

NASA: 'I went to the moon with a slide rule'

Continued from 1A

initiating fire and measuring temperature, pressure, smoke patterns and chemicals in the atmosphere for a variety of materials and scenarios until they came up with something that worked.

Chaffee's favorite moments include the landing of Apollo 11 on the moon. In his living room with his two children on his lap, he watched astronaut Neil Armstrong take the first step.

Another favorite memory is of Apollo 8. On Christmas Eve in 1968, Chaffee sat with colleagues in Mission Control and kept track of data as the spacecraft orbited the moon. As it came into view about midnight, a high-fidelity camera showed the surface of the moon in muted colors of grey, brown and black.

"The entire world could see the moon from an American spacecraft in orbit," Chaffee said.

On the screen, Chaffee spotted a bubble of green and blue on the horizon. A murmur of speculation, then someone said "That's the rising earth." For the first time, Chaffee said, people on earth saw the rising earth from the moon. The astronauts — Commander Frank Borman, James Lovell and William Anders — took turns reading the first 10 verses of Genesis.

"In the beginning, God created the heaven and earth..." Chaffee said. "What an emotional moment for everyone who was there. Tears were streaming down. You're trying to watch your data and trying to watch the TV and your heart is throbbing."

A photograph of the moon with the earth in the background hangs in Chaffee's home along with the text of Genesis 1:1.

He remembered another mission that involved Scott Carpenter, a Navy test pilot who became the second astronaut to orbit earth. During his Mercury flight in 1962, Carpenter practiced orienting the ship with a series of yaws and rolls and pitches. The test pilot/astronaut did so much switching back-and-forth

between regular and manual control that his fuel supply dropped low enough to threaten reentry. The astronaut came in at a worrisome angle.

"If the angle of re-entry is too narrow, you hit the atmosphere and skip like a stone," Chaffee said.

Carpenter made it back into earth's atmosphere, but overflowed the splashdown site in the Atlantic Ocean by 250 miles. The astronaut waited three hours for Navy divers to arrive.

Chaffee also talked about the logistics of being an aerospace engineer before the beginning of the computer age. To illustrate, he unsheathed his old slide rule from a leather case and held it up.

"I didn't have a four-function calculator until 1973," he said. "I went to the moon with a slide rule."

One has the sense that Chaffee could go on for hours, telling one interesting story after the next.

He now serves as something of an ambassador for NASA, visiting schools and other venues in a quest to spark excitement about space exploration. He oversees a weekend-long competition for high school students at the Johnson Space Center. This year, four teams of students designed settlements capable of housing 700 people on the surface of Venus, a hot and inhospitable planet. During the weekend, each 50-person team submits a project proposal and students transition from enthralled visitors to scientists working under a deadline.

"They come in bright and bushy-tailed and depart as zombies," Chaffee said.

Chaffee plans to keep sharing his love of rocket science with whoever will listen.

"I'm not through," he said. "The sun is not yet set."

He ended the pub talk with a request: "Write to your Congressman and urge full funding of NASA."

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Students interact with NASA engineer

East Oregonian

Retired NASA engineer Norman H. Chaffee spoke to approximately 150 students Wednesday about his 38 years at the space agency.

During the visit to the Pendleton UAS Test Range, Chaffee reconnected with Oregon STEM (science, technology, engineering and math) and robotics students he met last spring at the Johnson Space Center. The engineer encouraged them and their classmates to pursue their dreams in the field of technology innovation.

A video highlighted space flight endeavors that happened since Chaffee, of Pasadena, Texas, joined NASA in 1962. Among other subjects, Chaffee spoke about the imminent reality of inhabiting Mars and returning to colonize the moon within the students' lifetime. The students soaked in information on rockets, robotics, space travel and the future of STEM-related technologies.

The teens took turns interacting with Chaffee and touring the UAS Mission Control Facility, where they learned about a variety of robotics and aerospace technologies being developed in Pend-



Photo contributed by Ben Caldwell/The Duke Joseph Agency

Retired space systems engineer Dr. Norman H. Chaffee speaks with a group of about 150 STEM students Wednesday in at the Pendleton UAS Test Range at the Eastern Oregon Regional Airport.

leton. The students also experienced the MCIC lab's virtual reality simulation and its bevy of 3D printers. They held a thruster from the Apollo service module and an encapsulated Apollo heat shield.

Chaffee wore many hats throughout his long career at the Johnson Space Center, with roles as deputy division chief for the NASA Propulsion and Power Division, chief engineer for

Technical Program Systems Integration and the International Space Station Program, and chief of systems of the Engineering and Integration for the NASA Lunar Mars Exploration Program.

In 1987, Dr. Chaffee was named NASA Engineer of the Year. In 1991, he became deputy chief of the Automation and Robotics division.



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BRIEFLY

U.S., Israel to exit UN agency over alleged anti-Israel bias

PARIS (AP) — The United States announced Thursday it is pulling out of the U.N.'s educational, scientific and cultural agency because of what Washington sees as its anti-Israel bias and a need for "fundamental reform" in the agency.

Israeli Prime Minister Benjamin Netanyahu said Israel plans to follow suit.

While the Trump administration had been preparing for a likely withdrawal from UNESCO for months, the timing of the State Department's statement was unexpected. The Paris-based agency's executive board is in the midst of choosing a new chief — with Qatar's Hamad bin Abdulaziz al-Kawari leading the heated election heading into Friday's final vote.

Outgoing Director-General Irina Bokova expressed "profound regret" at the U.S. decision and tried to defend UNESCO's reputation. The organization is best known for its World Heritage program to protect cultural sites and traditions, but also works to improve education for girls, promote understanding of the Holocaust's horrors, and to defend media freedom.

Bokova called the U.S.'s planned departure a loss for "the United Nations family" and for multilateralism. The U.S. and UNESCO matter to each other more than ever now with "the rise of violent extremism and terrorism," she said.

The U.S. stopped funding UNESCO after it voted to include Palestine as a member state in 2011, but the State Department has maintained a UNESCO office and sought to weigh in on policy behind the scenes. The U.S. now owes about \$550 million in back payments.

Hotel: Gunman shot at crowd seconds after shooting guard

LAS VEGAS (AP) — Even as investigators struggle to unravel the mystery of what motivated a gunman to open fire on a Las Vegas concert crowd, confusion surrounds the sequence of events in the fatal few minutes of the worst mass shooting in modern U.S. history.

On Thursday, the hotel where gunman Stephen Paddock opened fire from his high-rise hotel suite disputed the official timeline for the Las Vegas massacre and rejected any suggestion hotel officials delayed summoning police for several minutes after the gunman's initial burst of fire.

It was the latest head-turning change in the investigation that has been frustrating for all involved. Since the Oct. 1 massacre, the timeline of the shooting has changed several times and police and hotel officials can't seem to agree on the basics of when the shooting happened.

In the most recent chronology given by investigators on Monday, police said Paddock sprayed 200 rounds into the hallway on the 32nd floor, wounding an unarmed security guard in the leg, six minutes before he unleashed his barrage of bullets on the festival crowd. That raised a series of questions about whether officers were given information quickly enough to possibly have a chance to take out the gunman before he could carry out the bloodshed.

But on Thursday, MGM Resorts International, which owns the Mandalay Bay, said it was no more than 40 seconds between the time the guard using his walkie talkie to call for help and Paddock opening fire on the crowd from two windows in his suite.

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