

By Arthur Hill

Chronicle Science Editor 1965-1974

Editor's Note: A half-century ago, Arthur Hill, the Chronicle's science editor, had the privilege of a perch on the threshold of history as Apollo 11 astronauts Neil Armstrong and Buzz Aldrin became the first humans to walk on the surface of the moon. Following are his recollections from that time.

It starts with the feet, and the ears.

The launch of a Saturn 5 rocket is at once one of the most beautiful, and the most terrifying, things you can see.

It's 1969, and we are three miles from the launch pad at Cape Canaveral, Florida yet the ground is shaking, and the ears are taking a beating from the 16 cycles per second vibration set up by the 7.5 million pounds of thrust from the rocket. The observation stands for the press are clattering in sympathy with the start of the Apollo 11 mission.

The Saturn rocket rises slowly from the pad, so slow at first that the thought runs through me: "My God, what if it explodes?"

There are a bank of telephones to my left, and I'm sort of poised for a foot race to snag one of them in order to contact the rewrite desk at the Chronicle. (Remember the time. There are no cell phones, no computers, no tiny tape recorders; there was only a pencil and a notepad.)

Fortunately, the liftoff is flawless, I can abort my run and the astronauts can continue theirs with their voyage to the moon.

NASA had erected a press site for viewing, put in a huge countdown clock and was piping in the commentary from Jack King at the launch control center. You will hear his voice during the 50th anniversary TV documentaries. After launch, the last thing King had to announce was that the rocket had cleared the tower.

At that point, control and all progress announcements shifted to Houston and the Manned Spacecraft Center.

The Chronicle team spent several days at Cape Canaveral prior to launch day. We wanted to capture as much of the launch as we could with color photographs, which were later published in Texas Magazine (yes, we had our own magazine, delivered with the Sunday paper) on Aug. 31, 1969.

I did some interviews, more for the magazine than the daily paper. Somehow, our head photographer, George Honeycutt, had gotten hold of the plans from National Geographic Magazine (probably his work for them on the Big Thicket) and set out to emulate them.

With David Nance, another Chronicle photographer, the equipment was set up 800 yards from the launch pad – too close for any humans, except the Apollo crew, of course. Photos of the rocket were taken with a telescope and a light sensing device invented by the Geographic. Light from the ignition of the rocket triggered a motor-driven camera. The photos were spectacular.

Thousands of people had poured into Cape Canaveral for the launch. Campers and other types of hard-to-identify vehicles had parked on the beach, and it was like one big, long block party fueled by beer and other liquids, also hard to identify.

The hotels, motels and watering holes on the main drag were doing a land-office business. I remember one, the Mousetrap, which seemed to have no closing hours at all. In Houston, you had to belong to a "club" to get a drink – not that joining a club was all that difficult.

Apollo 11 had turned into a major TV happening despite Vietnam, civil rights and a few other things going on at that same time.

Jay Barbree, who served as the space observer for decades at Cape Canaveral for NBC, recalled in a book that the phones at NBC never stopped ringing.

"One (caller) was certain the launch would bring about the end of the world," Barbree wrote. "Another was convinced his chickens would stop laying eggs and his cows would stop giving milk and wanted to know who would pay, and a third offered his 16-year-old virgin daughter to me if I could get him a seat on the rocket to the moon."

After the launch, the trick was to get back to Houston as quickly as possible. To help us out, Continental Airlines put on a special press flight non-stop to Hobby Airport. I can report that a good time was had by all on that flight. We were assigned space in the foyer of the main auditorium at MSC. We were not alone. Hundreds of reporters from around the world had been given little spaces around the perimeter of the auditorium.

The Chronicle's space was large compared with some others, but then we were "local" and would be there after Apollo was over.

Imagine the Johnson Space Center with no museum, no space hardware on the lawn, and some motels and a hotel across the street, on top of which NBC had constructed a penthouse studio. Most of the time, it was unoccupied.

At the time, Houston had two daily newspapers: the Houston Post and the Chronicle. The Post was the morning paper, and the Chronicle, the afternoon paper. In most cities, the morning paper had the larger circulation, but in Houston the situation was reversed.

My competitor at the Post was Jim Maloney. But since the Chronicle subscribed to every syndicate it could and I had a national beat, I had to contend with writers from the New York Times, Washington Post, Los Angeles Times and others in order to catch the eye of Dan Cobb, the news editor.

Once back at the MSC, we settled into our routine for the rest of the flight. Special emphasis was placed on July 20, the day of the lunar landing, but otherwise the flight controllers worked three eight-hour shifts and after each shift they would drop by the auditorium for a news conference and answer questions.

Most of those questions were generated by listening to the air-to-ground communications that NASA fed to us on a real-time basis along with commentary from the Public Affairs Office. There were other communications links we did not get to hear.

In order to hear clearly, headphones were necessary. Because the landing was a Sunday afternoon, all we could do was observe the TV and watch our morning paper colleagues slaving away until we got our chance Monday morning.

What about the astronauts' families? How were they holding up? NASA would issue periodic summaries about their activities, but most of the media had little contact with the families because of "The Contract." NASA had allowed Time/Life exclusive rights to the personal lives of the astronauts through the end of the Apollo program. This was an early example of celebrity journalism.

To be frank, I was glad I did not have to do it.

My job was to focus on the scientific aspects of the mission. But as is often the case, the rush to document events (they spent only a little over 21 hours on the lunar surface) meant overlooking some aspects of the flight as victory cigars were handed out to jubilant flight controllers in the mission control room.

