

Return of the rocket men

Nasa is planning manned missions to Mars by the 2030s, and the moon will be a key stepping stone. Three of the last surviving lunar astronauts from the historic Apollo programme, Buzz Aldrin (left), Charlie Duke and Harrison Schmitt, tell *Bryan Appleyard* what it's like to set foot on an alien world



Two paying customers are looking forward to a voyage around the moon, scheduled for next year. Their identities are being kept secret, though the ticket price is not — \$80m. They will fly SpaceX, the company formed by the internet billionaire and Tesla car builder Elon Musk. It may not happen — space is hard — but, if it does, will it mean human space exploration is back on the agenda? Are we going back to Mars and the stars? The surviving six moonwalkers hope so.

The last words spoken on the surface of the moon were: “Engine start push.” That was Eugene Cernan, the Apollo 17 commander, ordering the launch of the lander Challenger from the Taurus-Littrow Valley on December 14, 1972. He died in January this year, aged 82, having never seen another human go beyond low-Earth orbit in the intervening 44 years.

Myths have been spun around those last words. It has been widely reported that the supercool Cernan actually said, “Let’s get this mutha outta here,” a suitably legendary payoff. But Harrison Schmitt, who had walked with him on the surface, insists on the more mundane version: “It’s not in the transcript, let’s put it that way. We were on voice-activated communications at that time, so I’m afraid that was not said. I think the last words on the moon were ‘engine start push’ — and once you push that button, you’re not on the moon any more.”

Between July 1969 and December 1972, just 12 men walked on the moon. Nasa had three more Apollo missions ready to go, but popular excitement and political will had evaporated. An ugly, accident-prone dump truck that only went as far as low-Earth orbit — the space shuttle — replaced the gorgeous Saturn V rockets.

The memories of the 12 moonwalkers were all that remained. I ask Schmitt if he left anything behind.

“Well, a lot of geological equipment...” I meant anything personal.

“Almost entirely my memories.”

Charlie Duke, an Apollo 16 walker in April 1972, did leave something personal — a picture of his family. Would he like to go back and get it?

“After more than 40 years of monthly temperature variations between minus 275 degrees and 400 degrees Fahrenheit, I think it will be all shrivelled up and blackened by now.”

Of the six surviving walkers, three of them — Buzz Aldrin, Duke and Schmitt — are the stars of Starmus IV festival in Norway in June. This is a spectacular science-and-music event started by an astrophysicist, Garik Israelian. Other than the walkers, this one has Stephen Hawking, Brian May, Peter Gabriel, Richard Dawkins and more. But, let’s face it, the walkers are the stars; there’s something special about them: not even Elon Musk’s



space tourists will have the honour of actually setting foot on the moon.

All the Apollo astronauts seemed to possess a unique purity, a saintly purposefulness. Engineers, scientists and pilots — often all three — they got on with their supremely difficult job with matter-of-fact heroism. They have, as Tom Wolfe put it, “the right stuff”. But, among these aristocrats, the walkers are royalty. Only they have stood and worked on another world.

So, Buzz Aldrin, what did it feel like? “Fighter pilots weren’t trained or wired to feel. We had a job to do. I like to say we had ice water in our veins.”

No fear, then? “What was there to be afraid of? We’d trained for years and we knew what to do. I’ll tell you what is scary — having a MiG on your ass trying to shoot you down, like when I was a fighter pilot in Korea.”

Aldrin was the second walker. He stepped onto the lunar regolith (moon dirt) 19 minutes after Neil Armstrong on July 21, 1969. The world was watching.

“Everywhere I go in the world,” says Aldrin, “someone tells me where they were the night Neil and I walked on the moon.”

His fighter-pilot calm was not shared by the flight controllers in Houston. Charlie Duke, later a walker, was Capcom — capsule communicator — on Apollo 11. His is the voice you hear talking to the astronauts, and he knows better than anybody what a damn close-run thing that mission was.

“When we started the descent on Apollo 11, the whole place just started falling apart. Communications dropped out, we had to reorientate the space craft, we had to change antennae, the computer kept overloading.”

Then, most famously, Armstrong steered away from the planned landing site — too rocky — a move that left the lander with just a few seconds of fuel by the time it touched down. Finally, he announced: “The Eagle has landed.” And Duke replied: “You got a bunch of guys about to turn blue, we’re breathing again.”

