Space

Remarks by Congressman Les AuCoin
in the House of Representatives
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• Mr. AuCOIN. Mr. Speaker, ten years ago, between July 16 and July 24, a voyage took place that held the world a captive audience. That voyage was to the surface of the moon and back.

Somewhat surprisingly, a recent New York Times/CBS poll found people almost evenly divided about whether the Apollo project was worth the $25 billion it cost. A decade after man's greatest adventure, our feelings in hindsight are perhaps more ambivalent than at the height of the tumultuous 60s.

The technology that enabled us to watch those stark figures bounding around the surface of the moon improved so quickly that by the final moon mission we could watch the event as clearly and colorfully as if it were taking place in the next room. But how many of us were watching as the Apollo program came to an end? The national anticipation of a manned lunar landing and the imagination and goodwill of the world that we were able to capture were matched only by the speed in which we returned to business as usual.

Looking back it seemed easy. On May 25, 1961, when President Kennedy said that the United States "should commit itself to achieving the goal, before this decade is out, of landing a man on the moon and returning him safely to the earth," it was anything but easy. An American had not even orbited the earth. The Saturn V was merely the twinkle in Werhner von Braun's eye. The method for attempting a moon landing was still a highly debated subject on NASA's drawing boards. The Saturn launch pads had yet to rise from the Florida beaches that would become familiar the world over as Cape Canaveral and Kennedy Space Center, and the Manned Spaceflight Center in Houston had yet to be built.

The problems to be overcome were enormous; simply the design and construction of a rocket, a spacecraft, a landing vehicle and life support systems for a voyage to the moon and back. It is a tribute to the engineers of the manned space program that not a single American astronaut died during a total of 31 spaceflights by 71 individuals in an accumulation of hundreds of days in space.

As far as space program personnel were concerned, our $25 billion investment was quickly squandered as eight additional planned moon landings were scuttled due to lack of interest in the Congress and in the nation. Yet, from a scientific standpoint, the exploration of the moon had hardly begun when the Apollo 17 astronauts left the moon in December 1972.

Opponents of the Apollo program had called for space money to be spent on earthly pursuits. But the total $25 billion spent for the space program was stretched out over nearly nine years. The total spent for space in nine years looks infinitesimal compared to military spending in a single year. In fact, the total amount spent would have hardly made a dent in social programs that many thought we could have better directed our attention to at the time.

And the practical payoffs were great. An extensive study conducted in 1975 found that high technology endeavors, of which the space program is clearly the largest, result in significant rates of social return out of all proportion to their cost. It was determined that an increase in space research and development programs of $1 billion would have the following effects in just 10 years:

1. The gross national product would be $23 billion higher -- an annual return of more than 40 percent.
2. The inflation rate in 1985 would fall a full 2 percent.
3. Unemployment would be reduced by 400,000 jobs and the size of the labor force would rise by 1.1 million new jobs.

The simple fact is that research investments "spin off" to other industries through sharing of technology and productivity increases.

Just four mature examples of spinoffs are estimated to add up to a $7 billion "payoff" by 1983. Integrated circuits were developed for satellites and communications but are now used in many household products. Gas turbines, initally developed for jet-engine aircraft, have been widely spunoff for use in electric power generation plants. The Structural Analysis Computer Program, originally developed to design spacecraft, is now used to design automobiles, railroad tracks and cars, bridges and skyscrapers. The last mature spinoff is insulation for cryogenic -- extremely cold temperature -- uses.

NASA has been working on energy-efficient technology for years. NASA's "Tech House" at the Langley Research Center in Virginia is not just a compilation of space spinoffs but it integrates technical developments expected to be commercially available by 1981. Stringent NASA criteria meant that the initial costs of improvements must be repayable over the life of a 20-year mortgage. Space materials include "thermal shutters," fire-retardent materials, super insulation, solid-state appliance controls, low-noise flow valves, wiring, other heat-capture devices.

NASA has been in the forefront of developing technology to utilize alternative energy sources. A satellite power system to transmit energy to the earth; the harnessing of the wind; solar heating and cooling, NASA-developed solar energy in coordination with the Department of Energy being tested in different climatic zones; solar cells for replacement use of electricity; automobile turbines; electric vehicles; coal mining research -- all have been on NASA's drawing boards for some time.

It was notable that Skylab, the program that followed Apollo and used the same hardware to begin investigating the practical applications of space science in-depth, was virtually ignored by the American people. Earth resources photography, undertaken by Skylab and continued with Landsat satellites, has told us more useful information about the earth than we can absorb. Landsat satellites can look at 13,000 square mile patches of the earth at one time in a single picture, thereby revealing great features, such as geological faults, that are impossible to see from near-Earth. The repetitive coverage of Earth by the continuously orbiting satellites viewing the entire planet over a short period of time allows monitoring of dynamic Earth processes such as crop-growing cycles and land use.

We face a similar dilemma of lack of interest with the Space Shuttle program despite its promise of making manned spaceflight a valuable yet normal experience. But let me mention some significant facts about the ongoing space shuttle program.

Some 50,000 people in 47 states work on the space shuttle -- in addition to those employed by NASA. Reusable Space Shuttle Orbiters will reduce spaceflight costs an estimated $1 billion per year. The savings can mean additional payloads to meet predicted needs for Earth-oreinted applications -- advanced weather forecasts, communications, Earth resources photography and other benefits.

A pressurized module will fit in an Orbiter's cargo bay where scientists can work in shirt-sleeve environment for up to 30 days. It offers a platform for intensive Earth observations and human-directed experiments not unlike Skylab.

Naturally, spinoff technology cannot be utilized to its greatest potential if there is no process of disseminating the information. NASA has established a network of Industrial Applications Centers at universities across the nation to provide information retrieval services and technical assistance to industry. At six campuses NASA utilizes the world's largest technical data bank to apply the resultant information selectively to industry's problems.

The accomplishments of the Apollo program in scientific and engineering terms were enormous. Unlike expenditures in many other areas, the space program was constantly in the public eye, and we demanded a high level of demonstrable success. Despite the sheer complexity of the problem we were undertaking, there were never any cost overruns or pleas for additional time. We set a goal, demanded success, and complied with that demand.

The commitment to the future of manned space flight is in question. Just as with all scientific endeavors the financial cost may seem out of proportion to our immediate gains, but those gains will come about. However, in our quest to solve earthly problems we cannot overlook our desire to explore the unknown or the need to dedicate ourselves occassionally to the pursuit of pure science knowing of its eventual practical payoff. That is what Apollo 11 pointed out, and it is a lesson we should remember as we celebrate the 10th anniversary of that adventure.