Preface

Project Apollo was an American geopolitical and technical response to the threat of Soviet Communism in the second half of the twentieth century. Apollo was the third of three human spaceflight programs conducted by the National Aeronautics and Space Administration (NASA). Project Mercury was NASA's first human spaceflight program to prove American capability to orbiting a single astronaut around the Earth; the Soviet Union had already proved that capability with its first cosmonaut Yuri Gagarin in 1961. NASA's Project Gemini followed using a larger capsule for two astronauts, extending their time in Earth orbit for up to two weeks, to prove the ability to rendezvous with another spacecraft. Project Apollo was the lunar landing program meant to beat the Soviets putting men on the surface of the Moon and then returning them safely back to Earth.

Project Apollo was unlike any national effort the United States had conducted in its history. Science was not the imperative of Project Apollo; American technical prowess and the superiority of the capitalistic system were the principal drivers. However, the collective science community in the nation's universities, corporations, and NASA's own research centers provided the impetus behind what the astronauts were to do while on the lunar surface. In the end, the scientific discoveries and the benefits of the multitude of technologies derived from Project Apollo are what are remembered today. America's national prestige was bolstered around the world, and Project Apollo actually created a collective common human bond that transcended borders and languages.

The essence of the Apollo lunar landing missions was sample collection and surface experimentation. However, lunar scientific research preceded the Apollo program and even President John Kennedy's famous address to Congress in 1961. Lunar probes were the essential precursors before astronauts could land and explore the Moon's plains, massifs, and curious rills. These NASA programs were Ranger, Surveyor, and Lunar Orbiter. These programs provided vital information that proved that spacecraft could land there and astronauts could indeed walk on its surface and aid in selecting the most desirable landing sites for exploration.

To achieve the scientific goals of Project Apollo, virtually every piece of hardware had to be designed from a clean sheet of paper. These included the sampling tools and procedure for sample collection and storage and preservation for return to Earth. A Lunar Receiving Laboratory had to be designed and built to examine, test, and publish the findings. Numerous institutions outside of NASA competed for the privilege of conducting research on the lunar samples.

Terrestrial geologic training had to be conducted for the astronauts to know how to properly identify the samples while on the lunar surface. For the first several Apollo landing missions, rudimentary sample collection of loose soil, rocks, and core samples was all there was time for. On Apollo 14, there was an astronaut-pulled tool and sample-carrying cart. However, something far better and more productive was being designed and developed to help the astronauts with their surface tasks and mission.

A separate lunar rover program was begun to give the astronauts a vehicle that would permit them to travel many kilometers from the landing site and expand their scope of exploration, sampling, and photography. In addition, the LRV had a sophisticated tool carrier to secure the tongs, scoop, hammer, drill, and core tubes, as well as sample-carrying and storage areas. All lunar samples were stored in the Lunar Sample Return Container which was then placed inside the lunar module and ultimately transferred to the Command Module for return to Earth.

While the returning Apollo astronauts embarked on tours and speaking engagements, their precious lunar samples were delivered to the Lunar Receiving Laboratory in Houston, Texas, and were sorted, cataloged, and stored for detailed examination. Each sample had a story to tell of the history of the Moon and its formation and even the history of the solar system itself.

Examination of the Apollo lunar samples has continued for many years since the end of the Apollo program. It is with a profound sense of wonder that a scientist with a lifespan of but 80 years can look upon a lunar sample more than four billion years old.

There is a vast body of printed material covering all aspects of the Apollo program. Many peer-reviewed technical papers have been published on the lunar samples. Most of the findings written in these papers are pure science of greatest interest to fellow scientists and researchers. In this book I have striven to present the Apollo lunar samples' story of greatest interest to the lay reader. With regard to the Apollo lunar surface missions, I have confined myself to mission timelines specific to sample collection and voice transcripts supporting that.

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