

Chapter IV

The Marshall Reconstruction

In launching the Apollo Program, NASA also launched a reconstruction of the South. In the Moon program's "Fertile Crescent" that stretched from Houston to Huntsville to the Cape and back to New Orleans, NASA helped reconstruct the region's economic, demographic, social, and educational landscape.¹ Agency administrators, as managers of the command economy of space, "planned" some of the changes, especially in the economy. Other changes were unanticipated; "spillover" effects could be seen in the space program's effects on civil rights and education. But the impact was pervasive, permanent, and driven by federal dollars. This "Second Reconstruction," one historian has suggested, "went beyond the pork barrel into the realm of social planning."²

In part the reconstruction resulted from Kennedy and Johnson administration promises concerning the lunar program. They promised that the Apollo Program, like other programs of the New Frontier and Great Society, would promote progress in terms of advances in material plenty and social equality for the entire nation.³

The reformist impulse, however, combined with regional promotion. The South benefited most from space spending; it controlled key committee chairmanships in Congress, and military and NASA installations already dotted the landscape. As one commentator observed, NASA's Centers in the South formed an "arch" through which federal money passed. Marshall was the "keystone of this arch."⁴

Civil Rights

In the early 1960s, the most dramatic story in Alabama came not from the test stands at Redstone Arsenal, but from the streets of Montgomery, Birmingham, and Selma.⁵ The Heart of Dixie was the center of the civil rights struggle.

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Alabama evoked images of the scorched skeleton of a bus abandoned by Freedom Riders in Anniston, the confrontation at the Edmund Pettus Bridge in Selma, Bull Connor's dogs and firehoses in Birmingham, and Governor Wallace standing in a doorway at the University of Alabama in Tuscaloosa.

Marshall Space Flight Center could not operate in a technological vacuum, isolated from events to the south. The Center's role in the unfolding civil rights story revealed the interplay between the Federal Government and the states over civil rights. The sizable federal presence in Huntsville helped civil rights progress in Madison County and facilitated desegregation. Concurrently, Alabama's culture of segregation slowed Marshall's progress in black recruitment in comparison to federal installations elsewhere.

NASA was vulnerable to the race issue, since its major installations resided in the South and Project Apollo was to showcase American virtues. More than any other federal Agency, NASA needed to avoid the stains of American racism and be a symbol, "clean, technically perfect, the bearer of a myth."⁶

Before 1963, Marshall was little touched by the civil rights maelstrom that swirled through Alabama. The Center avoided controversy in the early 1960s because Huntsville offered a less promising place for civil rights advocates to make a stand than cities to the south. Civil rights leaders learned early that nonviolent direct action was most successful in confrontations with recalcitrant segregationists, and Huntsville politicians and businessmen wanted to avoid controversy. Madison County's prosperity depended on the Federal Government, and few wanted to jeopardize that support. The Gospel of Wealth had more disciples in Huntsville than did the Gospel of White Supremacy.

Circumstances in North Alabama differed from those in the rest of the state. North Alabama developed differently from the Black Belt to the south; with



Alabama Governor George Wallace and Dr. von Braun at Marshall.

smaller farms and fewer blacks, the north did not have the patterns of racial segregation that typified the southern plantation economy. Its politics had always been more liberal. In his successful races for governor in both 1962 and 1966, George Wallace received a smaller percentage of the vote in Madison County than in any other county in the state. Days before Wallace stood in the door of the University of Alabama in Tuscaloosa to bar the admission of a black student, the *Huntsville Times* said in an editorial, “One thing now is eminently clear—if U.S. troops are called to Tuscaloosa and to Huntsville, one man and one man alone bears the chief responsibility. That man is Governor George C. Wallace.”⁷

Marshall contributed to the state’s regional differences. “I never did feel that North Alabama should have been accused of some of the things that they were accused of,” explained Art Sanderson, who worked in the Marshall Personnel Department in the 1960s. “We brought people into this area from all over the country. All cultures. They were not just Mississippians, Alabamians, Tennesseans. They were from all over, Boston, from the major big schools, from California, Florida. We brought people with all different cultures to make up the ABMA and later Marshall Space Flight Center. You have got all these cultures coming in here, and they weren’t coming into Birmingham or Selma, they were coming here. I always felt that the people who came in here were quite a bit above the accusations about civil rights. It may have been true somewhere south of here. It was not true here. . . . I felt that everybody was here to do a job. We really didn’t have time for that kind of business.”⁸

If Huntsville was no Selma, neither was it a civil rights paradise. The Congress of Racial Equality (CORE) led sit-ins at Huntsville restaurants and lunch counters early in 1962. The protests led to several arrests and culminated in a visit by Martin Luther King in March.⁹ Although not as violent as confrontations elsewhere in Alabama, these events showed that Huntsville shared in the state’s culture of segregation.

