

100 Years

750 Meetings

A keepsake produced for the  
750th meeting of the  
**Harvard Travellers Club**  
held on May 27, 2003 at the  
Harvard Club of Boston  
374 Commonwealth Avenue  
Boston, Massachusetts.

*Before you know it this little pup of yours is going to be a Great Big Dog!*  
— Dr. Allen M. Cleghorn commenting on the Club at a meeting in 1905.

Dear Members of the Harvard Travellers Club,

Please note that this will be a Gala Celebration of the 750th meeting of the Club, and will have some special features including an enhanced menu and gifts. Unfortunately, this also means an enhanced price of \$40 each for a member and one guest, and \$45 for each additional guest. Considering the outstanding speaker and the special nature of this meeting, we may be in a position to move the meeting to Harvard Hall to accommodate all those wishing to attend. This makes it more important than usual to respond quickly if you intend to come to this meeting. Your cooperation is very much appreciated.

Robert O. Boardman  
Secretary-Treasurer



Astronaut F. Story Musgrave with a shuttle trainer and, inset, repairing the Hubble telescope.

TRANSCENDING THE PAROCHIAL

# Shaman of the space program

*Story Musgrave, America's senior astronaut, sees Earth 'whole'*

BY ELLIOT CARLSON

**W**hen F. Story Musgrave goes walking in space, as he did last December during the mission to repair the flawed Hubble Space Telescope, he doesn't do what a tourist might do in his spot. "I don't spend a lot of time looking at the stars," he says.

Instead, Musgrave turns toward home. "It's much more powerful for me to look at Earth," Musgrave says.

In daytime, "you don't see the actual cities," he says. "I know they're there and I can see them if I want to.

"But if you just kick back and look at the thing as a whole, it's nature," he adds. Yet, if Earth belongs to nature in daytime, "it's a human Earth at night. You see all the cities. You see all the interstates, all interconnected."

This view of the Earth—as something whole and interconnected—may be the most important thing to come out of the space program, Musgrave tells a Bulletin reporter.

That and a new sense of oneself as a

"planetary being"—a citizen of the globe. "Space travel has had to help transcend the parochial," he muses. "I would hope it has increased tolerance among people."

Story Musgrave has earned the right to philosophize a bit. Astronaut, surgeon, mathematician, computer analyst, pilot, ex-Marine, he is a certified Renaissance man. (He holds six college degrees, including a doctorate in medicine from Columbia University and a master's in literature from the University of Houston.)

Also, at age 58, he is the oldest, and easily the most experienced, astronaut ever to walk in space. "Experience is far more important than chronological age in this business," he observes.

Moreover, in executing three space walks as one of seven astronauts on board the shuttle Endeavor, he helped correct the visually-impaired Hubble Space Telescope.

As payload commander on the Endeavor, Musgrave's job was to "walk" to the telescope from the shuttle, which had moved up alongside the Hubble, and perform key repairs.

Working with astronaut Jeff Hoffman, Musgrave removed an old camera and inserted an upgraded, \$100 million replacement that compensates for the Hubble's flawed vision.

Now the Hubble produces astonishingly clear images of remote galaxies, giving the trouble-plagued National Aeronautics and Space Administration (NASA), which runs the space pro-

gram, one of its few successes lately.

Musgrave was delighted. "I took immense pleasure in the work," he says, "in being a mechanic, in helping pull this effort together."

Shortly after the Endeavor's return Musgrave met with a Bulletin reporter at the Johnson Space Center in Houston, where NASA's 106 astronauts are stationed when they're not flying shuttle missions.

Speaking with a soft drawl, Musgrave seems more shaman than scientist, an impression that is reinforced by his baldness (complete) and his trim, 5-foot-10-inch frame.

*'Experience is far more important than age in this business.'*

F. STORY MUSGRAVE

A man of many parts, he stays fit, mentally and physically, through outside interests that match his formidable resume: gardening, parachuting, scuba diving, soaring.

Especially soaring, maneuvering his glider to find wind currents that will keep him aloft for hours. "That's one of the most pleasurable things," he says. "It's very, very quiet and it's just you and the machine. It's like being in a sailboat."

