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COOPERATIVE SCIENCE: ORIGINS OF THE WILLIAM JOHNSON McDONALD OBSERVATORY, 1926-1939

by Laura Wimberley

During the Progressive era, several western states expanded and improved their public colleges and universities. Previous reliance on publicly funded state universities and a minimal system of high schools had hindered the region and it had not yet established its now renowned reputation for scientific study. In the two preceding decades, what scientific prestige the region enjoyed came mostly from privately endowed centers for oceanography and astronomy, particularly the University of California's Lick Observatory and the Harvard University-administered Lowell Observatory in Flagstaff, Arizona. Western historian Gerald Nash argues that "the strengthening of universities and scientific research centers in the West during the Progressive era provided the institutional framework for cultural experimentation in the future." In the 1920s, many scientists moved westward to take advantage of the comparative academic freedom of the new universities and of the more temperate climate. With discoveries such as that of the planet Pluto made in western observatories, the region began to make "a national impact on scientific research" on the eve of the Great Depression. Yet, the severity of the national economic downturn, coupled with the region's rapidly increasing population, strained public education facilities and threatened the future growth of this research.¹

In light of prevailing trends in the West between 1930 and 1940, the establishment of the University of Texas William Johnson McDonald Observatory seems an improbable development. The observatory's origins during the Great Depression suggests the possibility of federal assistance through direct funding or a provision of relief work. Ironically, this western research center arose in the throes of the Depression without the direct assistance of the New Deal. The observatory originated in a Cinderella story of sorts: originally the dream of one East Texan, the observatory eventually bound together Texans from every region. The development of the observatory presaged the western boom of "Big Science" by creating a new spirit of cooperation between two distinct university systems, the University of Texas (UT) and the University of Chicago.

Early in the twentieth century, the University of Texas, like many other western public universities, found itself with limited funds. Particularly during the governorship of James E. Ferguson (1915-1917), UT faced great obstacles in obtaining adequate funds to provide a basic curriculum, let alone any for enhancement of the university's research capabilities. Loudly decrying the influence of academic "elites," Governor Ferguson preferred spending educational funds on elementary and high school programs, particularly in the rural areas of Texas. The election of Miriam Ferguson to two year terms (1925-1927; 1933-1935) did not improve the university's position. Soon after her

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first election, "Ma" Ferguson, acting for her husband, "appointed three new regents, all more or less hostile to the old board" appointed by Governors William P. Hobby and Pat Neff. The old board had sought to expand the university's reputation through a broadening of both the curriculum and research capabilities.²

From its founding, UT sought national recognition as "a university of the first class" as promoted in the state Constitution of 1876.³ Despite this lofty aspiration, the university often felt like a step-child in comparison to the nation's major research universities. One primary goal of UT administrators was the development of an astronomy program. Interim President John William Calhoun wrote in 1924:

Among the pressing needs of the University of Texas is an astronomical observatory. When the University opened in 1883 it was planned to add astronomy to the curriculum at an early date, but no courses in astronomy were given until 1889; and there is at the present time not even a student observatory on campus... much less a research observatory with a large telescope such as are possessed by the Universities of California, Wisconsin, and Chicago.⁴

Due to the lack of funds, this goal seemed just as unattainable in 1924 as it had been for the past forty years.

Luckily for the university, a "fairy godfather" granted their wish two years later. William Johnson McDonald, an eighty-one year old bachelor banker from Paris, Texas, died on February 6, 1926. Leaving behind an estate valued at \$1.5 million, McDonald composed an unusual will bequeathing \$15,000 to each of eight heirs, and setting aside \$1,500 for his own grave. McDonald left about \$1 million of the remaining estate to UT "to erect and equip, or to aid in erecting and equipping, an astronomical observatory for the promotion and study of the science of astronomy." Naming the school's Board of Regents as trustees of the "William Johnson McDonald Observatory Fund," McDonald put no limits on the use of the fund.⁵