“The fact of the matter,” one of NASA Administrator James Webb’s assistants observed, “is that Huntsville is in Alabama.”¹⁰ Public facilities and public schools were segregated, and African Americans struggled to find housing. Black per capita income in Huntsville was less than half that of whites.¹¹ Employment opportunities were limited; African Americans comprised 18 percent of Huntsville’s population, but less than 1 percent of Marshall’s workforce.¹² Clyde

Foster, one of the few blacks who worked at Marshall in the early 1960s, recalled that he was not able to participate in training sessions in Huntsville, where public accommodations were segregated. Accommodations on the Arsenal and at Marshall were no longer segregated, but blacks still encountered barriers. “Most definitely there was discrimination,” Foster said. “There was this subtle kind of discrimination. Upward mobility just wasn’t there.”¹³ In May 1962, two black Marshall employees filed complaints with the President’s Committee on Equal Employment Opportunity. Joe D. Haynes charged discrimination barring promotion, and Joseph Ben Curry complained of assignments inappropriate to his job classification.¹⁴

Marshall nonetheless felt little pressure, mainly because the Kennedy administration did not promote civil rights in federal installations before the spring of 1963. The administration treated civil rights as a political issue, avoiding confrontations with southern politicians. Kennedy, who received overwhelming black support in his narrow victory in 1960, made gestures designed to appease civil rights advocates. He issued an executive order in April 1961 that established the President’s Committee on Equal Employment Opportunity and mandated that executive agencies prohibit discrimination. Marshall replied that its activities conformed fully, and this was enough to satisfy the administration.¹⁵ For the next two years Marshall focused on Saturn, and civil rights remained peripheral.

Events in the spring of 1963, many of them in Alabama, jolted the administration into action on civil rights. Marshall could not avoid repercussions of events transpiring a hundred miles to the south. Martin Luther King’s crusade in Birmingham in May became a pivotal confrontation when Sheriff Bull Connor sent dogs to attack marchers and turned firehoses on children. A bomb in a church killed three black girls attending Sunday school classes.

The Birmingham campaign prompted new presidential activism on civil rights. For the first time President Kennedy proclaimed the issue a moral one and moved to initiate legislation. Attorney General Robert Kennedy, long a critic of Vice President Lyndon B. Johnson’s leadership of the President’s Committee on Equal Employment Opportunity, met with the committee on 18 June. Webb, a protégé of Johnson, represented NASA. Kennedy grilled Johnson, puncturing his vague claims of progress. After “making the Vice President look like a fraud,” in the words of one observer, the Attorney General turned on Webb. “Mr. Webb,

I just raised a question of whether you can do this job and run a Center and administer its \$3.9 billion worth of contracts and make sure that Negroes and nonwhites have jobs . . . I am trying to ask some questions. I don't think I am able to get the answers, to tell you the truth."¹⁶

As Webb reacted, Marshall moved from the shadows to the spotlight. Webb informed von Braun that "The Vice President has expressed considerable concern over the lack of equal employment opportunity for Negroes in Huntsville, Alabama." Johnson directed NASA, the Department of Defense, and the Civil Service Commission to formulate a plan to address the problem. The agencies met on 18 June, and decided to conduct surveys of housing and federal employment practices in Huntsville; to provide assistance to Alabama A&M College and Tuskegee Institute, historically black colleges in Alabama; to meet with Huntsville contractors to find out their plans to ensure equal employment opportunity; and to ensure that blacks be granted a fair proportion of summer jobs at Marshall. Webb directed von Braun to give personal attention to developing equal employment opportunity programs at Marshall.¹⁷

Marshall established an Affirmative Action Program in June, following recommendations offered by a Civil Service team from Atlanta. Dr. Frank R. Albert became the first Equal Employment Opportunity Coordinator. Albert hired Charlie Smoot as a professional staffing recruiter; Marshall claimed Smoot was "possibly the first Negro recruiter in government service."¹⁸

Federal pressure had an immediate impact in Huntsville. With nearly 90 percent of the city economy based on federal funds, Washington had more leverage in Huntsville than elsewhere in Alabama. Federal contractors, most of whom worked for the Army at Redstone Arsenal or NASA at Marshall, recognized that they could lose funding. They met on 5 July at Brown Engineering in Huntsville, formed the Association of Huntsville Area Contractors, or AHAC, and named as their spokesman Milton K. Cummings of Brown Engineering.¹⁹ The committee agreed that contractors should take "immediate positive steps" to increase minority employment, to make "significant financial contributions" to aid black schools, to initiate immediate training programs for blacks, and to use their influence "to make our citizens more conscious of our responsibility in the area of housing, education, and the availability of private and public facilities."²⁰ AHAC agreed to keep NASA informed of its progress.²¹ The group had an immediate impact. L.C. McMillan, a black man who had been a college

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administrator in Texas, arrived three months later to serve as executive director. “I was expecting the usual six months of preparatory meetings when I came here to start the program,” he recalled, “but I was amazed to find that these people wanted to slice away the fat and get right down to the meat of a problem.”²²

The disappointing record of black recruitment at Marshall and its contractors stemmed from barriers that limited black access to scientific and technological education. Huntsville was a microcosm of a larger regional problem. The two colleges in the city divided along racial lines. Alabama A&M was a historically black college that conferred its first B.A. degrees in 1900. The University of Alabama established a Huntsville Center in 1950; like the main campus in Tuscaloosa, it was segregated. The curriculum at Alabama A&M centered on traditional programs at predominantly black colleges: teaching, social science, premedicine, and law.²³ The school had strong programs in the natural sciences and mathematics, but not in the modern engineering disciplines required by Marshall. A&M’s regulations complicated its relations with the Center. As Clyde Foster explained, “Because of the system, we couldn’t use available whites that were qualified to go out and teach at the Alabama A&M University.” And it was difficult to recruit blacks from elsewhere to come to Alabama. Foster, one of the recruiters, remembered, “The image at that particular time was the George Wallace image and made it very difficult for people like myself to go out and to recruit other blacks who could qualify to move into Alabama.”²⁴

Steps toward alleviating inequities in higher education began in the summer of 1963. On 13 June, two days after Governor Wallace blocked for five hours the admission of the first blacks to the University of Alabama, Marshall mathematician David M. McGlathery became the first black to enroll at the university’s Huntsville Center. Unlike the dramatic confrontation in Tuscaloosa, McGlathery’s enrollment proceeded without incident.²⁵