But if he is quiet-spoken, Musgrave

also is intense. In a hangar locker room near a full-sized shuttle trainer, he talks about virtually every aspect of America's space program, and he confronts willingly an increasingly asked question: Does the American space program make sense anymore?

He concedes there have been failures—ranging from the Challenger disaster in 1986 to the loss of the Mars Observer last August—that have diminished support for NASA and led Congress to scale back funding.

Equally damaging, some critics say, has been the breakup of the Soviet Union, whose orbiting of Sputnik in 1957 ignited the space race and fueled a costly competition between the two superpowers. While this rivalry may have generated NASA's initial funding, says Musgrave, "I don't think that was the real reason ... we're in space."

Musgrave believes it has nothing to do with jobs, technological spin-offs, microchips or scientific research, important as these things may be.

"The essence of being human is just like the old explorers," says Musgrave, citing legendary figures such as Vasco da Gama, Magellan and Columbus. "They weren't satisfied to stay in their part of the world. They had to explore every niche of it. So now we find ourselves doing the same thing, only we're leaping off our world."

Already, he insists, this "leap" is yielding dividends—a richer view of Earth, for one. Going out there "you have an

*continued on page 13*

# Musgrave

*continued from page 16*

immense appreciation for our home, the entire planet," he says. "You have that big picture, which can be really magical, of the entire forest as opposed to just seeing one tree at a time."

As a result, "space travel has had a very important globalizing effect, where you think of yourself as a planetary being instead of just belonging to one country," he says.

Musgrave says he's been fascinated by space for as long as he can remember. He recalls first becoming aware of the sky as a five-year-old growing up on a 1,000-acre dairy farm in western Massachusetts.

"I would lie down on my back on a plowed field and look at the stars," he recalls. "I didn't have any idea what a star was. I didn't have any knowledge. It was an attraction. It was just awe and wonder."

After a stint in the Marine Corps as an aviation electrician and aircraft crew chief, he started moving toward

## *'I didn't have any idea*

*what a star was. ... It was just awe and wonder.'*

F. STORY MUSGRAVE

his real career, albeit unknowingly.

While earning a swarm of academic degrees, in fields ranging from mathematics to chemistry, he cultivated a passion for flying, mastering many types of private aircraft.

The turning point for Musgrave came in the mid-1960s while he was serving a surgical internship at the University of Kentucky Medical Center. That's when NASA dropped its requirement that all astronauts be recruited from the ranks of military test pilots.

"It just struck me like a bolt of lightning," Musgrave recalls. "There it is, I thought. I found my calling."

In 1967, Musgrave was selected as a scientist-astronaut by NASA. He worked first on the design of the Skylab program. He made his first trip into space, as well as his first space walk, in 1983, during the maiden voyage of the Challenger.

Since then he has been one of NASA's busiest astronauts, logging 858 hours in space. His December shuttle flight was his fifth, a record.

Musgrave relishes the rigorous preparations as well as the physical experience of being in space.

He especially likes the sensation of weightlessness—"it's kind of magical." Unlike some astronauts, who sleep in hammocks attached to the shuttle wall, Musgrave sleeps floating. "You

bump into things, but not hard," he says. "It's peaceful."

But there also are nerve-wracking moments, such as one grueling task he undertook during the Hubble repair mission. His objective: to change an electronic unit that controls rotation of the solar ray drive (which collects rays from the sun and powers the Hubble).

"You had little tiny screws," Musgrave says, "two or three millimeter screws that were not captive," that is, not firmly held in place once they were loosened. Using a power tool, Musgrave had to remove 20 screws securing an electronic connector, change the unit and put the screws back.

"Without gravity, the screws just dance," he says. "As soon as you touch anything, the screws are dancing. And they dance their way out into space."

With one gloved hand free, Musgrave went after the screws. "A lot of them were loose and I caught them," he recalls. "Terrible thing to have to catch something that small, but I caught them. All but one. I was missing one at the end."

Time required: three hours. "I was at the edge of my ability to do that job," he says. "It was very close whether I

would get it done or not."

Musgrave is pleased with that mission's success not only because of the scientific information it will yield, but also because he has his own agenda. "I want the Hubble to find a planet," he says, noting that so far no planet has been detected outside Earth's solar system.

