

# Astronaut careers turn out to be close-ended

**Congressional cuts and dismantling of the space team have hit the corps of astronauts; at least 21 will not fly in current program**

by Everly Driscoll

The tickertape parades, White House fetes and world tours that have become the ritualized aftermath of manned space trips have camouflaged much of the difficulty an astronaut goes through in adjusting to an earthbound existence once his turn in space has come and gone. It is like training for a race, winning, then retiring, never to run again. A less dramatic but equally distressing problem is the case of the men who have given 4 to 12 years of their lives training for flights that will never come. This is like training for a race for years, never to run it at all.

As many as 22 astronauts face the possibility of no space flight in the current approved manned program. Of these 9 or 10 would be scientist-astronauts and 11 or 12 pilot-astronauts.

It is tempting to call their situation the result of fate, miscalculation or politics. But none of these alone adequately explains the current dilemma.

It was not planned to end this way.

**The 73 men chosen** as astronauts in seven groups from more than 4,000 applicants left careers as test pilots, physicians or scientists to begin training for a new career they hoped to pursue, not once or twice, but for the rest of their active lives.

In 1966 when the last astronaut selection process began, Gemini 12 had not flown and Apollo manned flights were two years off. Dr. George E. Mueller, Associate Administrator for Manned Space Flight at the National Aeronautics and Space Administration, was looking at options ranging from four to six Saturn 5 launches a year and from four to six Saturn 1-B launches a year from 1970 to 1975. These would run concurrently with and follow the first lunar landing; they would include additional moon landings, lunar orbital flights and the establishment of

manned laboratories in earth orbit. Fifteen Saturn 5's were reserved to insure just one moon landing, because no one could be sure the landing would be accomplished as soon as it was—on the fifth manned Apollo flight. For a program that ambitious—8 to 12 launches a year—lots of astronauts would be needed.

**Since then**, three moon landings have been canceled to fit the budget and to fund new projects such as the space shuttle. The Skylab program, formerly called the Apollo Applications Program, has incorporated the men of the Air Force's canceled Manned Earth Orbiting Laboratory (MOL) and has been cut to three three-man visits. (Seven astronauts now on flight status were formerly training to be MOL crewmen.)

And instead of a continuous career, the astronauts face a hiatus in manned flight of four to six years from the end of Skylab in 1973 to the shuttle flights.

Of the 50 astronauts still on flight status, 16 are veterans of from one to four space trips. Eleven or twelve rookies and six or seven veterans will fly in the last three Apollo and the Skylab missions. All 50 are currently assigned as prime, backup or support crew to these six flights or to advanced work on the shuttle.

"It's just the facts of life that we've got a surplus of astronauts to fly missions now," says Chief Astronaut Donald Kent (Deke) Slayton, head of the flight crew operations division at Houston's Manned Spacecraft Center.

"We've got plenty of work for them to do, and always have had, but they would prefer to be flying."

Trained for a unique job in space, the men possess a variety of advanced degrees in such fields as engineering, medicine, astronomy, physics, geology and astronautics (ace piloting). To be

selected they had to be, according to the selection board, "self-disciplined, highly motivated, able to make accurate on-the-spot decisions, remain cool under stress, be perfect physical specimens and endure solitude and cramped quarters."

In addition to their original careers, they have had three to five years of training in jets, instrumentation and flight mechanics, geology, meteorology, guidance and navigation systems and astronomy. For the weightless environment, they have trained underwater and in KC-135's. They have spent weeks in jungles and deserts for survival training, on geology field trips and at astronomical observatories. They then are assigned as a support crew and await their call for a space assignment.

**That call comes** from Deke Slayton, one of the original seven Mercury astronauts, who was grounded prematurely because of a health problem. "He chooses the crew on the basis of seniority," says one astronaut. "He told us he might not be able to fly us." Order of seniority has been generally followed for the pilot-astronauts, but not for the scientist-astronauts. Except for Slayton and five of the seven astronauts who have been killed, all 30 men of the first three groups chosen have flown in space. None of the members of Group IV, selected in 1965 and consisting of four scientist-astronauts, have flown. Five pilots from Group V, selected in 1966, have flown; four more will fly on Apollos 15 and 16. Nine pilots remain in Group V, nine scientists in Group VI, and seven pilots from the MOL program, transferred to NASA in 1969, in Group VII.

Although the final decision has not been made for crews on Apollo 17 or Skylabs I, II or III, "the men know fairly well where they stand," says



Photos: NASA

*Scientists and pilot-astronauts: Many may never fly in space.*

Slayton. Interviews bear him out.