Marshall also began to improve its ties with Alabama A&M. Delegates from Marshall met with state officials to press for increased funding for A&M and for building a library at the school. Marshall representatives also met with A&M officials and officials from Huntsville’s Oakwood College (a black sectarian college) to discuss grants-in-aid and internships. The Center reached beyond Madison County, sending representatives and surplus equipment to other black colleges, expanding recruitment, and inviting representatives from 12 black

colleges to Marshall to discuss cooperative training programs. By the end of the summer, NASA Associate Administrator George Mueller called Marshall's equal opportunity program "imaginative and well rounded."²⁶

Marshall came under fire again in August, when the hearing officer for the Haynes and Curry discrimination cases submitted his report. He found that both men had been victims of discrimination, and recommended that Haynes be promoted and Curry be reassigned to more appropriate duties.²⁷ The report noted that of 7,335 employees at Marshall, only 52 were black, and that blacks comprised only one-half of 1 percent of employees in GS-5 through GS-11 positions. It concluded that "a pattern of discrimination has and continues to exist at Marshall."²⁸

Von Braun accepted the charge of discrimination, but objected to some of the charges in the report as "gratuitous and unwarranted under the circumstances." He contended that the report might damage efforts then underway at Marshall to ensure equal employment opportunities. "While the figures cited in the opinion may be accurate," he argued, "they fail to reflect Marshall's attempts to encourage Negroes and other minority groups to seek employment; that there are few qualified personnel in such minority groups who are located in the area, and that those employed elsewhere are reluctant to move here."²⁹

After the Kennedy assassination and the accession of Lyndon Johnson to the presidency, Webb's advocacy of civil rights became more forceful. The Civil Rights Act of 1964 set new standards for federal agencies. Webb informed von Braun that the principal topic of discussion at a cabinet meeting he attended on 2 July had been the need for effective leadership to implement the Act, and suggested that Marshall's location in Huntsville made von Braun's support essential.³⁰

Webb recognized that the difficulty in implementing equal employment opportunity at Marshall was larger than Huntsville.³¹ On a speaking tour in Alabama in late October, he told civic leaders and businessmen in Montgomery that social conditions in the state made it difficult to recruit scientists, engineers, and managers, and suggested that leaders in Alabama should "address themselves in their own interests to the causes of these difficulties." Congressman Hale Boggs of Louisiana, after a conversation with NASA officials in Washington, announced that "hundreds" of Marshall's top personnel, including perhaps von Braun himself, might be transferred to Michoud.³²

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Alabamians reacted with consternation. “This is a big thing; this is a tragic thing; this is a terrible thing,” railed former Congressman Frank Boykin, who termed the proposal a “dastardly deal.” Boykin suggested that New Orleans, “down there in the marshes, . . . is a fine place to eat and drink, but there can be no better place on earth, if somebody wants to work and do some good for all mankind than Huntsville, Alabama.”³³ Some feared that the state was being punished for political transgressions, since Democratic electors had been left off the state ballot for the upcoming presidential election, virtually conceding the state to Republican Barry Goldwater. One constituent urged Alabama Senator John Sparkman to retaliate for this “political blackmail” by doing something about “the Webb creature,” and complained about “the Negroes having all the rights and the whites having none.” Businessmen worried about the effect of the announcement on impending transactions.³⁴ Sparkman met with Webb and contacted the President, and received assurances that nothing would be done to move operations from Huntsville.³⁵

Webb completed his Alabama tour with a stop in Huntsville. In a speech to Marshall employees and local businessmen, he assured them that NASA wanted to continue Apollo booster work at Marshall, and suggested that if people in Huntsville did their part, the number of employees at Marshall could increase over the next year or two. But he added a caveat: “If we cannot get the seasoned executives here that we need for the management function, then we will do more of this work at other locations.” When questioned about the “apparent” image of Alabama, he replied, “There is an unfavorable image, and we feel it in our recruiting; and the problems we face right now are not as hard as the problems we’re going to face a year from now.”³⁶

Reaction to Webb’s visit was mixed. Civic leaders believed he had given insufficient consideration to the differences between Huntsville and the rest of the state, but at the same time they initiated reforms that made those contrasts more striking. Huntsville Mayor Glenn Hearn established a biracial Human Relations Committee to seek improvement in racial relations, particularly in housing and employment. He set up a civil rights complaint department. Marshall, too, continued to work with community leaders through AHAC, the Marshall Advisory Committee, and the Chamber of Commerce Committee for Marshall Space Flight Center.

Von Braun addressed the Huntsville Chamber of Commerce on 8 December. He reiterated Webb’s argument, saying, “I think we should all admit this fact:

Alabama's image is marred by civil rights incidents and statements." He urged the businessmen to improve Huntsville's facilities for education, transportation, and recreation, but also challenged them to do more "for those less fortunate families who are bypassed by the big space and missile boom."³⁷

In the months that followed, von Braun continued to urge attention to Alabama's racial problems. He lamented that Alabama ranked "near the bottom" in education, that barriers to voting formed "a Berlin Wall around the ballot box." He cautioned that resistance to federal desegregation orders could reduce NASA expenditures in the state. "Obstructionism and defiance . . . can hurt and are hurting Alabama," he warned. The national press referred to him as "one of the most outspoken and persistent spokesmen for moderation and racial reconciliation in the South."³⁸