Shocked University of Texas administrators had no prior knowledge of the bequest but hailed the gift as "one that will provide for scientific research not possible otherwise." Dean Harry Benedict quickly announced plans to build an observatory larger than California's Lick Observatory. McDonald's bequest seemed especially puzzling since he had expressed no interest in UT prior to his death. The university newspaper the *Daily Texan* reported, "Mr. McDonald, so far as is known, had never visited the University and it was not known that he was especially interested in its welfare." UT President W. M. W. Splawn had met McDonald in Paris in 1914, but did not recall discussing a bequest. One member of the Dallas Astronomical Society, Dr. A. D. Laugenour, claimed that the Society's members had influenced McDonald to leave the bequest through their activities, although McDonald never joined the organization.⁶

Regardless of this speculation, McDonald most likely decided upon the bequest after his experiences at Harvard University in 1895-1896. While taking courses in botany at the university, he also visited the Harvard College

Observatory and soon took up astronomy as a hobby, reading books and purchasing a small telescope. Years later, McDonald told a friend that "astronomy is a wonderful science, but it is neglected by the colleges...They [the Northeast] have a lot better colleges than those in this section, because the rich people give the schools more money. And it takes a lot of it." He quietly decided to make use of his wealth to promote astronomy in his native state.⁷

Regardless of McDonald's noble intentions to further the study of astronomy, his other legatees resented his gift to the university. The family contested the will's validity in March 1926, claiming that McDonald had not been of sound mind. The case went to court five times, and UT fought back under the representation of Texas Attorney General Claud Pollard. The university brought in notable astronomers from around the country who testified that an interest in astronomy "did not necessarily indicate instability." After three years the courts probated the will on March 21, 1929 with \$1.26 million set aside for UT.⁸ Court costs and a separate out-of-court settlement reduced the amount available to UT to about \$900,000. State Senator Charles R. Floyd of Paris previously had maneuvered Senate Bill 254 through the legislature to exempt the observatory fund from state inheritance taxes in 1927, saving the university an estimated \$60,000 to \$80,000.⁹

In spite of the challenge to McDonald's will, the University of Texas received offers of land and suggestions about the proposed observatory from across the state immediately after the bequest in 1926. The far Southwest Texas community of Alpine sent a "Claims of Alpine" letter to the UT regents on February 25, 1926 to suggest Brewster County. The San Antonio Express suggested a home for the observatory southwest of that city and El Paso lobbied for nearby Mount Franklin. The Austin Chamber of Commerce requested private donations of 320-acre tracts of land west of Austin for the observatory. The Chamber received offers of twelve sites around the city, including Mount Barker, Cat Mountain, Jollyville, Anderson Mill, and Oak Hill. Despite these and other offers, university trustees chose to delay site selection until they legally secured the funds. Once the court ruled that the university could have \$900,000, the path seemed clear to select a site and begin construction. However, in January 1930, University of Texas President Harry Benedict made known his dissatisfaction with the prospect of a \$900,000 observatory; he announced that the university would wait ten years to build the observatory and put the money "on interest" in the meantime.¹⁰

The unstable financial climate of the times may have influenced Benedict's decision. The stock market crash of 1929 and the pervasive Depression which followed affected nearly every American, and greatly constricted the available funds for universities. State appropriations for higher education decreased by an average of thirty percent; most western universities responded by "reducing their faculties, and by cutting salaries of those who remained."¹¹ The Great Depression uprooted many Texans, sending them far afield in search of employment while communities scrambled to employ and feed their citizens. Benedict was understandably cautious about utilizing the bequest for a project which might appear frivolous in the context of the times.

As economic depression took its toll across the country, the Yerkes Observatory at the University of Chicago determined that it did not have the funds to build a previously planned observatory in the southern United States.¹² The astronomers preferred a southern latitude which would allow them to see more of the sky than possible at northern observatories. After some investigation, the Yerkes administrators discovered that the University of Texas had the money to build an observatory, but could not afford to staff it. The Yerkes administration theorized that cooperation between the University of Chicago and the University of Texas could provide a solution to both of their problems and allow the two institutions to proceed with their development in spite of their respective financial restraints. After several discussions, Texas and Chicago reached an agreement to jointly build and staff an observatory, officially announcing this agreement at the meeting of the International Astronomical Union at Harvard in 1932.

