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Hunter Freeman Beck

Harding University, hbeck@harding.edu

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HOWARD HUGHES AND THE DEVELOPMENT OF CINEMA, AVIATION, AND MEDICAL SCIENCE

By Hunter Freeman Beck

The development of the United States of America has been characterized by innovative men who challenged boundaries and the status quo. From Thomas Edison to Bill Gates, long remembered are the innovators who developed technology superior to what was then available. Few men in the country's history were as innovative as Howard Hughes, who established himself as a household name before turning 30 while triumphantly challenging different fields of research and entertainment. With successful ventures in filmmaking and aviation, as well as establishing a center for ongoing medical research, Hughes established himself as one of the most important men of the American 20th Century by revolutionizing cinema, expanding the boundaries of flight, and propelling medical science.

Howard Hughes Jr. was born in 1905. His father, Howard Hughes Sr., was a successful inventor, having perfected and patented a revolutionary drill bit that allowed oil drills to penetrate surfaces they previously could not.¹ After acquiring patents for the drill, Hughes Sr. co-founded the Sharp-Hughes Tool Company in Houston alongside Walter Sharp, securing financial success by leasing bits rather than selling them.² The company's success continued after Sharp's widow sold her half of the company, and the renamed Hughes Tool Company opened a branch in Los Angeles in 1920.³ By 1922, the success of the Hughes Tool Company was widely known, with rumors suggesting that the company was worth anywhere between seventeen-million and eighty-million dollars.⁴

Hughes' mother Allene fixated on her son's health. As her husband often travelled for business, the responsibility of raising her son fell almost entirely upon her.⁵ She pursued this responsibility with vigor. She constantly monitored his appearance, rushing him to the hospital at the sight of any

¹ Purnell W. Choppin, "From a Three-Headed Bit to a Major Philanthropy: The Surprising Legacy of Howard Hughes," *Proceedings of the American Philosophical Society* 142, no. 3 (September 1, 1998): 426.

² Barlett, 35.

³ John Keats, *Howard Hughes (New York: Randomhouse, 1966)*, 9.

⁴ *Ibid*, 11.

⁵ Barlett, 38.

abnormality, and the two retreated from the city during outbreaks of disease.⁶ Hughes was never away from his mother for longer than a day until age ten, when he was sent to summer camp from which she withdrew him early after a polio scare.⁷ Hughes often arrived late to school throughout his childhood, as a result of his mother's extensive morning routine that included rigorous examination of his feet, ears, throat, teeth, and bodily waste.⁸

Hughes reciprocated his father's propensity for mechanics at a young age. Between the ages of 10 and 13 he built a ham radio set, as well as a motorcycle he constructed by combining parts from his father's automobile with his own bicycle.⁹ At the age of 15, he spent the summer of 1920 studying cars and taking flying lessons that he paid for with his allowance.¹⁰ The tangible inheritance left by his father was just as formational for Hughes as the intangible. When his father died in 1924, Hughes was the major beneficiary of the Hughes estate.¹¹ At only 18, Hughes inherited \$870,000.¹² In addition to this sum, Hughes was set to inherit the majority of the multimillion-dollar business that the Hughes Tool Company had become when he came of age.¹³ Hughes quickly replicated the business acumen his father practiced, convincing family members to sell their stakes in the company to him so that he would become its sole owner.¹⁴ Several months later, Hughes successfully petitioned the Texas court to recognize him as an adult at the age of nineteen, and thus responsible for the family company. By 1925, Howard Hughes was the owner and operator of the Hughes Tool Company.

Having acquired full control of his father's company in Houston, Hughes abstained from involving himself in its operations.¹⁵ Instead, he moved to California with dreams of making movies.¹⁶ Hughes expanded the role of Caddo – the company subsidiary in Los Angeles – to making movies.

⁶ Bartlett, 38.

⁷ Ibid, 39, 41.

⁸ Richard Hack, *Hughes: The Private Diaries Memos and Letters (California: New Millennium Press, 2001)*, 28.

⁹ Keats, 7.

¹⁰ Keats, 9.

¹¹ Barlett, 53.

¹² Dennis Karwatka, "Howard Hughes and His Colorful Aircraft Career," *Tech Directions* 72, no. 5(December 1, 2012): 10.

¹³ Sauter, 66.

¹⁴ Hack, 52.

¹⁵ Barlett, 56.

¹⁶ Ibid, 60.

