is no absolute; instead everything is constructed. If so, what might be the case of the Moon landings? This has happened in history repeatedly, as versions of the past have replaced earlier versions that once seemed so true. For more than a half-century, for example, the Frontier Thesis as enunciated by Frederick Jackson Turner reigned supreme as a critical explanation offered for the manner in which the U.S. character emerged. It was dismantled and destroyed and all but forgotten in the last quarter of the twentieth century.[30] How might humanity view the Apollo program 100 years from now? Will it remain as it is now?

Endnotes

[1] Steve Cook, Marshall Space Flight Center Ares Project Manager, remarks to questions, 2008 Wernher von Braun Memorial Symposium Session 1: "Ares—A Project Making Progress," 21 October 2008.

[2] Several years ago I prepared "A Baker's Dozen of Books on Project Apollo," and I have updated it periodically since. These are singularly worthwhile books, but all support the dominant trope in the historiography. The titles include: Donald A. Beattie, *Taking Science to the Moon: Lunar Experiments and the Apollo Program* (Baltimore, Maryland: Johns Hopkins University Press, 2001); Roger E. Bilstein, *Stages to Saturn: A Technological History of the Apollo/Saturn Launch Vehicles* (Washington, DC: National Aeronautics and Space Administration, SP-4206, 1980); Courtney G. Brooks, James M. Grimwood, and Loyd S. Swenson Jr., *Chariots for Apollo: A History of Manned Lunar Spacecraft* (Washington, DC: National Aeronautics and Space Administration, SP-4205, 1979); Andrew Chaikin, *A Man on the Moon: The Voyages of the Apollo Astronauts* (New York: Viking, 1994); Michael Collins, *Carrying the Fire: An Astronaut's Journeys* (New York: Farrar, Straus and Giroux, 1974); *Apollo Expeditions to the Moon*, Edgar M. Cortright, editor (Washington, DC: National Aeronautics and Space Administration, SP-350, 1975); David M. Harland, *Exploring the Moon: The Apollo Expeditions* (Chicester, United Kingdom: Wiley-Praxis, 1999); Stephen B. Johnson, *The Secret of Apollo: Systems Management in American and European Space Programs* (Baltimore, Maryland: Johns Hopkins University Press, 2002); W. Henry Lambright, *Powering Apollo: James E. Webb of NASA* (Baltimore, Maryland: Johns Hopkins University Press, 1995); John M. Logsdon, *The Decision to Go to the Moon: Project Apollo and the National Interest* (Cambridge, Massachusetts: The MIT Press, 1970); Walter A. McDougall, *...The Heavens and the Earth: A Political History of the Space Age* (New York: Basic Books, 1985); Charles A. Murray and Catherine Bly Cox, *Apollo, the Race to the Moon* (New York: Simon and Schuster, 1989); David West Reynolds, *Apollo: The Epic Journey to the Moon* (New York: Harcourt, Brace, 2002).

[3] I made this argument in relation to Apollo in Roger D. Launius, "Perceptions of Apollo: Myth, Nostalgia, Memory or all of the Above?" *Space Policy*, Vol. 21, No. 2 (May 2005): pp. 129–139.

[4] The best example of this is Stephen J. Pyne, "Space: A Third Great Age of Discovery," *Space Policy*, Vol. 4, No. 3 (August 1988): pp. 187–199.

[5] Stephen J. Pyne, *The Ice: A Journey to Antarctica* (Iowa City: University of Iowa Press, 1986); *The Sciences in the American Context: New Perspectives*, Nathan Reingold, editor (Washington, DC: Smithsonian Institution Press, 1979); Norman Cousins et al., *Why Man Explores* (Washington, DC: NASA Educational Publication-125, 1976); Sarah L. Gall and Joseph T. Pramberger, *NASA Spinoffs: 30 Year Commemorative Edition* (Washington, DC: National Aeronautics and Space Administration, 1992).

[6] Lyndon B. Johnson, "President's News Conference at the LBJ Ranch," *Public Papers of the Presidents*, August 29, 1965, p. 944–45. See also Lyndon B. Johnson, "Michoud Assembly Facility, Louisiana," *Weekly Compilation of Presidential Documents*, December 12, 1967, p. 1967.