Other signs seemed to augur for constructive change. Alabama businessmen published a full-page ad in the Wall Street Journal and state newspapers calling for compliance with the Civil Rights Act. County school superintendents, in defiance of Governor Wallace, agreed to comply with provisions of federal law in order to continue to receive federal funds. Webb, taking note of these developments while preparing for a visit to Huntsville, conceded that "certain constructive forces in the state are endeavoring to move ahead to meet modern conditions and to get the past behind them."³⁹

While von Braun and Webb pressed for resolution of Alabama's racial problems, Governor Wallace continued to proclaim "segregation forever." Neither Webb nor von Braun mentioned Wallace by name, but both criticized his policies. Wallace had already had other confrontations with federal officials, of course; another, with NASA, seemed likely. NASA debated protocol over Vice President Hubert Humphrey's planned visit to Marshall: "Governor Wallace has sent feelers about a visit to Marshall. Should he be invited for the V/P meeting? Can V/P and NASA ignore him in his state?"⁴⁰

A confrontation came on 8 June, when Wallace, members of the state legislature, and 48 out-of-state newsmen visited Marshall for a Saturn test firing and addresses by von Braun and Webb. Von Braun urged his audience to "shed the shackles of the past," and suggested that Alabama might not achieve its promise of industrial growth under Wallace's policies. Webb added that "the size and importance of our operations in Alabama require us to add our support to the

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efforts of forward-looking and fair-minded leaders of the state.”⁴¹ When Webb and von Braun asked Wallace in a more informal setting if he would like to be the first person on the Moon, the governor replied, “Well, you fellows might not bring me back.”⁴²

By mid-1965, Huntsville’s leadership—von Braun, businessmen in AHAC, civic leaders, and educators—had shown initiative in seeking to overcome the effects of racial discrimination. Webb’s staff acknowledged that “the city of Huntsville is carrying out a very commendable effort on the local scene to improve matters,” but cautioned that “the solution to the problem is not an impressive list of things that are being done in the Huntsville area. It is a statewide problem that will call for state-wide solutions.”⁴³

Despite a promising start, Marshall’s equal opportunity program failed to alter the employment pattern at the Center. Marshall lagged behind other NASA Centers, consistently failing to meet minority hiring and promotion targets. By late 1969, Marshall had only eight blacks in grades above GS-11; the Manned Spacecraft Center in Houston had 21, and even Kennedy, with a much smaller workforce, had five.⁴⁴ A decade after Marshall initiated its affirmative action program, an internal NASA report singled out Marshall for its harshest criticism: “Most of the other Centers met their modest goals for the first year, with the exception of the Center which had the most extreme lack of proper staff and management support. This Center, located in Huntsville, Alabama, and in need of the most skilled compliance staff, had appointed only one totally inexperienced employee rather than the three highly qualified specialists required. The continuing failure of this Center to meet any of its goals has been repeatedly presented to NASA management which refused to take corrective action.”⁴⁵

Marshall’s shortcomings represented a portion of a larger NASA failure. NASA lagged behind other federal agencies in implementing equal opportunity programs. NASA’s minority employment rose only from 4.1 percent to 5.19 percent between 1966 and 1973, when overall federal minority employment reached 20 percent. Furthermore, most of its minority employees were clustered in lower grades. The Agency’s own EEO staff concluded that “NASA has failed to progress because it has never made equal opportunity a priority.”⁴⁶ Deputy Administrator George Low conceded that “Equal Opportunity is a sham in NASA,” and derided the Agency’s “total insensitivity to human rights and human beings.”⁴⁷

Marshall's achievements in fostering equal opportunity from 1963 to 1965 resulted from pressure from Washington. Webb, agencies charged to enforce the Civil Rights Act of 1964, and occasionally the White House pressured Marshall to change. This pressure declined in the late 1960s, even as the civil rights movement disintegrated into factions and lost popular support as riots charred the ghettos of northern cities. Establishment of a bureaucracy to further civil rights, the result of political pressure inside and outside government, undercut the political activism that had made civil rights progress possible.

Webb's message lost its sting. When asked again about Alabama's image on a visit to Huntsville in 1967, he responded that when he thought of Alabama he thought about the great job Marshall was doing, not about Wallace's opposition to desegregation. He reiterated that difficulties in hiring top managers persisted. Even these remarks, mild in comparison to early threats to move NASA business from Alabama, caused another furor; Huntsville businessmen contacted Senator Sparkman to see if he could do something about Webb.⁴⁸

Institutional limitations also affected Marshall's ability to meet civil rights goals. The Equal Employment Opportunity Program started when Marshall employment was near its peak. In the late 1960s, the Marshall workforce declined in number. NASA continued to shift work to contractors, and imposed reductions-in-force on Marshall as work on Saturn for Project Apollo began to wind down. It was difficult to increase minority employment when overall manpower was declining. Federal regulations for reductions-in-force dictated that the last people hired should be dismissed first, leaving recently hired minorities vulnerable. For the relatively few black scientists and engineers seeking jobs, the uncertainties of NASA's future and the lure of higher salaries elsewhere made employment in the private sector more attractive. NASA argued that given the constraints under which it operated, it was not doing badly; 3.4 percent of NASA's scientists and engineers were black, not far below the national figure of 3.5 percent.⁴⁹ Finally, Alabama's image was slow to change; it continued to be difficult to attract blacks to the state who had the requisite technical training to take jobs at Marshall. Thus Marshall's greatest achievement in civil rights in the 1960s was not in its own record of minority hiring, but in its impact on the community.