Howard Hughes

Hughes quickly earned moderate critical success and an encouraging profit with the 1927 release of *Everybody's Acting*.¹⁷ In 1928, he produced *Two Arabian Knights*, which garnered over half a million dollars in profit, as well as an Academy Award.¹⁸ While his films had success, Hughes had little involvement further than their financing, and subsequently could not be considered a filmmaker.¹⁹ Hughes did not involve himself seriously with any of his movies until the 1930 production of *Hell's Angels*.

Working for the first time as a director, Hughes worked tirelessly to make *Hell's Angels* perfect, prompting his aunt Annette Lummis to write: "He had thrown himself into the production with a zeal that excluded all else, and it was not uncommon for him to work twenty-four to thirty-six hours at a stretch. He devoted himself to it with a ruthless determination that frightened even him."²⁰ He wanted several takes of every shot, spending over a week to shoot one scene of a grand ball.²¹ He spent hours plotting out dogfights before constructing three-dimensional models of their flight paths, creating flight scenes unlike any seen before.²² He edited the film for months after shooting, experimenting with different color tints to achieve maximum effect while films were still shown in black and white.²³ The filming began before the inclusion of sound in movies, but the movie was still in production when that practice was introduced. Consequentially, Hughes spent over 1 million dollars adding sound and dialogue to the film.²⁴ When production was finally complete, Hughes had spent nearly 4 million dollars on the project, making it the most expensive movie at that time.²⁵

The immense effort that Hughes put into the making of *Hell's Angels* was returned in full. It garnered praise immediately, with one critic naming the film as "incomparably the greatest air spectacle ever projected" with scenes that had "rarely been rivaled in the whole history of motion picture thrills."²⁶ The movie received a similar reception in England, with one

¹⁷ Bartlett, 61.

¹⁸ Hack, 63.

¹⁹ Bartlett, 62.

²⁰ Ibid, 63.

²¹ Keats, 32.

²² Ibid.

²³ George Turner, "Hell's Angels' 60th Birthday," *American Cinematographer* 71 (July, 1990): 96.

²⁴ "Hell's Angels," *Time* 15, no. 23 (June 9, 1930): 56.

²⁵ Turner, 96.

²⁶ "Hell's Angels," 56.

British critic calling the film “the greatest masterpiece the screen has known.”²⁷ The movie’s success was lasting, as well, and it continued to be shown in theaters around the world for another twenty years after its release, earning 8 million dollars.²⁸ The movie received a second world premiere in 1989, hosted by the Smithsonian National Air & Space Museum.²⁹ With the success of *Hell’s Angels*, Hughes finally earned a reputation as a filmmaker, with reports claiming he signed on with Metro-Goldwyn-Mayer as a director in 1932.³⁰ With his first attempt at directing movies, Howard Hughes created one of the most successful films in the history of cinema.

In 1932, in the wake of the Great Depression, Hughes closed Caddo and agreed to stop making motion pictures until 1939 as part of a settlement with his ex-wife.³¹ No longer working in the entertainment industry, Hughes began to focus on another passion – flying.³² In the summer of 1932, Hughes bought a Boeing pursuit plane, and after acquiring an amphibious aircraft the next year, he organized the Hughes Aircraft Corporation.³³ Later that year, Hughes spent eighteen months flying across the country in the amphibian, stopping in cities including Phoenix, Houston, and New Orleans.³⁴ While he sharpened his ability as a pilot, Hughes assigned two of his engineers to develop the fastest plane in the world.³⁵

Hughes flew this plane, called the H-1, at a speed of 352 miles an hour in 1935, setting a world record for speed in a landplane.³⁶ Having conquered speed in the air, Hughes shifted his focus to distance.³⁷ One year later, he set another record after flying from California to New York.³⁸ Upon hearing that the weather was perfect throughout the country, Hughes abandoned his lunch and flew from Burbank to Newark in nine hours and twenty-seven minutes, breaking the transcontinental record.³⁹ For this feat, Hughes was rewarded by President Roosevelt with the Harmony Trophy,

²⁷ Keats, 44.

²⁸ Keats, 44.

²⁹ Turner, 96.

³⁰ “Howard Hughes to Direct Films,” *New York Times*, July 5, 1932.

³¹ Hack, 92.

³² *Ibid.*

³³ *Ibid.*, 93.

³⁴ Keats, 61.

³⁵ Hack, 95.

³⁶ Barlett, 88.

