output of nitrogen oxides). Emissions of hydrocarbons, the other major ingredient, are at best only slightly lower than in 1960. Carbon monoxide emissions have leveled off in recent years. And emissions of oxides of sulfur have followed a zigzag course, plunging downward in the late 1950's and early 1960's as industry was controlled, then increasing sharply in the mid-1960's with the introduction of new power plants, and now headed down sharply again with greater use of low-sulfur fuels. The number of smog alerts called was on a downtrend until 1962, then turned upward.

Most California pollution authorities agree that, if the laws and standards now on the books go into effect and are strictly enforced, air quality in Los Angeles should ultimately reach an "acceptable" level, which they define as roughly the level existing in the 1940's before air pollution was identified as a problem. However, these "acceptable" levels would probably not be reached until the 1980's because the strictest automobile emission standards would not go into effect until the 1970's and would not apply to used cars, which would thus continue to pollute the air until they disappear from the road in the 1980's. Moreover, no one is certain that the smog-reducing devices proposed for new cars would perform well over the full lifetime of the car, and there is no requirement for inspection.

In an effort to speed cleansing of the Los Angeles atmosphere, pollution authorities are considering a further crackdown on industry, including a complete ban on high-sulfur oil, curbs on oxides of nitrogen from industrial sources, and a prohibition against construction of any more conventional power plants in the county. They are also considering controls on used cars, aircraft, forklift trucks, motorcycles, farm vehicles, and space and hot-water heaters, as well as further changes in the composition of gasoline and in traffic flow patterns.

However, some experts believe a more fundamental approach is required. Haagen-Smit suggests that the ultimate solution lies in "attacking the root of the problem, the excessive use of the car at the expense of other less polluting means of transportation." He urges a search for new engine types and power sources, and the promotion of alternative means of transportation. Similarly, Irving R. Tabershaw, head of environmental health and safety at the University of California, Berkeley, suggests that emphasis be placed on improving the process of combustion. Citing Los Angeles as an example, Tabershaw concludes that air pollution control has been "a gigantic game of trial and error. . . . Each step has helped but an acceptable solution seems as far away as ever."—PHILIP M. BOFFEY

Space: Vienna Meeting Examines Value for Developing Nations

Vienna. Telling the poor nations of the world about outer space activities is a bit like reciting gourmet recipes to a starving man. In both cases, the listeners are likely to be acutely fascinated, but what's being said has little or nothing to do with their immediate problems.

Nevertheless the "haves" of space are usually eager to talk of their achievements—in fact, the creation of international awe is one of the enduring goals of both the Soviet and American space programs. The poor, or at least some of their conference circuit representatives, are even more eager to listen and also to seek some crumbs from the programs of the big powers. And these factors together account for the remarkable proceedings that took place 14–27 August in and around the Neue Hofberg, a splendiferous Hapsburg palace that today earns its way as an international conference center, a fall from grace that might be kept in mind by the proponents of various contemporary monumental structures of one sort or another.

The Vienna gathering, to which 67 nations sent some 600 participants and observers, is, of course, part of a long train of international space meetings, but, officially, it was the first United Nations Conference on the Exploration and Peaceful Uses of Outer Space. Specifically, it was charged by the U.N. General Assembly with examining "the practical benefits of space programs on the basis of technical and scientific achievements, and the opportunities available to non-space powers for international cooperation in space activities, with special reference to the needs of the developing countries."

Now, taking this mandate at face value, it is plain that a day or two of serious talk—rather than 2 whole weeks —could easily cross and crisscross all the realities, and not a few fantasies, vis-à-vis space and the developing nations. But it was the developing nations themselves that pushed hardest for the conference, and it was Austria, long active in U.N. space activities and eager to make Vienna an international meeting center on the Geneva style, that played the principal part in setting up a 2-week meeting, to be held in Vienna.

Though some of the mini-nations were represented by bored or bewildered-looking ambassadors dispatched from nearby capitals, a natural selection process more or less dictated that most of the developing nations were represented by professional staff members drawn from their inevitably tiny and struggling research establishments. These delegates were obviously delighted to be in the presence of the big leaguers from the two major space powers, and it is likely that they learned a good deal and also acquired some prestige and arguments for dealing with the politicians who control their budgets back home. How the Russians felt about the meeting is a matter on which they did not choose to chat, though it is said that they first proposed a conference of this sort back in the late 1950's, but then changed their minds. In 1966 they agreed to take part in a conference to be held in 1967; later, at their request, it was postponed to this year.