Huntsville's Growth

NASA's reconstruction of Huntsville and Madison County extended beyond civil rights. The Space Center also helped change the area's economic structure, social patterns, and educational institutions. NASA decisions and the Saturn program led directly to demographic and material growth in the area.

The Saturn Project helped bring in thousands of "in-migrants" to Huntsville. Aerospace workers moved to the city and thousands of other people followed them, lured by opportunities in a boomtown. At the peak of its growth, local officials estimated that 36 new residents moved into the city each day.⁵⁰ Huntsville's population grew from 16,437 in 1950 to 72,365 in 1960 and to 143,700 in 1966.⁵¹ The vast majority of the newcomers were white, young, urban, professional, and middle class. Huntsville's black population was relatively stable, meaning that the number of African Americans declined as a proportion of the total.⁵²

As more and more people came in, the city faced incredible pressures. Mayor Hearn figured that with the addition of every 1,000 people, the city needed "92 acres of residential land, 23 acres of streets, 13 acres of public land, four acres of retail stores, 263 houses, 550 cars, three miles of paved streets, 150,000 gallons of water a day, two extra policemen, and two extra firemen."⁵³ But like any boomtown the city often could not keep up with its new problems. In the early sixties Huntsville suffered from an inadequate airport, nonexistent public transportation, overreliance on automobiles, traffic congestion, strip development and suburban sprawl, a stagnating downtown, and deficient educational and health institutions.⁵⁴

The area addressed some of these problems relatively quickly. New facilities included a jet airport, three new hospitals, a four-lane "Parkway" to improve traffic flow, and a downtown redevelopment campaign that led to the construction of new civic buildings by the early seventies. Huntsville's public school system improved. School enrollments increased from 3,000 in 1950 to 15,500 in 1960 to 32,000 in 1967, and the city built an average of one new classroom per week between 1956 and 1968. Moreover educational standards and achievement improved. Such improvements came partly because Marshall-Redstone personnel had high expectations for their children and partly because their spouses often became teachers. By the end of the decade 80 to 95 percent of the

city's high school graduates continued on to college as opposed to the Alabama average of only 20 percent.⁵⁵

Marshall and its contractors also contributed to economic changes. NASA spending, combined with the aerospace spending on the Army's Redstone Arsenal, made Huntsville "virtually a one-economy city."⁵⁶ Economists estimated that 90 percent of the city economy in the 1960s was based on federal aerospace programs; Marshall accounted for 40 to 50 percent of the total. At the peak of Saturn work, Marshall and its contractors employed 29.4 percent of the total Huntsville workforce.⁵⁷ When city residents heard the sound of a Saturn test, then Mayor Robert B. Searcy said, "they heard the jingle of a cash register."⁵⁸

The creation of a federal space industry made Huntsville-Madison County less like neighboring rural counties and more like other Southern metropolitan areas. Aerospace dethroned agriculture in the local economy and "King Space" took the seat of "King Cotton."⁵⁹ The overthrow took material form when Chrysler, IBM, and Boeing refurbished a textile factory in the old Lincoln mill district and used it for Saturn work.⁶⁰ But unlike agriculture or the textile industry, the space industry offered "good jobs." Research and development jobs were interesting and innovating, employed skilled professionals, managers, and technicians, and paid middle-class salaries. In the space economy most people worked for the Federal Government and big, prominent "core" firms like Boeing and Chrysler. These employers offered workers considerable financial benefits and career opportunities.⁶¹

Not surprisingly residents of Madison County during the early sixties were on average prosperous. The county had the highest per capita income of any county in the state.⁶² The annual rate of growth of personal income in the city grew at more than twice the national rate between 1959 and 1966.⁶³ Huntsville, one visitor noted, was "an island of affluence afloat in agricultural Alabama."⁶⁴

Despite overall gains, the Saturn program could not correct existing income inequalities in the area. Per capita income in Huntsville was 50 percent of the national average in 1960 and only 80 percent in 1967. Income was less equitably distributed than the national average; in comparison with the rest of the nation, more income in Huntsville went to the richest 20 percent of the population.⁶⁵ A wage gap existed between employees in the space sector and those in the county's service, agricultural, and industrial sectors.⁶⁶ In addition, since

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space jobs went primarily to qualified whites, space spending helped perpetuate racial inequities. So although professional and technical jobs constituted 60.5 percent of total employment by NASA's Huntsville contractors, only 30 percent of their black employees worked in professional and technical jobs.⁶⁷ Black average income continued to run far behind that of whites.⁶⁸

The Saturn project changed the Huntsville economy. Local companies often blossomed with NASA contracts. For example, Brown Engineering, formerly Alabama Machine and Tool and currently Teledyne-Brown Engineering, grew from a small, local contractor to a prominent, national aerospace engineering firm. In other cases, Marshall helped firms use space hardware for commercial purposes. Technological "spinoffs" from Marshall's research and development in the 1960s included polyurethane insulation for construction and flat electrical cables and connectors.⁶⁹ Marshall also helped develop and disseminate to industry innovations in alloys, metal forming and bonding technology, welding techniques, metal grinding, and finishing machines. These improvements in metallurgy and machining were the Center's most important industrial innovations.⁷⁰ In other cases, the import of technical expertise encouraged the formation of new high technology companies that did not depend on government contracts. For instance, a computer specialist, who had originally come to Huntsville to work on Saturn's IU, formed Intergraph, a computer and software firm that by the 1980s would grow into a Fortune 500 company with worksites across the globe.

