# News of Science

## NSF Report on Exchange of Graduate Students

Approximately 34,000 students from other nations were studying in institutions of higher learning in the United States during 1953–54—equal to the combined enrollment of foreign students in all universities of Western Europe. Thirty years earlier, the universities of Western Europe attracted three times as many foreign students as those in the United States.

These data are part of a new report by the National Science Foundation on exchange of foreign and United States graduate students in the sciences, engineering, and other fields. The data are based on surveys of the Institute of International Education, New York City, and an NSF survey on graduate enrollment. The analysis is designed to complement a report of graduate-student enrollment and stipends in the academic year 1953–54, to be published by the foundation this summer.

Numbers of foreign students studying at United States colleges and universities have increased steadily since World War II, until, in 1955–56, 36,500 were reported, of whom 13,600 (37 percent) were at the graduate level. The increase is indicative of the demand for professional and technical personnel in all parts of the world, as well as of the fact that United States institutions of higher learning have achieved internationally recognized status. While the majority of foreign students in this country are studying at the undergraduate level, United States students abroad are predominantly at the graduate level.

Until 1946, the total number of foreign students at United States colleges and universities never exceeded 10,000, of which no more than 2000 to 3000 were graduate students. Since 1946, the number of foreign students in the United States has more than trebled. In 1953–54 about one-third of the foreign students here were studying at the graduate level (approximately 5 percent of the total U.S. graduate enrollment of 250,000). They were predominantly studying in the natural sciences and engineering. On the other hand, the approximately 9500 U.S. students abroad were primarily studying in the humanities, chiefly at the graduate level.

In 1953–54, about 5000 (50 percent) of foreign graduate students in America were from the following seven countries: Canada, China, India, Philippines, Mexico, Japan, and the United Kingdom. Slightly less than 3000 of these were from the Asian countries and adjoining islands. Since 1920, Asian students have outnumbered Europeans in American institutions. While the majority of all our foreign students have been from Asia, few Americans have gone to Asia to study. Of the Europeans studying in this country, the British have been the most numerous. Of Americans studying abroad, at both the graduate and undergraduate level, approximately 5600 (60 percent) were in Europe and 2800 (30 percent) in Canada and Mexico. The European countries chosen by most students were Italy, Switzerland, France, and the United Kingdom.

Of the approximately 10,000 foreign graduate students in this country in 1953–54, 5150 (52 percent) were in the fields of natural sciences and engineering. Only 26 percent of all American graduate students in this country were in these fields. Of American students in foreign schools, 13 percent were studying natural sciences and engineering. The humanities accounted for 62 percent; the remaining 25 percent were studying psychology, social sciences, education, and other fields. In recent years as many as 1800 Americans have been enrolled in foreign medical schools, while only 100 foreign students were in American medical schools.

Financial support for exchange students comes from various sources. Seventy-seven percent of foreign graduate students received all, and another 7 percent part, of their support from personal or nongovernmental sources; only 16 percent received full support, and 7 percent partial support, from U.S. or foreign governments. Of American graduate and undergraduate students abroad in 1954–55, 53 percent were estimated to have some major source of governmental or private support—32 percent received G.I. benefits; 11 percent, U.S. Government scholarships and fellowships; 6 percent were supported by private foundations and universities; and 3 to 4 percent were studying on special junior-year-abroad arrangements.

The complete report, *Reviews of Data on Research and Development, No. 4, Exchange of Foreign and American Graduate Students in the Sciences, Engineering, and Other Fields,* may be obtained by writing to the National Science Foundation, Washington 25, D.C.

## Vaccine for Goat Brucellosis

The first effective vaccine against brucellosis in goats has been developed at the University of California by Sanford Elberg, professor of bacteriology. The vaccine may also prove effective in sheep, which are attacked by the same species of bacteria that attacks goats, *Brucella melitensis.*

The vaccine was tried on some 40 female goats. One group was vaccinated in August or September, while a second group remained unvaccinated. In October–December the animals were bred, and 1 month later all of them were infected with a virulent strain of *Brucella melitensis.* Every one of the unvaccinated goats aborted; the vaccinated animals gave birth to healthy kids, and both mothers and kids were uninfected. The results have just been confirmed by a group of scientists in England, led by A. W. Stableforth of the Ministry of Agriculture and Fisheries Laboratory at Weybridge.

The new vaccine is expected to bring important benefits, particularly to Latin American and Mediterranean countries, where goats and sheep are of major economic significance. The World Health Organization and the U.S. Public Health Service helped finance Elberg's work.

## Cause of Multiple Sclerosis

The National Multiple Sclerosis Society has announced that investigators at Montefiore Hospital, New York, and the University of Pennsylvania, will attempt to verify the recent findings of Rose R. Ichelson, Philadelphia bacteriologist, who reported isolating and culturing a spirochetal organism from spinal fluid of multiple sclerosis patients. She believes that the spirochete (*Spirochaeta myelophthora*) is the cause of the disease that has puzzled scientists for 125 years.

The tests at Montefiore Hospital will be under the direction of Alfred Cohn, microbacteriologist at the hospital. The University of Pennsylvania tests will be directed by Edward D. DeLamater. In addition to the tests being conducted under Multiple Sclerosis Society auspices, at least five other laboratories have