UNITED STATES DEPARTMENT OF THE INTERIOR
RAY LYMAN WILBUR, Secretary
OFFICE OF EDUCATION
WILLIAM JOHN COOPER, Commissioner

BULLETIN, 1930, No. 9

SURVEY OF LAND-GRANT COLLEGES AND UNIVERSITIES

Directed by
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OFFICE OF EDUCATION

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LETTER OF TRANSMITTAL

DEPARTMENT OF THE INTERIOR,
OFFICE OF EDUCATION,
Washington, D. C., August 22, 1930.

SIR: At the request of the Association of Land-Grant Colleges and Universities, the Office of Education undertook July 1, 1927, a survey of the 69 land-grant colleges and universities, including 17 institutions for negroes. The survey was completed June 30, 1930. The expense of the survey was defrayed by Congress which appropriated $117,000 for the purpose.

For more than a half century these institutions have grown in importance as vital factors in the agricultural, industrial, and educational progress of the Nation. However, in view of the great changes that have come in the economic and social life of our country it became highly desirable to make a critical study of the achievements of these schools and to reappraise on a scientific basis their objectives and functions.

The survey provides basic data and information which can be used by these institutions and by the States in making adjustments that are necessary to develop a more effective educational program, and to render increasing service to the social and economic life of the Nation.

In order to promote the welfare of these schools and to assist the public in more fully understanding their contributions to society, I recommend the publication of this survey report as a bulletin of the Office of Education.

Respectfully submitted,

WILLIAM JOHN COOPER,
Commissioner.

The SECRETARY OF THE INTERIOR.

PART VII.—STAFF.

The earnings, training, experience, age, family responsibilities, type of work, rank, and scholarly affiliations of members of the staffs of colleges and universities are intimately related. The survey of land-grant institutions presented an opportunity to secure information in sufficient quantity to justify analysis of some of these relationships in greater detail than staff studies have usually undertaken. There are now 20,988 men and 5,321 women members of administrative and instructional staffs in the land-grant colleges and universities. More than 12,000 members of the staffs of these institutions cooperated by furnishing in usable form information requested by an extensive questionnaire.

Since limitations of time and space have made it impossible to analyze and present in this report all the information thus collected, the following list of items covered by this questionnaire may be of assistance to students who desire to pursue the subject further by personal investigation of the data on file in the United States Office of Education. The questionnaire secured information for each staff member concerning age, academic rank, title of position; college, school, or major division of service; department, sex, race, marital condition, birthplace, salary, perquisites, additional institutional earnings, noninstitutional employment; college, normal school, and university training upon both the undergraduate and graduate levels; major and minor subjects studied, work in professional education; earned and honorary degrees, degree equivalents; elementary and secondary school experience in teaching, supervisory and administrative work, and in various subject-matter fields; business and professional experience; college, normal school, and university experience with tenure, subject-matter field, level and nature of work in each such institution; age of attaining and length of service in each academic rank; teaching load; percentage of time employed by institution; distribution of time among different institutional duties; nature and number of publications; sabbatic and other leaves; membership in and attendance upon meetings of professional, scholastic, and scientific organizations; special honors attained.[1]

The statistical records of selected portions of the information secured by this questionnaire constitute the greater part of the report that follows. Comment has been restricted to the more obviously interesting and significant features of these records in order that a larger portion of the data themselves might be presented. It is believed that the statistical tables that follow will provide data for interpretation and study that have not usually been available to students and institutional administrators.

[1] For discussion of the staff from the standpoint of the major divisions see Parts IX, X, and XI, and Vol. II, Parts III and V.

Almost every staff problem is in some way related to the compensation paid staff members. The salaries paid members of the land-grant college staffs, therefore, present a convenient point of departure for presentation of the facts available with reference to rank, annual period of service, age, training, and other factors that are significant in evaluating the nature of the administrative and teaching forces in this group of institutions.

It is usually assumed that salary varies with rank and with the length of the period of annual service. Table 1 presents the facts with reference to these relationships for 51 of the land-grant institutions. This information is derived from the annual reports made by the land-grant institutions to the United States Office of Education.