³⁷ Hack, 97.

³⁸ *Ibid.*, 98.

³⁹ *Ibid.*, 99.

Howard Hughes

which honors the best aviator in the United States.⁴⁰ Later that year, Hughes challenged a bet that he could not eat lunch in Chicago and make it to Los Angeles in time for dinner.⁴¹ Hughes won the bet, eating lunch in Chicago around noon and dinner in Los Angeles around 7 that evening after an eight hour flight. After the flight, Hughes told the press that he had “learned more in the last eight hours than in the last ten years.”⁴²

In 1937, Hughes began preparing for his greatest conquest: a flight around the world that would open with the 3,641 mile route between New York and Paris flown by Charles Lindbergh.⁴³ He and his crew spent the year studying survival techniques and practicing shooting with rifles.⁴⁴ In July of 1938, Hughes and his crew embarked from New York on their world flight in a modified Lockheed plane named in honor of the 1939 World Fair.⁴⁵ Three days later, Hughes and his crew landed in New York again, met by 25,000 people.⁴⁶ The next day, 1,500,000 people flooded the streets of New York in a parade for Hughes.⁴⁷ The journey took ninety-one hours, setting the speed record for a world flight.⁴⁸ The record stood for nearly fifty years, until a 1987 re-creation of the flight completed the same route in eighty hours.⁴⁹

In addition to his accomplishment as a pilot, Hughes revolutionized aircraft development by designing the largest plane ever built.⁵⁰ In 1942, Hughes presented to the government a design for a flying boat called the *Hercules* that would be used for massive transport duty.⁵¹ The government approved the design, largely because it would be made of wood, which led to the nickname of the Spruce Goose.⁵² After years of work and criticism over the craft, Hughes planned for its first take-off in 1947.⁵³ He managed to fly

⁴⁰ Purnell, 427.

⁴¹ “Hughes Sets Mark Chicago to Coast,” *New York Times* (May 15, 1936): 27.

⁴² Hack, 99.

⁴³ Barlett, 94.

⁴⁴ Keats, 99.

⁴⁵ Hack, 111.

⁴⁶ Barlett, 97.

⁴⁷ Hack, 118.

⁴⁸ Choppin, 427.

⁴⁹ “Aviation Daredevils Beat Flight Record Set by Howard Hughes,” *Lexington Herald-Leader* (June 22, 1987).

⁵⁰ Choppin, 427.

⁵¹ Karwatka, 11.

⁵² *Ibid.*

⁵³ Choppin, 427.

the *Hercules* one mile, keeping it off of the ground for less than one minute.⁵⁴ While the test run proved to be the last flight of the *Hercules*, no larger aircraft has flown since, and its 321 foot wingspan greatly outclasses the 224 foot wingspan of the largest Boeing 747.⁵⁵ Throughout the 1930's, Howard Hughes shattered the limitations of the aviator, breaking multiple speed records, winning awards such as the Harmon Trophy, and redefining what aircraft were capable of.

While his father left Hughes a fortune and an affinity for invention, his mother left him with an intense awareness and fear of illness and germs.⁵⁶ Shortly after his parents died, Hughes wrote a will in which he dedicated many of the Hughes Tool Company's shares to a medical institution that he referred to as the Howard R. Hughes Medical Research Laboratory.⁵⁷ The institution was founded in 1953 and ultimately named the Howard Hughes Medical Institute. Former president Purnell Choppin wrote that while this will was later nullified, "it shows that Hughes was serious from an early age about using his fortune to advance medical research."⁵⁸ Hughes' interest in medical research grew out of an idiosyncratic dedication to hygiene he developed from his mother's excessive concern over his health. Though he was a successful producer and director, Hughes avoided Hollywood parties out of a neurotic fear of sickness.⁵⁹ Frank McCulloch, the last journalist known to have spoken with Hughes, noted in an article written in 1970 that Hughes was "dreadfully afraid of picking up germs through human contact."⁶⁰ As he grew older, he pursued medical knowledge, maintaining contact with physicians that treated him after plane crashes, conferring with them about medical research.⁶¹ The medical researcher who wrote the medical history of Hughes after his death noted that Hughes "knew his pharmacology backwards and forwards."⁶²

⁵⁴ Choppin, 427.

⁵⁵ Karwatka, 11.

⁵⁶ Sauter, 66.

⁵⁷ Choppin, 427.

⁵⁸ Choppin, 427.