A little of the ice in Aldrin’s veins seemed to melt when he first stepped onto the surface.

“My first words when I stepped on the moon were ‘magnificent desolation’”

Charlie Duke is more lyrical and exact. He looked back at Earth, 250,000 miles away. “We could see up to the Arctic Circle and down through Canada, the US and Mexico. The colours were just incredible: the crystal blue of the ocean, the brown of the land, the white of the snow and that jewel of Earth just suspended in the blackness of space. The sun shines so brightly, you don’t see any stars. The blackness of space was very vivid to me.”

He adds that, thanks to the training, “When I hit the surface, I felt right at home.”

Schmitt is a geologist and he spent much of his time looking downward at the dust,



GOOD MOON RISING Apollo 11 on its way and (left) launching on July 16, 1969

rocks and regolith of the Taurus-Littrow Valley, but occasionally he looked up.

“When you begin to look around and you see that you’re in this magnificent valley, brilliantly illuminated by a sun that is obviously brighter than any sun you can imagine, and all against the black of a black sky. The mountains themselves at 1,500 to 2,100 metres high on either side of us. It was really quite something... And the Earth is always in the same part of the sky. It really is a fantastic visual experience.”

Clearly all the training in the world cannot stop you being shocked by wonder. But there were also smaller, unexpected things about the journey. Schmitt was surprised into what sounds suspiciously close to fear as the Saturn V exploded into action.

“It was surprising to me just how much vibration there was. There were these five engines, each developing 1.5m lb of thrust, and we got this low-frequency vibration. You couldn’t read the gauges on the instrument panel... That feeling gets your attention.”

Aldrin was struck by the fineness of the regolith dust.

“Like talcum powder. That’s why I took one of the few photos on the moon of the iconic boot print.”

The dust also got to Duke. He noticed, back inside the lander, that when you rubbed it between your fingers, it felt “oily, like graphite”. He also said it smelt like gunpowder. Other walkers have said the same thing. But when transported back to Earth, it seemed to lose this smell. So does the moon smell? Well, it is possible the regolith emitted an odour on contact with

“The sun shines so brightly, you don’t see any stars. The blackness of space was very vivid to me” *Charlie Duke*

REX NASA

the oxygen in the lander — so maybe yes, the moon smells of gunpowder.

Aldrin spent 2¼ hours on the surface; Duke and Schmitt each spent more than 20 hours. Longer times on the surface — the latter two did three shifts of about seven hours each — meant exhaustion became a problem. Nasa was cautious about this — the walkers were ordered to pause every time their pulse rate went over 140.

“I found walking quite an easy thing to do,” says Schmitt. “I was used to cross-country skiing and I could use that technique of toe-push and glide across the surface, it took very little energy and I got quite a good clip.”

Handling things, however, was hard work. “The gloves really wore out your forearms pretty quickly. It was like squeezing a tennis ball.”

