

25th ANNUAL AMS SURVEY, 1981

First Report

- Faculty Salaries, Tenure, Women
 - Report on the 1981 Survey of New Doctorates
 - Salary Survey for New Recipients of Doctorates
 - Two Decades of Academic Salaries in Mathematics, 1960-1980

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First Report

The following pages contain a first report on the 1981 AMS Survey. Included in this report are data on faculty members in four-year colleges and universities, a report on the 1981 survey of new doctorates, a report on salaries of new recipients of doctorates, a report on academic salaries over the last two decades, and a list of names and thesis titles for members of the 1980-1981 Ph.D. class.

The Annual AMS Survey is conducted in two parts. Questionnaires were distributed in May to all departments in the mathematical sciences in colleges and universities in the United States and Canada, and, later to the recipients of doctoral degrees granted by these departments between July 1980 and June 1981, inclusive. This report is based on the information collected from these questionnaires. A second round of questionnaires was distributed in September; these are concerned with data on fall enrollments, class size, teaching loads and faculty mobility. These data will be reported in the February or April 1982 issue of the *Notices*.

This Survey is the twenty-fifth in an annual series begun in 1957 by the Society's Committee on the Economic Status of Teachers. The present Survey is under the direction of the Committee on Employment and Educational Policy (CEEP), whose members are Lida K. Barrett (chairman), Donald C. Rung, Hans Schneider, Robert J. Thompson, Barnet M. Weinstock, and William P. Ziemer. The questionnaires were devised by CEEP's Data Subcommittee consisting of Lida K. Barrett, Lincoln K. Durst, Wendell H. Fleming, Arthur P. Mattuck, Donald C. Rung (chairman), and Susan J. Devlin (consultant).

Faculty Salaries, Tenure, Women

The questionnaires sent to departments in the mathematical sciences asked for information on salaries and tenure. Departments submitted a minimum, median, and maximum salary figure for each of four academic ranks, for staff members both with and without doctorates. Annual salaries of full-time faculty members for the academic year of 9 or 10 months were sought. The 1981 questionnaire requested information for both the years 1980-1981 and 1981-1982. The sample in this survey is thus the same for both years and is different from the sample used in the Twenty-Fourth AMS Survey in 1980. In the salary tables on the following pages the numbers in parentheses give the range of the middle fifty percent of salaries reported. The figures outside the parentheses represent the minimum and maximum salary listed by any reporting institution. In some categories relatively few departments reported and, because significant figures were not available, salaries are not listed.

The information reported this year on the number of faculty members is based on returns from 781 departments in the mathematical sciences, 117 of which did not contain usable salary information.

For these reports, the departments are divided into groups according to the highest degree offered in the mathematical sciences. The doctorate-granting departments are in six groups as described in the box.

Group I and **Group II** include the leading departments of mathematics in the U.S. according to the findings of the American Council on Education in 1969¹, in which departments were ranked according to the quality of their graduate faculty.

Group I is composed of the 27 departments ranked highest.

Group II is made up of the other 37 leading departments listed in that report.

Group III contains all other U.S. departments of mathematics.

Group IV includes U.S. departments of statistics, biostatistics and biometrics.

Group V includes all other U.S. departments in the mathematical sciences.

Group VI consists of all doctorate-granting departments in the mathematical sciences in Canadian universities.

Although Canadian doctorate-granting departments are grouped separately, those granting bachelor and master degrees are included with U.S. departments, as in previous reports.

¹ The findings were published in *A Rating of Graduate Programs* by Kenneth D. Roose and Charles J. Andersen, American Council on Education, Washington, D.C., 1969, 115 pp. The information on mathematics was reprinted in the February 1971 issue of the *Notices*, pages 338-340.

TABLE 1: Total Faculty Reported for Four-Year Colleges and Universities

| | 1980-1981 | | | | 1981-1982 | | | |
|--------------------------|-------------|-------------|------------|-------------|-------------|-------------|------------|-------------|
| | FACULTY | | WOMEN | | FACULTY | | WOMEN | |
| | Total | With Tenure | Total | With Tenure | Total | With Tenure | Total | With Tenure |
| WITHOUT DOCTORATE | | | | | | | | |
| Instructor/Lecturer | 660 | 76 | 321 | 37 | 688 | 72 | 339 | 35 |
| Assistant Professor | 514 | 374 | 131 | 85 | 512 | 360 | 126 | 82 |
| Associate Professor | 450 | 436 | 53 | 48 | 446 | 429 | 60 | 54 |
| Professor | <u>143</u> | <u>140</u> | <u>13</u> | <u>13</u> | <u>143</u> | <u>138</u> | <u>10</u> | <u>10</u> |
| | 1767 | 1026 | 518 | 183 | 1789 | 999 | 535 | 181 |
| WITH DOCTORATE | | | | | | | | |
| Instructor/Lecturer | 218 | 8 | 39 | 2 | 200 | 9 | 36 | 3 |
| Assistant Professor | 2000 | 1243 | 267 | 27 | 2050 | 214 | 278 | 23 |
| Associate Professor | 2729 | 1472 | 196 | 169 | 2687 | 2397 | 208 | 177 |
| Professor | <u>3607</u> | <u>3497</u> | <u>138</u> | <u>132</u> | <u>3795</u> | <u>3673</u> | <u>154</u> | <u>141</u> |
| | 8554 | 6220 | 640 | 330 | 8732 | 6293 | 676 | 344 |

TABLE 2: Percent of Doctorate Faculty with Tenure

| | Fall 1980 | Fall 1981 |
|-----------------------|-----------|-----------|
| Groups I, II, III | 78.0% | 77.2% |
| Groups IV, V | 59.0% | 59.4% |
| Group VI | 84.5% | 84.4% |
| Masters and Bachelors | 71.5% | 70.7% |

TABLE 3: Response Rates

| Group | U.S. Departments | | | | | | |
|------------|----------------------|----|-----|----|----|----|----|
| | I | II | III | IV | V | M | B |
| % Response | 70 | 76 | 76 | 71 | 37 | 43 | 38 |
| Group | Canadian Departments | | | | | | |
| | VI | M | B | | | | |
| % Response | 43 | 35 | 16 | | | | |

Response Rates. Response rates among the various classes of departments vary widely, thus making it difficult to draw firm conclusions about the sizes of the faculty groups studied. Because the questionnaires request data for two years in a row, however, it is

possible to estimate relative changes from one year to the next with somewhat more confidence. This year's response rates are given in Table 3. As in past years, the greatest rates of response are in Groups I, II, and III, which have a combined response rate of 74% .