Otto Struve of the Yerkes Observatory later explained the universities' motivation for cooperation:

The cost for up-to-date equipment for astronomical research has steadily increased during the last hundred years. ... It is obvious that few, if any, of the existing American universities will be able to keep pace with this rapid increase in cost of astronomical instruments. ... There can be no doubt that the spirit of rivalry of our universities in striving to possess the largest or most powerful telescope in the world has brought about an overproduction of telescopes that now rank as small or moderate in size, and a consequent division of effort which might have been more usefully coordinated.

Since the advancement of astronomy must depend upon large and expensive equipment, the most natural course would be one of cooperation between several institutions in the construction and operation of one large instrument in place of several small and inefficient ones. This simple fact has been realized for a long time. The astronomical agreement between the University of Chicago and the University of Texas is, to my knowledge, the first definite attempt in this direction. The agreement owes its inception to the active interest and whole-hearted co-operation of the two presidents, Dr. Hutchins of Chicago and Dr. Benedict of Texas, and its completion to the broad-minded and progressive attitudes of the governing boards of the two institutions.¹³

The Chicago-Texas agreement marked the first cooperative effort by two American universities on such a large research project. Struve attempted to dispel potential problems between the cooperative team and other observatories by writing "to the heads of all important observatories to acquaint them with [the] plans and to invite their comments and suggestions...[he] knew that there might be resentment if the Chicago-Texas agreement were kept secret."¹⁴

The Chicago-Texas agreement earmarked the McDonald funds for construction of the observatory while Chicago's Yerkes astronomers staffed it. UT contributed about \$10,000 per year to the thirty-year project and Chicago contributed \$6,000 per year. The two universities agreed to name Struve as the director and left selection of the observatory site to the scientific community.¹⁵

The two universities allied themselves uneasily until the completion of

McDonald Observatory and its dedication; neither felt entirely comfortable in this new academic partnership. In characteristic mistrust of northern involvement in the state, a few of the University of Texas regents appointed by Governor Miriam "Ma" Ferguson questioned the nature of the agreement and the direction of the project by the Yerkes astronomers. The University of Chicago in turn feared that the University of Texas would take advantage of the astronomers' knowledge and funds for establishing the observatory and then end the contract. Despite their joint misgivings, the observatory plans went quickly into motion.¹⁶

The first item on the observatory agenda remained site selection. The University of Texas continued to receive suggestions on the observatory's location from all over the state. In addition to earlier suggestions from El Paso, Austin, San Antonio, and Alpine, the City of Marfa suggested Mount Livermore in the Davis Mountains. Sul Ross State College President H. W. Morelock offered to build a road up Mount Ord or any other place in Brewster County, and the plains around Amarillo also came into the picture as Chicago joined Texas in the venture. The UT regents faced a tough political decision in selecting the observatory site because larger population centers around the state pressed the university to select their cities.

Initially, the University of Texas desired a site close to its Austin campus. They felt El Paso was also easily accessible, but Fort Davis and Alpine seemed too remote to them. But the mountains surrounding these smaller towns gave them a comparative advantage over most other options. Most scientists insisted that the site needed an altitude of 6,000-7,000 feet and that for maximum image quality the atmosphere should be stable and transparent. Astronomers desired an area with a low population density at least two miles away from any house or street lights, and well away from the rumbles of trains and other noise. Additionally, they looked for a region with a dry climate and many cloudless nights.¹⁷

Struve sent C.T. Elvey and T.G. Mehlin, Jr., of Yerkes on a field expedition in June 1932 to find a site. The team tested sites across Texas and in eastern New Mexico, including Jollyville, the Davis Mountains, College Hill in Austin, the Hueco Mountains and Mount Franklin near El Paso, and El Capitan in the Guadalupe Mountains. After comparing their tests to similar tests taken at Mount Milson and Lowell observatories, Elvey and Mehlin recommended the Davis Mountains region. They chose three of the peaks for further study: Black or Spring Mountain, Blue Mountain, and Little Flat Top.¹⁸

These Davis Mountain sites easily met the scientists' criteria. The population in the surrounding Jeff Davis County was comparatively low at 0.8 people per square mile, and the nearest town in the county, Fort Davis, had a population of about 700 people. Each mountain stood over 7,000 feet and remained distant from street lights, trains, noise, smoke, and the dust of civilization. The area had an extremely dry climate and boasted of 300 days of sunshine per year. The three mountains had good altitude, clear atmosphere, and were on the appropriate latitude. The Yerkes experts declared that "the Davis Mountain

peaks afford unsurpassed visual conditions and the proportion of clear nights is much higher there than at Williams Bay," the home of the Yerkes Observatory outside Chicago.¹⁹

