

PHYSICS DEGREES during the 1950's

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The following summary of degrees granted in physics from 1950 through 1959 is based on data compiled by the US Office of Education. The author is a specialist for mathematics and physical science in the Office's Division of Higher Education.

DURING the decade of the 1950's the number of bachelor's and master's degrees in physics declined sharply during the first half and then increased just as markedly in the last half of the decade, with an especially large increase in the year 1958-59. With the exception of the low year 1949-50, the number of doctorates in physics did not vary significantly during the decade.

The numbers of degrees that were conferred at each level annually from 1949-50 through 1958-59, together with the percentages that these numbers represented among all degrees at each level, are shown in Table 1. The data in this table were obtained from the annual series of *Earned Degrees Conferred by Higher Educational Institutions*, published by the US Office of Education. Each annual report covers a period from July 1 of one year to June 30 of the next. No distinc-

tion is made between degrees earned in liberal arts or in preparation for teaching. The criterion that is used in classification is that there be a substantive major in physics. Double majors are counted as one half in each discipline. Thus, a double major by a student in physics and in mathematics is allocated half to physics and half to mathematics.

For the ten-year period as a whole, the 26 477 degrees conferred in physics at the bachelor's level constituted 0.77 per cent of the total number of bachelor's and first-professional degrees; the 8222 master's degrees represented 1.33 percent of the total number of master's degrees; and the 4629 doctor's degrees were 5.53 percent of the total number of earned doctorates (Ph.D., Ed.D., etc.). Thus, it is seen that the percentage of physics degrees of all the degrees awarded at each level rises sharply with the level of

Table 1. Number of Degrees Conferred Annually in Physics by Level of Degrees

Year ending June 30	Bachelor's degrees		Master's degrees		Doctorates	
	Number of degrees conferred	Percent of all degrees at this level*	Number of degrees conferred	Percent of all degrees at this level	Number of degrees conferred	Percent of all degrees at this level
1950	3414	.79	922	1.58	358	5.40
1951	2788	.73	973	1.49	443	6.04
1952	2247	.68	886	1.39	485	6.31
1953	2005	.66	721	1.18	478	5.75
1954	1952	.67	714	1.26	485	5.39
1955	1996	.70	729	1.25	511	5.78
1956	2335	.75	742	1.25	470	5.28
1957	2745	.81	825	1.33	453	5.17
1958	3186	.87	795	1.21	464	5.19
1959	3809	.99	915	1.32	482	5.15

* The percent at the bachelor's level is based upon all bachelor's and first-professional degrees conferred that year.

Table 2. The Percent of Degrees Awarded to Women Over the Ten-Year Period 1949-50 Through 1958-59

Level of degree	Percent of degrees awarded to women in				
	Physics	All physical sciences	Mathematics and statistics	All biological sciences	All disciplines
Bachelor's and first-professional	4.1	12.2	28.6	22.2	32.3
Master's	3.7	8.3	18.8	20.1	32.0
Doctor's	1.9	3.9	5.3	10.9	9.8

degree. From Table 1 it is seen that the annual percentages at the bachelor's and master's levels decreased during the first half of the decade before making a comeback, while the annual percentages of the doctorates remained fairly constant.

Beginning with the 1954-55 survey, the Office of Education published the numbers of institutions, by level of degrees, that conferred degrees in the various

disciplines for each year. The number of institutions conferring degrees in physics at the bachelor's level rose steadily from 421 in 1954-55 to 503 in 1958-59, and at the master's level from 131 to 142 for the same years. The number of institutions conferring doctorates in physics was 70 for each of the years 1954-55, 1955-56, and 1956-57, and was 68 for each of the years 1957-58 and 1958-59. It must be remembered

Table 3. Total Number of Doctorates in Physics Awarded by Individual Institution (1949-50 Through 1958-59)

Rank order	Institution	10-yr. total	Rank order	Institution	10-yr. total
1	University of California (all campuses)	426	29	Brown University	57
2	Massachusetts Institute of Technology	318	30	University of Maryland	54
3	Columbia University	175	30	Indiana University	54
4	Harvard University	162	32	University of Minnesota	53
5	University of Illinois	159	33	University of Notre Dame	51
6	Cornell University	150	34	University of Washington	47
7	Yale University	147	35	Illinois Institute of Technology	37
8	Ohio State University	139	35	University of Pittsburgh	37
9	University of Chicago	132	37	Case Institute of Technology	35
10	University of Wisconsin	130	38	State University of Iowa	34
11	California Institute of Technology	127	38	Michigan State University	34
12	University of Michigan	122	38	St. Louis University	34
13	Princeton University	111	41	Vanderbilt University	33
14	New York University	110	42	Northwestern University	31
15	University of Texas	101	43	Rutgers University	30
16	Johns Hopkins University	94	44	Syracuse University	29
17	Stanford University	90	44	University of North Carolina, Chapel Hill	29
18	Carnegie Institute of Technology	86	44	University of Utah	29
19	University of Pennsylvania	79	44	University of Kansas	29
20	University of Rochester	78	44	University of Tennessee	29
21	Duke University	75	49	University of Missouri	27
22	University of Virginia	72	50	University of Oklahoma	25
23	Iowa State University	71	50	Lehigh University	25
24	Washington University	70	52	University of Southern California	23
25	Purdue University	69	53	Louisiana State University	22
26	Catholic University	68	54	Polytechnic Institute of Brooklyn	21
27	Pennsylvania State University	61	54	Rensselaer Polytechnic Institute	21
27	Rice University	61			