Faculty Salaries

SIZE OF FACULTY

| 1980-1981 | | 1981-1982 | |
|-----------|-------------|-----------|-------------|
| FACULTY | WOMEN | FACULTY | WOMEN |
| Total | With Tenure | Total | With Tenure |
| 2 | 1 | 1 | 0 |
| 3 | 2 | 2 | 1 |

SALARIES
(in hundreds of dollars)

| 1980-1981 | | 1981-1982 | |
|--------------|-----------|--------------|-----------|
| Minimum | Median | Minimum | Median |
| 160(170-194) | (178-218) | 180(185-205) | (195-207) |
| 195(220-245) | (240-261) | 190(230-246) | (261-276) |
| 212(262-300) | (351-405) | 238(278-336) | (373-436) |

DOCTORATE GRANTING DEPARTMENTS. Group I (19 of 27 reporting)

| WITHOUT DOCTORATE | | WITH DOCTORATE | |
|---------------------|-----------|---------------------|-----------|
| Instructor/Lecturer | Professor | Instructor/Lecturer | Professor |
| 1 | 0 | 1 | 0 |
| 2 | 1 | 1 | 1 |
| 3 | 2 | 2 | 1 |
| 41 | 2 | 43 | 2 |
| 128 | 3 | 135 | 3 |
| 123 | 120 | 116 | 109 |
| 479 | 478 | 488 | 487 |
| 771 | 603 | 782 | 601 |

DOCTORATE GRANTING DEPARTMENTS. Group II (28 of 38 reporting)

| WITHOUT DOCTORATE | | WITH DOCTORATE | |
|---------------------|---------------------|---------------------|---------------------|
| Instructor/Lecturer | Assistant Professor | Instructor/Lecturer | Assistant Professor |
| 42 | 7 | 42 | 6 |
| 8 | 6 | 8 | 6 |
| 0 | 0 | 1 | 1 |
| 50 | 13 | 51 | 13 |
| 48 | 2 | 41 | 2 |
| 159 | 5 | 156 | 4 |
| 305 | 285 | 297 | 273 |
| 492 | 491 | 496 | 495 |
| 1004 | 783 | 990 | 774 |

DOCTORATE GRANTING DEPARTMENTS. Group III (66 of 87 reporting)

| WITHOUT DOCTORATE | | WITH DOCTORATE | |
|---------------------|---------------------|---------------------|---------------------|
| Instructor/Lecturer | Assistant Professor | Instructor/Lecturer | Assistant Professor |
| 95 | 12 | 104 | 11 |
| 54 | 47 | 50 | 43 |
| 46 | 45 | 43 | 42 |
| 15 | 15 | 17 | 16 |
| 210 | 119 | 214 | 112 |
| 40 | 1 | 40 | 1 |
| 353 | 46 | 358 | 39 |
| 586 | 522 | 522 | 495 |
| 713 | 711 | 759 | 755 |
| 1642 | 1280 | 1679 | 1290 |

DOCTORATE GRANTING DEPARTMENTS. Group IV
(45 of 64 reporting)

| | 22 | 1 | 9 | 0 | 21 | 1 | 10 | 0 | 110(120-174) | (132-174) | (132-180)209 | 115(135-186) | (145-189) | (145-202)222 |
|--------------------------|-----|-----|----|----|-----|-----|----|----|--------------|-----------|--------------|--------------|-----------|--------------|
| <u>WITHOUT DOCTORATE</u> | | | | | | | | | | | | | | |
| Instructor/Lecturer | 5 | 3 | 2 | 1 | 5 | 3 | 2 | 1 | --- | --- | --- | --- | --- | --- |
| Assistant Professor | 2 | 2 | 1 | 1 | 2 | 2 | 1 | 1 | --- | --- | --- | --- | --- | --- |
| Associate Professor | 3 | 3 | 0 | 0 | 3 | 3 | 0 | 0 | --- | --- | --- | --- | --- | --- |
| Professor | 32 | 9 | 12 | 2 | 31 | 9 | 13 | 2 | --- | --- | --- | --- | --- | --- |
| | | | | | | | | | | | | | | |
| <u>WITH DOCTORATE</u> | | | | | | | | | | | | | | |
| Instructor/Lecturer | 6 | 1 | 4 | 1 | 6 | 1 | 3 | 1 | --- | --- | --- | --- | --- | --- |
| Assistant Professor | 160 | 11 | 23 | 1 | 161 | 9 | 24 | 1 | --- | --- | --- | --- | --- | --- |
| Associate Professor | 131 | 110 | 11 | 7 | 118 | 99 | 11 | 9 | --- | --- | --- | --- | --- | --- |
| Professor | 273 | 273 | 10 | 10 | 295 | 294 | 11 | 10 | --- | --- | --- | --- | --- | --- |
| | 570 | 395 | 48 | 19 | 580 | 403 | 43 | 21 | --- | --- | --- | --- | --- | --- |

DOCTORATE GRANTING DEPARTMENTS. Group V
(50 of 135 reporting)

| | 32 | 0 | 6 | 0 | 31 | 0 | 9 | 0 | 160(160-220) | (168-240) | (175-287)300 | 120(170-210) | (180-256) | (200-300)312 |
|--------------------------|-----|-----|----|---|-----|-----|----|----|--------------|-----------|--------------|--------------|-----------|--------------|
| <u>WITHOUT DOCTORATE</u> | | | | | | | | | | | | | | |
| Instructor/Lecturer | 2 | 1 | 1 | 0 | 1 | 1 | 0 | 0 | --- | --- | --- | --- | --- | --- |
| Assistant Professor | 1 | 1 | 0 | 0 | 1 | 1 | 0 | 0 | --- | --- | --- | --- | --- | --- |
| Associate Professor | 6 | 6 | 0 | 0 | 6 | 6 | 0 | 0 | --- | --- | --- | --- | --- | --- |
| Professor | 41 | 8 | 7 | 0 | 39 | 8 | 9 | 0 | --- | --- | --- | --- | --- | --- |
| | | | | | | | | | | | | | | |
| <u>WITH DOCTORATE</u> | | | | | | | | | | | | | | |
| Instructor/Lecturer | 35 | 0 | 6 | 0 | 27 | 0 | 4 | 0 | --- | --- | --- | --- | --- | --- |
| Assistant Professor | 224 | 3 | 23 | 0 | 246 | 3 | 23 | 0 | --- | --- | --- | --- | --- | --- |
| Associate Professor | 183 | 136 | 8 | 5 | 190 | 148 | 8 | 7 | --- | --- | --- | --- | --- | --- |
| Professor | 337 | 262 | 6 | 4 | 350 | 274 | 7 | 5 | --- | --- | --- | --- | --- | --- |
| | 779 | 401 | 43 | 9 | 813 | 425 | 42 | 12 | --- | --- | --- | --- | --- | --- |