Struve came to Fort Davis to verify the information. He developed a congenial rapport with the people of Fort Davis who acted as his guides and visited his campsite. Struve rejected Spring Mountain due to its limited rocky areas (needed to build such a large edifice) and rejected Blue Mountain due to its greater exposure to weather at the edge of the Davis Mountain range. He felt Little Flat Top would be adequate, but preferred two other nearby sites, Flat Top and U Up and Down Mountain. Struve reasoned that U Up and Down was five miles nearer to Fort Davis than the other mountains under consideration and that the chances of finding water would be better there.²⁰

Struve chose a site 6,809 feet above sea level and ten miles northwest of Fort Davis at 104° 1.3' W longitude, 30° 40' N latitude. This particular mountain stood forty miles from the nearest railroad, sixteen miles from any street lights, and had more foliage to keep the dust and radiation down than the other peaks. The area also boasted dead silence in the evenings. However, the land was held under trust by Mrs. Violet Locke McIvor of Concord, New Hampshire, who leased the U Up and Down Ranch to local rancher Walter W. Negley.²¹

In an effort to persuade McIvor to donate the mountain for the observatory, local businessman W.S. Miller of Fort Davis proposed that the U Up and Down mountain be renamed Mount Locke (after McIvor's grandfather) and sent the name to the U.S. Commission on Geographical Place Names.²² McIvor appreciated the sentiment, but had already donated 200 acres for a state park and was reluctant to give any more land to the state. She suggested that the university obtain 200 acres from someone else to use for the state park and swap the parcels. Judge Edwin Fowlkes agreed to give 200 acres from his ranch on Little Flat Top for use as a state park, and the swap was made. Within twenty-four hours of receiving the deed to the McIvor property on April 17, 1933, the Texas Legislature passed a bill to build a road for Mount Locke.

While the UT Board of Regents had not yet given its official approval of the site, the people of the Davis Mountains area met the news of the land deal with enthusiasm. Fort Davis residents began to assist the project without any authorization from the university. In addition to W. S. Miller arranging and providing collateral for the land swap, the county commissioners quickly began to survey and build the road in April 1933. Another rancher, J.W. Merrill, had surveyed the land and ran lines around the property, and Sul Ross College in nearby Alpine donated a classroom and office space for the astronomers' use. The observatory already had brought work to the area without the site having been selected officially. After visiting Mount Locke, the regents gave their official approval of the site on August 9, 1933.²³

The university awarded the Warner & Swasey Company of Cleveland a contract to build the observatory on September 8, 1933. Warner & Swasey estimated the cost for the construction of the observatory and the world's second largest telescope at \$325,000. The 5000-pound telescope boasted an

eight-two inch diameter mirror made of the new Corning "special heat-resisting glass" now known as Pyrex. Reflecting the newest technology, the mirror had an aluminum and chromium coating instead of the traditional silver because these rugged metals do not need constant recoating and possess a high reflecting power. The twenty-six-foot long reflector telescope was supported by two piers which required 450 tons of concrete and ten tons of reinforcing steel. A seventy-one-foot high structural steel cylinder surmounted by a rotatable hemispherical dome of sixty-two feet in diameter housed the telescope.²⁴

The Warner & Swasey contract immediately stimulated the local economy and served as a Depression-era safety valve in Brewster, Jeff Davis, Presidio, and Pecos counties. A State Highway crew constructed the 8,000 foot road to the observatory, and drillers from Fort Stockton searched for usable water. A sub-contractor, Paterson-Leitch Co. of San Antonio, hired workers to build the concrete and steel piers and lay the foundation.²⁵

During 1933, construction workers included four men from San Antonio, four white men and seven "Mexicans" from Fort Davis, two men from Valentine, two white men and four "Mexicans" from Alpine, one man from San Angelo, and two men from Dallas. The men performed jobs as various as acting as foreman, carpenter, carpenter helper, shot firer, surveyor, hauling materials and equipment, or excavating. A second count in 1935, found that the construction workers included three men from Marfa, three men from Fort Davis, eight men from San Antonio, three men from Alpine, and five men from Ingleside, Waco, and Junction. These Texans worked as haulers, steel workers, steel welders, riveters, painters, and carpenters.²⁶

