The Journey

Valerie E. Martindale, Ph.D., CAsP, FAsMA

Today I was reminded of how universal our aspirations for exploration are.

As many of you know, I live and work in Tokyo. On my most recent trip to the United States, I visited Kennedy Space Center right before my return to Japan. I watched again the collection of television clips from 1969 that precede the theater presentation on Apollo 11. Every time I see them, I see them differently, depending on who is with me. With young companions, they seem old, tinny, and in need of explanation. But with those my age, or older, they are memories stronger in some ways than the television clips of today. I was transported back to my childhood, when my mother insisted I watch the Moon landing, sitting on the itchy rug in front of the color television my father had built from a kit, with the vacuum tubes that we periodically took to the drug store to test whenever the picture went out. How much the world has changed! And yet how much it has not.

At the end of the visit I chose some postcards and picture magnets to give to the support staff in the Tokyo office. Our Reference Materials Expert chose the slogan, "Failure is not an option," an invention of Hollywood that has been adopted as a motto for the space program. She described her own visit to the Space Center, but has no memories of the historic mission itself. Our Senior Administrative Assistant told me she, like me, was in elementary school when the Moon landing occurred, and she chose a picture of Neil Armstrong stepping onto the lunar surface. It was Mito-san, my Japanese teacher, who most touched me with her memories. She looked intently at the picture of Earth from space, and told me how she had been watching the lunar landing at the same time I was watching a world away. She described listening to the simultaneous translation, so well captured in those old television clips that the visitor center has collected from around the world, a translation that brought together people of all kinds in a moment of human accomplishment that has perhaps not been matched since.

Its inspirational meaning continues to resonate today. The International Space Station encapsulates, rather literally, the hopes of many nations. As I write this, six explorers—three American, two Russian, and one Japanese—orbit the Earth. Last fall the Space Medicine Division of JAXA, the Japanese Space Agency, was kind enough to host me for a day. I toured their facilities and spoke with doctors and researchers, and saw in their visitor center displays of Japan's contributions to the ISS and plans for future expansion, partners in the international enterprise. There is a pond in Tokyo that contains fish descended from fish flown in space, and several temples have cherry trees grown from seeds flown in space.

Even in countries without access to a manned space program, the dream propels imaginations. On a trip to Taiwan I talked with researchers who take inspiration from the idea of future habitations on the Moon and Mars to work on boosted efficiency for biosystems that can scavenge waste CO_2 and turn it into food and biomaterials. Australian researchers in plant biology are hoping to provide high-yield dwarf varieties of familiar crops. There are too many others to mention.

Wikipedia claims "As of 2017, 71 different government space agencies are in existence; 13 of those have launch capability. Six government space agencies - the Indian Space Research Organisation (ISRO), the European Space Agency (ESA), the China National Space Administration (CNSA), the Japan Aerospace Exploration Agency (JAXA), the National Aeronautics and Space Administration (NASA), and the Russian Federal Space Agency (RFSA or Roscosmos) - have full launch capabilities; these include the ability to launch and recover multiple satellites, deploy cryogenic rocket engines and operate extraterrestrial probes. Only three currently operating government space agencies in the world - RFSA and the CNSA and NASA - are capable of human spaceflight as of 2017." But commercial space operations are ramping up and the future may not be tied to government access. While I was at Kennedy Space Center, SpaceX was preparing to test the Falcon Heavy rocket, which will be the most powerful rocket ever when fully deployed. The test was delayed by the government shutdown in January, while Rocket Lab launched a smaller but equally momentous mission from New Zealand using privately owned launch facilities.

What roles will we be able to play in this expanding future? The answers will be as varied as we are. This issue of the journal is packed with abstracts that reflect that scope and diversity, and the spectrum of specialties needed. Our Annual Scientific Meeting is an expression of the marriage of inspiration and perspiration, to borrow a metaphor. We push the envelope, expand our world, redefine our capabilities and defy our limits, in an accumulation of small steps. Each of you, in your contribution, becomes part of the journey.

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CONTACT DETAILS:
Email: President@asma.org • **Web site:** www.asma.org • **Facebook:** Aerospace Medical Association • **Twitter:** @Aero_Med