

By EDWARD A. HENRY

Doctoral Dissertations Accepted— Ten Years of History

A ten-year review of one of the notable projects of the Association of Research Libraries.

FOR MANY YEARS Clarence J. West, of the National Research Council, edited an annual list of doctoral dissertations in science. Soon after the Association of Research Libraries was organized in 1931 it took as one of its projects the preparation of an annual list of such dissertations in all fields. The American Council of Learned Societies, the Social Science Research Council, the National Research Council, the American Council on Education, and the Association of American Universities all approved the project.

Donald B. Gilchrist, then librarian of the University of Rochester and also executive secretary of the Association of Research Libraries, undertook the task. He had much correspondence with Dr. West and made several trips to Washington for conferences with him. Dr. West was most helpful and cooperative in every possible way and Mr. Gilchrist, in his first "Introduction," expresses "especial thanks" to Dr. West, without whose cordial help the project could not have been realized. As an aid in starting the project, Dr. West secured a subsidy from the National Research Council and aided in securing similar aid from the American Council of Learned Societies, which sub-

sidies continued through three years at a decreasing rate.

Mr. Gilchrist sent calls for reports to all deans of graduate schools in the United States and Canada which were known to be granting doctoral degrees based upon research work. This specification automatically ruled out all honorary doctorates, all doctorates in medicine, veterinary medicine, dentistry, and the doctorate in law which is granted by the University of Chicago and some other universities to all their graduates in law. On the other hand, it includes not only doctorates in philosophy but also doctorates in education, in science, in library science, in the science of law (the graduate research degree), and a few other doctorates whenever these are based in part upon research dissertations. In some universities the graduate deans have referred the calls to the registrars, in others to the librarians, for reply, but in about half of the universities the information is still supplied by the graduate school deans. We mention this variation in source because in some institutions the librarians report only the dissertations received by the libraries. Thus the totals do not always agree exactly with totals compiled elsewhere—notably by the American Council on Education.

Mr. Gilchrist's first volume appeared in October 1934 under the title *Doctoral*

Dissertations Accepted by American Universities—1933-1934 (Number 1) and was published by the H. W. Wilson Company in New York City. It carried

reports from eighty-one universities. In arrangement it follows the plan used by Dr. West in his science reports. Table I herewith, by the zeros in earlier columns,