DOCTORATE GRANTING DEPARTMENTS. Group VI
(15 of 35 reporting)

| | 5 | 0 | 0 | 0 | 5 | 0 | 0 | 0 | 137(165-179) | (172-197) | (183-239)259 | 143(185-218) | (190-234) | (206-268)291 |
|--------------------------|-----|-----|----|---|-----|-----|----|---|--------------|-----------|--------------|--------------|-----------|--------------|
| <u>WITHOUT DOCTORATE</u> | | | | | | | | | | | | | | |
| Instructor/Lecturer | 2 | 0 | 0 | 0 | 2 | 1 | 0 | 0 | --- | --- | --- | --- | --- | --- |
| Assistant Professor | 7 | 7 | 2 | 2 | 7 | 7 | 2 | 2 | --- | --- | --- | --- | --- | --- |
| Associate Professor | 5 | 5 | 0 | 0 | 5 | 5 | 0 | 0 | --- | --- | --- | --- | --- | --- |
| Professor | 19 | 12 | 2 | 2 | 19 | 13 | 2 | 2 | --- | --- | --- | --- | --- | --- |
| | | | | | | | | | | | | | | |
| <u>WITH DOCTORATE</u> | | | | | | | | | | | | | | |
| Instructor/Lecturer | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | --- | --- | --- | --- | --- | --- |
| Assistant Professor | 66 | 16 | 6 | 1 | 61 | 10 | 5 | 1 | --- | --- | --- | --- | --- | --- |
| Associate Professor | 158 | 151 | 4 | 3 | 152 | 146 | 3 | 2 | --- | --- | --- | --- | --- | --- |
| Professor | 156 | 155 | 1 | 1 | 158 | 158 | 2 | 2 | --- | --- | --- | --- | --- | --- |
| | 381 | 322 | 11 | 5 | 372 | 314 | 10 | 5 | --- | --- | --- | --- | --- | --- |

SIZE OF FACULTY

1980-1981 1981-1982

| | FACULTY | | WOMEN | | FACULTY | | WOMEN | |
|---------------------|---------|-------------|-------|-------------|---------|-------------|-------|-------------|
| | Total | With Tenure | Total | With Tenure | Total | With Tenure | Total | With Tenure |
| Without Doctorate | 243 | 33 | 126 | 15 | 232 | 33 | 116 | 15 |
| Instructor/Lecturer | 192 | 167 | 48 | 36 | 191 | 157 | 46 | 33 |
| Assistant Professor | 175 | 174 | 18 | 17 | 171 | 170 | 21 | 20 |
| Associate Professor | 42 | 42 | 5 | 5 | 39 | 39 | 2 | 2 |
| Professor | 652 | 416 | 197 | 73 | 633 | 399 | 185 | 70 |
| With Doctorate | 33 | 1 | 6 | 0 | 28 | 2 | 8 | 1 |
| Instructor/Lecturer | 449 | 98 | 66 | 8 | 458 | 85 | 72 | 7 |
| Assistant Professor | 747 | 689 | 54 | 50 | 736 | 675 | 60 | 51 |
| Associate Professor | 705 | 696 | 42 | 42 | 762 | 752 | 52 | 47 |
| Professor | 1834 | 1484 | 168 | 100 | 1894 | 1514 | 192 | 106 |

MASTER DEGREE GRANTING DEPARTMENTS.

(151 of 355 reporting including 7 of 20 Canadian Departments)

WITHOUT DOCTORATE

| | 1980-1981 | | 1981-1982 | | 1981-1982 | | |
|---------------------|--------------|-----------|--------------|--------------|-----------|--------------|---------|
| | Minimum | Maximum | Minimum | Maximum | Minimum | Median | Maximum |
| Without Doctorate | 89(130-162) | (137-170) | (140-190)232 | 105(132-180) | (147-188) | (154-194)263 | |
| Instructor/Lecturer | 122(167-205) | (173-208) | (182-216)283 | 122(177-219) | (187-223) | (198-233)303 | |
| Assistant Professor | 148(200-251) | (211-257) | (218-263)420 | 161(210-274) | (218-279) | (236-281)482 | |
| Associate Professor | 206(235-380) | (235-338) | (235-338)384 | 214(249-349) | (250-348) | (250-349)449 | |
| Professor | 130(145-168) | (147-180) | (147-197)216 | 154(156-204) | (156-209) | (156-209)256 | |
| Instructor/Lecturer | 139(165-197) | (176-207) | (184-219)308 | 150(181-210) | (191-224) | (202-240)355 | |
| Assistant Professor | 148(197-228) | (220-248) | (232-277)425 | 161(212-247) | (236-271) | (251-300)489 | |
| Associate Professor | 159(240-287) | (265-318) | (287-345)436 | 168(254-306) | (286-340) | (314-355)476 | |
| Professor | 85(120-150) | (123-152) | (125-160)250 | 100(136-165) | (140-170) | (141-176)256 | |
| Instructor/Lecturer | 115(149-190) | (150-197) | (152-205)300 | 115(150-205) | (166-211) | (170-222)300 | |
| Assistant Professor | 138(180-220) | (180-228) | (180-235)320 | 140(199-240) | (200-249) | (200-255)330 | |
| Associate Professor | 169(214-281) | (215-288) | (215-283)380 | 181(227-303) | (230-309) | (230-320)413 | |
| Professor | 132(154-180) | (155-186) | (160-199)300 | 143(165-195) | (171-202) | (175-215)352 | |
| Instructor/Lecturer | 142(184-223) | (187-234) | (191-240)379 | 152(200-240) | (201-255) | (204-268)416 | |
| Assistant Professor | 143(212-274) | (222-291) | (226-307)452 | 143(231-297) | (240-316) | (250-333)576 | |
| Associate Professor | 143(212-274) | (222-291) | (226-307)452 | 143(231-297) | (240-316) | (250-333)576 | |
| Professor | 1532 | 972 | 195 | 90 | | | |

BACHELOR DEGREE GRANTING DEPARTMENTS.