Despite these successes, in the late 1960s and early 1970s, Huntsville was as dependent on federal funding as a city could be. If NASA pulled the plug on space spending, half the city would go down the drain. In 1966 a Marshall study warned that Apollo budget cuts would result in mass exodus, "large numbers of home mortgage defaults, business failures, and a serious regression in the overall economy." Besides depression in the city, cutbacks would devastate the Center, "one of the world's finest technological institutions."⁷¹ A NASA Headquarters report agreed, finding that the costs of allowing Huntsville's infrastructure to decline were "greater than the costs of sustaining it until it achieves a critical mass and diversification."⁷² When NASA's spending on Apollo began to constrict in the late 1960s, both the city and the Center would face years of uncertainty and austerity.

Marshall officials foresaw some of the troubles and recognized that the Center and the city of Huntsville were interdependent. Von Braun worked with civic and commercial leaders to create a social and educational environment that could facilitate economic growth and diversity. He cooperated with Army, business, and civic leaders to establish Cummings Research Park. Research Park eventually became a center for businesses specializing in advanced technology research, manufacturing, and management.⁷³

Von Braun also promoted education, especially university education. He recognized that Huntsville needed high quality academic and research institutions to attract and retain skilled people and to maintain NASA's investment. Therefore von Braun said his goal was to help Alabama get the nation's "Number 1 educational center for rocket and space technology" just as it had the "Number 1" football and rocket teams. He lobbied the state to upgrade the Huntsville Extension Center of the University of Alabama in Tuscaloosa. In 1961 von Braun successfully appealed to the Alabama legislature for a \$3 million bond issue to create a research institute on the extension Center's campus. With Marshall's support, the Center extended its graduate offerings and in 1966 became the University of Alabama in Huntsville (UAH), an independent campus in the Alabama system. UAH specialized in science and engineering and soon had millions of dollars in NASA contracts.

By improving Huntsville's educational and research institutions and bringing in skilled people, von Braun and NASA helped create Apollo's most important spinoff. The schools and skilled workers created an "environment for growth" and planted the seeds that would, in the long term, produce economic diversification in Madison County.⁷⁴

In addition, Marshall's Saturn rockets became the centerpiece in one of Huntsville's most visible concerns. The Space and Rocket Center opened in 1970 and housed an aerospace museum, theme park, and camp for children. The facility had a Saturn I and Saturn V on display and became the state's most popular tourist attraction. In becoming marketable as museum exhibits, the Saturns were a permanent spectacle that directed attention to the political and symbolic goals of the Apollo program.⁷⁵

In sum, many of Marshall's important achievements in the 1960s were side effects of its main mission of space exploration and technological innovation.

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Because of the Center, Huntsville and Madison County experienced a federal reconstruction of many social relationships and economic patterns. In race relations, the Center worked to open employment opportunities. In the economy, Marshall contributed to growth and diversity. In education, it helped improve public schools and form a new university and research center. The Marshall Center transformed Huntsville from the Watercress Capital of the South into Rocket City, U.S.A.

- 1 Loyd S. Swenson, "The Fertile Crescent: The South's Role in the Space Program," *Southwestern Historical Quarterly* 71 (1967–68), pp. 377–92.
- 2 Walter A. McDougall, *...the Heavens and the Earth: A Political History of the Space Age* (New York: Basic Books, Inc., 1985), p. 376.
- 3 Swenson, p. 376.
- 4 See Dale Carter, *The Final Frontier: The Rise and Fall of the American Rocket State* (London: Verso, 1988), esp. pp. 199–210.
- 5 Our following discussion on civil rights in its draft manuscript form was used in the preparation of *Wernher von Braun: Crusader for Space* by Ernst Stuhlinger and Frederick I. Ordway III (Krieger Publishing Company, 1994), pp. 187–88.
- 6 McDougall, p. 376.
- 7 Luther J. Carter, "Huntsville: Alabama Cotton Town Takes Off into the Space Age," *Science* 155(10 March 1967), p. 1228. "If Bayonets Come . . .," *Huntsville Times*, 9 June 1963.
- 8 Art Sanderson, Oral History Interview by Andrew J. Dunar (hereafter OHI by AJD), 20 April 1990, Huntsville, Alabama.
- 9 *Huntsville Times* clippings, 5 January to 24 March 1962; Richard Haley to Marvin (no last name given), 15 January 1962; and Richard Haley, "Case History of a Failure," 7 March 1962, Reel 17, Series V, Papers of the Congress of Racial Equality (CORE), Martin Luther King, Jr. Center, Atlanta, Georgia.
- 10 Ray Kline to Colonel L.W. Vogel, 11 May 1965, MSFC Directors Files, National Archives Depository Atlanta.
- 11 In 1962, black per capita income was \$2,457; white per capita income was \$5,386. Robert A. Myers, "Planning for Impact: A Case Study of the Impact of the Space Program on Huntsville, Alabama," M.A. Thesis, (New York University, 1967), p. 99.
- 12 One report claimed that "Negro housing, ghetto areas excepted, was virtually nonexistent." MSFC Manpower Office, "A Chronology of the Equal Employment Opportunity Program at MSFC," February 1971, pp. 2–3.
- 13 Clyde Foster, OHI by AJD, 23 April 1990, Huntsville, Alabama.
- 14 "Findings and Recommendations of the Hearing Officer, E. J. Spielman, in the Matter of the Complaints of Joseph Ben Curry and Joe D. Haynes," 5 August 1963, VI–M Discrimination Cases 1962 folder, Personnel—Legal Opinions File, Legal Office, MSFC.
- 15 Alfred S. Hodgson, NASA Headquarters, to Director, MSFC, telegram, 25 April 1961; von Braun to Hodgson, telegram, 27 April 1961, MSFC Directors Files, National Archives Depository Atlanta.

