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Astronaut/Engineer/Physician: Dr. Daniel Barry Speaks to SLA 2003
by Bonnie A. Osif and Eileen Dorschner

(Editors note: Dr. Daniel Barry spoke to an enthusiastic group during the Special Libraries Association’s 2003 annual conference in New York City. After his presentation and a reception, he sat with the authors for a question-and-answer session. This article is based on his talk and his answers during our meeting.)

Dr. Daniel Barry’s résumé could be the collective accomplishments of several people. He earned three degrees in electrical and computer engineering from Cornell and Princeton. He went on to earn his doctorate in medicine from the University of Miami. His internship was at the University of Michigan. He has applied his training in signal processing and prosthetic design, among other areas; published more than fifty articles; and has five patents.

If that isn’t enough, Dr. Barry noted his intense desire to become an astronaut. One of the first comments he made was that he is “a space nut too” and has wanted to be an astronaut for as long as he can remember. The path to the space shuttle was not easy. It took several applications before he made the pool of candidates, but once he did it was full speed ahead.

If there is one theme that came through very clearly, it is the importance of teamwork. During the training period, astronauts have a great deal of technical knowledge to learn and skills to master. However, the success of the mission and the safety of the crew depend on teamwork. “You trust your life to these people,” he noted.

One interesting example concerned spacewalks. Dr. Barry has several spacewalks on his résumé, one of which lasted almost eight hours. The activities on a spacewalk can be very complex, even more so when you consider they do them wearing bulky suits that limit maneuverability and dexterity, and visors that limit the ability to see. In addition, the astronauts can lose communication with one another at times during the walk, yet communication is vital. He noted that training and teamwork result in a crew who know one another, and understand what the others will do, so well that they can operate very well even without speaking. Teamwork and trust is vital.

Living in space presents the problems we can all imagine, as well as some very interesting ones that don’t necessarily come to mind. For example, suiting up for a spacewalk involves 183 steps, each of which must be done correctly and at the right time. We saw a shot of an astronaut suiting up while another crew member handled the checklist.

Eating looks like a child’s dream, with spheres of fluids floating to the mouth and catching hovering vegetables not only allowed, but a practical way of eating! Some of the scenes were both fun and informative. It is physics in action as you get away with “playing with your food.”

One aspect that may be overlooked is the workday. Astronauts on the shuttle technically have no free time. They work a full shift and have eight hours scheduled for sleep. Since the schedule is tight, they often spend several hours setting up experiments for the next day. This schedule, depending on the duration of the flight, can last for ten days, at which time they get a half day off.

So, how do they fit in those fun, interesting, and sometimes silly experiments we often see in the videos? During experiments and other tasks, there may be some downtime while the crew waits for instructions or some other task that takes time. That’s when they can “play,” a term used loosely because there is almost always some aspect of learning involved in these activities. For example, Dr. Barry is interested in the spatial “knowledge” of the hand in space. The hand loses any idea of where it is and can float up the side of the body. He noted that while it takes time for the limbs to learn to live in space, the brain adapts rapidly.

One way of adapting to life in space is for the experienced astronauts to move off to the side or corner of the shuttle. This allows the rookies to adjust without any unnecessary bumps and kicks! Neuroplasticity is a term to describe how fast people can adjust to space and how long it takes to forget these adjustments—issues of interest to the astronaut, scientist, and anyone near a new or returning astronaut!
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How does NASA utilize a person with such varied skills as Dr. Barry has? The answer: in any way possible. Dr. Barry had been advised to follow the path of what he loved to do, then find a way to apply that in space. This advice led to his Ph.D. in engineering, followed two years later with his M.D. While it took him several tries to make NASA in 1992, he utilized his degrees in numerous ways until then. His engineering background was useful as a flight engineer, and he has been the third person in the shuttle cockpit. His athletic ability was an aid in the construction work he has done with the shuttle and the space station. His medical degree, ironically, might be the least used. Though he does use these skills if crew members are not feeling well and in his studies on physical changes in crew during flight, he noted he has not had to play doctor much on the flight. NASA will need to develop medical procedures for longer trips and for dire emergencies that may someday occur in flight. While the original thought might be to get the shuttle back to Earth as soon as possible, there are problems that might be better treated in space.

He noted some of the long-term physical changes documented during our decades in space, including bone density loss of 1 percent per month. These losses are not completely reversible and have real implication for long flights. Muscle atrophy and immune system changes also have been noted. Other areas of interest are kidney function, radiation, motor control and coordination, and psychosocial issues.

On a less technical note, Dr. Barry spoke eloquently about the view from space. He regaled the audience with a number of photos, emphasizing that they simply did not do justice to the real thing. The colors are magnificent from space and the fragility of the atmosphere is very evident. Interestingly, he mentioned two things visible from space that may not come to mind for those of us on terra firma—contrails and boat wakes. He showed slides with these clearly visible from the shuttle, which were breathtakingly beautiful.

We ended our interview with a discussion of the value of spaceflight and the future. Dr. Barry noted that Earth has benefited from the space program's many contributions; however, that is not the overriding reason to go into space. We've learned about physiology, how to live in a closed environment, and new technologies. But there seemed to be a realistic awe in the entire process that was contagious. One benefit he mentioned was that the knowledge gained in the space program could lead to a self-sustaining colony in space. He questioned whether we are alone: Has life evolved elsewhere without DNA? Is life different? Is all life DNA based? Has it converged? Diverged? Was it on Earth first or someplace else first? Any of these possibilities means we are not alone. But if life is no place else, then we are alone and therefore we are "the icing on the cake." Having colonies protects us from catastrophe, and a colony makes practical sense.

We ended our conversation with a discussion on the possibilities of life in other places and space colonies—topics of science fiction. Dr. Barry noted he was a fan of science fiction and has a "Star Trek perspective," which makes perfect sense in light of the first comments he made during his presentation and interview. He is a fan of libraries and librarians, someone who knows his town librarian by name and visits the library weekly to pick up books for himself and his family.

Dr. Barry noted that librarians are "enablers of knowledge." People can't stand on the shoulders of giants if they have never heard of them, and the librarian passes the knowledge to others. His Hadley, Massachusetts, librarian "feeds me my reading" and keeps a list of books for him. Reading is important to his family, who visit the library together. During his training period, Dr. Barry read to his children over the telephone each night—a total of fourteen books, including the Redwall series, The Count of Monte Cristo, and Robin Hood.

Any librarian who was able to attend the hour with Dr. Barry likely walked out feeling a renewed sense of mission. Though none of us has yet flown in space, Dr. Barry reminded us all of the teamwork of our profession—that of a group of librarians building useful collections and Web sites, working together to answer difficult questions, and providing the instruction, information, and coordination needed to accomplish the goals of putting people on the moon, in the space station, and, someday, beyond.
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