



# Managing the unmanageable: Apollo, space age management and American social problems

Roger D. Launius

*Division of Space History, National Air and Space Museum, Smithsonian Institution, PO Box 37012, NASM Room 3556, MRC 311, Washington, DC 20013-7012, USA*

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## Abstract

There are numerous beliefs about the ability of the federal government to accomplish positive results in social transformation using space program management practices that have become a part of American culture. In the middle of the 1960s, NASA Administrator James E. Webb asked why, if the USA could accomplish Apollo, “can’t we do something for grandma with Medicare”?. This led to efforts by Webb and others at NASA to export the management practices that enabled the successful lunar landing program toward solving the myriad social problems taken up by the Johnson administration and its successors in the USA. The application of these ideas to city administration, public health, welfare programs, energy, and veterans’ affairs offers a case study in seeking to control what ultimately proved uncontrollable. The linkage of space policy and social policy may seem tenuous at first, but both celebrate the power of the federal government and the state system to affect in fundamental ways the lives of citizens. This article explores those linkages, the relationship between the authority of experts and political leaders, and the manner in which management practices successful at NASA may have been applied with varying success to other governmental organizations.

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## 1. Introduction

When John F. Kennedy took office in January 1961, an energized national government, prompted by activists in senior positions, sought to use the power of the federal government to effect change. His administration expressed a strong consensus that science and technology, coupled with proper leadership and the inspiration of a great cause, could solve almost any problem of society. David Halberstam shrewdly observed “if there was anything that bound the men [of the Kennedy administration], their followers, and their subordinates together, it was the belief that sheer intelligence and rationality could answer and solve anything”. This translated into an ever-increasing commitment to science and technology to resolve problems and point the direction for the future [1].

At sum, this activism represented an expression of political power through a concept known as the “positive liberal state”. In essence, it celebrated the use of state power for public good. It was a given for the Kennedy

administration that human exploration of the Solar System was always viewed as reasonable and forward-looking and led to “good” results for all concerned. Without perhaps seeking to do so, human space exploration, at least in its US incarnation, offered an important perspective on a debate that has raged over the proper place of state power since the beginning of republic. The Democrats engaged in an activist approach to government, with Washington taking the initiative to effect change through the power of what has been termed “the positive liberal state”. Examples of governmental activism on the part of the Democratic administrations of the early 1960s abound, and the war on poverty, the Peace Corps, support for civil rights, the Great Society programs of Lyndon Johnson, and a host of other initiatives are examples. Johnson even tried to defend NASA as a part of his “Great Society” initiatives, arguing that it helped poor southern communities with an infusion of federal investment in high technology [2].

As one historian remarked about this philosophy of government, the state would actively “promote the general welfare, raise the level of opportunity for all men, and aid all individuals to develop their full potentialities”. It would

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*E-mail address:* [launiusr@si.edu](mailto:launiusr@si.edu)

assert active control in this process, seeking improvements to society “both economic and moral, and they did not believe in leaving others alone” [3].

## 2. James E. Webb and Space Age America

In such an environment, it seems obvious that NASA officials would view the methods that led to success in the space program as adaptable in seeking to solve the other problems of society. James E. Webb, NASA Administrator from 1961 to 1968, was the central actor in this effort. He moved beyond the space agency’s mandate to develop and use technology for the peaceful exploration of space to implement a task beyond the strengthening of the economic and educational interests of the USA. He sought to create a “Space Age America” and argued for the export of the technocracy and bureaucracy needed for Apollo to address societal needs. He had a broad litany of targets: stimulation of the economy, advancement of education, and application of new management techniques and technologies to solve urban, agricultural or resource problems. In Project Apollo he saw the seeds of transformation for the nation as a whole. The Moon landing program combined intensive planning and hierarchical organization with decentralized decision making and innovation. In accomplishing the Moon program, NASA successfully integrated myriad technical and professional cultures with a centralized management structure that applied sophisticated systems management and configuration control. Webb also deserved credit for leading the effort to create a management structure responsive to both NASA’s organizational culture and the national society beyond the organization [4].