Such a discovery would have staggering implications, Musgrave says. "We're going to find other living forms out there," and that, he adds, would be "the most significant event that could happen in your lifetime or mine. It would be another Copernican revolution in which people would have to revise their ideas of their place in the universe."

Whatever the Hubble finds, NASA's successful rescue mission, experts agree, has infused new life into the agency's next major project—the \$26 billion space station.

Musgrave wants to be part of it, and he's hoping to participate in the assembly of the space station, work on which is expected to begin in 1997. He's also hoping to be part of NASA's next shuttle mission to the Hubble in 1997, when the telescope is due to get new state-of-the-art instruments.

"I plan to keep going," he says. He maintains age actually has enhanced his abilities, but adds that diminished skills would likely be preceded by tell-tale clues. "I will know when things are not going well," he says. "I suspect that the first thing that happens would be a lack of awe and wonder and enthusiasm. It gets down to passion. I believe in passion and I still have plenty of that."

# Taking time to see the stars: an astronaut's lifelong journey

By John Yemma  
GLOBE STAFF



GLOBE PHOTO / DONNA CARSON

**Astronaut Story Musgrave displays  
tools he has used in past spacewalks.**

**H**OUSTON - 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 '40s, 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 that was where home was."

Now 61, Story Musgrave has been through  
MUSGRAVE, Page A2

# Preparing for last trip, astronaut still aims high

■ MUSGRAVE  
Continued from Page A1

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 his native 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."

## "Preparing all my life"

Mechanically inclined but no scholar, Musgrave had difficulty completing high school at St. Mark's in Southborough and dropped out to join the Marines 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



CLOSE PHOTO: DONNA CARSON

At 61, astronaut Story Musgrave has become an eager student of the humanities, writing poetry and taking up gardening and ballet in his search for meaning in his life and a way to express his experiences in space.

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 residing in one

**'My philosophy is you can't understand something until you've surrendered to it. It's why the idea of conquering space was so abhorrent to me.'**

STORY MUSGRAVE  
Astronaut

A fragment from one of his poems, "Cosmic Irrillies," describes the effect:

Cosmic flashes in my brain  
Cosmic rays and Wilson clouds  
Clear my consciousness.  
Memories of infinity,  
Particles of eternity,  
Stars pierce my eyes.  
In my brain, fire flies  
Pulsars of light  
Punctuate my night.

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.'"

## Not a conquest

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've surrendered to it," he says. "It's why the idea of conquering space was so abhorrent to me from the very begin-

program... 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 repairman 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 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.

#### Watching the stars

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.

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 the 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."

#### Criticizing NASA

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 a 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

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 at 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."

## Telescope repair tested skill of veteran known for his focus

HOUSTON — In the weeks before a space mission, Story Musgrave spends many hours working out tasks in the minivan-sized shuttle simulator.

Such focus is the trademark of an astronaut who, though he's a celebrity around NASA for leading the 1993 Hubble repair mission, rarely lets his concentration break.

Hubble was a make-or-break moment for NASA, which had experienced the 1986 Challenger disaster and lost a series of satellites in the years that followed. The crew of the shuttle Endeavour had to fix the faulty telescope in five days of space walks. Musgrave trained for 1½ years, working out every detail in simulators, in a vacuum chamber, on an air-bearing floor and in an immersion tank.

"I look upon all of this as a ballet," Musgrave said. "I would ask, 'What is the body position? What is the body motion?' With your suit, you have 480 pounds of mass. It doesn't weigh anything, but if you get it going you have to deal with its mass."

Some 300 tools were used in five days of space walks, and Musgrave

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STORY MUSGRAVE  
Led Hubble repair mission

had to know where each of them was at any time — "the way a ballerina learns a two-hour ballet and knows where every foot and every toe will be and knows the kinesiology of the whole thing."

In this five-day ballet of two people in space suits, he says, every motion had to be perfected. He practiced for half an hour in an immersion tank extracting a pin because he found that he could not reach it straight on; he backhanded it instead.