For example, it was not immediately clear to observers on the outside that Armstrong had to change the landing site by about four miles to avoid landing in a large crater the size of a football field. All we knew was that fuel in the lunar module, nicknamed Eagle, was running dangerously low and that Eagle was within seconds of either having to abort or perhaps become the newest crater on the Moon.

"It required flying manually over the rock field to find a reasonably good area," Armstrong later admitted.

A crucial part of the landing was the "small step" and "giant leap for mankind," as Armstrong said when he stepped off the ladder of the lunar module. Some scientists had speculated that the surface might be too dusty and gritty to support the astronauts. However, the landing pods on the lunar module did not sink in to any great degree, providing confidence that the mission could continue as planned.

Armstrong described the surface as "fine and powdery" and that his boots only went in about an "eighth of an inch." The footprints he and Aldrin left should still be there, preserved in the airlessness of the moon.

There wasn't much time for scientific work, but Apollo 11 squeezed in three experiments: a solar wind experiment, a laser reflector and four solar-powered seismometers called the Passive Seismic Experiment Package for tracking moon quakes, should there be any.

There were – very small but detectable because the moon is a geologically quiet place so any activity is amplified. Apollo 12 gave the Apollo 11 equipment a workout by deliberately dumping the ascent stage of their lunar module into the surface. The moon rang like a bell. Later Apollo flights set off explosives, and the secrets of the Moon's interior were set free.

As it turns out, like Earth, there is a crust, mantle and core, only smaller. And most of the quakes are caused by the gravitational tug-of-war between the two celestial bodies, not meteors.

The seismic experiment continued sending data until 1977, when budgetary cuts forced scientists to shut it down.

And then there were the rocks — 48 pounds from Apollo 11 and 842 pounds from all the Apollo flights. Some of them were kept under seal until this year so that they could be examined using techniques not available until now.

The success of Apollo 11 led NASA and the science community to optimistic predictions about the future of human space exploration.

"I'm sure that before 1990 somebody will have stepped out on Mars; it's more likely closer to 1985 or 1986," said Dr. Kurt H. Debus, then head of the John F. Kennedy Space Center at Cape Canaveral.

Debus envisioned a two-pronged program involving a permanent space station/laboratory orbiting Earth and more extensive

exploration of the moon. Speaking about a manned mission to Mars, "The space station by itself will give us all the necessary tools to find out what engineering data are still required," he said.

As for the moon, Dr. Debus said "One could think of a small lunar base. If we find permafrost there, then it may be worthwhile to look at the Moon as a supply source for fuel, because you could make hydrogen and oxygen out of water."

But having been conceived as a space race, Apollo 11 carried with it the ultimate price of winning a politically motivated endeavor – early termination of the program. Thus, the final three missions fell under the budgetary ax and Apollo 17 became the capstone for manned scientific exploration of the moon.

From the leftover bits and pieces of Apollo, NASA fashioned what some called a public relations rendezvous and docking flight in earth orbit between itself and Russia.

Other items were sent to museums and an upper stage of the Saturn rocket was turned into a precursor of Debus' space station. Called Skylab, it paved the way for the International Space Station (ISS) we have today.

NASA embarked on an extensive agenda, sending unmanned probes to observe every planet in the solar system, several interesting satellites of those planets and even further out into deeper space.

Decades went by with humans exploring the Moon definitely in the "been there, done that" category, although different plans would surface from time to time. Then in 2009, water ice was found on the Moon, as Debus had speculated.

A spent rocket stage from NASA's Lunar Crater Observation and Sensing Satellite was deliberately crashed into Cabeus, a two-mile-deep crater in the South Pole region of the Moon. In the eternal shadow and near absolute cold at the bottom of the crater, any water from eons ago would be imprisoned there. "Indeed yes, we found water and we didn't find just a little bit. We found a significant amount," said Anthony Colaprete, head of the experiment.

Later, looking at the vapor analysis data collected by the probe, the impact at 5,600 miles per hour was estimated to have formed a hole of up to 100 feet wide and released at least 26 gallons of water.

Plans for additional human exploration of the moon have taken on new life, especially as an ideal environment where ideas for a Mars mission could be tested.

NASA has been changing, too. The success of the space station led to increasing contributions from other nations enhancing the "international" name of the ISS. And from the commercial sector, firms began to encroach on what had been the sole prerogative of government-funded space projects.

This mix of nations and commercial interests is an important aspect of the latest "back to the Moon" effort, which would have us sending two astronauts (a man and a woman, NASA promises) to the lunar South Pole by 2024 followed by a "sustained presence" by 2028.

As usual, there is new nomenclature to learn. The program is called "Artemis" named for the twin sister of Apollo and goddess of the Moon in Greek mythology. The Artemis price tag is \$22.6 billion. Apollo cost \$25 billion.

With the caveat that these plans are politically vulnerable, there is a beefed-up command module called Orion, designed for a crew of four. It plus a European-made service module will sit atop the Space Launch System (SLS) – a giant rocket that is already undergoing ground testing.

It's about 15 times more powerful than the Saturn 5 moon rocket and is the first of even stronger versions to come. This combination (Artemis 1) will be tested in an unmanned checkout flight going 40,000 miles beyond the moon. Assuming all goes well, on Artemis 2 four astronauts will take the new spacecraft in a loop around the moon.

Artemis 3 would be the first crew on the lunar surface. Various cargo, developed commercially, will be waiting for them at the lunar South Pole landing site, delivered from an orbiting lunar parking lot that NASA calls the Gateway.

The Gateway is a clever move and of key importance to the success of Artemis and Mars beyond. Could all this change? You bet. It's the nature of the beast.