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- 16 Arthur M. Schlesinger, Jr., *Robert Kennedy and His Times* (Boston: Houghton Mifflin Company, 1978), pp. 335–36.
- 17 Webb to von Braun, 24 June 1963, Minority Groups folder, NASA History Division Documents Collection, NASA Headquarters, Washington, DC.
- 18 MSFC Manpower Office, “A Chronology of the Equal Employment Opportunity Program at MSFC,” February 1971, p. 5.
- 19 The organization was originally known as the Huntsville Contractors Equal Employment Opportunity Committee, but soon assumed the title AHAC. Cummings later founded the Huntsville-Madison County Community Action Committee, and became its first chairman.
- 20 Report of meeting of Huntsville Contractors, 5 July 1963, MSFC Directors Files, National Archives Depository Atlanta.
- 21 Report of meeting of Huntsville Contractors, 5 July 1963, MSFC Directors Files, National Archives Depository Atlanta.
- 22 *Huntsville Times*, 24 April 1966, 8 May 1966.
- 23 MSFC Manpower Office, “A Chronology of the Equal Employment Opportunity Program at MSFC,” February 1971, p. 3.
- 24 Clyde Foster, OHI by AJD, 23 April 1990, Huntsville, Alabama.
- 25 *Huntsville Times*, 13 June 1963.
- 26 Von Braun to Webb, 15 July 1963; Mueller to Webb, 24 August 1964, MSFC Directors Files, National Archives Depository Atlanta. When the representatives of the 12 colleges visited Huntsville in July, they stayed at a local motel that had previously been segregated. MSFC Manpower Office, “A Chronology of the Equal Employment Opportunity Program at MSFC,” February 1971, p. 6.
- 27 The recommendation regarding Curry was made moot by his resignation on 20 September. Haynes was promoted. Harry Gorman to von Braun, memorandum, 20 September 1963, MSFC Directors Files, National Archives Depository Atlanta.
- 28 “Findings and Recommendations of the Hearing Officer, E. J. Spielman, in the Matter of the Complaints of Joseph Ben Curry and Joe D. Haynes,” 5 August 1963, VI–M Discrimination Cases 1963 folder, Personnel—Legal Opinions File, Legal Office, MSFC.
- 29 Von Braun to Webb, 24 September 1963, VI–M Discrimination Cases 1963 folder, Personnel—Legal Opinions File, Legal Office, MSFC.
- 30 Webb to von Braun, 13 July 1964, MSFC Directors Files, National Archives Depository Atlanta.
- 31 Webb had earlier acknowledged to von Braun that “The problems you face in this area [equal employment opportunity] are somewhat more difficult than they may be in other parts of the country.” Webb to von Braun, 19 April 1963, MSFC Directors Files, National Archives Depository Atlanta.
- 32 *New York Times*, 24 October 1964. Speaking in Florence, Webb claimed that NASA had offered one vital post at MSFC to about 30 executives, all of whom turned it down. *Huntsville Times*, 19 January 1967.
- 33 Frank W. Boykin to Thomas W. Martin, 26 October 1964, Federal Government-NASA folder, Box 66A677, No. 7, John J. Sparkman Papers, Special Collections, University of Alabama, Tuscaloosa, Alabama. Boykin, who was from Mobile, retired from Congress in January 1963 after serving nearly 18 years.

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- 34 Marian Cook to Sparkman, 28 October 1964; Hugh Morrow, Jr. to Sparkman, 27 October 1964; David Henderson Head to Sparkman, 26 October 1964, Federal Government-NASA folder, Box 66A677, No. 7, John J. Sparkman Papers, Special Collections, University of Alabama, Tuscaloosa, Alabama.
- 35 Sparkman to Boykin, 29 October 1964, Federal Government-NASA folder, Box 66A677, No. 7, John J. Sparkman Papers, Special Collections, University of Alabama, Tuscaloosa, Alabama.
- 36 *Marshall Star*, 4 November 1964; Webb, transcript of remarks to Huntsville Chamber of Commerce, October 1964, MSFC History Office. Webb to Congressman Robert R. Casey, 17 November 1964, NASA-Marshall Space Flight Center folder, box 170, Webb Papers, Harry S. Truman Library, Independence, Missouri.
- 37 Wernher von Braun, "Huntsville in the Space Age," Address to Huntsville-Madison County Chamber of Commerce, 8 December 1964, MSFC History Office.
- 38 Ben A. Franklin, "Von Braun's New Role—Racist Critic," *San Francisco Chronicle*, 16 June 1965. Franklin was a *New York Times* correspondent.
- 39 Webb to Drs. Bisplinghoff, Mueller and Newell, memorandum, 3 May 1965, Alabama State Legislature-MSFC folder, box 222, Webb Papers, Harry S. Truman Library, Independence, Missouri.
- 40 "JW" to Mr. Scheer and Mr. Callaghan, 10 March 1965, George C. Wallace Biography folder, NASA History Division Documents Collection, NASA Headquarters, Washington, DC.
- 41 *New York Times*, 9 June 1965. That evening, Webb addressed AHAC. He praised Milton Cummings, Arthur Pilling, and the organization for having "truly taken affirmative action to assure equal employment opportunity in Huntsville." "Remarks for Mr. Webb to Use at Meeting with Association of Huntsville Area Contractors," 8 June 1965, Alabama State Legislature-MSFC folder, box 222, Webb Papers, Harry S. Truman Library, Independence, Missouri.
- 42 Ben A. Franklin, "Von Braun's New Role—Racist Critic," *San Francisco Chronicle*, 16 June 1965.
- 43 Ray Kline to Colonel L. W. Vogel, 11 May 1965, MSFC Directors Files, National Archives Depository Atlanta.
- 44 George Low to Robert J. Brown, 24 June 1970, Minority Groups folder, NASA History Division Documents Collection, NASA Headquarters, Washington, DC.
- 45 "NASA Equal Opportunity Program," appended to Ruth Bates Harris, Joseph M. Hogan, and Samuel Lynn to James C. Fletcher, 20 September 1973, NASA History Division Documents Collection, NASA Headquarters, Washington, DC.
- 46 *Ibid.* The Headquarters staff further complained that "Appropriate statements have been issued, but when the commitment is tested, it is found lacking. A sound equal opportunity staff was permitted to be formed, but it has been continuously kept short of resources and under the control of insensitive middle management. Field installations have been required to establish equal opportunity offices, but in cases where they proposed to appoint unqualified, uncommitted persons to staff these programs, the objections of the Headquarters Equal Opportunity staff were overruled."
- 47 "Excerpt of Remarks by Dr. George M. Low before Conference on EEO," undated