(407 of 1066 reporting including 5 of 31 Canadian Departments)

WITHOUT DOCTORATE

| | 1980-1981 | | 1981-1982 | | FACULTY | | WOMEN | |
|---------------------|-----------|-------------|-----------|-------------|---------|-------------|-------|-------------|
| | Total | With Tenure | Total | With Tenure | Total | With Tenure | Total | With Tenure |
| Without Doctorate | 220 | 23 | 105 | 10 | 252 | 21 | 118 | 9 |
| Instructor/Lecturer | 251 | 150 | 63 | 34 | 255 | 149 | 64 | 35 |
| Assistant Professor | 219 | 207 | 27 | 24 | 222 | 207 | 29 | 25 |
| Associate Professor | 70 | 67 | 7 | 7 | 71 | 67 | 7 | 7 |
| Professor | 760 | 447 | 202 | 75 | 800 | 944 | 218 | 76 |

WITH DOCTORATE

| | 1980-1981 | | 1981-1982 | | FACULTY | | WOMEN | |
|---------------------|-----------|-------------|-----------|-------------|---------|-------------|-------|-------------|
| | Total | With Tenure | Total | With Tenure | Total | With Tenure | Total | With Tenure |
| Without Doctorate | 14 | 1 | 2 | 0 | 14 | 1 | 5 | 0 |
| Instructor/Lecturer | 462 | 61 | 82 | 7 | 475 | 61 | 90 | 6 |
| Assistant Professor | 545 | 459 | 59 | 48 | 556 | 452 | 63 | 52 |
| Associate Professor | 452 | 431 | 37 | 33 | 487 | 458 | 37 | 32 |
| Professor | 1473 | 952 | 180 | 88 | 1532 | 972 | 195 | 90 |

Report on the 1981 Survey of New Doctorates

by Donald C. Rung

This report concerns new doctorates in the mathematical sciences. It includes the employment status of recipients of 1980-1981 doctorates in the mathematical sciences, and a breakdown according to their sex, minority group, and citizenship. In addition, trends in the number of doctoral degrees in the mathematical sciences are reported for each group of departments as defined by the 1969 American Council on Education survey (described on the first page of this report of the 1981 Survey).

For the first time in several years the number of new doctorates reported (905) is greater than that of the previous year's figure (858). It should be noted that part of the increase is the result of efforts to increase the response rate in the area of operations research and management science. It is clear that the demand is now somewhat in excess of the supply. There were only 32 doctorates still seeking employment (the lowest number within recent memory) and, if past experience holds, most will find employment this year. Based upon

these reports over the last three years and the increased demand for doctorates reported in the Employment Register the author believes that an increase in the number of new doctorates to a level of 950 per year is necessary to meet the demand especially in the more applicable areas.

The percentage of new doctorates who are women increased sharply from 12.7% in 1979-1980 to 16.4% in 1980-1981. In absolute numbers there were 148 women who received doctorates in 1981 as compared to 108 in 1980. It is interesting to note that the percentage still seeking employment was the same (4%) for both men and women. This percentage is the lowest in recent years and also indicates that employment opportunities continue to be good. (A second report on the employment status of the 1980-1981 doctorates is planned for the February or April 1982 issue of the *Notices*.)

The number of new doctorates who have left the U.S. or Canada and have not been reported to have

TABLE 1: 1980-1981 Employment Status of New Doctorates in the Mathematical Sciences

| Type of Employer | PURE MATHEMATICS | | | | | | Statistics | Computer Science | Operations Research | Applied Mathematics | Mathematics Education | Other | Total |
|---------------------------------|---------------------------|----------------------------------|-----------------------|-------|-------------|-----|------------|------------------|---------------------|---------------------|-----------------------|-------|-------|
| | Algebra and Number Theory | Analysis and Functional Analysis | Geometry and Topology | Logic | Probability | | | | | | | | |
| Group I | 14 | 17 | 16 | 6 | 1 | 1 | | | 4 | | 2 | 61 | |
| Group II | 8 | 9 | 16 | 4 | 1 | 3 | 1 | | 3 | | 2 | 47 | |
| Group III | 7 | 6 | 8 | 1 | 1 | 4 | 4 | | 4 | 1 | 6 | 42 | |
| Group IV | | | | | | 28 | | | | | 1 | 31 | |
| Group V | | | | 1 | | 4 | 25 | 8 | 7 | | 1 | 46 | |
| Masters | 12 | 22 | 10 | 3 | 2 | 12 | 3 | 2 | 6 | 1 | 5 | 78 | |
| Bachelors | 24 | 17 | 10 | 1 | | 7 | 2 | | 5 | 1 | 2 | 69 | |
| Two-year College or High School | | 2 | | | | | | | 1 | 1 | 3 | 7 | |
| Other Academic Depts. | 2 | 2 | 1 | | 2 | 33 | 7 | 14 | 11 | 1 | 8 | 81 | |
| Research Institutes | 1 | 3 | 5 | | | 5 | 1 | 2 | 7 | | 1 | 25 | |
| Government | 1 | 3 | 1 | | 1 | 8 | | 2 | 5 | | 2 | 23 | |
| Business and Industry | 6 | 13 | 7 | 2 | 6 | 43 | 26 | 17 | 28 | 1 | 6 | 155 | |
| Canada, Academic | 1 | 3 | | | | 6 | 6 | | 4 | 1 | 3 | 24 | |
| Canada, Nonacademic | 1 | 1 | 2 | | | 1 | 2 | 2 | 1 | | | 10 | |
| Foreign, Academic | 17 | 8 | 8 | | 4 | 17 | 5 | 1 | 8 | 1 | 2 | 71 | |
| Foreign, Nonacademic | 4 | 9 | 4 | | | 9 | 2 | 11 | 8 | | 2 | 49 | |
| Not seeking employ. | | | | | 1 | | | 2 | | 1 | | 4 | |
| Not yet employed | 5 | 2 | 3 | 1 | | 11 | | 2 | 5 | | 3 | 32 | |
| Unknown | 3 | 6 | 5 | 1 | 1 | 16 | 8 | 1 | 7 | 1 | | 49 | |
| | 106 | 123 | 96 | 20 | 22 | 208 | 92 | 64 | 114 | 10 | 49 | 904 | |

accepted academic positions nearly doubled from 29 in 1979-1980 to 49 in 1980-1981. The number of doctorates in this category exceeds both the number who have taken positions in Group II departments and the number who have taken positions in Group III departments.