TABLE I
Number of Dissertations Accepted at Contributing Institutions, by Year

Rank		1934	1935	1936	1937	1938	1939	1940	1941	1942	1943	Totals
1	Columbia	179	207	191	203	178	203	198	199	187	145	1,890
2	Chicago	159	153	168	167	161	179	163	174	197	143	1,664
3	Wisconsin	125	127	118	130	147	147	160	196	163	133	1,446
4	Harvard	148	132	155	126	129	107	153	155	129	89	1,323
5	Cornell	88	136	124	125	130	130	131	167	117	128	1,276
6	Yale	117	128	118	135	105	132	113	137	122	49	1,156
7	California, Berkeley	112	112	98	106	113	94	122	136	130	114	1,137
8	New York	108	86	102	97	98	121	125	136	145	117	1,135
9	Michigan	113	90	94	107	111	89	141	122	94	102	1,063
10	Illinois	94	90	94	111	100	106	130	139	111	83	1,058
11	Ohio	82	103	77	82	88	101	97	152	123	91	996
12	Minnesota	79	82	80	83	71	88	113	105	114	123	938
13	Iowa	76	81	100	85	97	91	86	86	108	91	901
14	Johns Hopkins	104	50	67	64	83	65	65	62	68	34	662
15	Pennsylvania	62	50	63	54	54	54	71	42	66	60	576
16	Catholic	46	30	45	37	52	57	45	75	98	84	569
17	Massachusetts Tech.	41	40	49	54	58	66	64	71	59	47	549
18	Iowa State	42	35	62	48	42	46	53	67	62	51	508
19	Princeton	57	41	43	52	52	55	57	69	43	37	506
20	Pittsburgh	49	38	37	44	46	62	43	60	64	49	492
21	Northwestern	40	32	39	42	39	42	58	59	67	56	474
22	Stanford	38	45	42	38	23	56	42	59	38	45	426
23	Texas	23	29	21	32	33	42	46	53	45	37	361
24	Pennsylvania State	19	23	27	19	33	31	40	56	38	56	342
25	Toronto	36	27	36	35	34	32	35	38	36	18	327
26	California Tech.	30	30	36	26	25	32	30	29	28	23	289
27	Duke	22	29	25	24	29	31	23	46	34	24	287
28	McGill	25	34	22	30	26	33	32	25	36	24	287
29	Southern California	17	23	28	30	28	27	33	42	35	22	285
30	North Carolina	14	16	22	26	31	35	34	33	39	34	284
31	Washington, Seattle	18	27	26	27	27	35	33	30	17	24	264
32	Virginia	29	25	24	22	25	28	26	34	19	20	252
33	Purdue	10	16	22	20	12	14	28	51	43	25	241
34	Missouri	9	24	20	24	22	22	24	28	24	37	234
35	Maryland	15	21	20	17	17	16	18	29	30	29	212
36	Nebraska	19	24	17	22	20	15	24	24	34	12	211
37	Fordham	29	19	18	17	23	21	23	21	20	17	208
38	George Peabody	19	23	14	5	22	26	20	34	22	14	199
39	Cincinnati	16	16	14	15	16	30	27	21	18	20	193
40	Brown	20	15	25	17	14	15	19	25	24	15	189
41	Indiana	20	12	18	17	24	17	11	19	21	20	179
42	Western Reserve	11	15	17	19	13	24	25	18	14	21	177
43	Rochester	5	11	14	11	20	15	25	24	17	22	164
44	Rutgers	11	11	16	9	13	20	12	15	19	16	142
45	Boston	7	6	9	12	16	22	20	25	12	8	137
46	Southern Baptist	22	13	11	10	12	10	4	16	22	14	134
47	Colorado	8	13	16	10	13	10	13	21	18	9	131
48	Kansas	19	18	8	11	11	8	8	18	10	8	119
49	Bryn Mawr	11	14	3	16	9	10	12	9	19	14	117
50	Radcliffe	10	13	13	12	14	12	11	14	10	8	117
51	Washington, St. Louis	8	14	12	13	13	17	4	13	16	4	114
52	Louisiana	0	2	6	13	13	9	25	16	16	12	112
53	St. Louis	12	12	8	14	15	11	8	9	11	10	110
54	Clark	10	12	8	9	9	10	6	14	14	5	97
55	Notre Dame	18	2	6	4	6	11	12	14	14	10	97
56	Vanderbilt	8	4	11	9	9	14	9	16	10	5	95
57	Michigan State	8	14	8	11	7	7	10	13	8	7	93
58	Lawrence*	5	1	3	6	5	8	13	11	8	13	73
59	Temple	2	10	2	11	8	6	8	9	7	6	69
60	George Washington	11	10	7	3	8	6	1	5	10	7	68

* This is the Institute of Paper Chemistry at Lawrence College.