"I trained three years in the Air Force for the MOL flight," says one of the transferred astronauts. "That was canceled; now I am here [at NASA] and it doesn't look good for a flight."

Although flight opportunities have been diminishing yearly, and MSC is faced with another reduction of 185 employes by the middle of 1972, only one of the 56 pilots has resigned from the astronaut corps before flying in space; that was for health reasons. But of the 17 scientists, 4 have quit. One resigned immediately after selection for personal reasons; one completed the initial eight months of classroom training, but resigned rather than take pilot training; another quit after one year due to problems with jet-soloing.

But Dr. Frank Curtis Michel participated for four years before resigning. "Basically," says Dr. Michel, who is now a professor of space science and physics at Rice University in Houston, "I saw the handwriting on the wall as early as 1967 when NASA was unable to come up with a definite program beyond Apollo. The fact that our group [Group IV] was skipped bothered me, but we pretty much understood that we would not be flying on the first three moon landings or so. But when it became clear that we might not be able to fly in Apollo at all [three flights had been dropped], I had a crisis of confidence."

**Dr. Michel** returned to the academic community. "Some people believe that to be a good scientist requires the same night-and-day-devotion to the job as to be a good astronaut. It's very hard to wear two hats."

Most of the men indicate, however, that even if they don't fly, they would like to stay active in the program because of, as one puts it, "the wealth of experience, training and knowledge" they get. "My chances look very slim," says astronomer Dr. Karl G. Henize.

"I will be keenly disappointed if I don't get to fly but if I had it to do all over again, I would still be in the program. It's the most exciting thing going on in this generation." Dr. Henize is on the support crew for Apollo 15 and is the principal investigator scientist for a Skylab experiment to photograph the ultraviolet emissions of stars. With his experiment he hopes to be able to fill in the gap made by the loss of an Orbiting Astronomical Observatory in November (SN: 12/5/70, p. 427) which was also to study ultraviolet emissions.

Story Musgrave, like the others, will stay regardless. He has six degrees, including doctorates in physiology and medicine. In addition to time spent in spacecraft simulators and working on Skylab medical experiments, he practices surgery every month in Denver and is a part-time instructor at the University of Kentucky Medical Center.

**"It is not enough to be a pure scientist in space,"** he says. "There are certain squares you have to fill and certain capabilities to maintain." He sees man's role in space as scientific within itself: "To some people, if you fly *Drosophila* flies or vinegar gnats (both planned for Skylab), that is science. If you use man, it's not. They fail to look at the merit of the human experience."

Whether the astronauts stay in the program beyond the 1973 Skylab is unalterably linked to the entire question of the future of the space program. Some believe that man's presence in space is inevitable and essential. Others believe that unmanned spacecraft could do what man does considerably cheaper. NASA is banking the future of manned space flight on the development of a reusable rocket shuttle that would cut the cost of both manned and unmanned flights. If the program is approved by Congress, the astronauts would be needed for planning the design and use of the rocket. But this too

### The surplus of astronauts

Of 4,000-plus applicants:

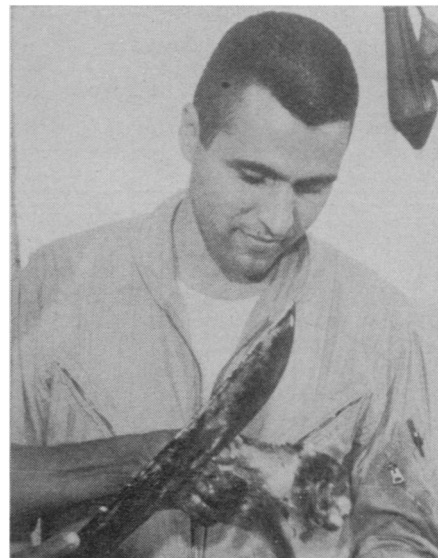
- 73—chosen
- 8—deceased (2 flew)
- 10—flew in space; then retired
- 5—resigned before flying

Leaves: 50—currently on flight status

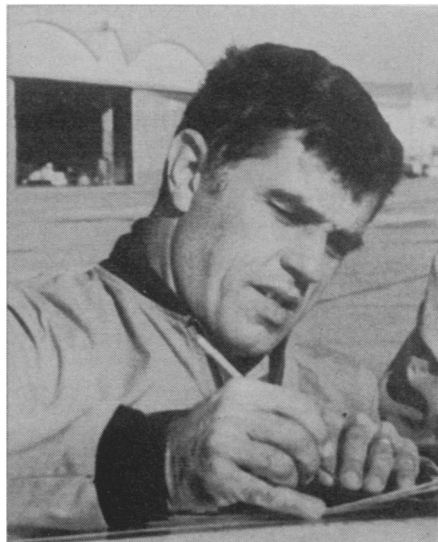
Of the 50:

