pipe, which is not refrigerated and can hold up to 3/4 gallon of milk, "for a considerable length of time"—perfect conditions for bacteria to multiply.

In addition, authorities found a 2-inch section of dead space in one of the valves that is not flushed out during routine maintenance, providing another possible site for bacterial growth.

What accounts for the April contamination? Officials discovered that one of the two valves was also attached to a T-shaped piece of pipe and also had a section of dead space where milk could stand. To close off one of the three ends of the pipe, the report said, workers freely interchanged threaded caps from raw or pasteurized lines. The report speculates that a small number of salmonella on a threaded cap could have contaminated milk in the pipe.

One of the baffling facts uncovered early on is absence of the enzyme phosphatase in any of the recovered containers of milk. Raw milk contains the enzyme. The report explains that the level was far below the level of detection. To be detected in a 25,000-gallon tank of pasteurized milk, the volume of raw milk would have to be greater than 25 gallons, it explained.

Other pieces of the investigation are falling together too. Plasmid analyses of the *Salmonella typhimurium* from the recent outbreak match the same strain that caused another outbreak last August in the Chicago area. Hillfarm milk was implicated in that outbreak, but on slim evidence.

The investigation continues. Officials are trying to locate dairy herds that may be harboring the bacteria in order to buttress their theory that the bacteria originated from outside the dairy.—**MARJORIE SUN**

Engineering "Crisis" Abating, Study Says

Alarmed sounds to the contrary, the engineering profession is in rather good shape, according to a National Research Council report, "Engineering Education and Practice in the United States." The quality of engineers is climbing; the scope of engineering is broadening. The profession, the most numerous one in the country after teaching, has the lowest unemployment rate—2 percent.

According to a committee headed by retired IBM executive Jerrier A. Haddad, the most persistent problem is the shortage of faculty in doctoral-level graduate programs. Foreigners holding temporary visas occupy 40 percent of these positions. Nonetheless, the report says the most recent data indicate that engineering faculty are "no longer leaving the schools at a significantly greater rate than they [are] coming in from industry," and that increasing numbers of native entering doctoral students offer hope for future faculty augmentation.

Some universities are complaining that they do not have the equipment or the manpower to meet growing student demand. On the other hand, the vigorous competitive situation is resulting in engineers with "dramatically higher communication and social skills"—and SAT scores—"as compared to past stereotypes of the engineer."

A cloud on the horizon is evidence that the number of women and minority people entering the profession has been leveling off. Female enrollments in undergraduate engineering programs began a precipitous climb in 1972, reaching 15 percent by 1984. But now it looks as though further progress will depend on more early exposure to science and math. "Even high school is too late," observed panel member Jordan Baruch, who suggested at a briefing that professional societies could do much more to get the "taste of engineering down into childhood."

Yet to appear from the study, which was commissioned in 1980 by the National Science Foundation (NSF), are companion reports on research, education (including continuing education), and employment.

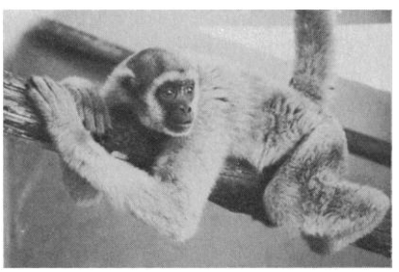
Details on "Participation of Foreign Citizens in U.S. Science and Engineering" is offered in an NSF report that appeared in January. This reveals that as of 1983, almost one quarter of all graduate students were foreigners, the commonest countries of origin being China and Taiwan, India, Iran, and Korea. Over half of those who obtain doctorates in the United States stay here, and increasing numbers are reporting postgraduation plans to work in this country.

—**CONSTANCE HOLDEN**

International Primate Campaign Launched

The World Wildlife Fund (WWF) has commenced a major campaign to save the world's wild primates that will entail raising $1 million within the next 5 years.

Primates are serving as the "flagship species" to focus public attention on the need to stem the destruction of rainforest habitat, which is disappearing at a rate of 10 to 20 million hectares—or an area about the size of New York State—per year. About one-third of the 200 primate species



Russell Mittermeier

Brazilian muriqui

are threatened, and one in seven will be extinct by 2000 unless action is taken immediately, according to campaign director Russell A. Mittermeier.

The WWF, which already spends $300,000 to $400,000 a year on primate programs, has formulated a detailed Primate Action Plan covering research, education, and training. Special attention will be focused on Brazil, which is home to 25 percent of the world's primates; Madagascar, which sustains a variety of unique species of lemurs; and central Africa, where a variety of new gorilla programs are being launched.

Although primates' habitats are being destroyed at a frightening rate, WWF-U.S. president Russell Train observed at a news briefing that officials of the countries in question are becoming increasingly eager to cooperate in conservation efforts. For example, the muriqui of Brazil, a rare monkey with unique human-type traits, was virtually unknown 5 years ago. Now it is featured on Brazilian stamps and telephone books and seems to be on its way to becoming the "panda" of Brazil.

—**CONSTANCE HOLDEN**