TABLE I—Continued

Rank	1934	1935	1936	1937	1938	1939	1940	1941	1942	1943	Totals
61 Syracuse	3	7	6	4	16	11	3	10	2	6	68
62 Georgetown	0	19	19	1	0	6	9	6	2	5	67
63 Oklahoma	5	8	7	9	1	8	5	8	3	6	60
64 Kentucky	8	1	2	7	7	7	7	4	5	7	55
65 Rensselaer Polytech.	7	11	5	8	4	3	1	6	5	4	54
66 Boston College	9	6	8	7	9	7	3	0	4	0	53
67 Massachusetts	6	6	2	2	3	5	12	7	6	4	53
68 American	9	8	8	5	4	1	6	2	6	0	49
69 Hartford Theol.	8	4	6	4	5	3	5	5	4	5	49
70 Brooklyn Polytech.	0	1	1	6	1	2	4	9	10	14	48
71 California, Los Angeles ...	0	0	0	0	0	0	0	13	15	20	48
72 Carnegie Tech.	1	6	3	2	6	3	3	5	6	9	44
73 Florida	2	3	7	3	4	6	1	7	5	6	44
74 Rice	5	7	2	3	1	5	6	7	3	5	44
75 West Virginia	0	13	4	2	2	3	4	4	3	3	38
76 Oregon State	0	4	1	1	5	3	4	8	6	5	37
77 Washington State	5	4	1	1	4	5	2	3	0	6	31
78 Niagara	0	2	5	8	7	1	1	4	2	0	30
79 Marquette	2	0	2	1	7	3	4	4	2	4	29
80 Drew Theol.	0	8	4	1	3	2	3	4	2	1	28
81 Oregon	2	3	1	2	7	2	2	3	1	4	27
82 Laval	0	0	0	0	0	0	0	0	0	23	23
83 Union Theol.	3	0	3	2	5	5	1	2	1	1	23
84 Dropsie	3	5	1	4	2	2	1	2	2	0	22
85 Arizona	3	2	1	1	3	1	2	3	1	1	18
86 Kansas State	0	0	0	1	4	2	2	1	6	2	18
87 North Dakota	3	2	3	3	1	3	2	0	0	1	18
88 Tulane	4	1	2	1	0	1	2	2	3	2	18
89 Loyola, Chicago	0	0	0	0	2	2	5	3	2	2	16
90 St. Johns	0	0	0	0	0	2	1	3	8	1	15
91 Colorado Mines	3	0	0	0	1	0	3	2	0	0	9
92 Biblical Seminary	2	1	0	1	0	0	0	2	1	0	7
93 Claremont	0	0	0	1	0	0	0	0	2	0	3
94 Georgia	0	0	0	0	0	0	2	0	1	0	3
95 Smith	2	0	0	0	0	0	0	0	1	0	3
96 Duquesne	0	1	0	0	0	1	0	0	0	0	2
97 Fletcher	0	0	0	0	0	0	0	1	0	1	2
98 Tennessee	0	0	0	0	2	0	0	0	0	0	2
Totals	2,630	2,649	2,683	2,709	2,768	2,928	3,088	3,526	3,243	2,689	28,913

shows the gradual increase in the number of universities reporting until today ninety-eight are reporting regularly, though some, like Tennessee, are no longer offering work toward the doctoral degree, and others, like Smith College, only occasionally grant such a degree.

Mr. Gilchrist edited five annuals but died suddenly from a heart attack in August 1939 while the sixth volume in the series was in preparation. It was completed by his secretary, Mrs. Grace M. Bilhorn, and the present writer was named editor of the series at the time of the mid-winter meeting in December 1939. We have continued the series through the balance of the first decade without any material change from the precedents set by

Mr. Gilchrist. He added the subject of biochemistry in 1938. We added speech and home economics in 1941. We enlarged "Bacteriology" to "Bacteriology and Microbiology" and also enlarged "Slavic Literature" to "East European Literature," in order to avoid adding other new subjects.

The editorial costs of the series have always been provided by the Association of Research Libraries. The publication costs have been carried by the H. W. Wilson Company, the subsidies for the first three years helping to keep the load from becoming too heavy. By 1940 the Wilson Company account with the Association of Research Libraries was so nearly in black ink that we saw visions of sales

reimbursing a portion of our editorial costs, but the war has put at least a temporary end to that vision. Meanwhile we owe a debt of gratitude to the Wilson Company, which has carried the financial burden. The stock of back volumes on hand, if and when sold, will square all accounts.

Expressions from deans, reviewers, librarians, and others have provided ample evidence that the volumes are filling a real need in the world of research. In 1942 the *New York Times* became interested and published an editorial on December 21 which was based upon the series. In the last few years orders have

