News and Comment

Space in Houston: NASA's Arrival Bringing New Skills and Interests to Nation's Petrochemical Center

Houston. This southwest metropolis wasn't hurting economically before NASA decided last year to make it the site for its Manned Spacecraft Center; and, in a sense, the huge installation, now under construction, can be regarded as no more than icing on a very rich and oily cake. But, beyond the rosy statistics that pour from the Chamber of Commerce (the nation's sixth largest city, third largest deep-sea port, site of 75 percent of U.S. petrochemical capacity, and, on the way, the world's first air-conditioned stadium—capacity, 50,000), the implantation of space science and engineering in this community is producing a ferment with profound implications for the distribution and growth of the nation's technological resources.

In terms of size—with the petrochemical industry excluded—Houston's research facilities could at present probably be deposited without very much notice in a small corner of Cambridge, Massachusetts. Cambridge is not likely to find itself eclipsed, but with the Space Center as a magnet, Houston has, in a matter of months, become the permanent destination for thousands of scientists and engineers—in government and nongovernment employ—who previously considered the area as vocationally barren as the Azores. And, with their arrival, the local universities, particularly Rice and the University of Houston, have vigorously undertaken curriculum revisions and new programs aimed at serving this new population, and, perhaps even more significantly, are using the new people to enlarge and improve their faculties. The effects of this human inflow defy measurement, but in the turbulent period through which science and technology are now passing, the new gravitational pull of the Southwest qualifies as one of the most significant events. Sociologically it is also a rich vein, for whatever the results may be, they are not likely to be insignificant when several thousand highly educated people and their families almost overnight become new members of a community. (Studies to evaluate NASA's social and economic impact on Houston and other space centers were recommended last summer at a comprehensive review of space research, under the auspices of the National Academy of Sciences. The task is unquestionably a difficult one, and delays are to be expected; but the fact is that a significant response to the recommendation is only now getting underway, and this is limited to a few areas, not including Houston. The result is a loss of a rare and fleeting opportunity for the social sciences.)

Located on a stretch of flatland 22 miles from downtown Houston, the Manned Spacecraft Center began growing in size and concept even before construction began in April 1962. The original announcement said it would occupy a 1000-acre site, donated by Rice University, and that it would cost $30 million; not long afterward NASA purchased an additional 600 acres adjoining the site, and the cost estimate was raised to $120 million. The costs now tend to be vaguely defined, with some estimates running over $200 million, but, in any case, the Center is to be the locale for training astronauts, developing and testing manned spacecraft, and controlling launches, once they are aloft from Cape Canaveral.

At present, in buildings scattered around Houston, some 2800 NASA employees are at work, awaiting completion of the Center next year; figures on ultimate employment levels tend to be as rubbery as the cost estimates, but it is said that by this summer employment will reach 3500. In the meantime, the lure of NASA's purchasing power has brought research and development firms flocking to Houston. Among them, for example, is the Philco Corporation, which says it plans to bring in a force of 400 professionals on a $33 million contract to provide electronic equipment for the Center. Some 90 other firms have set up facilities or have stationed representatives in Houston to keep in touch with NASA's requirements.

The pursuit of the government dollar is old stuff for industry, and while universities are not novices in that line, the arrival of NASA has opened exciting new avenues of excellence and affluence for Houston's institutions of higher education. Like the city itself, the University of Houston and its small but relatively wealthy neighbor, Rice University, did not need NASA to pay their bills. But NASA, as much as any government agency, is a consumer of carefully cultivated mindpower, and one of its first actions upon arriving in Houston was to develop warm and intimate relations with the local universities, as well as with Texas A. & M., 100 miles away. It was the presence of these universities, NASA has contended, that contributed to its decision to locate in Houston, not only for improving the skills of its personnel but also because it has become well established that the presence of good educational facilities, in conjunction with the government's liberal policies on in-service training for its employees, helps overcome the salary advantage offered by private industry. The universities, for their part, have responded enthusiastically to the presence of their affluent new neighbor, and if there is any tension or resentment between Houston academia and the federal government, it is well concealed.

During the current academic year, 85 NASA employees are enrolled in University of Houston graduate courses and Houston faculty members serve as NASA consultants. NASA personnel will eventually serve on the Houston faculty. In addition, the university is housing the NASA computing center, until the Spacecraft Center is completed, and it has developed courses in computer technology.

Rice, with an enrollment of 2000, as compared with Houston's 13,800, is responding to the presence of NASA by establishing a department of space science that will offer master's and doctoral programs. It has also departed from its traditional policy of accepting only full-time students by accepting 19 NASA employees on a part-time basis; it is encouraging its faculty to serve as NASA consultants and it expects that NASA employees will teach on its cam-

pus. Texas A. & M. though geographically distant from the new space facility, sends two faculty members to Houston twice a week to teach space-oriented courses.

