uation at Ohio State University (OSU) may be fairly typical.

Today the OSU engineering school has more than 1000 students in the senior class, or more than twice as many as it had 5 years ago. But, whereas 20 percent or more of the graduating seniors continued into graduate training in the 1960's, less than 10 percent are doing so now. Instead, most go into industry where starting salaries are often running as much as $20,000 a year and the work may seem more interesting professionally than what a university might offer.

According to Donald Glower, OSU's dean of engineering and a member of the delegation of deans from the American Society of Engineering Education that called on Frank Press last year, OSU is having to look increasingly to foreigners for candidates for its Ph.D. programs in engineering and for the numerous new teaching jobs created by the boom in undergraduate enrollment. "You can get as many foreign nationals as you want [for the graduate programs]," Glower said.

These students—and Glower says they are "very, very good"—come mainly from Taiwan, India, the Arab nations, western Europe, and Japan; they usually have already earned the equivalent of a bachelor's degree in their home countries.

After receiving their Ph.D., many want to remain in this country, but find it easier to get a faculty position than a job in industry, where visa restrictions and restrictions having to do with access to classified and proprietary information may pose a problem. Glower says that, already, 15 percent of the OSU engineering faculty of about 300 is foreign-born and that the proportion of foreigners is rapidly increasing.

By next September, OSU must fill 40 vacancies in the engineering school, and, according to Glower, if the job candidates were screened strictly on the basis of their academic qualifications, 90 percent of those chosen would be foreigners. Glower feels that it is undesirable for foreign nationals, brought up under alien political and economic systems, to make up a large part of an American engineering school faculty.

According to Glower, OSU, like most other schools, has not had the money to equip its laboratories in keeping with the revolution in engineering brought on by the rapid introduction of modern computer technology, as in interactive graphics, robotics, and microprocessors. "Our graduates are going out into industry not knowing the technology of today," he said. "They have been trained in the technology of yesterday."

In Glower's view, this is particularly unfortunate when these graduates join companies which have themselves fallen behind in the engineering revolution. Many small- to medium-sized companies are known to be in this laggard state.

Along with many of his colleagues among the engineering school deans, Glower would like to see NSF—or, better yet, a new "national engineering foundation"—provide $20-to-30 million a year in matching funds to the engineering schools for 5 years—funds earmarked for bringing their laboratory equipment up to date. He believes that major companies such as General Motors and IBM would willingly match the NSF money.

At NSF and the Department of Education nobody is ready to speculate yet as to what the federal government should do to bolster science and engineering education. Currently, NSF is asking Congress to authorize $85.7 million for its science and engineering education programs in fiscal 1981, or $7.5 million more than was authorized for 1980. Department of Education programs directly related to science and engineering education are much smaller, because most programs in this field were retained by NSF when the new department was created.

Science and engineering education is, of course, very much affected by inflation and some of the other problems that afflict the rest of education. The leveling off and decline in college and university enrollments in many science courses during the 1970's after the earlier expansion (partly associated with the postwar baby boom) has made for an uninviting job market in some fields. If enough promising students are discouraged from pursuing careers in science, there will be shortages later on.

At the secondary-school level, NSF-sponsored surveys indicate that science is still not regarded as a part of the general education program for most students. Also, because of weaknesses in counseling at the junior and senior high levels, some able students are entering college without the mathematics and other prerequisites necessary for them to complete a major in science or engineering in 4 years.

Just what NSF and other federal agencies can do about all this in an era of tightening budgets and rampant inflation is anything but clear. Nonetheless, by calling for the science and engineering education study to be done, and done posthaste, President Carter is creating expectations which, in this political season, he presumably will take steps to try to satisfy.—LUTHER J. CARTER

High-Tech Sales to U.S.S.R. Further Reduced

The Administration has set down what it calls "tough new controls" on the export of high technology and industrial know-how to the Soviet Union. This represents formalization of a temporary new policy enunciated by President Carter in a 4 January speech following the Soviet invasion of Afghanistan.

Until now, this country has been exporting some $200 million worth of high-technology items annually to the Soviet Union. About 70 percent of this commerce has required obtaining exceptions to rules established by COCOM, the Coordinating Committee on Export Controls, which is comprised of NATO members and Japan. COCOM has agreed on a long list of high-technology goods whose export to the Soviet Union and its allies requires approval of all the members. Computers comprise the largest single category of items; there are hundreds of others such as oil drilling equipment, computer parts and software, lasers, and sophisticated machine tools. Under the new American policy, very few exceptions to the COCOM list will be allowed.

Since the Soviet invasion, some 700 export licenses and license applications have been suspended, the vast majority involving sales of computers. Officials at a background briefing could not assign any monetary value to the aborted transactions; however, before the invasion there were 494 license applications pending covering $155 million worth of goods. The total number of exceptions granted last year by COCOM was 1500; 25 percent of these involved exports to Russia, and the United States was the exporter in 40 percent of these cases.