It is also said that, lacking any large inventory of space applications, such as weather or communication satellites, the Soviet wanted to stress science, but when the developing nations said they wanted to stress space applications, the Soviets went along. As it turned out, the Soviets had relatively little to say about space applications, but for whatever it's worth these days, they did execute some skillful digs at the United States. As for the United States delega-

tion, it was large, distinguished, and outwardly enthusiastic about bestowing the blessings of space on less fortunate lands, but, privately, a number of members felt the proceedings were ridiculous and bemoaned having to spend 2 weeks patiently discussing matters that are amply set forth in numerous slick NASA pamphlets.

In any case, there was the conference, with a variety of space-related luminaries in full or partial attendance, among them no less a figure than NASA Director James E. Webb, who, according to the keepers of such records, was making his first appearance at an international space conference. Webb explained that after having long devoted himself to the internal aspects of NASA, he now felt it was time to look to some of the external aspects. The American delegation included two congressmen who might well have been provided for the occasion by central casting: George P. Miller of California, chairman of the Science and Astronautics Committee, and the committee's ranking Republican, James G. Fulton of Pennsylvania, both of whom were scheduled to depart the conference with Webb to inspect a tracking station in Madrid. Then there was Frederick Seitz, president of the National Academy of Sciences, who, among other things, delivered a strong endorsement of manned space flight. Seitz also told his audience that the U.S. spends only about one-half percent of its gross national product on space activities, and that this sum "is far less than the expenditures for various forms of entertainment and amusement." He also expressed his indebtedness to Professor A. Danjon of the Paris Observatory for "pointing out to me that the outlay of the Danish Goverment in the Sixteenth Century for Tycho Brahe's observatory, which provided first Kepler and then Newton with the key information for their work on the motion of the planets, was about the same on a percentage of gross national product basis as the U.S. investment in science." It is difficult to say what was made of this by the representatives of the world's poor.

There was also the manufacturer of a specially constructed ball-point pen of which NASA is said to have bought 500 for taking notes in space. The manufacturer somehow managed to present 50 of his product to the Russians, who agreed to use them in their space journeys, thus giving rise to the claim that the pen will be the first piece of American-made equipment to go into a Soviet spacecraft. Webb was asked about the pens, which, with a claimed development price of $1 million, sell for $1.98 apiece. He replied that NASA buys many things, and he did not specifically recall the pen.

Then there were the Russians, who brought a large delegation, including cosmonaut A. Alexej Leonow, the first man to "walk" in space, as well as an enormous display of spacecraft and related equipment. Leonow read a paper by his late fellow cosmonaut, Yuri Gagarin, who died recently in a plane crash. The paper laid great emphasis on the importance of manned space flight, which makes you wonder what sort of problems Soviet man-in-space enthusiasts may be having with their political leaders. At a press conference, Leonow was asked whether the Russians planned to travel to the moon by a direct route, or by earth or lunar orbit. He replied, "I'll tell you when I get back." Asked for the number of Soviet cosmonauts, he replied that only those who have flown in space are designated cosmonauts; all the others are trainees "and there are a sufficient number of them for the program."

The Americans, who were without an astronaut or a display beyond a small apparatus for receiving satellite weather photos, pointed out that the Russian display was a traveling show that had been to Expo '67 and several other places. Further, they said, it was not U.S. policy to put on big displays at such meetings. But a member of the delegation said, "We tried to get some money for a display but it's practically impossible to get a nickel these days." The Americans did show an Apollo spacesuit at a press conference. A NASA aide threw a switch in a pack attached to the rear of the suit, and out came a tape-recorded voice describing various details of the suit.

Serving as vice president and scientific chairman of the conference was Vikram A. Sarabhai, who heads India's atomic energy and space programs. In an address at the opening of the conference, Sarabhai stressed the potential of a satellite TV system that could easily and with relative economy reach all of India's 560,000 villages. But then, to the despair of those who think India should at least for the present avoid the vast costs of home-grown big technology, he went on to declare that "advanced nations often play a negative role in their interaction with the developing countries. There is seduction by their political and commercial salesmen who dangle new gimmicks which they suggest should be imported rather than indigenous capability be developed and supported. There are those who preach as guardians of the economic well-being of the developing nations that they must proceed step-by-step, following the same process by which the nations themselves progressed." Sarabhai said he wanted no part of that approach, and then, turning to space communications, noted that, while the developed nations—meaning the U.S. in this case—have dealt the underdeveloped into space communications systems, there would be anxiety as long as one nation controlled the launch and operation of the satellites. "As long as there is no effective mutuality or interdependence between the two, many nations left only with the ground segment would probably feel the need for some measure of redundant capability under complete national jurisdiction." To this he added, "Perhaps collaborative participation of nations in the construction and operation of a launching system for the peaceful uses of outer space would be realized in the long run. . . . Those systems that do not provide full participation by all nations in all aspects of technology in which they are competent to partake, are in my humble opinion not saleable, much less sustainable in the long run. Attempts to promote them

News Internship

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merely poison international relations and the climate of cooperation."