At some level this was to be expected. Born not long after the turn of the 20th century in Granville County, NC, Webb embraced as formative experiences modernity, progressivism and an increased involvement of science and technology in the lives of Americans. After graduating in education from the University of North Carolina, he came to Washington, DC, during the New Deal and adopted its central tenets of governmental action. He also studied law at George Washington University and was admitted to the Bar of the District of Columbia in 1936. He entered public service in 1932 by serving as personal assistant to Democratic Congressman Edward W. Pou, from the 4th North Carolina District, who was also Chair of the House Rules Committee. He also later worked for O. Max Gardner, a Washington power broker, attorney and former governor of South Carolina. After serving as a Marine aviator in World War II, Webb returned to Washington after the war and became director of the Truman administration’s Bureau of the Budget. In 1949 President Truman asked Webb to become Undersecretary of State. When the Truman administration ended early in 1953, Webb left Washington for a position at the Kerr-McGee Oil Corporation in Oklahoma, whose principal was Senator Robert Kerr. In that post, he honed his

ideas on the role of science and technology in the modern society, on the place of education for the future of the nation, and on the possibilities of the federal government to effect positive change [5].

Webb cut his political and philosophical teeth on the pragmatic, innovative, liberal approach to using government for “public good”—insofar as that could be determined, and those decisions were always controversial—then so much a part of the Democratic Party’s *raison d’être* [6]. His long experience in Washington was very useful during his years at NASA, where he lobbied for federal support for the space program and dealt with competing interests on Capitol Hill and in the White House. By the time of his arrival at NASA in 1961, Webb was a longtime Washington insider who had developed significant skills in bureaucratic politics. Just as he came to the leadership of NASA, Webb wrote to a colleague about the place of the Democrats in affecting society in a positive manner: “I believe in the Democratic Party as a vehicle for good government and second...for the public good” [7]. In the end and through a variety of methods, as NASA administrator, Webb built a seamless web of political liaisons that brought continued support to accomplishing the Apollo Moon landing on the “end of the decade” schedule that President John F. Kennedy had announced in 1961. Webb left NASA in October 1968, just as Apollo was nearing a successful completion, but his place as a manager and bureaucrat par excellence was secure [8].

Webb’s commitment to activism in government for the “benefit of society” found expression in many settings. In Webb’s conception, the nation would succeed best if science and technology were harnessed by society as a whole for peaceful and positive purposes, used for solving social and environmental problems, and for fostering economic growth and business diversity. He thought education in the sciences and engineering would be a handmaiden in this effort. In the end Webb’s “Space Age America” would be one of unlimited potential, one in which “right relationships” prevailed.

While in Oklahoma in the 1950s, Webb was a driving force behind the creation of the Frontiers of Science Foundation. The organizing group, led by Webb, believed that “the future lay in the area of scientific knowledge and its development”. It pressed for the development of curricula for senior high-school and university students in science and mathematics, aggressive research programs that would attract government grants and contracts as well as industry dollars to the region, and the relocation to the area of science and technology organizations. At a fundamental level, this effort was about economic growth and development in Oklahoma, and Webb constantly emphasized that practical result from the Frontiers of Science Foundation’s efforts [9]. Likewise, once at NASA, Webb was persistent in his belief that investment in science and technology would return multifold what was initially invested. Webb addressed a memorandum to NASA officials less than six months after he arrived at the agency,

stating his position on the role of science and technology in advancing the US economy: “One of the most important aspects of the space program is the possibility of the feedback of valuable, new technological ideas and know-how for use in the American economy” [10]. Not long thereafter he discussed with E.F. Buryan, president of Motec Industries Inc., “the urgent necessity for a strong technological underpinning for any regional economic system that has survival qualities. Indeed, the presence of basic research and the kinds of people who do basic research is of urgent importance for the long run and should be effectively worked out along with the technological and industrial competence”. Webb viewed NASA as critical to that economic development. “We are going to spend 30–35 billion dollars pushing the most advanced science and technology”, he wrote, and then “endeavoring in every way possible to feed back what we learn into the total national economy” [11].