In addition to curbing high-technology exports, officials said they would be taking "a very careful hard look" at policies governing the export of "process technology," meaning U.S. assistance in setting up manufacturing plants in "industrial sectors of military relevance" to the Soviets. Although it has consistently been American policy not to sell the Russians anything that could support their military activities, trucks built at the Kama River plant in the Soviet Union,

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which American firms helped build in 1972, have been spotted in military use in countries such as Poland and Afghanistan.

Consultations are now under way with COCOM members to get them to stand behind the tougher U.S. policy. Officials expressed confidence that our allies would cooperate in the program and that the new initiative will make it a lot harder for the Soviet Union to obtain the high-technology items it wants. The officials did not speculate on what we would do next if our allies do not cooperate, but, said one, "We are committed to seeing that this kind of material does not reach the Soviet Union."

What Is Siberian Ulcer Doing in Sverdlovsk?

After 2 days of bluster and denials, the Soviet Union has acknowledged that there was an outbreak of anthrax, a deadly cattle disease, among the citizens of the closed industrial city of Sverdlovsk last year. However, they contend that the disease resulted from eating infected meat and not from a germ warfare explosion, as the U.S. government has intimated. The State Department believes several hundred people died in the episode, but the Soviets have not confirmed any fatalities.

There has been speculation that the publicizing of the alleged disaster is part of an attempt by the U.S. government to stir up anti-Soviet sentiment following the Afghanistan invasion, a notion supported by a senior intelligence official, who told the *New York Times* that the timing of the news was "no accident."

However, a Russian science journalist told *Science* he believes the reports are true and that had it not been for a last-minute wind shift, many more people might have been killed. Mark Popovsky, who immigrated to the United States last year, said that in January he received underground communications from friends in Sverdlovsk who believe there was an accident at a nearby bacteriological warfare institute. "My sources told me the wind blew toward town but then turned around," said Popovsky through an interpreter.

According to Popovsky's friends, an explosion in a military compound north of the city created a poisonous cloud carrying anthrax bacteria. A number of employees of a nearby brick factory perished before they could be brought to the hospital, and victims died with high fevers. The epidemic lasted a month, causing about 1000 deaths. The friends reported that the government denied everything, then said a mistake had been made. They also said citizens of Sverdlovsk were subsequently vaccinated twice against anthrax. Popovsky said they recalled an earlier accident that occurred in the same place in 1958, in which fatalities were kept down by another wind shift. Said Popovsky, "They ask me until what time will God continue to save the city by changing the wind."

Popovsky, who spent several decades collecting information on the Soviet science establishment—much of it contained in a book, *Manipulated Science*, published last year—said the Soviets have been actively engaged in bacteriological warfare research ever since the signing of the first agreement to halt such work in 1925. He says a special secret bacteriological institute operated outside Moscow in the 1920's and 1930's and then was moved to an island in Lake Seliger, where it was camouflaged as an institute of cattle disease until World War II. When the war began, Stalin ordered the institute moved to Kirov, and subsequently a chain of institutes was established to study germ warfare. When Popovsky left the Soviet Union early last year, he says, he had definite knowledge of two such installations, in Kirov and Sverdlovsk, and tentative knowledge of two others, in Kalinin and Novosibirsk. (A British magazine carried rumors last October of a germ warfare accident in Novosibirsk.) "Everything I have said," concluded Popovsky, "gives me a basis to believe that what the American press is reporting is true."

Meanwhile, the sources of the State Department's information about the alleged accident remain obscure. Reports of the explosion first appeared in a German tabloid, *Bild Zeitung*, last October. But since then department spokesmen have indicated there has been corroboration from other sources. The matter is currently under discussion in Geneva, where the 1975 protocol against production or use of bacterial warfare agents is under review.

Psychiatrists Study Three-Mile Trauma

The first anniversary of the Three Mile Island episode is now upon us (the accident officially began at 4 a.m. on 28 March 1979) and there is no end in sight to the postmortems. One of these is a study which is probably the first of its kind: a disaster survey of a nondisaster. Studies of the psychological aftereffects of natural disasters are common. But Three Mile Island is a case where no physical damage to the population or environs occurred; only psychologically does it rank as a trauma.

The President's commission on the accident reported, 6 months afterwards, that the incident had a demoralizing effect on large numbers of people. Now the National Institute of Mental Health is directing a survey to identify long-range psychological effects on those regarded as the most vulnerable members of the population. The study, headed by Evelyn Bromet of the Western Psychiatric Institute and Clinic in Pittsburgh, involves 1000 people living in the vicinity of Three Mile Island. They are divided into three groups: mothers of small children born within the year prior to the accident (most of whom followed the governor's advice to evacuate), unionized plant employees, and clients of the public mental health system who had been in treatment within 6 months prior to the accident.

Bromet's team of interviewers—all of them screened for antinuclear bias—have already completed phase one of the survey, in which respondents were asked general questions related to their emotional well-being and primary social relationships over the previous year.

Phase two, currently under way, involves reinterviewing all these people, with the idea of gaining a picture of their emotional well-being over the entire course of their lives. (Women who were pregnant at the time of the accident are not included in the survey because the state health department is conducting its own survey with them.)

Constance Holden