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**COVER:** The private inventor has fallen on hard times, faced with rising costs and increasingly sophisticated technology. But evidence is mounting that such individuals still account for a disproportionate share of the most original ideas, and efforts are being made to "reinvent" this honorable profession. The patent application drawings shown recall the illustrious past of the independent inventor: Edison's electric lamp, Whitney's cotton gin, the Bell telephone, Colt's "gun that won the West," the first barbed wire fence by J.F. Glidden and McCormick's reaper. See p. 60. (Diagrams from U.S. Patent Office.)





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COMMENT

# The Mars Landing: Just the Beginning

It is a dream of the ages—to land safely on the surface of Mars—and now it has been fulfilled. At 4:53 a.m. PDT, July 20th, at a distance of 19 light minutes across the solar system, the lonely emissary from planet earth known as the Viking I lander, settled on the lowland plains of the western Chryse basin and, 25 seconds later, began taking the first Mars-based photographs of the Martian surface. It was seven years to the day after the first Apollo landing on the moon.

At Viking Mission Control headquarters in Pasadena, the wait for confirmation of touchdown was of necessity the longest ever for a U.S. spacecraft landing—19 agonizing minutes for the radio signal to reach earth. Finally from mission control came the jubilant cry: "Touchdown! We have touchdown!" The sounds of cheers resounded. Two minutes later in the press auditorium, national television was interviewing science fiction writer, Ray Bradbury, a curiously appropriate choice. His poetic imagination and narrative skills, represented in such classic works as *The Martian Chronicles,* seemed perfectly to epitomize the melding of scientific and human yearnings that carried us inevitably toward Mars.

Forty-one minutes after the landing signal, the first thin sliver of a photograph began coming onto the monitor. Within moments, an unbelievably sharp close-up revealed dozens of small angular rocks near the lander's base. The clarity was greater than most had even hoped. Viking lander imagery team leader, Thomas A. Mutch (normally a reserved fellow), was ecstatic. "The resolution is fantastic . . . the detail is incredible. . . . Beautiful boulders. A geologist's delight." Then came the slow buildup of the panorama view, revealing a gently undulating rock-strewn Martian terrain, "a lovely scene," said Mutch. The camera continued presenting clear views as it turned across the maximum 300° panorama. "One can't believe that it would work this well," said Mutch. There was unmistakable awe in his voice.

It was a day of true human excitement and drama, a fitting start for mankind's first surface view of Mars. "To think what happened today!" exclaimed NASA associate administrator Noel W. Hinners, "I have tears in my eyes. It's really an emotional experience."

Thus has begun the next step in humankind's quest outward into the unknown. The spirit of exploration, the striving to understand and appreciate the natural world—whether on earth or elsewhere—is one of the more noble aspirations of the human spirit. There's no denying the sense of exhilaration, the feeling of unfettered freedom, the nearly spiritual sense of renewed vitality that these first views of the Martian landscape imparted to those who were a part of the effort, and it is clear they hope that the public at large can in some degree share such rewards from these and other planetary explorations. "Thank you, the American people, for making it possible," said Hinners.

A. Thomas Young, of the Viking science steering group, aptly noted that with the Viking landing, the search is just beginning. The Viking mission itself is just beginning despite its already epic legacy of beautifully detailed photos taken during the past month of avalanche-draped Martian canyons, sculptured mesas reminiscent of Monument Valley in the U.S. Southeast, and virtually everywhere, striking evidence of formerly vast amounts of flowing surface water.

The coming weeks and months should produce a marvelously rich abundance of information about the planet Mars as, one by one, Viking's scientific instruments begin revealing the planet's secrets to a waiting earth.

Much of the attention will be devoted to the search for evidence of life. The scientific and human importance of that quest is self-evident. But the biology experiments make up only one of the 13 scientific areas under study by Viking, and the questions the other 12 are addressing are equally consequential. What is the composition and structure of the Martian interior? Are there marsquakes? Is Mars tectonically active? These are key scientific question from just one of the 13 experimental areas, seismology. Each of the 13 areas will help answer momentous questions about the origin and history of Mars and the other terrestrial planets.

Then there's the larger sense in which the Viking landing is just a start. With the Soviet Venera landings on Venus and now the U.S. Viking landing on Mars, the people of earth have now tentatively extended their senses to the two nearest planets. Outward lies the rest of the solar system—and the stars. "Truly," as Tom Young said minutes after the first pictures were seen, "today the search begins."

*—Kendrick Frazier*