Webb continued his crusade on behalf of the role of NASA’s science and technology as a catalyst for economic growth throughout the remainder of his career. He badgered governors, mayors, members of Congress, and business leaders to recognize and pursue, as he put it, “the best ways of utilizing the tremendous developments of science and technology in what might be called a total-community-workable-plan kind of concept” [12]. He emphasized

that the nation has, through its democratic processes, adopted an important large program in which many elements of our society are cooperating, and which is in reality the development of technology to do exploration and application of new knowledge...I would like to make the point that we have here in the national government the means for making decisions through the representatives of the people and actions by them based on responsible representations and recommendations by the President...this program is typical of the rapidly changing environment of our times, and terminate[s] with the concept that change is the most important feature of life today [13].

These were significant attributes in the development and application of science and technology in modern America and the harnessing of it for public good through the democratic process.

Webb also recognized that this effort was properly within the province of the federal government as it undertook actions for public good in the “positive liberal state”. In a statement of his position concerning a NASA industrial applications program in 1962, Webb noted:

1. Eighty percent of the professional and technical personnel engaged in the research and development activity in the United States are working, directly or indirectly, on government programs.
2. Seventy percent of all research and development expenditures in this country are currently being financed by the government.

The stimulation of business and industrial growth through application of new knowledge and innovations gleaned from this huge research and development program can be of great significance. It may well assist in achieving the Administration’s goal of increasing the Gross National Product at a five percent rate over the next decade. Moreover, it is incumbent on us, while achieving our specific mission objectives, to make available to citizens generally the specific practical benefits which can flow from a research and development program of this magnitude [14].

If the macroeconomic studies sponsored by NASA were an indication, as Webb anticipated, the returns on investment in space research and development were astounding. A Midwestern Research Institute (MRI) study of 1971 determined that NASA R&D provided an overall 7:1 return. Essentially, for every dollar spent on R&D, seven dollars were returned to the gross domestic product (GDP). MRI later refined its study, calculating this time an even higher 9:1 return on investment. That was nothing compared to a Chase Econometrics study performed in 1975, which reported a whopping 14:1 return on investment [15].

At the same time, Webb believed that the lessons of management employed at NASA—of course he viewed himself as central to defining that management structure—would have application in other problems that the nation faced. His approach to “space age management”, as he termed it, focused on conducting a symphony of many diverse elements to accomplish truly large-scale and significant objectives. “It seems to me, and I believe you agree”, he wrote in 1961, “that one of the greatest challenges to democratic government is the ability to carry on large-scale organized effort efficiently. If we don’t use our resources efficiently, we simply cannot compete in the kind of whirl we are in” [16]. He also laid out this belief for Senator Estes Kefauver (D-TN) in 1963:

As a nation we are in a period of vast and rapid change when we must find better ways to use and guide the giant forces at play to ends that will prevent war and make for a better world. The management systems, the new kinds of relationships we are developing in the government-university-industry field, and the research in methods of organization which we are conducting, have the potential to powerfully reinforce our democratic institutions. I would like very much to endeavor to find, if possible, those constructive areas within which we could work together along this line [17].

As he wrote in 1969, “Our Society has reached a point where its progress and even its survival increasingly depend upon our ability to organize the complex and to do the unusual”. Proper expertise, well organized and led, and with sufficient resources could resolve the “many great economic, social, and political problems” that pressed the

nation [18]. Webb viewed the approach to Apollo management as a model of what might be tried elsewhere.

Other observers also viewed the management structure of NASA as central to its success in the Webb era. The Apollo Moon landings represented an endeavor that demonstrated both the technological and the economic virtuosity of the United States and established national pre-eminence over rival nations—the primary goal of the program when first envisioned by the Kennedy administration in 1961. One editorial in the November 1968 issue of *Science* magazine, the publication of the American Association for the Advancement of Science, speaks to the Apollo program's management system: "In terms of numbers of dollars or of men, NASA has not been our largest national undertaking, but in terms of complexity, rate of growth, and technological sophistication it has been unique...It may turn out that [the space program's] most valuable spin-off of all will be human rather than technological: better knowledge of how to plan, coordinate, and monitor the multitudinous and varied activities of the organizations required to accomplish great social undertakings" [19]. If such was the expectation, what took place in this exporting of knowledge and practice to other arenas in the public sphere?

