

power to review agency strategies, but not to control budgets.

Among the committee's specific suggestions for scientific research is a proposal to "focus on ways of decreasing dependence upon chemically synthesized nitrogen fertilizer" and to increase reliance on biologically fixed nitrogen by use of manure and inter-cropping with nitrogen-fixing plants.

Asked if he was advocating a return to the principles of organic farming, Wittwer said that "Obviously it relates to the so-called issue of organic farming, but it is broader than that. The use of legumes is becoming a lost technology. That and other techniques of nitrogen fixation are vastly lacking in our nation, and we need to use all the resources we have."

Wittwer seems to have played an unusually active—and maybe effective—role for the chairman of an academy committee. Not only has he drawn up a slate of quite radical suggestions for reform and got the victims to agree to them in advance, but he also intends to follow up on his committee's recommendations and see that they are implemented. "Too many times

House Committee Does Some Stargazing

A congressional committee last summer held hearings that should provide spiritual if not material sustenance for the National Aeronautics and Space Administration (NASA), which is now confined to a "bare bones" annual budget of \$3.3 billion and trembling in anticipation of how it will be hit by the President's proposed \$28 billion budget cut.

The hearings, published in early November, were on "Future Space Programs" and were held by the space subcommittee of the House Committee on Science and Technology. While the future promises of space may not sway the stony hearts at the Office of Management and Budget (OMB), the testimony at the hearings, conducted by subcommittee chairman Don Fuqua (D-Fla.), made it clear there are plenty of starry-eyed philosophers, scientists, and aerospace officials eagerly anticipating the day when America pulls out of its post-Apollo hangover and once again shows enthusiasm about exploring the universe.

The purpose of the hearings, according to a committee staff member, was to obtain a long-term, philosophically tinged look into space and the future; to provide a sense of direction; and "to prevent a post-Apollo, where-do-we-go-from-here type thing." Right now, NASA appears to feel that the space shuttle, now at the peak of its funding (\$1.2 billion in fiscal 1976) is its lifeline to the future, but, as Cornell astronomer Carl Sagan observed, "shuttle represents a capability, not a program." So much thinking remains to be done.

The subcommittee's final report makes it clear that it was not interested in the views of the pessimists and naysayers. Instead it sought a broad range of opinion, not just from the same old aerospace people, but from adventurers and visionaries as well. The result makes for some fairly zippy reading (if any compilation totaling 1404 pages can be so described), heavily larded with what might be called pie in the sky.

Leading off the testimony was publisher and visionary Norman Cousins, who made some inspirational statements about man's need to become "a cosmic species instead of earth-bound species," and some bordering on fatuousness, such as: "I think that we cease being unique if we lose our interest in the unknown." Princeton physicist Gerard K. O'Neill submitted a detailed description of his vision of orbiting space colonies (which received a good deal of attention in the press last summer) comprising up to 10,000 individuals luxuriously revolving in an earthlike paradise and getting all their raw materials with the aid of an automated launcher to chew off pieces of the moon.

Writer Arthur Clarke lamented the "failure of nerve" that has prevented us from moving on with orbiting solar power plants, putting heavy industries on Mercury, and developing space colonies, all of which he felt would lead to the uniting of all the people on earth. Krafft A. Ehricke of Rockwell International submitted several hundred pages of plans on how man could follow the "extraterrestrial imperative," seeing as

how mankind is obviously outgrowing its mother planet. Anthropologist Carleton S. Coon contributed recommendations for selection of candidates for, and social organization of, extraterrestrial colonies for maximum comfort and harmony.

There was also plenty of attention given to the expansion of the existing space program: the future of satellite communications, earth resources and weather satellites, gravity-free biological and materials research, planetary probes, solar power transmission, and space science. The hearings contain a preview of the yet-to-be-published NASA study, "Outlook for Space," a year-long, in-house effort to identify and evaluate future possibilities of space.

The hearings were much more a rangy look into the future than an assessment of past and current NASA activities. One of the few contributors who had anything critical to say was John S. Lewis, planetary physicist at the Massachusetts Institute of Technology. Said he, "... the domination of the NASA budget by enormous politically inspired projects such as Apollo, Viking, and the space shuttle ... is ... a serious disservice to those interested in a rational, effective, and productive space program." He criticized the shuttle development schedule for being "unkeyed to payload development milestones," and said, "the peculiar fascination of some people with canals and little green men [on Mars] has led to the enormous leap from the Mariner 9 orbiter to the billion-dollar life-seeking laboratory called Viking." Far more sensible, in his view, would have been the launching of a series of small, inexpensive general-purpose spacecraft to find out what we were looking for first.

The recommendations of the report are fairly general, emphasizing the need for "clear and immediate benefits to the society on earth," and winding up with a recommendation that next year's NASA budget be increased by at least 25 percent.

The Fuqua (pronounced Few-quay) hearings may best be taken as an effort to reignite some congressional and public interest in the space program, and to persuade policy-makers of the need for a steady commitment to offset the wild oscillations in public interest and expectations that were the product of the Apollo program.

While NASA is, of course, pleased with all the attention, there is little likelihood that the hearings will change the budget picture. The agency doesn't have any particularly close friends at OMB, and the President's involvement in space has not extended visibly beyond shaking hands with astronauts. A former NASA official believes the agency is now suffering from unwarranted feelings of inferiority and neglect now that its high glamor days are, at least temporarily, over. He believes NASA administrator James Fletcher is trying too hard to "sell space" and justify the agency's existence on the basis of flashy projects when, in fact, the agency has abundantly demonstrated its worth and—whether or not it gets on television all the time—is obviously here to stay.—C.H.