The project coordinators from Chicago and Cleveland referred to all of these workers as "local." Workers brought their wives and children with them and lived either in tents on Mount Locke or with families in the area. Often these were the first jobs they had obtained in two to three years. Paychecks resulted in great excitement: in 1935, Barry Scobee wrote, "They were being careful of their new curiosities - cents and dollars. Some men laughed like kids and kissed their first checks. One steel worker showed his first check to this writer with a grin that was all but drowned in tears." In a separate project, Dallas State Senator Thomas Love arranged for relief labor to finish the last fifty miles of the Scenic Loop Road past Mount Locke. Not all work was done on-site. Paterson-Leitch Co.'s Cleveland branch made a full-size drawing of the dome structure and built a wooden model of the dome to guarantee quality workmanship. The dome was assembled in Cleveland, taken apart, shipped in several pieces to Texas, then reassembled at Mount Locke.²⁷

Although astronomers began using a small twelve-inch telescope at the observatory site in October 1934, and the new eighty-two inch telescope in March 1939, the formal dedication and opening of the Observatory took place on May 5, 1939. A festive atmosphere permeated the dedication. Invited state and university dignitaries rode a chartered train from San Antonio to Alpine, and the Texas State Radio Network broadcasted the proceedings. The dedication ceremony was held in conjunction with a meeting of the American

Association for the Advancement of Science at Sul Ross College in Alpine. Notable astronomers from all over the world presented significant scientific papers on astrophysics and other matters during the three-day conference. Prior to the dedication ceremony, the Warner and Swasey Co. hosted a rodeo barbeque at the nearby Prude Ranch.²⁸

In a cruel twist of fate, rain, thunder, and lightning punctuated the dedication speeches. The weather could not dampen the spirits of the attendees. Several speakers claimed that the McDonald Observatory's telescope gave astronomers the greatest range of any current telescope — with one exclaiming "it can see all of the sky but the 30° immediately around the South Pole." Each asserted that the observatory was at the best place for astronomy research in the entire country. The orators praised the deceased Benedict for selecting the site most conducive to scientific research rather than bowing to pressures exerted by the larger communities in the state. Several speeches also stressed that the observatory did not receive taxpayer money for construction or for operation except through university funds. The speakers and the press coverage also reflected a sharp awareness of current world events, praising the observatory as "a symbol of freedom of man's mind to explore the boundless areas of truth without any restriction whatsoever."²⁹ A New York Times editorial expounded on this idea:

All is not lost in a world which can turn from strife to the heavens and profit by the serenity with which the manipulators of McDonald's great eye go about their business of plumbing space and poking into stars. In fact, the serenity makes one wonder what would happen to some of the dictators if they were translated to Mount Locke for a few weeks and permitted to sweep the heavens with one of the finest telescopes ever constructed. Suns so big that a thousand like our own could be dropped into any one of them, space measured in terms of millions of light-years, novae bursting out suddenly and perhaps giving birth to planetary systems like our own — such spectacles reduce this earth to the importance of a speck of dust on a plate-glass window. It is humility that the dictators need, and no science is so effective a humiliator as astronomy.³⁰

The McDonald Observatory soon brought renown to the University of Texas through discoveries such as the new moons around Uranus and Neptune, evidence that Mars' polar caps are frost and change seasonally, and proof that Saturn's rings consist of rocks and ice-covered boulders. Today the Observatory is best known through its popular radio program, *Star Date*.³¹

The establishment of the McDonald Observatory does not fall neatly into the development of "Big Science" in the West because of its private funding and non-military purpose. The "Big Science" projects did not develop in the West until about the time the observatory was dedicated ("The Manhattan Project" was conceived in 1939), and many did not blossom until well into the defense effort for World War II and afterwards.³² But the size and status of the observatory in housing the world's second largest telescope suggest that the McDonald Observatory serves as a precursor for the "Big Science" projects and the continued growth of science in the West.