### 3. Experimenting with knowledge: NASA's Sustaining University Program

One of Webb's earliest efforts to bridge the divide between NASA and its new approach came with his creation of educational institutions at NASA to enhance the agency's influence beyond. For example, within a few months of the Apollo commitment in 1961, James Webb led NASA down one of its most innovative paths of the era. He established the Sustaining University Program (SUP) to increase the size and quality of scientific and technical (S&T) education programs, with the goal of reshaping the nation through large-scale S&T activities. Using fellowships, grants and facilities monies it aimed at expanding the number of scientists and engineers, especially with advanced degrees, spreading federal largesse far beyond the bounds previously known to geographically and ethnically and racially separated institutions. As Webb explained, he hoped to entice outstanding students to enroll in programs across the nation rather than at only a few elite schools. He also sought to use these funds for interdisciplinary research across broad areas of research, even including social scientists, who would study the impacts of science and technology. Finally, Webb intended SUP as a strategic, proactive effort to advance society as a whole, with NASA playing a key role [20].

The Sustaining Universities Program proved successful in building support for NASA and the Apollo program during the 1960s, in no small measure because large sums of money with relatively few restrictions were made available nationwide. By 1965, a NASA report noted, "142 universities have received grants to support a total of

3132 candidates for predoctoral training fellowships in space-related fields. Research grants under the Sustaining University Program have been made to 53 educational institutions, most of them involving interdisciplinary effort, and many of them "seed grants" aimed at strengthening research activity at universities capable of expanding their research programs" [21]. By 1970, something over 4000 doctorates had been earned by SUP students. Training large numbers of scientists and engineers, which SUP facilitated, epitomized what the program did best.

Even so, Webb's larger goal of using universities for NASA-based socioeconomic progress, despite its idealistic origins and noble objectives, proved elusive. As one NASA report concluded in 1968:

Little evidence was found that the Memorandums of Understanding associated with Sustaining University Program facilities grants have led to anything but talk. Usually only a few administrators with a university even knew about the Memorandum. They had not attempted to use it as a tool to induce changes in procedures or attitudes; they did not regard it as requiring them to do anything new or different.

The same report noted that Webb had intended the SUP as broad-based, involving scientists, engineers and social scientists. But efforts to persuade university officials "to involve social scientists in their research [was met] with little response. The small amount of social-science involvement that does exist is usually on a subproject that does not interact with other research". This involvement, critical to Webb's view of NASA as a transforming force in American society, therefore represented at best a marginal success [22]. Despite Webb's haranguing of anyone in universities who would listen, his crusade to use space technology to raise the spirit and performance of the USA fell far short of his vision.

### 4. Exporting "space age management"

With the mixed success of Webb's approach to "space age management" at NASA, it may be surprising that he sought to export his ideas to other arenas with as much zeal as he demonstrated throughout his career at NASA, as well as thereafter. He immediately latched on to the problems of the city that were apparent as the decade of the 1960s began but became more acute as time passed. In March 1963, he co-sponsored with the Ford Foundation, the University of California, and the city of Oakland a conference on "Space, Science, and Urban Life". It posed two important questions: "(1) Can a national program of space exploration be applicable to the daily tasks of men and women who live and work in our central cities? (2) How may new knowledge, developing in these days of scientific and technological revolution, be used to seek answers to the critical issues expanding urban populations?". These are important questions but the answers by

the participants to them were less than impressive. Since these numbered Webb, Representative George Miller, Presidential Science Advisor Jerome B. Weisner, and a host of academics and industry leaders, one might have expected more concrete results. Instead, there were considerable broad assertions of possibilities but not much in the way of prescriptive ideas [23].