TABLE 1.—*Salaries for 1928–29 in 51 land-grant colleges*[1]

Salaries paid for academic year ending June 30	Number of full-time staff									
	Deans		Professors		Associate professors		Assistant professors		Instructors	
	9 mos.	12 mos.	9 mos.	12 mos.	9 mos.	12 mos.	9 mos.	12 mos.	9 mos.	12 mos.
1	2	3	4	5	6	7	8	9	10	11
Up to $1,499		18	11		4	1	8	3	118	73
$1,500–$1,749		1					44	4	301	77
$1,750–$1,999			1		1	1	9	30	645	122
$2,000–$2,249	1	4	4	4	9	4	126	60	805	212
$2,250–$2,499		2	4	3	19	25	209	91	279	117
$2,500–$2,749	1	4	52	23	83	78	421	192	195	73
$2,750–$2,999	1		14	16	80	106	181	67	43	37
$3,000–$3,249	4	4	78	82	193	141	350	174	27	45
$3,250–$3,499	2	1	82	69	149	58	96	85	9	4
$3,500–$3,749	1	10	235	186	176	88	84	71	7	8
$3,750–$3,999	1	9	131	158	83	42	19	10	2	2
$4,000–$4,249	5	34	322	245	41	64	27	23	1	1
$4,250–$4,499	5	7	146	54	18	17	9	8		1
$4,500–$4,749	4	20	203	151	18	13	14	7	1	
$4,750–$4,999	5	17	61	51	3	6	3			
$5,000–$5,249	24	37	207	149	6	12	6	3		
$5,250–$5,499	4	4	23	4	2	1		1		
$5,500–$5,749	6	13	83	44		1	2	1		
$5,750–$5,999	1	4	10	6		1		1		
$6,000–$6,249	7	30	98	54	1	4	3			
$6,250–$6,499	1	1	2	1						
$6,500–$6,749	1	18	32	31	1					
$6,750–$6,999			1				1			
$7,000–$7,249	1	12	36	31		1				
$7,250–$7,499		3								
$7,500–$7,749	13	5	16	20	1		1			
$7,750–$7,999		1	1							
$8,000–$8,249	2	5	12	10						
$8,250–$8,499										
$8,500–$8,749	2	8		1						
$8,750–$8,999		1								
$9,000 and over	5	10	9	4						
Total number of cases	97	283	1,847	1,397	888	664	1,633	861	2,433	772
Median	5,193	5,071	4,278	4,161	3,342	3,207	2,738	2,880	2,005	2,134

[1] Massachusetts Institute of Technology is omitted.

One striking fact brought out by this table is the curious condition that exists with reference to the salaries of deans, professors, and associate professors, who serve upon the basis of 12 months annually. The median salary for these staff members is less than the median for staff members of similar academic rank who serve upon the nine months' basis.

In order to determine whether the levels of salaries for the different ranks vary as between the different geographical regions and to discover the relationship of salaries upon the 9 and 12 months' bases in the same areas, Tables 2 to 6 were prepared from the basic data from which Table 1 was derived.

TABLE 2.—*Salaries for North Atlantic Division*[1]