It should be noted that the number of new doctorates reported as conferred by Group V departments which include computer science is considerably less than the actual number. It may be that the numbers reported to the AMS represent less than one-half of the total number. It is estimated that in 1979-1980 there were about 250 doctorates in the computer sciences while our figure in the October 1979 *Notices* was 110.

Employment Status of New Doctorates, 1980-1981. Table 1 shows the employment status, by type of employer and field of degree, of 905 recipients of doctoral degrees conferred by mathematical sciences departments in the U.S. and Canada between July 1, 1980 and June 30, 1981. These 905 individuals are listed, with their thesis titles, later in this report.

In rows 1 through 5, the recipients are counted who accepted appointments in U.S. doctorate-granting mathematical sciences departments (Groups I-V). In the next two rows, the figures represent those accepting appointments in U.S. mathematical sciences departments granting masters and bachelors degrees only. The information was obtained both from the departments granting the degrees and from questionnaires subsequently completed by about 42% of the recipients themselves.

Among those 1980-1981 new doctorates employed in the U.S. about 56% took positions in university or college mathematical sciences departments. About 27% took positions in government, business, and industry, while the remaining 17% are in two-year colleges, high schools, other academic departments, or research institutes. These figures are similar to those reported last year.

Table 1 shows as "not yet employed" about 4% of the 1980-1981 new doctorates (this excludes those whose employment status is unknown, and those now in Canada or other foreign countries). The data in Table 1 were in many instances obtained early in the summer of 1981 and do not reflect subsequent hiring during the summer; an update of Table 1 is planned for the February or April 1982 *Notices*. A similar update last year revealed that nearly all new 1979-1980 doctorates not yet employed by early summer subsequently found positions by Fall 1980. (See the *Notices*, October 1980, page 608, and February 1981, page 171.) Only eight individuals included in Table 1 were reported as having taken part-time employment.

Sex, Race, and Citizenship of New Doctorates, 1980-1981. Table 2 below represents a breakdown according to sex, racial/ethnic group, and citizenship of these 905 new doctorates. The information summarized in Table 2 was obtained from department heads and in some cases from recipients themselves.

Table 2 shows that 16.4% of the 1980-1981 doctorates are women. This is an increase from the 12.7 percentage

TABLE 2: Sex, Race, and Citizenship of New Doctorates

July 1, 1980-June 30, 1981

| U.S. DEGREES | MEN | | | | | WOMEN | | | | | TOTAL |
|---|-------------|----------|------------|-----------|------------|-------------|----------|-----------|-----------|-------------|------------|
| | CITIZENSHIP | | | | | CITIZENSHIP | | | | | |
| | U. S. | Canada | Other | Not Known | Total Men | U. S. | Canada | Other | Not Known | Total Women | |
| RACIAL/ETHNIC GROUP | | | | | | | | | | | |
| Asian, Pacific Islander | 18 | | 86 | 4 | 108 | 10 | | 16 | | 26 | 134 |
| Black | 6 | | 9 | | 15 | 2 | | | | 2 | 17 |
| American Indian, Eskimo, Aleut | 1 | | | | 1 | 2 | | | | 2 | 3 |
| Mexican American, Chicano, Puerto Rican | 1 | | 5 | | 6 | 1 | | 2 | | 3 | 9 |
| None of those above | 412 | 6 | 128 | 1 | 547 | 81 | 1 | 16 | 1 | 99 | 646 |
| Unknown | 26 | | 4 | 3 | 33 | 6 | | | | 6 | 39 |
| Total Number | 465 | 6 | 232 | 8 | 711 | 102 | 1 | 34 | 1 | 138 | 848 |

| CANADIAN DEGREES | MEN | | | | | WOMEN | | | | | TOTAL |
|---|-------------|-----------|-----------|-----------|-----------|-------------|----------|----------|-----------|-------------|-----------|
| | CITIZENSHIP | | | | | CITIZENSHIP | | | | | |
| | U. S. | Canada | Other | Not Known | Total Men | U. S. | Canada | Other | Not Known | Total Women | |
| RACIAL/ETHNIC GROUP | | | | | | | | | | | |
| Asian, Pacific Islander | | 2 | 7 | | 9 | | | 1 | | 1 | 10 |
| Black | | | 1 | | 1 | | | | | | 1 |
| American Indian, Eskimo, Aleut | | | | | | | | | | | |
| Mexican American, Chicano, Puerto Rican | | | 1 | | 1 | | | | | | 1 |
| None of those above | | 20 | 10 | | 30 | 1 | 5 | 1 | | 7 | 37 |
| Unknown | | 4 | 1 | | 5 | | 1 | | 1 | 2 | 7 |
| Total Number | | 26 | 20 | | 46 | 1 | 6 | 2 | 1 | 10 | 56 |

reported a year ago. Table 2 shows forty-one new doctorates who are both U.S. citizens and members of a minority group, an increase of six from last year; as in previous years this represents only a small percentage of the total.

Analysis of the 1980-1981 employment forms for the new U.S. doctorates indicates that 12% of those employed by Groups I, II, and III departments are women, as compared to 8% last year. Among new doctorates employed by bachelors and masters degree-granting departments 29% are women, while among those employed by government, business, and industry 15% are women.

Trends in the Number of New Doctorates. Table 3 gives the number of doctorates granted during 1978-1979, 1979-1980, and 1980-1981 by those departments in Groups I-VI, *which reported in all three years*. The number of such departments is indicated in parentheses.

Table 3 shows that the percentage of doctorates from Groups I and II has decreased from 44% in 1980 to 39% in 1981. It is interesting to note that the total number of doctorates reported from Groups III and IV now exceeds those reported from Groups I and II.

