

STORY MUSGRAVE

Sometimes, out in space, Story Musgrave thinks about the cottage known as Linwood in Stockbridge. Linwood is part of the Norman Rockwell Museum, a shrine to all that is wholesome and healthy in America. But during the 1930s and 40's, long before rockets were carrying Musgrave and other astronauts into orbit, Linwood was home to the Musgrave family. It was not a happy place. "Dad was very violent, very harsh, exceedingly malicious," Musgrave recalls. "Both mom and dad were alcoholics."

To escape Percy Musgrave's drunken temper, young Story would often slip off into the darkened woods and lie on his back looking at the stars. "I perceived a very screwed-up world and needed to escape humanity," Musgrave says. "Even at the age of 3 I would go off into the total darkness and feel that was where home was."

Now at 61, Story Musgrave has been through more difficulty and reached nearer the stars than most humans. When he takes his final flight on the space shuttle Nov. 8 -- becoming the oldest human ever to go into space -- his career will have completed a giant arc that has taken him far from the Berkshires and the broken family he was born into.

Among NASA colleagues he is known as "Dr. Details" because of his excruciating attention to every aspect of a space mission. But Musgrave is no space jock. He is a scientist who is also a late-blooming philosopher and poet, a man who even in his seventh decade has an insatiable appetite for knowledge.

Musgrave's roots go deep in New England. Ancestral namesakes were Joseph Story, an early Supreme Court Justice, and William Wetmore Story, a 19th century sculptor. His mother's family settled in western Massachusetts; his father was from Boston. They set up housekeeping on a dairy farm amid gently rolling hills. But despite the idyllic setting, Story Musgrave's family was riven by conflict and tragedy. When he was 10, his mother took him and fled Percy Musgrave's abuse. His two brothers, one older and one younger, stayed behind with his father. Story and his mother lived variously in Boston, back in Stockbridge with relatives, in Lee, Cheshire and Pittsfield.

Tragedy shadowed the family. His older brother, a Navy aviator, died catapulting off an aircraft carrier in the Pacific. His younger brother committed suicide playing Russian roulette. His long-suffering mother and cruel father both killed themselves.

Through all that, Story Musgrave doggedly pushed ahead, a sole survivor determined to make sense out of life. "He's a stubborn son of a gun," says Mark Swan, a cousin who grew up with him. "He just stuck it out."

Mechanically inclined but no scholar, Musgrave had difficulty completing high school at St. Marks in Southborough and dropped out to join the Marine Corps at age 18. But he knew he needed an education and he went back to school, eventually earning degrees in math,

chemistry and computer programming. He received a doctorate in medicine from Columbia and a master's in physiology and biophysics from the University of Kentucky, and in 1967 he joined the space program. "It just seemed like I had been preparing all my life for it," he says. "When the space program came along, bang, the epiphany struck and there was no going back."

Musgrave did not go into orbit until 1983, spending most of the 1970s designing space tools and human interfaces for the shuttle. He has now been in space five times and is best known as the cool-headed lead repair man in the crucial Hubble Telescope repair mission of 1993.

What really makes Musgrave a different kind of astronaut, however, is his relatively recent interest in the humanities. He is, he says, hungry to find meaning in his life -- "cosmological meaning, biological meaning, species meaning" -- and that is best accomplished through a journey of the mind, not the body. For the past 10 years, at an age when most people begin to slow down mentally, Musgrave has been devouring literature, philosophy and metaphysics. He is working on master's degrees in history and psychology. Musgrave has steeped himself in the New England transcendentalists, recognizes his own quest as similar to the one Melville described in his whaling epic. He has studied ballet and taken up gardening, and he once carried a copy of John Dewey's "Art as Experience" into space. He also writes poetry.

A soft-spoken man with the slow, confident cadence of an airline pilot, Musgrave has approached the arts with the same diligence he brought to fixing tractors, flying, scuba diving, performing surgery and choreographing shuttle missions. His modest house a few miles from the Johnson Space Center in Houston is packed with books, file cabinets and computers. Twice divorced and the father of five children ranging in age from 9 to 35, Musgrave lives alone.

His books are well-worn, annotated and each labeled according to his own cataloging system. A tour through his library is a tour through a remarkably eclectic mind that ranges from Edmund Wilson to Virginia Woolf, Marcel Proust to Edward Hoagland -- "and St. Augustine, of course, I love St. Augustine," he says. "And 'Varieties of Religious Experience.' William James. That's an extraordinary book. When people are in religious ecstasy, the way they write. St. Theresa! Whoa."

The file cabinets are filled with spiral notebooks from night school at the University of Houston. Musgrave uses three notebooks for each subject -- one for the straight lecture, another for what the ideas mean to him and the third for how the ideas can be applied to the experience of space flight. Each year he methodically reviews the notebooks to make sure the knowledge is still relevant to him.