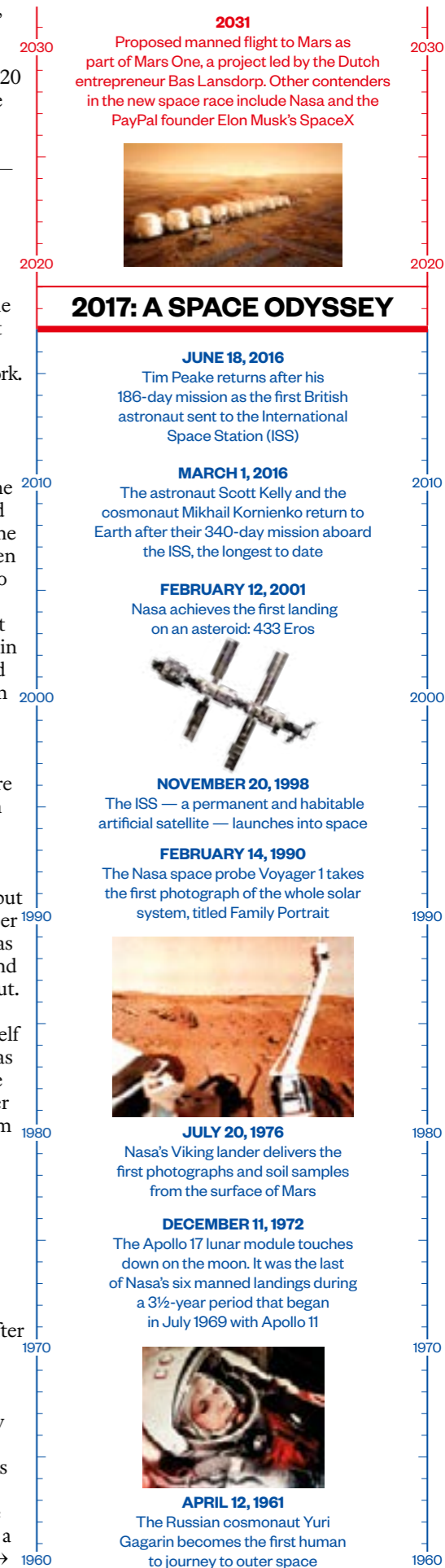
Sleeping baffles me. In my mind, you’d have to have dangerously high levels of the right stuff to doze off in a tiny pressurised can on the moon. They all tell me about the alarmingly delicate skin of the lander when unpressurised — “It had a beer-can feel to it,” says Duke. When pressurised, it becomes taut and hard — but still, it’s not a very sedative thought that this paper-thin sheet was the only thing between you and the vacuum of space. Duke’s partner, John Young, had no problems on their first night, but Duke did.

“Yeah it was a problem... we had some sleeping pills in our medical kit. They were not knockout pills, they were just enough to put your mind on idle, so I got about four hours.”

The pre-moon biographies of all these men clearly have right stuff in common, but there are variations. Aldrin was an engineer and fighter pilot, as was Duke. Schmitt was a geologist who had to undergo aircraft and helicopter training to become an astronaut. Aldrin was religious, a presbyterian. He took a special kit with him and gave himself communion. He did it without publicity as the crew of Apollo 8 — which orbited the moon, but did not land on it, in December 1969 — had got in trouble for reading from the Bible. Nasa did not want any religious comments made by any of them.

It was to be post-moon that their right stuff was tested, though. After years of intense training followed by enormous global publicity and the high-adrenaline adventure of going further than any humans had been before (or since), they seemed to run into a wall of bafflement after the mission. Especially Aldrin.

“I struggled for a while. I decided to return to the air force and I was the first astronaut to do that, but they didn’t know what to do with a guy who walked on the moon, so I didn’t get the assignment I was hoping for... I floundered, struggled with alcohol and depression and my family life suffered and ended in divorce. It took me a while to get my life back together and >>>



focus on my passion — space. Now, at the age of 87, things are better than ever!”

Duke, at first, had similar problems. “The question of what are you going to do now came up almost immediately after Apollo. I was offered a job in Washington by Nasa, to be a deputy administrator, but my marriage was such a problem at that stage, and I knew it would end if we went to Washington.”

He was restive, frustrated.

“I had this problem that I couldn’t find any peace. I should be satisfied, I’m one of the 12 guys who walked on the moon. Through all this, things were getting worse. My wife, Dorothy, by 1975 she was on the verge of suicide... Looking back, that lifestyle we had during Apollo — it just stopped; that leads to problems for a lot of folks.”

He thought money might be the answer. He had rich friends and they seemed to be OK. He made money in business for a couple of years, but that didn’t provide the calmative he sought. Finally, both he and his wife found peace in the faith of the Episcopal (Anglican) Church.

Schmitt seems to have had the strongest dose of post-moon right stuff, perhaps because he had gone there as a scientist and that provided him with a role when he came back.

“I didn’t have the problems some of the guys may have had because I was immediately trying to understand the science of these samples. I always had an interest in politics, so I started thinking about running for the US Senate, which I did in 1976.” He was a Republican senator for New Mexico between 1977 and 1983.

But there was one disaster they all — even Schmitt — had to deal with. Apollo 17 marked the end of the programme and the consignment of all that wonderful, beautiful engineering to museums. This was, like many collisions between politics and wonder, madness. The Saturn V technology had years of life left in it.

The cancellation was partly political — Congress and the Nixon administration had imposed tighter budgets and Nasa’s workforce was being forced to shrink — down from 400,000 in the mid-1960s to 190,000 in 1970. But also, Nasa was not sure that further moon missions represented value for money and there were competing programmes — a space station and the space shuttle.