The cooperation of the University of Chicago and The University of Texas gives the development of the observatory added significance. This appears to be the first attempt at an inter-university partnership, particularly between private and public institutions. The curious nature of this cooperation becomes evident in the partners' cautious approach to the agreement and careful handling of its development and announcement. The scientific and academic communities accepted the partnership with grace, despite a tradition of university rivalry, and well may have received inspiration for future collaborative efforts from the Chicago-Texas team.

McDonald Observatory resulted from the cooperative efforts of university officials, scientists, and citizens who built on the secret dream of one East Texan to further a science he loved in a state he treasured. William Johnson McDonald made the funding of the observatory possible, but the people of Jeff Davis and Brewster counties facilitated its placement in the Davis Mountains and particularly on Mount Locke. The University of Texas gained its long-sought observatory and an opportunity to continue its ascent to the status of a "first class" university in 1939. Texans celebrated with the university: they believed that McDonald Observatory would bring "renown to Texas in the world of science." In their eyes, Texas was "attaining cultural maturity," and a big boost from Paris' William Johnson McDonald helped give the state that opportunity.³³

NOTES

¹Gerald Nash, *The American West in the Twentieth Century: A Short History of an Urban Oasis* (Albuquerque, 1985), pp. 59, 61, 128-29.

²Lewis L. Gould, *Progressives and Prohibitionists: Texas Democrats in the Wilson Era* (Austin, 1973), pp. 185-221; Otto Struve, "The Birth of McDonald Observatory," *Sky and Telescope* 24 no. 6 (December 1937), p. 320.

³W. J. Battle, "A Concise History of the University of Texas, 1883-1950," *The Southwestern Historical Quarterly* LIV no. 4 (April 1951), p. 392.

⁴Chairman of the Board of Regents, "Acceptance of McDonald Observatory," *Addresses Made at the Dedication Exercises of the William Johnson McDonald Observatory on Mount Locke, Jeff Davis County, Texas: May 5, 1939, Dr. Edward Randall presiding* (Austin, date unknown, presumably 1939), pp. 28-29.

⁵David S. Evans and J. Derral Mulholland, *Big and Bright: A History of McDonald Observatory* (Austin, 1986), pp. 165-169.

⁶*New York Times*, February 14, 1926; *Austin American Statesman*, February 13 and 14, 1926; *Dallas Morning News*, February 15, 1926; *Daily Texan*, February 25, 1926; *Austin American Statesman*, February 13 and March 4, 1926.

⁷Paul M. Batchelder and Mamie Birge Mayfield, "Biography of William Johnson McDonald, 1844-1926," in The University of Texas, *The University of Texas Contributions from the McDonald Observatory, Fort Davis, Texas, Number 1* (Austin, date unknown, presumably 1940), p. 8; D. L. Byrd, "McDonald Observatory," in *Paris News*, 1981, as included in Louise Floyd Meyers, comp., *Legislative History of Charles R. Floyd, Paris, Texas* (Austin, date unknown, presumably 1989), placed in the Eugene C. Barker Texas History Center on March 12, 1990; *Houston Post*, May 5, 1939. In the 1890s, elite men began seeking immortalization by means of endowing observatories; Lick insisted that he be interred inside the telescope at his namesake observatory. McDonald may have been influenced by this as well.

⁸*Austin American Statesman*, March 16, 17, 23, 1926; Evans and Mulholland, *Big and Bright*, pp. 12-20.

⁹*Texas State Journal*, 40th Legislature, Regular Session, 1927, 200, 552, 1027; Meyers, *Legislative History of Senator Charles R. Floyd*, unnumbered pages; Ira P. Hildebranch of The University of Texas School of Law to The University of Texas President W.M.W. Splawn, January

18, 1927, in Meyers, *Legislative History of Senator Charles R. Floyd; Austin American Statesman*, February 25, 1926; H. G. Wheat of H. G. Wheat Company of Paris to State Senator Charles R. Floyd of Paris, September 28, 1926, included in Meyers, *Legislative History of Senator Charles R. Floyd*.

¹⁰*Alpine Avalanche*, February 18, 25, 1926. The Alpine Chamber of Commerce, at the suggestion of Superintendent of Alpine City Schools William Melton, had hoped to establish an observatory in the area prior to the McDonald bequest. State Senator Benjamin F. Berkeley carried the "Claims of Alpine" letter to Austin; Editorial, *San Antonio Express*, February 15, 1926; *Daily Texan*, March 9, 1926; *Austin American Statesman*, March 11, 1926; *Daily Texan*, March 11, 1926; Evans and Mulholland, *Big and Bright*, 20; *New York Times*, January 26, 1930.