- 16—are space veterans
  - 12 or 13—will fly on the remaining Apollos and Skylab
  - 21 or 22—will not fly
- Of those who will not fly:\*
- 9 or 10—are scientists
  - 11 or 12—are pilots

\* in current program



*Dr. Schmitt: First geologist-astronaut.*



*Dr. Henize: "My chances look slim."*



*Dr. Musgrave: It's not enough to be a pure scientist in space.*

## ... astronauts

is uncertain; if some Congressmen and scientists win, there will never be a shuttle (SN: 8/29/70, p. 179).

Dr. Eugene Shoemaker of the California Institute of Technology believes the solution to the current astronaut situation and the future of manned flight lies in the better use of the men who fly in space. "The manned flight program is down to the wire," he says. "The crucial issue that NASA has not faced is what is the role of man in space." As chairman of the National Academy of Sciences committee that screened applicants for the two groups of scientist-astronauts, he has been close to the situation. He believes that man's role up to the first lunar landing (Apollo 11) was part of the national commitment. "After we landed, I was exhilarated. NASA did it and in style. We met the national goal. But in so doing, the real issue of learning how best to use a man in space never came about." That, he believes, should have begun after the first landing.

"I am not saying that we are not getting good science from Apollo," says Dr. Shoemaker. "We could hardly miss; the moon is so rich. We possibly could

have gotten the same from a \$24 billion unmanned program. So with men we ought to do better. We have to show that it paid off to put man into space in the first place."

Dr. Shoemaker, like many others, believes that this can really be done in the manned program only by flying a trained scientist. "So far we have used the astronauts as essentially highly paid technicians, to set up the scientific experiments on the moon," he says. "I have real respect for the pilots who fly the spacecraft, but two could do it; the third could be a scientist. A man fully trained as an observational scientist could discover things. He could see not 10 percent, but 1,000 to 10,000 percent more than a pilot with scientific training."

But the chances of a professional scientist reaching the moon anytime in the 1970's do not look good, although scientists will fly on Skylab. Of the first group of scientists, only one is a geologist—Dr. Harrison H. Schmitt. Owen K. Garriot, who has a Ph.D. in electrical engineering, is assigned to follow the telescope experiment on Skylab. Joseph P. Kerwin has a doctorate in

medicine and Edward G. Gibson has a doctorate in engineering and physics. Both are also working on Skylab.

Dr. Schmitt is assigned as a backup crewman on Apollo 15. With only one exception, those assigned to the backup crew of one flight have been the prime crew three Apollo flights later. If this sequence is followed for the selection of the last Apollo mission (17), the backup crew of Apollo 14 will be the last on the moon in this decade: Eugene A. Cernan, Ronald E. Evans and Joe H. Engle. Had Apollo 18 not been canceled, the Apollo 15 backup crew, including Dr. Schmitt, would probably have been the prime crew for that mission. Slayton, however, emphasizes that he has not yet made a decision on the crew for Apollo 17.

Dr. Garriot, a NASA consultant and Stanford University teacher before his selection, is working on Skylab's eight-telescope array. He believes man's potential role in space is one of added flexibility. "It will be a real-time decision as to what experiment should be employed in a given situation, like a transient event," he says. "For example, man can use the fine-pointing accuracy of the telescopes to photograph specific points of interest on the sun's disk." Although his chances for Skylab look good, he doesn't presume: "I will be very disappointed if I don't fly."

There is Congressional concern that a four-year lapse in the manned program is wasteful. "It would be a waste of our national resources and past investments not to use our expertise in an ongoing way," says Sen. Richard S. Schweiker (R-Conn.) of the lapse. "If this can be done for a very small additional investment it would be a tragedy not to do it," he says.

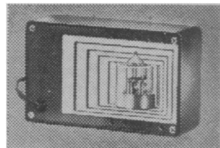
There are alternatives such as use of the left-over command modules and Saturn 1-B's for earth orbital observation flights—perhaps one a year following Skylab. These would use hardware already developed, but would involve the yearly cost of maintaining a minimal but proficient manned flight capability instead of dismantling it in 1973.

Whether the current Administration or Congress will permit NASA to continue to use the men it has trained is uncertain. But the 50 men now on flight status hope so.

