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## Science & Engineering Doctorates to U.S. Citizens Decline

The number of U.S. citizens who received science and engineering (S/E) doctorates in 1985 declined 3 percent from the previous year to 12,600, the lowest level since 1968.<sup>1</sup> This decline reflects a general trend that has persisted for nearly 15 years.

S/E doctorates awarded by U.S. universities to U.S. and foreign citizens peaked at 19,000 in 1972 and 1973. The number declined through 1977 to 17,050 and then increased gradually by 7 percent to 18,255 in 1985. During the 1973-78 period there were decreases in the number of doctorates awarded to both U.S. citizens and noncitizens, but the proportion of doctorates earned by U.S. citizens remained relatively stable at approximately 80 percent. Since 1978, however, the number of S/E degrees earned by foreign citizens has increased while that of those earned by U.S. citizens has continued to decline. By 1985 the U.S. share of S/E degree holders had dropped to 72 percent.

The decline in S/E doctorates to U.S. citizens overall reflects the net effect of four distinct trends, with differences between engineering and sciences and between men and women.

Awards in engineering increased in 1985 for both U.S. males and females. The increase for women continued a strong 7-year trend, when awards nearly quadrupled though remaining under 10 percent of the U.S.-citizen total. For males, a second successive year of increase was

recorded after more than a decade of general decline. During the 1970-83 period, the number of U.S. males earning engineering doctorates fell by more than half.

The general decline in science awards to U.S. citizens, while evident in all fields, has been most severe in mathematics, where doctorates dropped by nearly 60 percent between 1970 and 1985. The trends in science awards for men and women differed from the patterns for engineering. The number of U.S. males receiving science doctorates in 1985 continued a virtually uninterrupted 14-year decline. The 30 percent fewer awards to males in 1985 than in 1970 amounts to a difference of more than 3,400 degrees, which is a number greater than the combined total of this nation's men and women in engineering.

In contrast to the trend for men, the number of science doctorates to U.S. women continued to increase through 1984, though more slowly in the eighties. The slight decrease of 2 percent in 1985 resulted from declines in the three science areas where the participation of women has been proportionally highest: biological sciences, social sciences, and psychology.

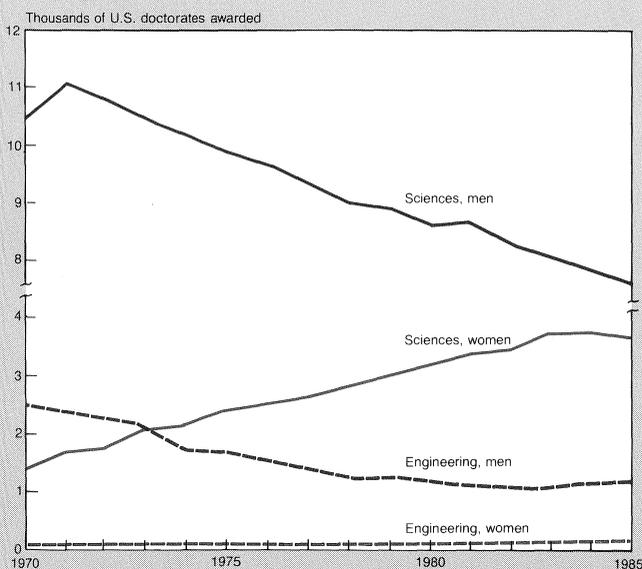
The patterns for women's representation in S/E fields is repeated in non-S/E fields, where women traditionally have had higher representation. For example, in education the proportion of degrees earned by U.S. women rose

from 20 percent in 1970 to 46 percent in 1980 and 54 percent in 1985. And in English and American language and literature, the increases were from 30 percent in 1970 to 49 percent in 1980 and 56 percent in 1985.

Most of the trends in doctorate awards observed here are likely to continue, based on a review of fulltime graduate enrollment in S/E fields. The substantial S/E enrollment increases among full-time women graduate students that marked the early eighties have ceased or reversed in some science fields, such as social sciences and environmental sciences. Similarly, among foreign students the rapid enrollment increases in doctorate-granting institutions in the early eighties have slowed or reversed in all broad fields. Thus, there may be only slight to moderate increases in degree awards to U.S. women and to foreign citizens in the near future.

<sup>1</sup> The Survey of Earned Doctorates is conducted annually by the National Research Council for the National Science Foundation, the National Endowment for the Humanities, the National Institutes of Health, and the Department of Education. Approximately 95 percent of the 1985 recipients of the Ph.D. and similar doctorates (such as Ed.D.) responded to the survey questionnaire. The database also includes some information on nonrespondents that was obtained from public sources. Recipients of first-professional degrees (the M.D. degrees, for example) are not included.

Science and engineering doctorates earned by U.S. citizens



S/E doctorates to U.S. citizens: 1970 and 1985