Salaries paid for academic year ended June 30	Number of full-time staff									
	Deans		Professors		Associate professors		Assistant professors		Instructors	
	9 mos.	12 mos.	9 mos.	12 mos.	9 mos.	12 mos.	9 mos.	12 mos.	9 mos.	12 mos.
1	2	3	4	5	6	7	8	9	10	11
Up to $1,499		1						2	36	35
$1,500-$1,749								1	98	11
$1,750-$1,999							2	3	100	25
$2,000-$2,249		1	1	2			35	10	127	26
$2,250-$2,499				2	2	1	40	9	53	23
$2,500-$2,749			2	7	18	2	79	35	30	19
$2,750-$2,999			2		22	7	39	11	7	6
$3,000-$3,249		2	9	8	22	11	101	23	3	20
$3,250-$3,499			16	22	7	14	34	13	3	1
$3,500-$3,749		3	69	51	12	10	26	11		1
$3,750-$3,999		1	64	51	3	4	7	1		
$4,000-$4,249	1	8	73	73	6	3	7	2	1	
$4,250-$4,499		2	27	21	1		3			
$4,500-$4,749		2	41	33			2			
$4,750-$4,999	1	4	12	13						
$5,000-$5,249	3	6	58	57	1		5			
$5,250-$5,499			1	1						
$5,500-$5,749			9	11			1			
$5,750-$5,999			1							
$6,000-$6,249	2		15	15			1			
$6,250-$6,499										
$6,500-$6,749		3	3	4						
$6,750-$6,999										
$7,000-$7,249	1	5	15	15						
$7,250-$7,499										
$7,500-$7,749	2		3	4			1			
$7,750-$7,999		1								
$8,000-$8,249	1		5	5						
$8,250-$8,499										
$8,500-$8,749	2									
$8,750-$8,999										
$9,000 and over	3	2	4	4						
Total number of cases	16	41	420	399	94	52	383	121	455	167
Median	7,500	4,781	4,195	4,193	3,057	3,339	2,978	2,761	1,991	2,120

[1] North Atlantic Division: Maine, New Hampshire, Vermont, Massachusetts, Rhode Island, Connecticut, New York, New Jersey, and Pennsylvania.

TABLE 3.—*Salaries for North Central Division*[1]

Salaries paid for academic year ended June 30	Number of full-time staff									
	Deans		Professors		Associate professors		Assistant professors		Instructors	
	9 mos.	12 mos.	9 mos.	12 mos.	9 mos.	12 mos.	9 mos.	12 mos.	9 mos.	12 mos.
1	2	3	4	5	6	7	8	9	10	11
Up to $1,499			1				4	1	32	13
$1,500–$1,749							1	2	114	32
$1,750–$1,999					1	1	12		289	54
$2,000–$2,249			1	2	8	2	54	21	403	87
$2,250–$2,499			2		9	1	64	22	126	45
$2,500–$2,749		1	13	5	26	5	151	71	114	37
$2,750–$2,999	1		7	3	14	9	93	46	25	38
$3,000–$3,249			27	11	75	60	137	106	17	21
$3,250–$3,499	1		14	10	62	30	36	44	2	2
$3,500–$3,749	1	1	28	38	75	50	46	54	6	7
$3,750–$3,999	1	6	17	29	51	32	10	7	2	
$4,000–$4,249	1	5	91	100	31	41	18	12		1
$4,250–$4,499		1	43	20	17	6	6	4		1
$4,500–$4,749		5	102	60	17	10	12	7		
$4,750–$4,999		1	39	21	3	4	3			
$5,000–$5,249	3	9	113	68	5	9	1	1		
$5,250–$5,499	1	1	22	2	2	1		1		
$5,500–$5,749	3	8	54	19		1	1	1		
$5,750–$5,999		2	8	4		1		1		
$6,000–$6,249	3	9	62	36	1	1	2			
$6,250–$6,499			2	1						
$6,500–$6,749	1	13	22	21	1					
$6,750–$6,999			1				1			
$7,000–$7,249		6	8	11		1				
$7,250–$7,499		1								
$7,500–$7,749	11	3	6	14	1					
$7,750–$7,999			1							
$8,000–$8,249	1	5	2	4						
$8,250–$8,499										
$8,500–$8,749		8		1						
$8,750–$8,999		1								
$9,000 and over	2	8	1							
Total number of cases	30	94	687	493	401	268	852	401	1,130	328
Median	6,500	6,194	4,744	4,577	3,512	3,630	2,858	3,088	2,081	2,187

[1] North Central Division: Ohio, Indiana, Illinois, Michigan, Wisconsin, Minnesota, Iowa, Missouri, North Dakota, South Dakota, Nebraska, and Kansas.