TABLE 3: Number of New Mathematical Sciences Doctorates Reported

| | 78-79 | 79-80 | 80-81 |
|-----------------------|------------|------------|------------|
| Group I (24 depts.) | 214 | 227 | 192 |
| Group II (34 depts.) | 130 | 118 | 108 |
| Group III (74 depts.) | <u>132</u> | <u>135</u> | <u>160</u> |
| Subtotal | 476 | 480 | 460 |
| Group IV (39 depts.) | 133 | 104 | 146 |
| Group V (29 depts.) | 116 | 116 | 115 |
| Group VI (30 depts.) | <u>59</u> | <u>54</u> | <u>51</u> |
| Subtotal | 308 | 274 | 312 |
| TOTAL | 784 | 754 | 772 |

Salary Survey for New Recipients of Doctorates

The figures for 1981 in this article were compiled from questionnaires sent to individuals who received a doctorate in the mathematical sciences during the 1980-1981 academic year from universities in the United States and Canada. This year no attempt was made to obtain information from individuals who were reported to have left the U.S. or Canada.

Questionnaires requesting information on salaries and professional experience were distributed to 780 recipients of degrees using addresses provided by the departments which granted the degrees. Of these, 7 were returned by the postal service as undeliverable and could not be forwarded. There were 381 individuals who returned forms between late June and early September. The tables below are based on the responses from 354 of these individuals (291 men and 63 women). Data from 27 responses were not used in the compilation of the tables below; forms with insufficient data, or from individuals who had indicated they had part-time employment, were not yet employed, or were not seeking employment were considered unusable.

Readers should be warned that the data in this report are obtained from a self-selected sample and inferences from them may not be representative of the population. More comprehensive information on the number, the sex-minority group status-citizenship, and the employment status of the recipients of new doctorates granted last year in the mathematical sciences in the U.S. and Canada may be found in the previous article of this report on the 1981 Survey.

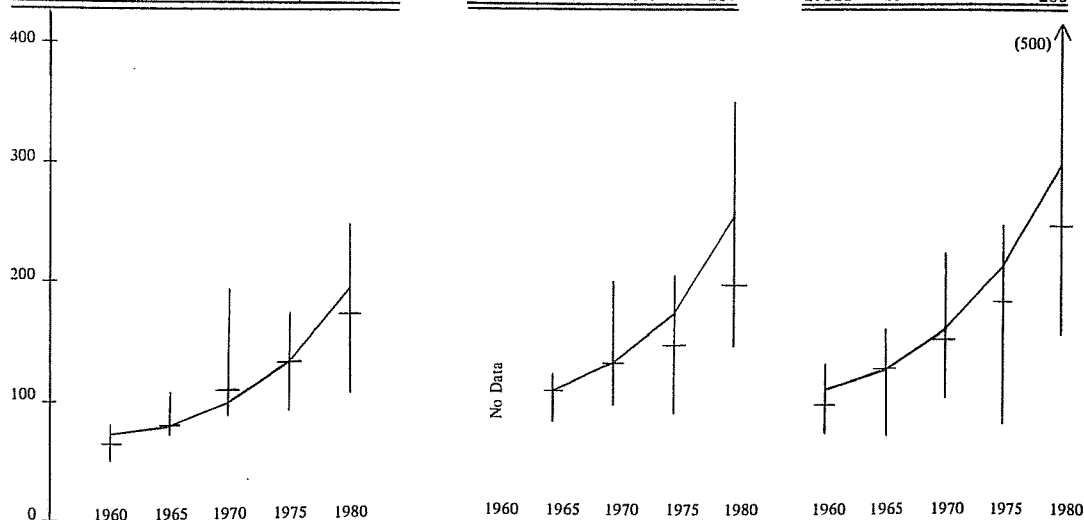
Key to Tables. *Salaries* are listed in hundreds of dollars. *Years* listed refer to the academic year ending in the listed year. *M* and *F* are Male and Female respectively. *One year experience* means that the persons had experience limited to one year or less in the same position or a position similar to the one reported; some persons receiving a doctorate had been employed in their present position for several years. $(X + Y)$ means there are *X men and Y women* in the 1981 sample. Quartile figures are given only in cases where the number of responses is large enough to make them meaningful.

Nine-Month Salaries

| Year | Min. | Q ₁ | Median | Q ₃ | Max. |
|---|------|----------------|--------|----------------|------|
| TEACHING OR TEACHING AND RESEARCH (159 + 32) | | | | | |
| 1977 | 72 | 130 | 140 | 150 | 328 |
| 1978 | 92 | 135 | 145 | 159 | 211 |
| 1979 | 100 | 145 | 157 | 170 | 234 |
| 1980 | 105 | 155 | 171 | 185 | 250 |
| 1981 | 130 | 175 | 190 | 210 | 320 |
| 1977M | 72 | 130 | 140 | 150 | 328 |
| 1977F | 72 | 120 | 135 | 148 | 170 |
| 1978M | 100 | 135 | 145 | 160 | 211 |
| 1978F | 92 | 131 | 145 | 151 | 195 |
| 1979M | 100 | 145 | 158 | 170 | 234 |
| 1979F | 115 | 145 | 152 | 171 | 200 |
| 1980M | 120 | 155 | 171 | 185 | 250 |
| 1980F | 105 | 151 | 164 | 198 | 210 |
| 1981M | 130 | 175 | 190 | 210 | 320 |
| 1981F | 146 | 177 | 195 | 216 | 300 |
| One year experience (139 + 18) | | | | | |
| 1981M | 135 | 175 | 190 | 209 | 320 |
| 1981F | 146 | 174 | 191 | 210 | 285 |

Twelve-Month Salaries

| Year | Min. | Median | Max. | Year | Min. | Median | Max. |
|--|------|--------|------|------------------------------|------|--------|------|
| TEACHING OR TEACHING AND RESEARCH (33 + 11) | | | | GOVERNMENT (16 + 3) | | | |
| 1977 | 111 | 170 | 260 | 1977 | 105 | 187 | 330 |
| 1978 | 101 | 185 | 290 | 1978 | 170 | 220 | 320 |
| 1979 | 120 | 195 | 240 | 1979 | 180 | 243 | 357 |
| 1980 | 143 | 195 | 350 | 1980 | 156 | 244 | 501 |
| 1981 | 156 | 203 | 400 | 1981 | 220 | 290 | 460 |
| 1977M | 111 | 170 | 260 | 1977M | 105 | 192 | 330 |
| 1977F | 125 | - | 182 | 1977F | 115 | 182 | 204 |
| 1978M | 101 | 180 | 290 | 1978M | 170 | 220 | 320 |
| 1978F | 187 | 195 | 223 | 1978F | 170 | 200 | 250 |
| 1979M | 120 | 188 | 240 | 1979M | 180 | 254 | 357 |
| 1979F | 210 | 233 | 240 | 1979F | 190 | 231 | 256 |
| 1980M | 143 | 190 | 350 | 1980M | 156 | 230 | 501 |
| 1980F | 147 | 200 | 220 | 1980F | 205 | 247 | 280 |
| 1981M | 156 | 200 | 400 | 1981M | 220 | 294 | 400 |
| 1981F | 165 | 213 | 290 | 1981F | 252 | 269 | 460 |
| One year experience (27 + 10) | | | | One year experience (10 + 2) | | | |
| 1981M | 156 | 200 | 290 | 1981M | 220 | 250 | 305 |
| 1981F | 165 | 199 | 280 | 1981F | 252 | - | 269 |