NASA's arrival also provided the spur for the three universities to get together quickly and harmoniously on an agreement to accept each other's graduate credits, thus enlarging the choice of courses for NASA personnel studying for advanced degrees,

While warnings abound that federal money is enmeshed in unseen strings, Rice's president, Kenneth S. Pitzer, argues that the perils are overrated. He does so, incidentally, from the vantage point of a man who has seen the university-government relationship from various key positions on both sides—including those of dean of the college of chemistry at the University of California and director of research for the Atomic Energy Commission.

"It is a fact today that the federal government is in partnership with universities at the research level," he said in an interview. "There is no danger to the university as long as it makes sure that it does not get in too deep. If we get into a position—as some universities have—where a major portion of faculty salaries are coming from federal funds, then we'd be in trouble. But at this point, we are interested in getting federal funds for expansion, and we feel that the danger of not getting these funds is greater than the danger of getting them. My main concern about federal money is that we might not get enough of it."

Pitzer added that he did not feel any sympathy with complaints about requirements for accounting for federal research funds. "We have no complaints," he said. "Accounting to the government is necessary and reasonable. The government has a right to know what's being done with its money."

Figures for the last academic year show that Rice, with an annual budget of $5.9 million, received a total of $922,000 from various federal agencies. It ended the year in the black, as it has traditionally done, but this year it is going in for a deficit budget and aggressive fund-raising, with no qualms about the supposed perils of looking to Washington for money. (It is also seeking a charter revision that will permit it to charge tuition for the first time in its 52-year history. With one or two minor exceptions, Rice is the only private major educational institution that is tuition-free, a fact that has turned out to be something of an impediment when it has gone out to raise funds. It hopes to replace the no-tuition policy with a generous scholarship program that will permit it to maintain its enviable position for attracting a large percentage of the brightest high school students in the southwest; last year, for example, 45 percent of the freshman class were high school valedictorians.)

In their relationships with the local universities, NASA officials have been an unbelievably discreet and well-behaved lot. One university department head recalled that "when they first arrived, it was plain that they didn't know their way around the campus as well as let's say the ONR [Office of Naval Research] people. But they were very careful and polite and they came to us with the best of will. They have been bending over backwards ever since to make certain that everything goes as smoothly as possible.

"We were fearful at first that there might be occasional pressure for us to accept a student that we ordinarily might not accept, or things like that. But we haven't yet had anything to complain about."

NASA officials respond to this admiration with similar words for the universities. They note that the University of Houston, which has traditionally sought to serve the part-time adult education needs of the community, is more responsive to their needs than Rice, but they shudder at any intimation that they are not totally satisfied with the reception afforded them by both Houston universities, as well as by Texas A. & M.

For the future, NASA's relationship with universities in Houston and elsewhere appears to hold nothing but riches for both parties. But just how this relationship will evolve, and what place NASA will ultimately hold in the grand scheme of federal aid for education, are matters that are quite uncertain. It is plain that in space-oriented science at the graduate level, NASA is now moving into education with the sort of vigor and wealth that recall the early expansionist days of the National Institutes of Health. It is doing this with the blessings of the administration, which has found space to be a politically uncomplicated channel for pumping money into education. Congress, however, is now awakening to the fact that, without anyone taking very much notice, NASA has evolved into one of the major federal education agencies. The amount of money that it is spending in this field defies accounting, but last week Senator Clinton Anderson (D–N. Mex.), the new chairman of the Senate Aeronautical and Space Sciences Committee, put the figure at $56 million for the forthcoming fiscal year and announced that the committee would make "a detailed study of the space program's impact on education." The study, in preparation for hearings on NASA's overall budgetary request, is not likely to have any detrimental effect on the space agency's educational effort, since the space committees in both houses are yet to show the slightest hostility to NASA's involvement in higher education. But the hearings could serve the useful purpose of setting forth NASA's own thinking about its plans for education, and, perhaps they will go into the touchy issue of why NASA has steered, with diminutive exceptions, away from making funds available for the undergraduate levels of education.

NASA officials are known to be eager to help undergraduate institutions and even to provide some sort of help for secondary schools. But, while it is historically acceptable for the federal government to give money away at the graduate level, it becomes a sticky matter politically to do so at the lower levels. Quietly, at a few places, NASA has made some funds available for undergraduate programs, but with opposition to the space program growing in Congress and elsewhere, the space agency is not inclined to test congressional sentiments on the matter. Many persons feel, however, that NASA is unnecessarily cautious, and that if it laid out a well-prepared case for assisting talented young students who show promise for productive participation in the space program, it would not find Congress at all offended.

—D. S. GREENBERG

Westford Needles: New Attempt Set

A new attempt to carry out the controversial Westford "needles" experiment will be made "in the near future," according to an announcement this week from M.I.T.'s Lincoln Laboratory.

The experiment is intended to place a band of 400 million fine copper filaments into a polar orbit 2000 miles above the earth. Protests that the needles would interfere with astronomical observations have been discounted by several special study groups convened by the government.—D.S.G.