TABLE II
Numbers of Dissertations Produced in Various Subject Fields, by Year

Rank	Subject	1934	1935	1936	1937	1938	1939	1940	1941	1942	1943	Totals
1	Chemistry	503	470	482	497	426	482	527	672	588	538	5,185
2	Education	265	287	294	290	311	289	309	342	344	318	3,049
3	English Literature ^a	150	142	162	165	183	174	183	192	164	148	1,663
4	Physics	121	150	147	158	148	165	148	191	146	124	1,498
5	Modern History	130	148	129	124	144	138	135	163	145	115	1,371
6	Economics	109	103	117	127	143	150	141	176	181	114	1,361
7	Psychology	104	101	118	112	108	123	120	117	125	95	1,123
8	Zoology	111	113	132	98	102	102	112	125	110	103	1,108
9	Botany	117	110	108	88	106	108	112	102	120	89	1,060
10	Mathematics	87	77	84	76	62	91	103	95	85	44	804
11	Romance Literature ^a	66	71	87	79	73	82	75	90	70	60	753
12	Biochemistry	—	—	—	—	101	127	130	116	138	129	741
13	Physiology	69	76	83	103	66	59	70	77	66	49	718
14	Religion	62	56	54	60	68	67	54	89	115	84	709
15	Engineering	97	63	48	70	59	44	77	76	47	22	603
16	Sociology	35	57	35	49	56	71	68	74	76	49	570
17	Agriculture	62	77	53	48	37	40	58	78	55	61	569
18	Political Science	55	44	45	71	49	44	78	74	55	54	569
19	Philosophy	54	50	49	52	49	69	61	59	50	43	536
20	Geology	55	62	64	42	58	49	55	53	56	36	530
21	Bacteriology and Microbiology	51	38	41	46	40	56	59	71	69	56	527
22	Classical History and Literature ^a	46	56	51	66	50	49	43	54	44	37	496
23	Entomology	34	34	30	51	33	47	48	46	44	32	399
24	Germanic Literature ^a	25	35	40	33	51	37	44	39	32	26	362
25	Genetics	16	10	21	13	31	32	26	31	23	29	232
26	Pharmacology	15	10	18	14	19	23	23	31	31	29	213
27	Horticulture	9	24	14	21	16	11	20	33	21	14	173
28	Anatomy	10	25	15	14	20	17	21	18	16	10	166
29	Anthropology	10	13	20	15	18	11	26	19	14	12	158
30	Art and Archeology	11	10	12	14	12	20	15	19	27	17	157
31	Geography	17	15	8	13	13	17	18	16	16	10	143
32	International Law and Relations	13	9	3	15	14	20	14	16	19	7	130
33	Law	16	14	15	7	5	16	17	15	5	11	121
34	Metallurgy	14	11	16	7	7	9	11	17	11	13	116
35	Medicine and Surgery	18	14	12	1	7	9	19	18	15	10	114
36	Medieval History	11	10	7	14	18	12	8	21	5	5	111
37	Public Health	10	4	13	9	15	8	15	15	14	6	109
38	Oriental Literature ^a	8	15	12	6	8	13	11	12	11	10	106
39	Music	8	4	7	6	4	11	12	13	18	15	98
40	Astronomy	11	11	5	9	12	5	6	11	7	14	91
41	Paleontology	8	12	10	8	9	13	11	11	6	3	91
42	Speech	—	—	—	—	—	—	—	17	30	27	74
43	General Literature ^a	2	6	14	3	4	8	5	15	6	7	70
44	Mineralogy	6	1	5	3	5	1	4	3	6	4	38
45	Library Science	2	6	2	3	1	5	3	4	7	3	36
46	Meteorology	2	1	—	1	4	2	—	1	3	2	16
47	East European Literature ^a	—	—	1	2	3	2	—	3	1	1	13
48	General History	2	2	—	6	—	—	—	1	2	—	13
49	Home Economics	—	—	—	—	—	—	—	4	3	3	10
50	Seismology	3	2	—	—	—	—	2	1	1	1	10
Totals		2,630	2,649	2,683	2,709	2,768	2,928	3,088	3,526	3,243	2,689	28,913

^a Language is always included with literature.

come to us from several industrial research laboratories, orders which we have forwarded to the Wilson Company.

For the present article we have prepared two tables which summarize information from all ten compilations. They are arranged differently from those in the volumes, in order to bring out different facts. Table I is a list of all institutions which have ever reported any dissertations. It is arranged in order of the total number of doctoral dissertations accepted during the ten years covered by our series. When the total figures are identical, the order is alphabetical. Table II is a list of all the subject fields under which dissertations have been arranged. The table is arranged by the total number of dissertations in each field during the ten years and alphabetically when totals are identical.

Table I is slightly unfair to such institutions as Université Laval (no. 82) which made its first report, covering two years, in 1943. Laval began granting doctorates in 1942 but did not know of us or we of it until after our 1942 volume was in print. If average number of degrees were the basis of arrangement, Laval would rank somewhere in the forties. The University of California at Los Angeles (no. 71) began granting doctorates in 1941 and in only three years has surpassed the ten-year total for the California Institute of Technology. In terms of averages U.C.L.A. should also rank in the forty group along with Western Reserve, Rochester, etc.