“Nasa had three Apollo vehicles that were ready to fly,” says Duke, “and they cancelled those missions, which was very

“We became risk averse after the shuttle astronauts. Humanity needs to explore, like we did in 1969” *Buzz Aldrin*



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disappointing. But that was a political decision. And then, while we were on the moon, Congress approved the space shuttle programme. Well, that put us back into Earth orbit for the next 30 years.”

“When the Apollo missions ended,” says Aldrin, “we all felt that Mars was the next step. I wasn’t disappointed that we hadn’t been back to the moon because we needed to go beyond the moon. In 1985, I was working [on] cycling orbits between the Earth and the moon for tourism, but Nasa wasn’t interested because we already knew how to go to the moon.”

Spacecraft that move in “cycling orbits” travel in continuous trajectories around the moon (or Mars) and Earth. These would be a much cheaper method of transport.

“There were a lot of mistakes that were made. We became risk-averse after the shuttle astronauts. Bureaucracy makes things move slower. We cancelled the shuttle programme even though we didn’t have a rocket ready [for manned launches into Earth orbit] and now we’ve been relying on the Russians to get our astronauts up to our \$100bn space station.”

Duke is similarly distressed by the reliance on Russia: “I think there’s something fundamentally wrong with that.”

“I was, in retrospect,” says Schmitt, “certainly disappointed that the political issues of the time did not convince the leadership of the United States that we should continue to produce the Saturn V rocket and use it on a regular basis, not only to explore the moon, but to build space stations and then ultimately to go on to Mars. There could have been an enhancement of that very, very robust Saturn V technology. History will look at that a little bit askance, but it’s the way it turned out to be.”

The upside to cancelling the programme is that it preserved the moonwalkers’ unique aura. In the absence of real space exploration, they became the apostles of space, advocates of exploration. “I consider myself a global space statesman,” says

Aldrin. “Humanity needs to explore, to push beyond current limits, just like we did in 1969.”

Finally, in old age, their advocacy seems to be working. Nasa has plans to go back to the moon and then to Mars. The Trump administration seems to be backing this. The president recently signed a bill authorising \$19.5bn for Nasa. This means space funding will not be cut and Nasa will be able to continue with its launch system and Orion capsule programme, which aims to land humans on Mars by the 2030s. On top of that there is a new wave of private spacefaring — like Elon Musk’s voyage around the moon and then, he says, Mars. Aldrin has other ideas. Things are looking up for the old walkers. Its just what Aldrin wants — Earth orbit for the private sector, deep space for the public.

“We have to rely on the private sector to get to Earth orbit. Nasa should be focused instead on deep-space exploration... My cyclor is the best transportation system to bring humans and cargo to Mars. But we can’t ignore the moon. It’s an important stepping stone for Mars. We, the USA, have to lead the rest of the nations of the world to build an international base on the moon to mine the ice. That ice can be turned into rocket fuel... From there we will learn how to live on another planet, along with all the things we need to do to enable missions to Mars.”

Politics ensured that the Apollo moon landings were the start of nothing — no space tourism, no voyages to Mars and beyond. Instead, they joined Woodstock, the Beatles, hippies and Muhammad Ali as something strange and astounding that happened in the 1960s and early 1970s. They have become exotic, almost unbelievable memories. The surviving walkers still dream their dreams of space adventures, and of a time when the world agreed it was all worthwhile, and when men with the right stuff could say they had seen and done things nobody had ever seen or done before ■

The Starmus IV festival runs June 18-23 in Trondheim, Norway. Tickets at starmus.com

Want to meet the moonwalkers in person?

We are giving away a pair of tickets (worth £850 each) to the Starmus IV space festival in Norway, from June 18-23. The prize includes flights and accommodation at the Clarion Hotel in Trondheim. You and a friend will watch Buzz Aldrin, Charlie Duke and Harrison Schmitt speak and meet them afterwards. You will also receive a complimentary copy of the book *Starmus: Beyond the Horizon*, signed by the trio. The competition closes at midnight on Tuesday, April 11. For terms and conditions, and to enter the competition, visit thesundaytimes.co.uk/starmus