[7] To determine how widespread this question is, in 2001 I undertook a search of the Dow Jones database, which includes full text of more than 6,000 newspapers, magazines, newswires, and transcripts. Some of the publications go back to the 1980s but most have data only from the 1990s. Except for perhaps Lexis-Nexis, Dow Jones is the largest full-text database available. There are more than 6,901 articles using this phrase, or a variation of it, in the database. Among them was a statement by former White House Chief of Staff, Mack McClarty concerning Mexico on National Public Radio's "All Things Considered," entitled, "Analysis: President Bush to visit Mexico and its President." Maria Elena Salinas, co-anchor at Miami-based Spanish-language cable network Univision, used this phrase when

discussing her decision to list the Apollo Moon landings as first in the top 100 news events of the twentieth century. Levinson A. Atomic bombing of Hiroshima tops journalists' list of century's news. Associated Press. 24 February 1999.

[8] Among those criticisms, see Hugo Young, Bryan Silcock, and Peter Dunn, *Journey to Tranquillity: The History of Man's Assault on the Moon* (Garden City, New York: Doubleday, 1970); Erlend A. Kennan and Edmund H. Harvey Jr., *Mission to the Moon: A Critical Examination of NASA and the Space Program* (New York: William Morrow and Co., 1969); John V. Moeser, *The Space Program and the Urban Problem: Case Studies of the Components on National Consensus* (Washington, DC: Program of Policy Studies in Science and Technology, George Washington University, 1969); Edwin Diamond, *The Rise and Fall of the Space Age* (Garden City, New York: Doubleday and Co., 1964).

[9] Roger E. Bilstein, *Testing Aircraft, Exploring Space: An Illustrated History of NACA and NASA* (Baltimore, Maryland: Johns Hopkins University Press, 2003), p. 200.

[10] Vannevar Bush to James E. Webb, Administrator, NASA, April 11, 1963, p. 2, Presidential Papers, John F. Kennedy Library, Boston, Massachusetts.

[11] Amitai, Etzioni, *The Moon-Doggle: Domestic and International Implications of the Space Race* (Garden City, New York: Doubleday, 1964), p. 70. See Alton Frye, "Politics—The First Dimension of Space," *Journal of Conflict Resolution*, Vol. 10 (March 1966): pp. 103–112, for a review of *Moondoggle*.

[12] Etzioni, *Moon-Doggle*, p. 195.

[13] Robert Dallek, "Johnson, Project Apollo, and the Politics of Space Program Planning," in *Spaceflight and the Myth of Presidential Leadership*, Roger D. Launius and Howard E. McCurdy, editors (Urbana: University of Illinois Press, 1997), pp. 75–88.

[14] Bernard Weinraub, "Some Applaud as Rocket Lifts, but Rest Just Stare," *New York Times*, 17 July 1969, p. 1.

[15] James L. Kauffman, *Selling Outer Space: Kennedy, the Media, and Funding for Project Apollo, 1961–1963* (Tuscaloosa: University of Alabama Press, 1994); Mark E. Byrnes, *Politics and Space: Image Making by NASA* (New York, Praeger, 1994); Neil de Grasse Tyson, "Expanding the Frontiers of Knowledge," in *Looking Backward. Looking Forward: Forty Years of U.S. Human Spaceflight Symposium*, Stephen J. Garber, editor (Washington, DC: NASA SP-2002-4107, 2002), pp. 127–136.

[16] Roger D. Launius, "Public Opinion Polls and Perceptions of U.S. Human Spaceflight," *Space Policy*, Vol. 19, No. 3 (August 2003): pp. 163–175.

[17] Dwight D. Eisenhower, "Are We Headed in the Wrong Direction?" *Saturday Evening Post*, 11–18 August 1962, p. 24.

[18] Dwight D. Eisenhower, "Why I Am a Republican," *Saturday Evening Post*, 11 April 1964, p. 19.

[19] The reinterpretation of America in the 1960s has been a major cottage industry in recent years, and the reassessment has as often as not been negative. Anyone wishing to pursue study of the reorientation of American society in the 1960s should read Milton Viorst, *Fire in the Streets: America in the 1960s* (New York: Simon and Schuster, 1979); Allen J. Matusow, *The Unraveling of America: A History of Liberalism in the 1960s* (New York: Harper and Row, 1984); William L. O'Neill, *Coming Apart* (Chicago: Quadrangle Books, 1971); Godfrey Hodgen, *America in Our Time: From World War II to Nixon, What Happened and Why* (Garden City, New York: Doubleday and Co., 1976); Morris Dickstein, *Gates of Eden: American Culture in the Sixties* (New York: Basic Books, 1977). For works that question the "Great Society" and the social upheaval of the 1960s, see Myron Magnet, *The Dream and the Nightmare: The Sixties Legacy to the Underclass* (New York: William Morrow and Company, 1993); Thomas C. Reeves, *The Empty Church: The Suicide of Liberal Christianity* (New York: Free Press, 1996); Charles Murray, *Losing Ground: Ameri-*