that the number of institutions granting degrees in a specific discipline at a certain level in a given year will not usually represent the universe of institutions authorized to grant these degrees because, in some years, some of the institutions lack students completing the requirements for such a degree.

The percentage of physics degrees awarded to women, by level of degree, for the ten-year period is shown in Table 2, along with the comparable percentage figures for all the physical sciences combined, for mathematics and statistics, for the biological sciences, and for all disciplines. It is apparent from this table that physics is not a popular field among women. The principal reason why the percentages in physics are so much lower than are those in the physical sciences as a whole is that a relatively much larger number of women major in the big field of chemistry at each level. On the other hand, the percentages of degrees to women in geology are quite comparable to those in physics.

In the Fall of 1957 the Office of Education commenced an annual study of the number of junior-year

majors in the sciences and mathematics. These data permit advance estimates to be made of the numbers of bachelor's degrees which will be awarded later. In the Fall of 1957 there were 5254 junior-year majors in physics. There were 3809 bachelor's degrees conferred in physics during 1958-59. Based upon 5826 junior-year majors in physics in the Fall of 1958 and 6036 in the Fall of 1959, it is estimated that the numbers of bachelor's degrees in physics in 1959-60,¹ and in 1960-61 will be 4000 and 4200, respectively. The plus 3.6 expected percent change in the number of physics graduates from 1959-60 to 1960-61 is the highest of the physical sciences. There is expected to be a 2.6 percent decline for the physical sciences as a whole. On the other hand, mathematics and statistics, presently the most rapidly growing of the major fields, will increase by 17.6 percent, according to estimates.

Table 3 shows the total number of doctorates in physics awarded by individual institutions for the ten-year period, 1949-50 through 1958-59. The 82 different institutions which awarded the degrees are ranked in decreasing order of the total number each institution awarded during the ten-year period. The first 14 institutions granted more doctorates in physics than the remaining 68 did. The University of California heads the list with 426 degrees. It must be remembered, however, that this figure is the total for all campuses, including both Berkeley and Los Angeles. In its report to the Office of Education the University of California does not give separate breakdowns for each of its campuses.

The number of different institutions granting the doctor's degrees in physics has been increasing rapidly in recent years. Seventeen universities which did not grant a doctorate in physics during the decade of the fifties have thus far received support for new doctoral programs in physics under Title IV of the National Defense Education Act of 1958, bringing the number of institutions granting doctor's degrees in physics at least up to 99. These institutions are:

<i>Rank order</i>	<i>Institution</i>	<i>10-yr. total</i>
56	Fordham University	18
56	University of Cincinnati	18
58	University of Colorado	16
58	Temple University	16
60	Boston University	15
60	Oregon State University	15
62	University of Buffalo	14
63	Agricultural and Mechanical College of Texas	13
64	University of Florida	11
65	University of Oregon	10
66	University of Connecticut	9
67	University of Kentucky	8
67	University of Nebraska	8
67	Washington State University	8
70	University of Alabama	6
70	Radcliffe College	6
70	University of New Mexico	6
73	Kansas State University	4
73	George Washington University	4
75	Florida State University	3
75	Georgia Institute of Technology	3
77	Colorado State University	1
77	Emory University	1
77	Wayne State University	1
77	Bryn Mawr College	1
77	Baylor University	1
77	Western Reserve University	1

University of Arkansas
University of Arizona
Georgetown University
Howard University
University of Georgia
Boston College
Tufts University
Worcester Polytechnic Institute
University of Missouri School of Mines and Metallurgy
New Mexico State University
Ohio University
Oklahoma State University
Linfield College (with Oregon State University)
University of South Carolina
Texas Christian University
Virginia Polytechnic Institute
West Virginia University

¹ According to information just released by the Office of Education, the number of bachelor's degrees conferred in physics during the year 1959-60 was 4338; master's degrees, 1073; and doctor's degrees, 487.