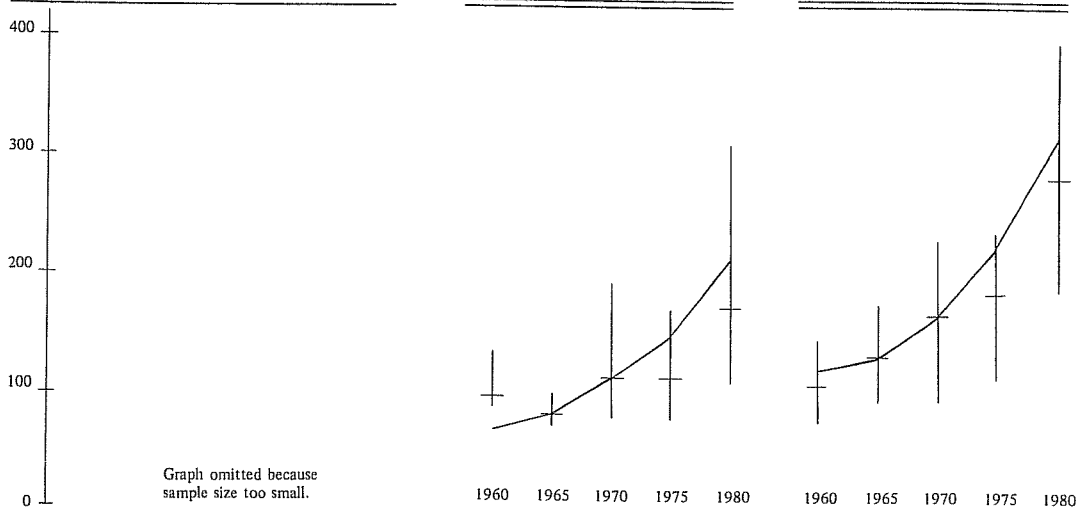


Nine-Month Salaries

| Year | Min. | Q ₁ | Median | Q ₃ | Max. |
|-----------------------------|------|----------------|--------|----------------|------|
| RESEARCH (2 + 1) | | | | | |
| 1977 | 80 | - | 86 | - | 160 |
| 1978 | 120 | - | - | - | 125 |
| 1979 | 110 | - | 132 | - | 160 |
| 1980 | 125 | - | 137 | - | 180 |
| 1981 | 143 | - | - | - | 145 |
| 1977M | 80 | - | - | - | 160 |
| 1977F | - | - | 86 | - | - |
| 1978M | 120 | - | - | - | 125 |
| 1978F | - | - | - | - | - |
| 1979M | 110 | - | 132 | - | 160 |
| 1979F | - | - | - | - | - |
| 1980M | 125 | - | 137 | - | 180 |
| 1980F | - | - | - | - | - |
| 1981M | 143 | - | - | - | 145 |
| 1981F | - | - | 145 | - | - |
| One year experience (2 + 1) | | | | | |
| 1981M | 143 | - | - | - | 145 |
| 1981F | - | - | 145 | - | - |

Twelve-Month Salaries

| Year | Min. | Median | Max. | Year | Min. | Median | Max. |
|------------------------------|------|--------|------|---------------------------------|------|--------|------|
| RESEARCH (17 + 3) | | | | BUSINESS AND INDUSTRY (64 + 13) | | | |
| 1977 | 100 | 156 | 250 | 1977 | 100 | 210 | 380 |
| 1978 | 100 | 185 | 248 | 1978 | 145 | 240 | 387 |
| 1979 | 100 | 174 | 271 | 1979 | 140 | 254 | 380 |
| 1980 | 120 | 180 | 321 | 1980 | 190 | 284 | 400 |
| 1981 | 140 | 200 | 280 | 1981 | 195 | 308 | 500 |
| 1977M | 100 | 139 | 210 | 1977M | 100 | 216 | 380 |
| 1977F | 190 | 222 | 250 | 1977F | 130 | 195 | 220 |
| 1978M | 100 | 187 | 248 | 1978M | 145 | 246 | 387 |
| 1978F | - | 180 | - | 1978F | 180 | 210 | 251 |
| 1979M | 100 | 174 | 271 | 1979M | 140 | 251 | 380 |
| 1979F | - | - | - | 1979F | 200 | 255 | 350 |
| 1980M | 120 | 180 | 321 | 1980M | 190 | 284 | 400 |
| 1980F | 178 | 200 | 264 | 1980F | 218 | 283 | 345 |
| 1981M | 140 | 200 | 280 | 1981M | 195 | 319 | 500 |
| 1981F | 150 | 168 | 200 | 1981F | 226 | 290 | 358 |
| One year experience (16 + 3) | | | | One year experience (44 + 13) | | | |
| 1981M | 140 | 200 | 280 | 1981M | 195 | 304 | 390 |
| 1981F | 150 | 168 | 200 | 1981F | 226 | 290 | 358 |



Graphs. For each category and year, the median salary is denoted by a horizontal bar, a vertical bar extends to the extremes. The connected line segments relate the 1965 starting salary and its dollar value for each year. Thus, if a slope of the actual starting salaries is less than that of the corresponding segment, starting salaries did not keep up with inflation. Note

that starting salaries for all categories fall significantly behind the cost of living in 1975 as compared to 1970. In most cases, though, the rate of increase from 1970 to 1975 keeps up with inflation. Increases of starting salaries in the late seventies, however, do not make up for the loss in the early seventies.

Two Decades of Academic Salaries in Mathematics, 1960-1980

by Donald C. Rung

Since 1957 the Society has published surveys of salaries of faculty members in mathematics, so that the mathematical community may assess general salary levels. It has become apparent during the last several years that the salaries of mathematicians in academic positions have declined.