The point of all this, he says, is to try to derive meaning from experience and then to "express space". Without such preparation, the rare opportunity of space flight is wasted. "If you don't work on the inner experience beforehand, the inner experience is not going to happen," Musgrave says. "There are loads of people who have told me, 'The greatest thing I regret is that I've been up in space three times and retired and never saw the stars.' I say, 'Don't feel bad, that's the average.'"

At least once a mission, Musgrave turns off the lights in the shuttle cockpit and watches the stars. He also plays with the radical perceptual shifts that occur in free fall, such as the way his brain shifts his vision to try to create a top and bottom when there is no gravity as a reference point. And just before going to sleep, he shuts his eyes and watches the white tracers of cosmic rays, unbuffered by the atmosphere, crash into his eyeballs. A fragment from one of his poems, "Cosmic Fireflies," describes the effect:

Cosmic flashes in my brain,
Cosmic rays and Wilson clouds,
Clear my consciousness.

Memory of infinity,
Particles of eternity.

Starlets pierce my eyes.
In my brain, fire flies.

Periods of light,
Punctuate my night.

But space-flight is not all bliss and poetry. Especially not blastoff. "It is not pleasant," he says. "You just hope you are going to live. I'm scared to death." He desperately wishes there were another way into orbit, for although he enjoys risky activities like flying and parachuting, he does not do them for the sake of risk. "People don't believe me, but I'm not a risk taker. I want to control risk, I want to minimize it and not get hurt."

The shuttle, he says, is the most dangerous manned space vehicle the United States has ever built, "a butterfly strapped to a rocket." Musgrave personally favors a return to the streamlined Apollo-type configuration, where the payload can be carried below a reusable crew capsule and the capsule is equipped with an escape system. But he acknowledges that because of the ongoing space station project, NASA is stuck with the shuttle for another 10 or 15 years.

"We need low-cost, reliable, safe access to space, which we do not have today," Musgrave says. "If I were running the space program I would have had that the No. 1 priority decades ago." Such frankness has earned Musgrave a place among a small group of iconoclasts in a NASA culture that otherwise tries to present an uncomplaining face to Congress and the public.

"Story has lots of ideas on redesign and is worried about technical capability and the fragility of humans in the space environment," says Marvin Minsky, an MIT professor who met Musgrave while serving on a NASA advisory panel several years ago. "I know of other imaginative people, but not so many who are able to do both the imaginative and practical work," the artificial intelligence specialist says. "He is a man who really built himself."

On the night before a launch, Musgrave usually walks outside the beachside bungalow where NASA houses the shuttle crew. He lies in the surf and looks across the water toward Cape Canaveral at the huge, illuminated shuttle strapped to its enormous boosters. It is then, he says, that he often thinks about the kind of species humans are slowly evolving toward -- how Earth life made its way out of the water and onto land and is now reaching for the stars.

"Oh, mentally I'm way out there", he says with a chuckle. "I believe intelligence is everywhere. There are billions of intelligences -- other living forms, other creations, other evolutions. I think scientifically it's a certainty." Musgrave is critical of UFO buffs who take snippets of astronauts' conversations and construe them as sightings. But he is open-minded about the possibility of contacting other intelligences.

"I'm very grounded, but at the same time I try to communicate with other intelligences," Musgrave says. "I know it is one trillionth of a trillionth possibility. I know it is almost impossible, but it's fun to do. It is an openness, an acknowledgement that says, 'I know you're out there and if you'll come get me I would love to go.'"

If he has one message for future space travelers, it is to approach the experience by "listening and observing" and not by trying to be the master. "My philosophy is you can't understand something until you have surrendered to it," he says. "It's why the idea of conquering space was so abhorrent to me from the very beginning. That is just what you don't want to do. You'll never know it if your idea is to go out and conquer it."

That thoughtful approach has entranced people who have listened to Musgrave lecture and seen his slides and videos over the years. "It comes through in his slides. He has a deep, aesthetic appreciation of experience in a different environment," says Larry Hickman, a philosophy professor at the University of Southern Illinois who heard Musgrave at a meeting of the Society for the Advancement of American Philosophy.

NASA officials have told Musgrave he will not fly again after his mission ends next month. He accepts the decision, although he does not agree with it. "It doesn't have to be," he says. "I'm medically qualified. I'm physically blessed. I think I'm better than I ever was in terms of what it takes to work in space. I think I peaked around 60. That is surprising to me, except I see how much experience counts."

After almost 30 years at NASA, he says, "people know that I can't walk away from it. It's in my heart. It's in my soul. It's in my blood."