TABLE 4.—*Salaries for South Atlantic Division*[1]

Salaries paid for academic year ended June 30	Number of full-time staff									
	Deans		Professors		Associate professors		Assistant professors		Instructors	
	9 mos.	12 mos.	9 mos.	12 mos.	9 mos.	12 mos.	9 mos.	12 mos.	9 mos	12 mos.
1	2	3	4	5	6	7	8	9	10	11
Up to $1,499			9		4		3		26	19
$1,500–$1,749								1	26	7
$1,750–$1,999			1				1	9	72	9
$2,000–$2,249			1			1	25	10	109	19
$2,250–$2,499		2				12	26	8	25	6
$2,500–$2,749			1	6	6	31	41	11	7	
$2,750–$2,999			1	6	20	27	12	5		1
$3,000–$3,249	1	1	7	22	38	21	2	8	1	
$3,250–$3,499		1	5	3	22	5		3		
$3,500–$3,749		5	49	13	13	5	1	1		
$3,750–$3,999		2	12	6	1					1
$4,000–$4,249	1		60	23	1	1	1			
$4,250–$4,499		1	52	1						
$4,500–$4,749		5	17	15						
$4,750–$4,999	1	4	2	1						
$5,000–$5,249	8	1	3	2						
$5,250–$5,499		2								
$5,500–$5,749	2	2		1						
$5,750–$5,999			1	2						
$6,000–$6,249	2	7								
$6,250–$6,499										
$6,500–$6,749		1								
$6,750–$6,999										
$7,000–$7,249										
$7,250–$7,499										
$7,500 and over		2								
Total number of cases	15	36	221	101	105	103	112	56	266	62
Median	5,141	4,813	4,102	3,750	3,148	2,819	2,506	2,500	2,021	1,889

[1] South Atlantic Division: Maryland, Virginia, West Virginia, North Carolina, South Carolina, Delaware, Georgia, Florida, and Porto Rico.

TABLE 5.—*Salaries for South Central Division* [1]

Salaries paid for academic year ended June 30	Number of full-time staff									
	Deans		Professors		Associate professors		Assistant professors		Instructors	
	9 mos.	12 mos.	9 mos.	12 mos.	9 mos.	12 mos.	9 mos.	12 mos.	9 mos	12 mos.
1	2	3	4	5	6	7	8	9	10	11
Up to $1,499							1		12	2
$1,500–$1,749							3		33	21
$1,750–$1,999							4	17	85	25
$2,000–$2,249			1		1		12	11	66	46
$2,250–$2,499			1		3	6	37	27	24	14
$2,500–$2,749	1	1	3	1	5	19	32	42	10	2
$2,750–$2,999			2	4	10	51	19	15	3	
$3,000–$3,249	2		15	28	33	25	13	8	2	2
$3,250–$3,499	1		25	11	12	5	9		1	1
$3,500–$3,749			52	31	18	8	3	1		
$3,750–$3,999			26	54	1		1			
$4,000–$4,249	1	8	44	31		1	1			
$4,250–$4,499	2	2	14	6						
$4,500–$4,749	4		5	5						
$4,750–$4,999	3	2								
$5,000–$5,249	9	8	2							
$5,250–$5,499	1									
$5,500–$5,749	1									
$5,750–$5,999	1	1								
$6,000–$6,249		10								
$6,250–$6,499	1	1								
$6,500–$6,749		1		1						
$6,750–$6,999										
$7,000 and over		1		1						
Total number of cases	27	35	190	173	83	115	135	121	236	113
Median	4,958	5,141	3,731	3,803	3,170	2,909	2,582	2,533	1,965	2,046

[1] South Central Division: Kentucky, Tennessee, Alabama, Mississippi, Louisiana, Texas, Arkansas, and Oklahoma.

TABLE 6.—*Salaries for Western Division*[1]