In an attempt to understand salary levels in mathematics over the last two decades the author made a study, published in the October 1979 *Notices*, which compared various salary levels in mathematics for the years 1960, 1970, and 1978. As mentioned in that article the 1980 salary levels would be of particular interest insofar as they would signal salary

levels to be expected during the 80s. The present article updates that survey by adding the 1980 salary figures to the two tables presented in the 1979 article. Unfortunately the prediction made in that article has become a reality. Except in two instances, salaries in current dollars are at or below 1978 levels, which themselves were considerably below comparable 1970 figures. Thus salaries continue to erode toward 1960 levels. Academic salaries in mathematics enter the 80s accompanied by a persistent decline in constant dollars from salary levels existing in 1970.

Tables I and II support these conclusions. Table I compares salaries of new Ph.D.'s in the years 1960,

1970, 1978, and 1980, and Table II compares salaries for the various professorial ranks in these same four years. Salaries are given in terms of 1960 dollars, with the salaries in current dollars given in parentheses for the year in question. These current dollar salary figures were taken from the AMS Salary Surveys for the years 1960, 1970, 1978, and 1980 and were converted to 1960 dollars using the implicit price deflator index prepared by the Bureau of Economic Analysis of the U.S. Department of Commerce and often used by educational planners. It is a somewhat more conservative index than, say, the Consumer Price Index. The index stood at 68.7 in 1960, 91.4 in 1970, 150 in 1978, and 177.4 in 1980. Using this index, the 1970 dollar is multiplied by 0.75, the 1978 dollar multiplied by 0.46, and the 1980 dollar by .39 (to equal the 1960 dollar).

TABLE I: Salary for New Recipients of the Doctorate

in 1960 dollars (current dollars in parentheses)

| Position | 1960 | 1970 | 1978 | 1980 |
|----------|----------|----------------------|----------------------|----------------------|
| Teaching | \$ 6,500 | \$ 8,300 (11,000) | \$ 6,700 (14,500) | \$ 6,700 (17,100) |
| Research | 6,600 | 8,300 (10,500) | 6,700 (14,500) | 5,300 (13,700) |

TABLE II: Faculty Salaries

in 1960 dollars (current dollars in parentheses)

| | 1960 | 1970 | 1978 | 1980 |
|---------------------|--------|----------------------|----------------------|----------------------|
| Group I | | | | |
| Asst. Professors \$ | 7,300 | \$ 8,700 (11,600) | \$ 7,400 (16,000) | \$ 7,700 (19,800) |
| Assoc. Professors | 8,600 | 10,900 (14,500) | 9,700 (21,100) | 9,700 (25,000) |
| Full Professors | 11,700 | 17,700 (22,500) | 14,600 (31,700) | 14,700 (37,800) |
| Group II | | | | |
| Asst. Professors | 7,500 | 9,100 (12,200) | 7,600 (16,600) | 7,500 (19,300) |
| Assoc. Professors | 8,300 | 11,300 (15,100) | 9,600 (20,900) | 9,500 (24,500) |
| Full Professors | 10,900 | 16,100 (21,500) | 13,400 (29,200) | 13,100 (33,700) |
| Group III | | | | |
| Asst. Professors | | 9,100 (12,200) | 7,500 (16,300) | 7,300 (18,700) |
| Assoc. Professors | | 11,300 (15,100) | 9,500 (20,700) | 9,300 (23,900) |
| Full Professors | | 15,200 (20,300) | 12,600 (27,400) | 12,500 (32,000) |

The index is given in Table III. It has been revised recently by the government and the most recent index is given in this article. It differs from the index given in the 1979 article for the years 1973-1978. Thus, in both Tables I and II the 1978 salaries have been adjusted to 1960 dollars using the more recent index resulting in slightly higher 1960 dollars than those reported in 1979.

A further word of explanation on the tables: the figures used to compare salaries in Table I for new recipients of the doctorate were obtained from the Society's Annual Survey, reported in the October *Notices* for the years 1960, 1970, 1978, and 1980, respectively. A slightly different technique was used to arrive at the professorial salaries given in Table II. The Society has conducted its Annual Survey since 1957. The salaries for each of the years given in Table II were computed using the salary for that year as reported in the succeeding year's Survey. Thus, the 1960 numbers are from the Survey as reported in the October 1961 *Notices*; the 1970 figures are from the October 1971 *Notices*; the 1978 figures are from the October 1979 *Notices*, and the 1980 figures are from this issue of the *Notices*. To arrive at a representative salary for each rank, the median salaries for the 25th and 75th percentiles were averaged. The classification of departments of universities and colleges in various groups for the purpose of reporting salaries has changed between 1961 and 1970. However, there are enough similarities in the groupings to retain the comparisons in the salaries of Group I and Group II departments. Comparisons of the salaries in Group III have been given only for 1970, 1978, and 1980. (See the first page of this report of the 1981 Survey for definitions of the groups.) For the other categories of departments in the Annual AMS Survey, it is a simple matter to produce comparative figures similar to the ones presented here by using the implicit price deflator index given in Table III.

This article presents no solution to the salary dilemma. We must continue to attract those talented in mathematics, but we face strong competition from related fields where salaries are considerably more attractive. Yet mathematics remains the single discipline able to offer the proper foundations for work in science and so its vitality is of primary importance.

TABLE III: Implicit Price Deflator

prepared by
Bureau of Economic Analysis
U.S. Department of Commerce

| Year | Index Value | Year | Index Value |
|------|-------------|------|-------------|
| 1956 | 62.9 | 1969 | 86.7 |
| 1957 | 65.0 | 1970 | 91.4 |
| 1958 | 66.1 | 1971 | 96.0 |
| 1959 | 67.5 | 1972 | 100.0 |
| 1960 | 68.7 | 1973 | 105.7 |
| 1961 | 69.3 | 1974 | 114.9 |
| 1962 | 70.6 | 1975 | 125.6 |
| 1963 | 71.6 | 1976 | 132.1 |
| 1964 | 72.7 | 1977 | 139.8 |
| 1965 | 74.3 | 1978 | 150.0 |
| 1966 | 76.8 | 1979 | 162.8 |
| 1967 | 79.0 | 1980 | 177.4 |
| 1968 | 82.6 | | |