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- (apparently 1973), NASA History Division Documents Collection, NASA Headquarters, Washington, DC.
- 48 Webb to Hubert H. Humphrey, 17 March 1967, Center file, MSFC Correspondence folder, NASA History Division Documents Collection, NASA Headquarters, Washington, DC.; *Huntsville Times*, 19 January 1967.
- 49 Levine, p. 121.
- 50 Roger W. Hough, "Some Major Impacts of the National Space Program, V. Economic Impacts," (Menlo Park, CA: Stanford Research Institute, June 1968), p. 23, MSFC History Office.
- 51 MSFC, "Apollo Phase Out Economic Impact Study," 15 September 1966, MSFC History Office.
- 52 Robert A. Myers, "Planning for Impact: A Case Study of the Impact of the Space Program on Huntsville, Alabama," (M.A. thesis, New York University, 1967), chap. V.
- 53 Dolan, p. 46.
- 54 Myers, chap. III. For a discussion of changes in Huntsville in the 25 years after the founding of the Redstone Arsenal, see a 16-page supplement to the *Huntsville Times*, 3 November 1974, hereinafter cited as Supplement.
- 55 Virgil Christianson, "Space Era's Impact on Community," *Huntsville Times* (1 January 1968); Don Eddins, "City Schools Faced Growth Unprecedented," Supplement, p. 11; Bilstein, pp. 390–94; Hough, pp. 20–21.
- 56 "'Rocket City' Lives on 'Space Economy,'" *New York Times* (28 June 1960).
- 57 Mary A. Holman, *The Political Economy of the Space Program* (Palo Alto, CA: Pacific Books), pp. 200, 203–205; Myers, chap. IV.
- 58 Paul O'Neill, "The Splendid Anachronism of Huntsville," *Fortune* 65 (June 1962), p. 238.
- 59 Patricia Dolan, "Huntsville—Space City, USA," *GE Challenge* (Spring 1968), p. 45.
- 60 O'Neill, p. 231.
- 61 See discussion of Standard Metropolitan Statistical Areas in William W. Falk and Thomas A. Lyson, *High Tech, Low Tech, No Tech: Recent Industrial and Occupational Change in the South* (Albany, NY: State University of New York, 1988), esp. pp. 11, 16, 37–49.
- 62 R.M. Nicholson, "Economic Impact Study, Apollo Program Supplementary Data: Comparison of Decatur, Alabama with Huntsville," 5 December 1966, MSFC History Office.
- 63 Holman, p. 206.
- 64 Rudy Abramson, "Huntsville—A City with a Case of Moon Madness," *Los Angeles Times* (5 June 1966).
- 65 Holman, pp. 207–09.
- 66 Myers, chap. IV, esp. p. 65.
- 67 MSF Field Center Development, "Economic and Social Benefits of the Manned Space Flight Program," no date, MSFC History Office, pp. 30, 32.
- 68 Myers, p. 99.
- 69 MSFC Manpower Office, Administration and Technical Services, "Impact of MSFC on Local Business and Government," 8 June 1971, MSFC History Office.
- 70 Bilstein, pp. 396–97, 399.
- 71 MSFC, "Apollo Phase Out Economic Impact Study," 15 September 1966, pp. 16–17, MSFC History Office.

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- 72 MSF Field Center Development, "Economic and Social Benefits of the Manned Space Flight Program," no date, p. xxii, MSFC History Office.
- 73 Wernher von Braun, "Remarks to Alabama Legislature," 20 June 1961, "Ground Breaking Ceremony, UAH Research Institute," 20 December 1962, MSFC History Office; UAH, "Summary Report: Self-Study for Reaffirmation of SACS Accreditation," January 1985; Bilstein, pp. 392–93; "City's Research Park Among Nation's Finest," Supplement, p. 6; Don Eddins, "University of Alabama Spreads Wings," Supplement, p. 13.
- 74 Hough, pp. 8–15.
- 75 Michael L. Smith, "Selling the Moon: The U.S. Manned Space Program and the Triumph of Commodity Scientism," in Richard Wightman Fox and T.J. Lears, eds., *The Culture of Consumption: Critical Essays in American History, 1880–1980* (New York: Pantheon, 1983), pp. 175–209.