This expression of views, obviously directed at the U.S.-dominated 62-nation INTELSAT consortium for space communications, provided a nice backdrop for a subsequent Soviet proposal to set up a worldwide satellite communications system, INTERSPUTNIK, to be run "on democratic principles." The Soviets were pressed to tell when, how, and so forth, but had little else to say, except that it should be done.

And so the conference went, amidst currents of East-West antagonisms, commercial nonsense, and the eagerness of the poor nations both to benefit from the big powers' skills in space and also to be free of their domination.

Perhaps the most touching event in the proceedings took place when a delegate from a small nation told how his laboratory successfully pieced together a receiver for ESSA's weather pictures. "We get very good pictures," he said, "but what should we do with them? When I asked my government for some money to build additional equipment, they wouldn't give it to me." Someone then raised the question of whether some source of funds, perhaps the UN, might not be established for such circumstances. But no one had any pleasing answer, least of all the representatives from NASA, where the space applications budget is currently $96 million out of a total budget exceeding $4 billion.

There was much talk about employing satellites for surveying earth resources, crop inspection, and other purposes of clearcut economic significance, but as Academy President Seitz pointed out in a panel discussion, "What we need is money for initial experiments. And then we have to think on a ten-year time scale, provided we get the money."

What are you doing that can help us now? That, in one form or another, was often asked by representatives of several of the developing nations. NASA could proudly point to weather, communication and navigation systems, but remarkable as these may be, it was not clear that they have much relevance for the misfortunes of the world's poor. In fact, one got the impression that there really wasn't much to be said in answer to that question. Considering the plight of the people whom some of these delegates represented, one could only gasp at a NASA paper on "Contributions of Space Technology to Solutions of Medical Problems," wherein was told the story of how a micrometeoroid sensor was adapted for the purpose of measuring chick embryo heartbeat.

Then there was a paper by Homer E. Newell, Associate Administrator of NASA, whose sensors for silver linings were especially well tuned. Newell, who long presided over NASA's space science program while it was repeatedly raped to provide funds for the lunar landing program, said that one great virtue of space applications was that they created a broad understanding of the importance of basic research. If space applications do "no more than establish an appreciation, once and for all, of the practical values of basic research, that in itself will be a supremely valuable intellectual effort."

To top that, Franz Joseph himself would have had to come into the Hofberg and proclaim the rebirth of the Empire.—D. S. GREENBERG

Federal City College: Trying To Be "Relevant"

Five blocks from the Capitol, in a drab, block-long three-story former government office building, faculty, administrators, and staff of the new Federal City College (FCC) are preparing for the college's opening on 9 September. Less than 2 years ago, they began to build a college, which, by all tests, seems desperately needed by the Washington community.

For years, the proportion of graduates of Washington's public high school who have gone on to college has been low—usually less than 35 percent. When dropouts are considered—and about one quarter of the 8000 or so students entering in the ninth grade drop out before graduation—that percentage is significantly lowered. One main factor has been the lack of quality public higher education in the District of Columbia. D.C. Teachers College (DCTC), until now the only public institution in Washington, has been woefully inadequate, and recently has run into accreditation problems. Eventually it will be taken over by FCC. But aside from DCTC, there has been no place for many Washington high school graduates to go. Local private universities and the public institutions in neighboring states have entrance requirements that are too stiff or costs that are too high for most D.C. students —over 90 percent of whom are black and most of whom are poor. Finally, in 1966, at the urging of Senator Wayne Morse and others (Morse is called by some the "Father of Federal City College"), Congress established FCC and the Washington Technical Institute.

FCC, therefore, is a unique form of public education. Other big-city colleges have begun to concentrate on serving their communities and on dealing with the special problems of black Americans, as FCC plans to do, but FCC alone was established and is funded by Congress. As FCC President Frank Farner puts it, "The members of Congress who decide on our budget are not going to get any votes from the people whose lives they're affecting with their decisions."

To get its money, FCC goes through a maze of eight review bodies. First, the budget request is examined by the D.C. Board of Higher Education, the governing body of FCC, whose members are appointed by the District government. Then the request goes through the D.C. budget machinery and the entire congressional authorization and appropriations process.

FCC, for its first year, has an operating budget of $4.3 million, and its request was cut only once along the line—some 6 percent by the Senate Committee on the District of Columbia. FCC administrators were even able to get a supplementary appropriation to take care of additional students, when applications went way above expectations late this spring. A truer test of the attitude of Congress should come, though, when next year's budget is