Number of Doctorates

A study of this table reveals several facts of more or less interest. There is a "big ten" among universities in terms of total doctorates. Exactly ten have granted

over one thousand degrees in the ten-year period. Ohio State University with 996 just missed making it a "big eleven." Minnesota with 938 and Iowa with 901 are not far behind. Then comes a big gap, with no institution falling in the eight hundreds or the seven hundreds. Only Johns Hopkins with 662 degrees stands between 901 and 576.

Most institutions showed a fairly steady increase in doctorates until 1941 (which was the all-time peak year), and then followed a decline due to the war calling young men away. A few institutions, chiefly those carrying on much scientific research, like Chicago and McGill, reached their peaks in 1942, perhaps because men engaged in essential research were deferred until their work was completed. McGill has reported an unusually large percentage of its doctors to be engaged upon "secret war research." Minnesota alone of the larger institutions has not shown any decline as yet.

One wonders how it happened that Johns Hopkins (no. 14) had its largest number of doctorates in 1934 and has never since approached that figure. Georgetown University (no. 62) had peak figures in 1935 and 1936 and has never since approached them. West Virginia (no. 75) was overlooked in 1934 and reported a double year in 1935 but has never again reached even half of that figure. There are probably interesting explanations behind all of these unusual cases. However, even more interesting is the general uniformity of the figures for most schools.

Table II is also very interesting since it reveals the importance of the various fields of study or at least the interest which research students take in them. From it one can hardly escape the conclusion that

we are living in an age when chemistry is the queen of the sciences and the king of all subject fields. Almost 18 per cent of all dissertations accepted during the last ten years were in chemistry. Or if we add biochemistry (they were grouped together until 1938) over 20 per cent have been in chemistry. Education, in second place, has only 60 per cent as many as chemistry, a very poor second. English language and literature is a poor third, with only a little over half as many as education. The next six subjects fall close behind English, making a list of nine subjects each of which was represented by over one thousand dissertations in the ten-year period. No subject attained a figure in the nine hundreds, and only mathematics, with 804, fell between that class and the seven hundreds, in which four other subjects are grouped.

Of these first nine subject fields, four—education, English, modern history, and economics—fall outside the science field. Together they received 7444 dissertations, against 9965 in the five science fields. This points up my report to *Science*,¹ which shows that over the ten-year period approximately 56 per cent of all doctoral dissertations have been classified in the sciences each year and about 44 per cent in the social sciences and humanities. The maximum variation from the median in any one year has been less than 2 per cent. This uniformity was almost startling to us when it appeared on our charts, especially when compared to the very uneven distribution of dissertations among the various subjects. (Observe the gaps in the "totals" column from 1060 to 753,

¹ *Science* 99:401-02, May 26, 1944.

with only one, 804, in between; from 709 to 570, with one, 603, between; from 496 to 399 and then 362, 232, etc.)

Total Dissertations by Years

Finally, we call attention to the totals at the foot of the columns. These reveal the fact that the number of dissertations accepted rose steadily each year until 1940, then jumped very steeply to an all-time high of 3526 in 1941. Several librarians commented upon the large numbers they were reporting for 1941 and explained it by saying that big defense wages had persuaded many young men, especially in the sciences, to hurry up and finish their dissertations. As a result, said they, the 1941 was almost a two-year crop of science dissertations. They predicted a sharp decline in numbers for 1942. But in 1942 the total reported, while smaller than 1941, was almost exactly the number predicted by the curve of increase from 1934 on. Then came 1943 with a very sharp decline, a figure almost identical with the 1936 figure. This was, of course, to be expected. But it raises several disturbing questions. Were we turning out too many doctors in recent years? (Practically all have found places. The *New York Times* editorial mentioned above declared that we needed all.) Is the 1943 total below the figure necessary to provide a normal supply of faculty members to our universities? Will our great industrial research laboratories have to face a shortage of younger chemists and physicists as a result of this decline? Who is wise enough to answer these questions? Meanwhile we are looking forward with interest to discover what returns 1944 will show.