Salaries paid for academic year ended June 30	Number of full-time staff									
	Deans		Professors		Associate professors		Assistant professors		Instructors	
	9 mos.	12 mos.	9 mos.	12 mos.	9 mos.	12 mos.	9 mos.	12 mos.	9 mos.	12 mos.
1	2	3	4	5	6	7	8	9	10	11
Up to $1,499		17	1			1			12	4
$1,500–$1,749		1							33	6
$1,750–$1,999							5	1	99	9
$2,000–$2,249	1	3				1	43	8	100	34
$2,250–$2,499			1	1	5	5	44	25	51	29
$2,500–$2,749		2	6	4	26	21	118	33	34	15
$2,750–$2,999			2	3	14	12	18	20	8	2
$3,000–$3,249	1	1	20	13	25	24	97	29	4	2
$3,250–$3,499			22	23	46	4	17	25	3	
$3,500–$3,749		1	37	43	58	15	8	4	1	
$3,750–$3,999			22	18	27	6	1	2		1
$4,000–$4,249	1	13	54	18	3	18		9		
$4,250–$4,499	3	1	10	6		11		4		
$4,500–$4,749		8	38	38	1	3			1	
$4,750–$4,999		6	8	16		2				
$5,000–$5,249	1	13	31	22		3		2		
$5,250–$5,499	2	1		1						
$5,500–$5,749		3	20	13						
$5,750–$5,999		1								
$6,000–$6,249		4	21	3						
$6,250–$6,499										
$6,500–$6,749			7	5						
$6,750–$6,999										
$7,000–$7,249			13	1						
$7,250–$7,499		2								
$7,500–$7,749			7	2						
$7,750–$7,999										
$8,000–$8,249			5	1						
$8,250–$8,499										
$8,500–$8,749										
$8,750–$8,999										
$9,000 and over			4							
Total number of cases	9	77	329	231	205	126	351	162	346	102
Median	4,375	4,375	4,248	4,146	3,427	3,240	2,677	2,925	2,073	2,235

[1] Western Division: Montana, Wyoming, Colorado, New Mexico, Arizona, Utah, Nevada, Idaho, Washington, Oregon, and California. Also Alaska and Hawaii.

For convenience in making comparisons, Table 7, showing median salaries by geographical divisions, ranks, and annual periods of service, was prepared from the detailed information presented by Tables 1 to 6.

TABLE 7.—*Median salaries 1928–29* [1]

Division	Salaries of staff members									
	Deans		Professors		Associate professors		Assistant professors		Instructors	
	9 mos.	12 mos.	9 mos.	12 mos.	9 mos.	12 mos.	9 mos.	12 mos.	9 mos.	12 mos.
1	2	3	4	5	6	7	8	9	10	11
North Atlantic	$7,500	$4,781	$4,195	$4,193	$3,057	$3,339	$2,978	$2,761	$1,991	$2,120
North Central	6,500	6,194	4,744	4,577	3,512	3,630	2,858	3,088	2,081	2,187
South Atlantic	5,141	4,813	4,102	3,750	3,148	2,819	2,506	2,500	2,021	1,889
South Central	4,958	5,141	3,731	3,803	3,170	2,909	2,582	2,533	1,965	2,046
Western	4,375	4,375	4,248	4,146	3,427	3,240	2,677	2,925	2,073	2,235
Median for entire United States	5,193	5,071	4,278	4,161	3,342	3,207	2,738	2,880	2,005	2,134
Q_1	4,703	4,131	3,765	3,705	3,034	2,884	2,491	2,535	1,823	1,838
Q_3	6,438	6,194	5,074	5,010	3,682	3,612	3,148	3,242	2,236	2,453

[1] Concerning teaching staff in 51 land-grant colleges and universities, Massachusetts Institute of Technology is omitted.

In addition to the regular salaries recorded by Tables 1 to 6, some staff members receive perquisites and for special service, such as that in summer school or for extension work, are given extra pay by the institutions. Many supplement their institutional earnings by outside work for which pay is received. Table 8 shows for the United States and for each of the five geographical divisions the number and percentage of total staff reported that supplement their regular institutional salaries in these ways.

TABLE 8.—*Total number of cases with perquisites, additional earnings, and outside earnings, by major geographic divisions*

Major geographic division	Total number of cases	Perquisites		Additional earnings		Outside earnings	
		Number	Per cent	Number	Per cent	Number	Per cent
1	2	3	4	5	6	7	8
North Atlantic	2,079	87	4.18	483	23.23	458	22.02
North Central	4,883	247	5.05	990	20.27	831	17.01
South Atlantic	1,383	168	12.14	256	18.51	132	9.54
South Central	1,806	183	10.13	321	17.77	192	10.63
Western	1,881	122	6.48	328	17.43	280	14.88
Entire United States	12,032	807	6.77	2,378	19.76	1,893	15.73

Tables 9 to 14 show the range of these perquisites, additional insitutional and outside earnings for the United States and each geographical division, and Table 15 the median in each area and in the United States for the three methods of supplementing regular salaries.