"It is discouraging to be so strapped for funds that we must junk spacecraft and capabilities that have been paid for simply to save the cost of using them," says Dr. Anthony W. England, one of the scientist-astronauts. Either on the moon or in earth orbit, says Dr. England, "man's flexibility and perspicacity cannot be equalled by a preprogrammed machine or by a man remotely operating a machine." □

## KEEP PACE WITH SPACE AGE! SEE MOON SHOTS—LANDINGS, SPACE FLIGHTS, CLOSE-UP! AMAZING SCIENCE BUYS for FUN, STUDY or PROFIT

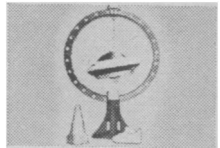
### LOW-COST XENON STROBE!



Price breakthrough in bright, reliable electronic strobes. 50W / Second xenon tube. Variable flash rate — 60 to 500 per minute. Long life—more than 1,000,000 flashes. Printed circuit board design. Safe, durable Bakelite case. Externally mounted bulb, plastic shield. 6 1/4" X 3 3/4" X 2 1/2".

14 oz. Perfect for psychedelic, stop-action lighting effects for home light shows, parties, displays. Stock No. 71,342Q ----- \$24.95 Ppd. Stock No. 71,343Q Build-It-Yourself Kit ----- \$19.95 Ppd.

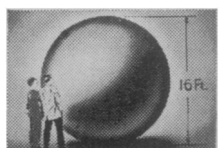
### BATTERY POWERED GYROSCOPE



For the first time—have the fun & enjoyment of a gyro without bother of constant string winding & pulling. 5" diam. flying-saucer shaped. Spins on its edge, upside down, on your head, hanging from a string, drives rocket car races around a ring... you'll be amazed at its performance. Even flipping switch to off is an experience—speeds up to a blur... for almost 3 minutes without power. Terrific accessories including rocket car, pedestal, 9" diameter, orbit ring, ring pedestal, cap, chain, loop, instructions. Uses 2 regular "C" batt., not incl.

Stock No. 71,161Q ----- \$6.00 Ppd.

### GIANT WEATHER BALLOONS



"Balls of fun" for kids, traffic stoppers for stores, terrific for amateur meteorologist. Create a neighborhood sensation. Great backyard fun. Exciting beach attraction. Amateur meteorologists use to measure cloud heights, wind speed, and temp. Made of heavy duty neoprene. Inflate with vacuum cleaner or auto air hose; or locally available helium for high rise.

Stock No. 60,568Q ----- 8' ----- \$2.00 Ppd. Stock No. 60,632Q ----- 16' ----- \$7.00 Ppd.

### VISIT OUR FACTORY RETAIL STORE!

5 Min. From Jersey Turnpike Exit #3. 15 Min. to Phila., either bridge. See 4,000 Unusual Bargains Plus Exclusive Store Sale Items. FREE Light Show Every Afternoon. Store Hours—8-5:30, Saturday 8-4:30, Closed Sunday.

### JUST PRESS . . . and colors bloom!

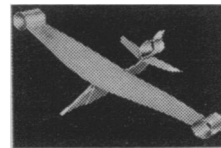
Liquid crystal pressure disc puts world of color under your thumb. Just press . . . and presto—full spectrum of colors magically bloom in ever changing shapeless patterns. More pressure—deeper the color. Change viewing angle—colors change again. The secret's the amazing liquid crystals—sealed in vinyl & 3" sq. Plexiglas® disc. Look like liquid—have structure of crystal. Great conversation piece, fantastic coaster, your own portable "wet show."



Stock No. 41,272Q ----- \$2.25 Ppd.

### GREAT INT'L PAPER PLANE BOOK

Official fly-them-yourself book of paper airplanes from SCIENTIFIC AMERICAN'S "1st International Competition." Includes plans of all winning entries, time-of-flight records, photos, technical data, commentaries. Has 20 unusual designs on perforated pages for easy tear-out. You won't believe how some of them fly! Amusing, entertaining. 128 pages. 9" x 11 1/2".



Stock No. 9391Q ----- \$2.95 Ppd.

### MAIL COUPON FOR GIANT FREE CATALOG

148 Pages! More than 4,000 UNUSUAL BARGAINS!

Enormous variety of telescopes, microscopes, binoculars, magnets, magnifiers, photo components, lenses, prisms, optical instruments, parts, Science Fair kits, projects, and accessories. Write for Free Catalog "Q." Edmund Scientific Co., 300 Edscorp Building, Barrington, New Jersey 08007.



Name \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_

**EDMUND SCIENTIFIC CO.** 300 EDSCORP BLDG. BARRINGTON, NEW JERSEY 08007  
ORDER BY STOCK NUMBER • SEND CHECK OR MONEY ORDER • MONEY-BACK GUARANTEE