One reviewer of the published proceedings boiled down the issues discussed at the conference into three broad themes. First, the large-scale effort of NASA to reach the Moon had forced the organization of resources and capabilities on a scale seldom seen in non-military situations and that knowledge gained from the process could be transferred to the private sector and benefit the nation as a whole. Second, at the same time there was nothing special about technological solutions and their applicability to urban problems. As one participant put it, “Science and technology have done to the city what they have done to any part of human endeavor they have touched. They have freed us more and more from our environment; they have given us more opportunity to manipulate it” [24]. A third theme was the belief that the federal government would become increasingly involved in the affairs of ordinary citizens, the economy and the social setting. These major themes aside, there was little in the book on how science and technology could help solve some of the challenges faced in the cities of the USA. It might lead to cleaner burning fuels, more efficient automobiles, better mass transit systems, solving problems that are inherently technological. But the truly dicey problems of race, class, economic disparities and the like defied a technological fix [25].

The same might be said of the most systematic approach to this issue ever made by James E. Webb. In 1969 he published *Space Age Management: The Large Scale Approach*, originally prepared in 1968 as a set of three lectures for the McKinsey Foundation Lecture Series sponsored by the Graduate School of Business at Columbia University. At the time, NASA was riding a crest of excitement caused by the culmination of the Apollo program and the successful missions to the Moon. Certainly not a scholarly work, *Space Age Management* offered what was essentially a motivational set of speeches on the leadership issues and challenges for any manager of large-scale projects. Webb drew upon his broad experience in government service, as well as his work with voluntary associations, to cast what he thought of as universal commonalities between large-scale projects aimed at resolving specific problems wherever they might be found. At no time did he translate the lessons of Apollo’s management structure into terms that might be transportable to address society’s ills within the context of the democratic process. He emphasized management and leadership in changing conditions, the virtues of flexible and adaptive organizational structures, and the desire to use the power of the federal government to be active about improving the lives of Americans.

Webb insisted that the nation was in serious trouble, making offhand remarks about urban crises, failing infrastructure, the war on poverty and a wealth of other social issues. He believed that the only way of meeting these challenges was to organize and coordinate activities on a massive scale. Calm and deliberate responses were necessary, Webb asserted, and thought that a “multi-disciplinary, large-scale effort” must be “more deliberate, more carefully planned, and more interrelated to a multitude of important activities than crisis conditions permit” [26]. Drawing lessons from Apollo, the Polaris missile development program, the New Deal’s Tennessee Valley Authority, the Marshall Plan for post-WWII reconstruction and the State Department’s postwar reorganization, he argued for a complex management approach to better serve the nation in the face of a complex and changing world. At one level Webb seemed to advocate, as one reviewer noted,

for more and better research in the area of management—for better and more dependable ways to organize and administer the great enterprises in which our nation must increasingly engage. This research, according to Mr. Webb, must provide greater knowledge and deeper understanding of what successful leaders in unprecedented endeavors really do, why they do it in a prescribed manner, and what the effects of these actions are [27].

As an advocate of the use of science and technology in the service of the positive liberal state, Webb proved a persistent if not entirely successful apostle. He never got beyond the general ideas of large-scale “space age management” as a panacea for all of the ills of society but he never, ever, stopped talking about it.

While Webb advocated, some in NASA were uneasy about it. For one, NASA Deputy Administrator Robert C. Seamans Jr expressed dismay that Webb perhaps “went a little far” [28]. He was concerned that such efforts might distract the NASA leadership team from the task of reaching the Moon. The transporting of these management ideas outside NASA might be a good thing, he believed, but it was not the space agency’s primary responsibility and anything that might intrude on that primary responsibility was troublesome.