¹¹Nash, *The American West*, p. 138.

¹²Struve, "The Birth of McDonald Observatory," p. 317.

¹³"The McDonald Observatory" pamphlet for the University of Chicago, quoted in Barry Scobee, "Beginnings of the Great McDonald Observatory," *West Texas Historical and Scientific Society* No. 5 (December 1934), pp. 18-19.

¹⁴Struve, "The Birth of McDonald Observatory," p. 318.

¹⁵*New York Times*, September 8, 1932; *Austin American Statesman*, September 8, 1932.

¹⁶Struve, "The Birth of McDonald Observatory," p. 320; Evans and Mulholland, *Big and Bright*, p. 27.

¹⁷In the early speculation, it was falsely reported by the *Austin American Statesman* on March 4, 1926, that there would be two observatories built: a student observatory in Austin and another in the Davis Mountains for planetary research; *Austin American Statesman*, March 4, 11, 1926; *Alpine Avalanche*, March 4, 1926.

¹⁸Scobee, "Beginnings of the Great McDonald Observatory," pp. 20-21.

¹⁹*New York Times*, September 8, 1932; Scobee, "Beginnings of the Great McDonald Observatory," p. 22.

²⁰Scobee, "Beginnings of the Great McDonald Observatory," 21-22; Struve, "The Birth of McDonald Observatory," p. 318.

²¹*Daily Texan*, May 4, 1939; Scobee, "Beginnings of the Great McDonald Observatory," p. 21; Homer P. Rainey, "Dedication of the McDonald Observatory," in *Addresses Made at the Dedication*, p.47; Scobee, "Beginnings of the Great McDonald Observatory," pp. 22-23.

²²Accounts of the naming of the mountain vary. Evans and Mulholland claim that the name was submitted to the commission. However, locating any reference to such a commission or its records stumped the reference librarians in the Government Document Repository of Sterling C. Evans Library. Scobee credits W. S. Miller with popularizing the name.

²³Scobee, "Beginnings of the Great McDonald Observatory," pp. 24-25; Evans and Mulholland, p. 38.

²⁴*New York Times*, September 8, 10, 1933; October 20, 1934.

²⁵*New York Times*, April 22, 1934; Scobee, "Beginnings of the Great McDonald Observatory," pp. 26-28.

²⁶Scobee, "Beginnings of the Great McDonald Observatory," pp. 26-28.

²⁷Barry Scobee, "Building of McDonald Observatory, II," *West Texas Historical and Scientific Society*, No. 7 (December 1937), pp. 45-46; *Alpine Avalanche*, December 7, 1934. The road from Fort Davis to Mount Locke had already been completed. Scobee, "Beginnings of the Great McDonald Observatory," pp. 26-28.

²⁸*Austin American Statesman*, May 3, 5, 6, 7 (pictorial), 1939; *Daily Texan*, May 4, 6, 10, 1939; *Big Bend Sentinel*, May 5, 12, 1939; *Houston Post*, May 5, 1939; Editorial, *New York Times*, May 6, 1939.

²⁹*Addresses Made at the Dedication; Austin American Statesman*, May 3, 5, 6, 7 (pictorial), 1939; *Daily Texan*, May 4, 6, 10, 1939; *Big Bend Sentinel*, May 5, 12, 1939; *Houston Post*, May 5, 1939.

³⁰Dick Stanley, "Comet to shed light on McDonald Strengths," *Austin American Statesman*, September 14, 1983, included in Meyers, *Legislative History of Senator Charles R. Floyd*; The University of Chicago Press, *The William Johnson McDonald Observatory of the University of Texas, Fort Davis, Texas* (Chicago, 1940), pp. 25-27.

³¹Editorial, *New York Times*, May 6, 1939.

³²Clark Kerr, *The Uses of the University* (Cambridge, Massachusetts, 1964), pp. 48, 52.

³³*Austin American Statesman*, September 8, 1932. Editorial, *Houston Post*, May 5, 1939.