TABLE 9.—*Total number of cases with perquisites, additional earnings, and outside earnings*

WHOLE UNITED STATES

Range	Perquisites	Additional earnings	Outside earnings
Up to $299	164	607	605
$300-$599	334	1,133	637
$600-$899	156	451	195
$900-$1,199	74	65	154
$1,200 and over	79	122	302
Total	807	2,378	1,893
No data	11,225	9,654	10,139

NORTH ATLANTIC DIVISION [1]

Up to $299	24	88	143
$300-$599	31	236	139
$600-$899	9	102	48
$900-$1,199	17	22	55
$1,200 and over	6	35	73
Total	87	483	458
No data	1,992	1,596	1,621

NORTH CENTRAL DIVISION [2]

Up to $299	57	264	280
$300-$599	68	484	287
$600-$899	71	174	78
$900-$1,199	21	20	47
$1,200 and over	30	48	139
Total	247	990	831
No data	4,636	3,893	4,052

SOUTH ATLANTIC DIVISION [3]

Up to $299	35	69	36
$300-$599	89	127	48
$600-$899	27	49	12
$900-$1,199	13	5	15
$1,200 and over	4	6	21
Total	168	256	132
No data	1,215	1,127	1,251

SOUTH CENTRAL DIVISION [4]

Up to $299	27	91	60
$300-$599	96	154	58
$600-$899	29	60	27
$900-$1,199	10	7	18
$1,200 and over	21	9	29
Total	183	321	192
No data	1,623	1,485	1,614

[1] North Atlantic Division: Maine, New Hampshire, Vermont, Massachusetts, Rhode Island, Connecticut, New York, New Jersey, and Pennsylvania.
[2] North Central Division: Ohio, Indiana, Illinois, Michigan, Wisconsin, Minnesota, Iowa, Missouri, North Dakota, South Dakota, Nebraska, and Kansas.
[3] South Atlantic Division: Maryland, Virginia, West Virginia, North Carolina, South Carolina, Delaware, Georgia, Florida, and Porto Rico.
[4] South Central Division: Kentucky, Tennessee, Alabama, Mississippi, Louisiana, Texas, Arkansas, and Oklahoma.

TABLE 9.—*Total number of cases with perquisites, additional earnings, and outside earnings*—Continued

WESTERN DIVISION [1]

Range	Perquisites	Additional earnings	Outside earnings
Up to $299	21	95	86
$300–$599	50	132	105
$600–$899	20	66	30
$900–$1,199	13	11	19
$1,200 and over	18	24	40
Total	122	328	280
No data	1,759	1,553	1,601

[1] Western Division: Montana, Wyoming, Colorado, New Mexico, Arizona, Utah, Nevada, Idaho, Washington, Oregon, and California. Also Alaska and Hawaii.

TABLE 10.—*Median amount of perquisites, additional earnings, and outside earnings by major geographic divisions*

Major geographic division	Perquisites	Additional earnings	Outside earnings
North Atlantic	$489	$495	$485
North Central	589	580	442
South Atlantic	465	439	487
South Central	501	435	486
Western	540	457	443
Entire United States	515	454	461

Tables 11, 12, and 13 show perquisites, additional institutional earnings, and outside earnings in relation to the salaries of staff members who receive such supplements to their regular salaries.