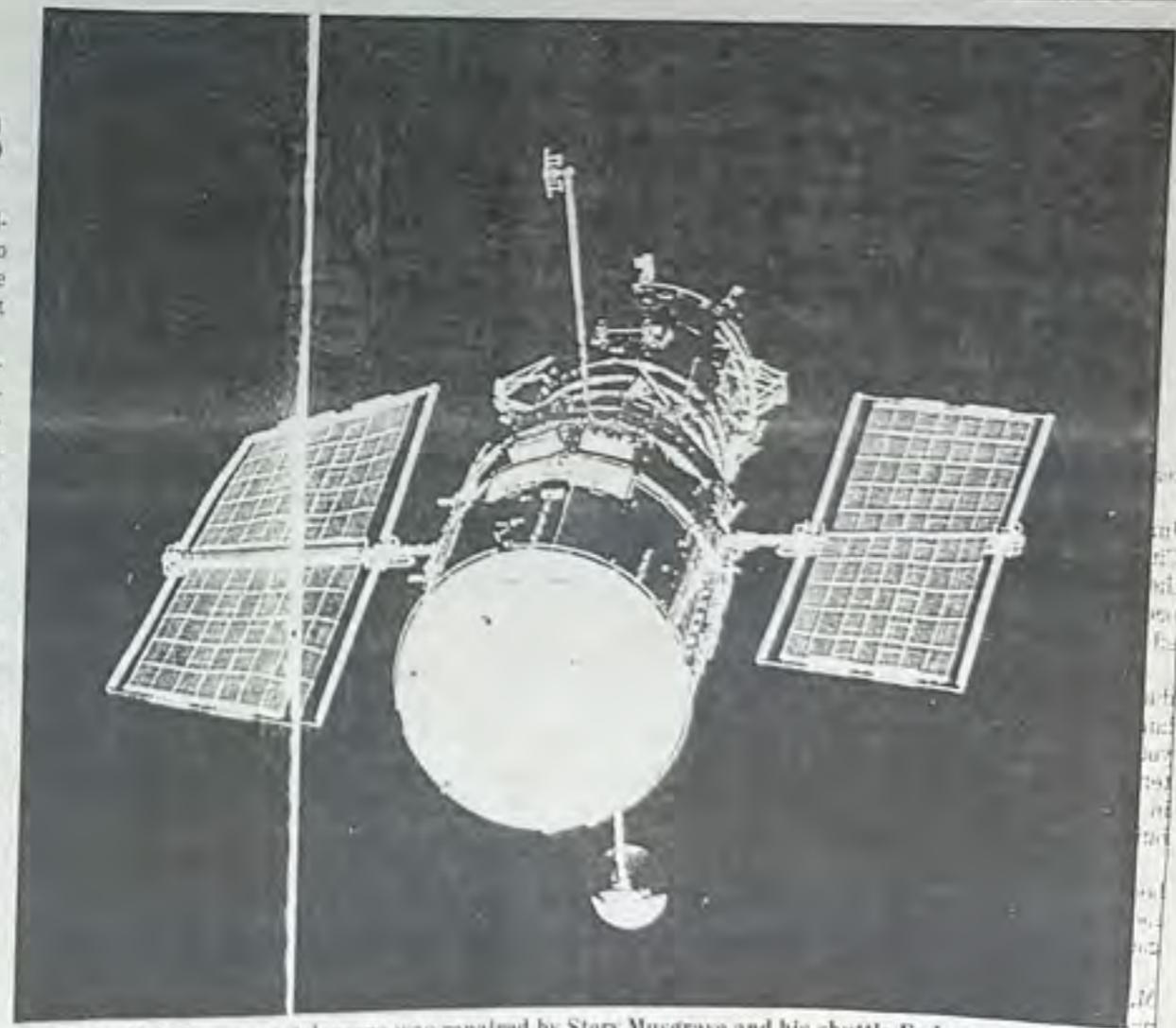
He also determined that his colleague, Jeff Hoffman, would have to stuff him bodily into one spot in the optical path of the telescope so that he could do some tricky work.

But he never lost the big picture, he says, citing American pragmatic philosopher John Dewey as his inspiration. His approach was first to take in the whole scene — the stars, the continents spinning below him, the craft in orbit — and then narrow to the specific task.

By doing this, he says, he was able to remain flexible and determine if the task was about to change because of external factors such as a setting sun or the impending loss of a ground station as the Earth rotates.