Disciples of Webb tried to apply his ideas to other problems, but also without much success. Thomas C. Paine, who succeeded Webb as NASA Administrator in 1969, tried to show the commonalities of NASA and the cities, as well as their dissimilarities. He noted that science and technology could help deal with many infrastructure issues in cities, ranging from transportation systems to the delivery of city services. But he also found that NASA probably had an easier challenge than did major US cities. NASA had the luxury of defining “specific, stated, measurable goals” but cities’ objectives were more diffuse and less measurable. They “have their report card marked against wobbly success standards involving prejudice,

special interest, wishful thinking, conflicting values, loose rhetoric prophecy and revelation, or, in the current vernacular—SOUL. A social theory to guide urban society is nonexistent—or worse!” Paine admitted that whatever arguments he might make on the application of space age management to the problems of the cities were abstract but modern management approaches, formalized planning, and strong measures of performance were a step in the right direction [29].

At the time of Apollo 11 the Rev. Ralph Abernathy, successor to Martin Luther King as head of the Southern Christian Leadership Conference, protested against the launch to call attention to the plight of the poor of the USA. He and 500 marchers of the Poor People’s Campaign arrived at the Kennedy Space Center to contest the meaning of the Moon launch [30]. The protesters held an all-night vigil as the countdown proceeded and then made a march with two mule-drawn wagons as a reminder that, while the nation spent significant money on the Apollo program, poverty ravaged many Americans’ lives. As Hosea Williams said at the time, “We do not oppose the Moon shot. Our purpose is to protest America’s inability to choose human priorities” [31].

This protest pointed more effectively than almost anything else the confluence of high-technology challenges and the more mundane but ever-present problems of American society. Abernathy asked to meet the NASA leadership and Thomas Paine agreed to this the day before the launch. As he recorded the incident:

We were coatless, standing under a cloudy sky, with distant thunder rumbling, and a very light mist of rain occasionally falling. After a good deal of chanting, oratory and lining up, the group marched slowly toward us, singing “We Shall Overcome”. In the lead were several mules being led by the Rev. Abernathy, Hosea Williams and other leading members of the Southern Christian Leadership Conference. The leaders came up to us and halted, facing Julian [Scheer] and myself, while the remainder of the group walked around and surrounded us...One fifth of the population lacks adequate food, clothing, shelter and medical care, [Rev. Abernathy] said. The money for the space program, he stated, should be spent to feed the hungry, clothe the naked, tend the sick, and house the shelterless.

Abernathy said that he had three requests for NASA, that ten families of his group be allowed to view the launch, that NASA “support the movement to combat the nation’s poverty, hunger and other social problems” and that NASA’s technical people work “to tackle the problem of hunger”.

Paine responded with one of the best answers ever crafted in such a setting. He invited Abernathy and a busload of his supporters to view the Apollo 11 launch from the VIP site with other dignitaries. Paine commented on how hard it was to apply NASA’s scientific and technological knowledge to the problems of society.

“I stated that if we could solve the problems of poverty in the United States by not pushing the button to launch men to the moon tomorrow then we would not push that button”. He added:

I said that the great technological advances of NASA were child’s play compared to the tremendously difficult human problems with which he and his people were concerned. I said that he should regard the space program, however, as an encouraging demonstration of what the American people could accomplish when they had vision, leadership and adequate resources of competent people and money to overcome obstacles. I said I hoped that he would hitch his wagons to our rocket, using the space program as a spur to the nation to tackle problems boldly in other areas, and using NASA’s space successes as a yardstick by which progress in other areas should be measured. I said that although I could not promise early results, I would certainly do everything in my own personal power to help him in his fight for better conditions for all Americans, and that his request that science and engineering assist in this task was a sound one which, in the long run, would indeed help.

Paine then asked Abernathy, when he held a prayer meeting later that day with his protestors, that they “pray for the safety of our astronauts”. As Paine recalled, “He responded with emotion that they would certainly pray for the safety and success of the astronauts, and that as Americans they were as proud of our space achievements as anybody in the country” [32].