TABLE 11.—*Perquisites of staff members according to salaries*

Salary	Total number cases	Perquisites					
		No data	$299 and less	$300 to $599	$600 to $899	$900 to $1,199	$1,200 and over
1	2	3	4	5	6	7	8
No data	149	144	1	1	1	1	1
$1,999 and less	2,202	2,056	47	58	21	9	11
$2,000–$2,999	4,341	3,975	69	157	75	30	35
$3,000–$3,999	3,257	3,081	35	66	46	12	17
$4,000–$4,999	1,323	1,265	9	32	5	6	6
$5,000–$5,999	463	441	3	10	5	1	3
$6,000–$6,499	117	109	0	4	1	2	1
$6,500–$6,999	39	35	0	2	1	1	0
$7,000–$7,999	96	87	0	3	1	2	3
$8,000–$9,999	30	24	0	1	0	2	3
$10,000–$12,499	10	8	0	0	0	2	0
$12,500–$14,999	1	0	0	0	0	0	1
$15,000 and over	4	0	0	0	0	1	3
Total	12,032	11,225	164	334	156	89	84

TABLE 12.—*Additional institutional earnings of staff according to salaries*

Yearly salary	Total number of cases	Additional earnings					
		No data	$299 and less	$300 to $599	$600 to $899	$900 to $1,199	$1,200 and over
1	2	3	4	5	6	7	8
No data	149	141	1	4	1	0	2
$1,999 and less	2,202	1,852	162	133	23	5	27
$2,000–$2,999	4,341	3,589	260	300	61	8	33
$3,000–$3,999	3,257	2,498	135	412	164	18	30
$4,000–$4,999	1,323	982	35	155	116	19	16
$5,000–$5,999	463	345	11	27	58	9	13
$6,000–$6,499	117	93	0	5	14	3	2
$6,500–$6,999	39	35	1	0	2	1	0
$7,000–$7,999	96	80	2	5	9	0	0
$8,000–$9,999	30	25	1	1	2	1	0
$10,000–$12,499	10	9	0	0	1	0	0
$12,500–$14,999	1	1	0	0	0	0	0
$15,000 and over	4	4	0	0	0	0	0
Total	12,032	9,654	608	1,132	451	64	123

TABLE 13.—*Outside earnings of staff members according to salaries*

Salary	Total number of cases	Outside earnings								
		No data	$299 and less	$300 to $599	$600 to $899	$900 to $1,199	$1,200 to $1,799	$1,800 to $2,399	$2,400 to $4,999	$5,000 and over
1	2	3	4	5	6	7	8	9	10	11
No data	149	134	1	1	0	2	2	1	5	3
$1,999 and less	2,202	1,833	86	142	18	18	25	19	37	24
$2,000–$2,999	4,341	3,846	157	195	64	33	17	7	20	2
$3,000–$3,999	3,257	2,782	172	148	68	44	16	13	10	4
$4,000–$4,999	1,323	1,001	134	85	22	34	22	10	8	7
$5,000–$5,999	463	352	29	36	14	9	6	5	10	2
$6,000–$6,499	117	68	15	15	2	5	2	1	4	5
$6,500–$6,999	39	28	4	2	2	2	1	0	0	0
$7,000–$7,999	96	63	5	10	4	3	2	1	6	2
$8,000–$9,999	30	24	1	2	0	2	1	0	0	0
$10,000–$12,499	10	6	1	0	0	1	0	0	2	0
$12,500–$14,999	1	0	0	0	1	0	0	0	0	0
$15,000 and over	4	3	0	1	0	0	0	0	0	0
Total	12,032	10,140	605	637	195	153	94	57	102	49

The assumption is sometimes made that salaries bear a definite relationship to the training of staff members as evidenced by the degrees that they hold. Table 19 shows the frequency with which various salaries are distributed among those whose highest degrees are the bachelor's, master's, and doctor's and among those who hold no degree.

TABLE 14.—*Highest degree received by staff members according to salaries*

Salary	Total number of cases	Highest degree received					
		No data	No degree	A. B., B. S.	M. A., M. S.	Ph. D., Sc. D.	Miscellaneous
1	2	3	4	5	6	7	8
No data	149	25	18	52	31	23	0
$1,999 and less	2,202	201	119	1,032	706	84	0
$2,000–$2,999	4,341	339	181	1,807	1,575	438	1
$3,000–$3,999	3,257	143	86	1,104	1,107	816	1
$4,000–$4,999	1,323	52	16	371	404	480	0
$5,000–$5,999	463	10	9	101	130	213	0
$6,000–$6,499	117	4	4	23	27	59	0
$6,500–$6,999	39	4	0	10	8	17	0
$7,000–$7,999	96	2	2	23	19	50	0
$8,000–$9,999	30	1	0	14	9	6	0
$10,000–$12,499	10	0	0	4	3	3	0
$12,500–$14,999	1	0	0	0	1	0	0
$15,000 and over	4	0	0	1	3	0	0
Total	12,032	781	435	4,542	4,083	2,189	2