can Social Policy, 1950–1980 (New York: Basic Books, 1984); Irwin Unger, *The Best of Intentions: The Triumph and Failure of the Great Society Under Kennedy, Johnson and Nixon* (Naugatuck, Connecticut.: Brandywine Press, 1995); Gareth Davies, *From Opportunity to Entitlement: The Transformation and Decline of Great Society Liberalism* (Lawrence: University Press of Kansas, 1997); Arthur Benavie, *Social Security Under the Gun* (New York: Palgrave Macmillan, 2003); *Cold War Triumphalism: The Misuse of History After the Fall of Communism*, Ellen Schrecker, editor (New York: New Press, 2004).

[20] Walter A. McDougall, "Technocracy and Statecraft in the Space Age: Toward the History of a Saltation," *American Historical Review*, Vol. 87, No. 4 (October 1982): 1010–1040, quote from p. 1025.

[21] Walter A. McDougall, *...The Heavens and the Earth: A Political History of the Space Age*, in *Journal of American History* (New York: Basic Books, 1985).

[22] Darryl L. Roberts, "Space and International Politics: Models of Growth and Constraint in Militarization," *Journal of Peace Research*, Vol. 23, No. 3 (September 1986): pp. 291–298.

[23] This subject has been discussed in Andrew J. Butrica, *Single Stage to Orbit: Politics, Space Technology, and the Quest for Reusable Rocketry* (Baltimore, Maryland: Johns Hopkins University Press, 2003); W. D. Kay, "Space Policy Redefined: The Reagan Administration and the Commercialization of Space," *Business and Economic History*, Vol. 27, No. 1 (Fall 1998): 237–247. An element of manipulation science data has also surfaced. For instance, this may be found in such works as Mark Bowen, *Thin Ice: Unlocking the Secrets of Climate in the World's Highest Mountains* (New York: Henry Holt and Co., 2005), which talks at length about NASA and censorship concerning global climate change.

[24] Alex Roland, "How Sputnik Changed Us," *New York Times*, 7 April 1985, pp. 1, 6, quote from p. 6.

[25] McDougall, *...The Heavens and the Earth*, p. 5.

[26] McDougall, *...The Heavens and the Earth*, pp. 6–7.

[27] Robert Griffith, "Roots of Technocracy," Book Review, *Science* Vol. 230, No. 4730 (6 December 1985): p. 1154.

[28] Ralph E. Lapp, *The New Priesthood: The Scientific Elite and the Uses of Power* (New York: Harper & Row, 1965), pp. 227–228. Similar cautions, but aimed at the use of science and technology to dupe Americans, may be found in Robert L. Park, *Voodoo Science: The Road from Foolishness to Fraud* (New York: Oxford University Press, 2000); Amitai Etzioni, *The Limits of Privacy* (New York: Basic Books, 2000).

[29] See the fascinating discussion of myth and history in Hayden White, *Metahistory: The Historical Imagination in Nineteenth-Century Europe* (Baltimore, Maryland: Johns Hopkins University Press, 1973); Roland Barthes, "The Discourse of History," translated with an introduction by Stephen Bann, *Comparative Criticism: A Yearbook, Volume 3* (Cambridge, UK: Cambridge University Press, 1981), pp. 3–20; Dominick LaCapra, *Rethinking Intellectual History* (Ithaca, New York: Cornell University Press, 1983); Brook Thomas, *The New Historicism: And Other Old-Fashioned Topics* (Princeton, New Jersey: Princeton University Press, 1991).

[30] Frederick Jackson Turner, "The Significance of the Frontier in American History," *The Frontier in American History* (New York: Holt, Rinehart, and Winston, 1920), pp. 1–38; Richard Slotkin, *Gunfighter Nation: The Myth of the Frontier in Twentieth-Century America* (New York: Atheneum, 1992); John Mack Faragher, *Rereading Frederick Jackson Turner: The Significance of the Frontier in American History, and Other Essays* (New York: Henry Holt, 1994); Allan G. Bogue, *Frederick Jackson Turner: Strange Roads Going Down* (Norman, Oklahoma: University of Oklahoma Press, 1998); Ray Allen Billington, *America's Frontier Heritage* (Albuquerque, New Mexico: University of New Mexico Press, 1974).