Paine rightly concluded here that the social problems of the USA could not be solved entirely by revectoring resources from NASA to other initiatives. He also rightly agreed that the problems of society were much more complex and defied resolution using the tools, knowledge and resources employed to accomplish Project Apollo. While it might be tempting to generalize from the experience of NASA during the 1960s that its success might be duplicated elsewhere, such was not the case. As one observer commented: “NASA’s effective implementation of the Apollo mission shows that anything we set our minds to can be done, provided all the conditions are met. Unfortunately, there will be few areas in American life where such will be the case. Nevertheless, Apollo will serve as an everlasting precedent to which optimists will be able to point”. In a manner uniquely ironic, the success of NASA under James Webb showed how malleable and straightforward technological fixes might be accomplished when applied to technological challenges. But they must be questioned whenever they are applied to the task of transforming society [33]. Almost all NASA officials since James Webb have agreed that this was the case. Space age management as a concept ended at NASA with the departure of James Webb from the scene.

What has been said along those lines since is much more modest, and while there have been important efforts to

create useful technologies—solar energy, biomedical breakthroughs and a host of other spin-off technologies—these have very much been viewed as serendipity. NASA calls these “spin-offs”, commercial products that had at least some of their origins as a result of space flight-related research. In most years the agency publishes a book describing some of the most spectacular, and they range from laser angioplasty to body imaging for medical diagnostics to imaging and data analysis technology. Spin-offs have not only been Tang and Teflon, therefore; neither of which was actually developed for the space program [34]. With the caveat that technology transfer is an exceptionally complex subject that is almost impossible to track properly, these various studies show much about the prospect of gaining technological “free gifts” from the US effort to get to the Moon.

Whether good or bad, no amount of cost–benefit analysis, which the spin-off argument essentially makes, can sustain NASA’s historic level of funding. More useful is a counterfactual question. How would life today be different if there were no space program? There can be no fully satisfactory answer to that question. One person’s vision is another’s belly laugh, but perhaps we can begin with the elimination of the microchip. Without it our lives would be significantly different, and many of the high-technology capabilities we enjoy—starting with biomedical diagnostics and related technologies and ending with telecommunications breakthroughs—might well have followed different courses and perhaps have lagged beyond their present breakneck pace as a result. Some of us might well think that a positive development, although probably global communication and the like. The point, of course, is that the past did not have to develop in the way that it did, and that there is evidence to suggest that Apollo and the larger space program pushed technological development along certain paths that might have not been followed otherwise, both for good and for bad [35]. They did not, however, transform society, a task beyond the reach of the technological verisimilitude demonstrated by NASA even in Webb’s era.

## 5. Conclusion

Space age management as a concept was a product largely of the mind of James Webb, and was advanced through the force of his indomitable will. Very little of substance came from it and even less persisted beyond the Apollo era. In its time and place, however, it found some adherents, although most were modest in their claims for it. Technological fixes found expression in some decidedly technological concerns in the USA’s urban areas, but certainly not elsewhere. In the end most would probably agree with the assessment of William Hines in a column in the *Birmingham News*: “[Although NASA] could be depended on to give a good account of itself in purely scientific or engineering situations, its ability to handle

problems with a big ‘people’ component is largely untested”. He added that Wernher von Braun remarked at a social setting “that getting to the moon was easier than getting to his table in the ballroom because down here on Earth there are always people in the way” [36].

There do seem to be some things that the positive liberal state has had good success accomplishing. There are others that have thus far eluded its best practitioners. One might draw several conclusions from this discussion. One is that there is no hope of large-scale management of social problems that has much chance of success. One would be well to avoid leaping to such a determination. Another might be that space age management as a concept advocated by James Webb was flawed. Such might be the case, especially when seeking its universal rather than a limited application. Others might question the nature of the positive liberal state as a whole, but this condemns Americans to a society without promise and hope for a better place. In the 1830s, an astute French interpreter of US society, Alexis de Toqueville, observed that Americans had a “lively faith in human perfectibility” and that as a society they believed they were “a body progressing” rather than one that either declined or remained stable [37]. If anything, de Toqueville understated this belief, for the concept of America as a land of progress and advance sustains the national character. Perhaps a more modest sense of this may be adopted when considering Apollo, space age management and American social problems.

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