"I remember him saying that during extravehicular activity he told his fellow astronauts to stop every 10 minutes and look around, since it is so easy to get enmeshed in details," said Larry Hickman, director of the Center for Dewey Studies at the University of Southern Illinois at Carbondale. "That is what Dewey says: Details should always be seen in the wider context."

JOHN YEMMA



The faulty Hubble space telescope was repaired by Story Musgrave and his shuttle Endeavour colleagues in a make-or-break mission for NASA in 1993.

## FORMER U.S. ASTRONAUTS

### **MUSGRAVE, Story, Civilian**

Born August 19, 1935, in Boston, Massachusetts. Hometown, Lexington, Kentucky. Bachelor of science in mathematics and statistics from Syracuse University; bachelor of arts in chemistry from Marietta College; master of business administration in operations analysis and computer programming from University of California at Los Angeles; master of science in physiology and biophysics from University of Kentucky; master of arts in literature from University of Houston; doctorate of medicine from Columbia University. Flew on STS-6, STS 51-F, STS-33, STS-44, STS-61 and STS-80. Cumulative hours of space flight are more than 1,166. Cumulative EVA time is more than 26 hours.

### **NAGEL, Steven R., Colonel, U.S. Air Force (Retired)**

Born October 27, 1946, in Canton, Illinois. Bachelor of science in aeronautical and astronautical engineering from University of Illinois; master of science in mechanical engineering from California State University at Fresno. Flew on STS 51-G, STS 61-A, STS-37, and STS-55. Cumulative hours of space flight are more than 721.

### **NELSON, George D., Civilian**

Born July 13, 1950, in Charles City, Iowa. Bachelor of science in physics from Harvey Mudd College; master of science and doctorate of philosophy in astronomy from University of Washington. Flew on STS 41-C, STS 61-C, and STS-26. Cumulative hours of space flight are more than 410. Cumulative EVA time is more than 10 hours.

### **O'CONNOR, Bryan D., Colonel, U.S. Marine Corps (Retired)**

Born September 6, 1946, in Orange, California. Bachelor of science in engineering from U.S. Naval Academy; master of science in aeronautical systems from West Florida University. Flew on STS 61-B and STS-40. Cumulative hours of space flight are more than 383.

### **O'LEARY, Brian T., Civilian**

Born January 27, 1940, in Boston, Massachusetts. Bachelor of arts in physics from Williams College; master of arts in astronomy from Georgetown University; doctorate of philosophy in astronomy from University of California at Berkeley.

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## Computer File: CentenaryMinute4Meetings

### Centenary Minute No 4 - April 9, 2002

Including this evening the Club has held 741 regular meetings. I say regular because there have also been special meetings and lunches and in the early days of the Club—when the Fellows ran things—there were also Fellows Meetings and Dinners.

In going through the Club records I've come up with a total of 887 talks given at regular meetings, meaning there were two and sometimes three talks at a single meeting.

Classifying the talks, wherever possible, by geographical area, I come up with following, in descending order of frequency:

Asia	26%
Africa	15%
The Pacific	9%
South America	8%
USA	8%
Canada	7%
Europe	6%
Arctic	6%
Central America	4%
Middle East	4%
Antarctic	3%
Space	1%
The Caribbean	1%

And under 1%, Australia and The World.

Doing the same as far as subject is concerned, again in descending order:

Mountaineering	30%
Natural history	23%
Nautical	13%
Public Affairs & Hunting, each	7%
Exploration & Flight, each	4%
Health	3%
Archaeology, Anthropology & Historical, each	2%
Glaciers, Anthropology & Science, each	1%

Who has spoken to the Club the most times? Our member, Club Medallist Bradford Washburn. He's spoken on 13 occasions, the first on December 16, 1930, when he spoke on "Mountain Photography in the High Alps," and most recently at the 700<sup>th</sup> meeting on March 11, 1997, when his subjects was "Matterhorn, McKinley and Everest."

By the way, in combing through the Archives I've discovered Brad's Nomination Blank, dated February 24, 1931 (making him and Norman Vaughan our members of longest standing). Occupation is given as student, address as Lowell House. A note at the foot of the Blank instructs the proposer (who is Brad's case was Hal Coolidge): "It is requested that a brief statement be made on the back of this blank respecting the candidate." On the back appears: "Mountain climbing & Alaska."