⁵⁹ Barlett, 70.

⁶⁰ McCulloch, Frank. "A Midnight Ride with Howard Hughes." *Time* 95, no. 25 (December 21, 1970): 68.

⁶¹ Choppin, 428.

⁶² "Researcher Says 1946 Plane Crash Gave Hughes 30-Year Drug Habit," *New York Times* (August 30, 1979): 8.

When Hughes created the Howard Hughes Medical Institute, the purported goal of the institution was to “provide millions of dollars for medical research to combat disease and human suffering.”⁶³ In truth, the organization, which received all of the Hughes Aircraft Company stock, originally served mostly to reduce the amount of money Hughes lost in income taxes each year.⁶⁴ While the Howard Hughes Medical Institute was made primarily to benefit Hughes himself, critics and skeptics admitted that it still supported and propelled medical research to some degree.⁶⁵ Since its inception, the Howard Hughes Medical Institute has funded talented medical scholars, allowing them to devote themselves to research.⁶⁶ Within its first two decades, the institute spent nearly twenty-million dollars on medical research.⁶⁷

While initially the Howard Hughes Medical Institute functioned only partly to propel medical study, that changed after his death in 1976. In 1984, a new group of trustees was appointed.⁶⁸ Wishing to fulfill the original goal of promoting medical research, the trustees sold Hughes Aircraft for five-billion dollars in 1985.⁶⁹ After removing the organization from the defense industry, this group of trustees began to transform the Howard Hughes Medical Institute into an organization dedicated to biomedical research. The organization now represents a collection of scientists from different fields working together with full funding.⁷⁰ The organization’s research budget rose from less than 80 million dollars in 1984 to 413 million dollars in 1996.⁷¹ The institute continued to expand, opening more research centers across the country.⁷² While it has expanded its services and research, the institute continues to support talented scientists, funding over 300 individual researchers a year and allowing them to conduct research in a

⁶³ Barlett, 198.

⁶⁴ Ibid, 199.

⁶⁵ Albert Benjamin Gerber, *Bashful Billionaire: The Story of Howard Hughes* (New York: Dell Publishing, 1968): 345.

⁶⁶ Gerber, 346.

⁶⁷ Barbara J. Culliton, "Howard Hughes Medical Institute: In the Reclusive Tradition," *Science* 193, no. 4249 (July 16, 1976): 211.

⁶⁸ Choppin, 428.

⁶⁹ Ibid, 429.

⁷⁰ Vicki Browner, "Room of Its Own," *EMBO Reports* 5, no. 9 (2004): 852.

⁷¹ Choppin, 429.

⁷² Browner, 851.

variety of medical fields.⁷³ By 1996, the organization had funded five Nobel Prize winners, as well as over fifty members of the National Academy of Sciences.⁷⁴ The Howard Hughes Medical Institute contributed to other research programs, as well, giving 335 million dollars to 220 colleges and universities between 1988 and 1998.⁷⁵ By creating the Howard Hughes Medical Institute, Howard Hughes – a man crippled by a desire for supreme health – continues to strengthen the medical community today, nearly forty years after his death.

Throughout his career, Howard Hughes pursued innovation. He explored different fields throughout his career, and he never stopped challenging the status quo. As a director, Hughes worked tirelessly to create unprecedented audial and visual effects such as spoken dialogue and the inclusion of color. By spending hours plotting flight paths, he created flight scenes that featured unseen precision and excitement. Through this, he developed a new, exciting cinematic experience with *Hell's Angels*, which still today is considered a masterpiece in film. As an aviator, Hughes continually demanded more from his aircraft and from himself. He studied and practiced new flying techniques and flight paths to reach longer distances. He and his team developed and tweaked his aircraft to maximize their speed or capacity, building two of the most impressive planes of the 20th Century in the *H-1* and the *Hercules*. By refusing to settle for contemporary limits, he set new standards for aviation. Finally, as an entrepreneur Hughes continues to propel medical science through the Howard Hughes Medical Institute. The institution has funded and continues to support hundreds of talented researchers and schools, ensuring private, well-equipped medical research across the country. By creating this impressive organization and the capital behind it, the medically-driven Hughes ensured his role in the propulsion of medical research. By driving development in cinema, aviation, and medical science, Howard Hughes established himself as one of the most important innovators of the American 20th Century.

⁷³ Browner, 851.

⁷⁴ Choppin, 429.

⁷⁵ Ibid.