Inasmuch as staff members have in many cases pursued study without satisfying the conditions that lead to degrees, Table 15 was prepared in order to show the relationship of salaries to years of training above high school without reference to whether such training did or did not lead to a degree. This table should be studied in connection with Table 14.

TABLE 15.—*Relationship of salaries to years training above high school*

Years training above high school	Total number of cases	Yearly salary												
		No reply	$1,999 and less	$2,000 to $2,999	$3,000 to $3,999	$4,000 to $4,999	$5,000 to $5,999	$6,000 to $6,499	$6,500 to $6,999	$7,000 to $7,999	$8,000 to $9,999	$10,000 to $12,499	$12,500 to $14,999	$15,000 and over
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
No reply	622	25	172	253	118	38	10	2	3	1	0	0	0	0
None	21	0	7	5	5	1	1	1	1	0	0	0	0	0
1 to 4 years	3,208	58	647	1,344	848	273	69	22	5	20	10	1	0	1
5 to 6 years	4,091	32	881	1,586	1,000	384	138	27	11	16	10	4	1	1
7 years and above	4,000	34	495	1,153	1,286	627	245	65	19	59	10	5	0	2

Since there has been considerable discussion recently in regard to the money value of higher education and of academic degrees in employments other than those of teaching and research, Table 16 was prepared to show the relationship between degrees held by staff members and their outside, noninstitutional earnings. Although this table should be used with caution since many factors such as age, rank, institutional salaries, and the nature of the outside employment tend to render interpretation uncertain, it is at least interesting to note the apparent indication that of those who have outside

earnings, staff members with the lower degrees frequently earn larger amounts than is the case of those who hold the higher degrees.

TABLE 16.—*Highest degree of staff members with relation to outside earnings*

Outside earnings	Total number of cases	Highest degree received					
		No reply	No degree	A. B., B. S.	M. A., M. S.	Ph. D., Sc. D.	Miscellaneous degrees
1	2	3	4	5	6	7	8
No reply	10,134	676	384	3,831	3,446	1,795	2
$299 and less	611	25	11	203	222	150	0
$300-$599	637	32	13	270	206	116	0
$600-$899	195	8	4	72	78	33	0
$900-$1,199	153	7	3	55	49	39	0
$1,200-$1,799	94	6	3	36	28	21	0
$1,800-$2,399	53	5	6	19	13	10	0
$2,400-$4,999	106	10	9	40	29	18	0
$5,000 and over	49	12	2	17	11	7	0
Total	12,032	781	435	4,543	4,082	2,189	2

The relationships that salaries bear to the type of work done by staff members, undergraduate instruction, graduate work, research, administration, extension, creative work other than research, and maintenance of public contacts are presented by Tables 21 to 27.

Attention is called to the fact that the largest groups of staff members who devote from 80 per cent to 100 per cent of their time to any type of work other than administration and public contacts are found in each case in the $2,000 to $2,999 range of salaries, while the largest number spending from 80 per cent to 100 per cent of their time upon administrative work is found in the salary range from $3,000 to $3,999. Tables 17 to 23 will repay careful, detailed study and analysis.

TABLE 17.—*Percentage of time staff members devote to undergraduates with reference to salary range*

Salary	Total number of cases	Percentage of time devoted to undergraduates						
		No data	No time	19 per cent or less	20 to 39 per cent	40 to 59 per cent	60 to 79 per cent	80 to 100 per cent
1	2	3	4	5	6	7	8	9
No data	140	52	22	4	9	19	11	32
$1,999 and less	2,202	687	275	65	144	301	181	549
$2,000-$2,999	4,341	981	1,004	75	163	287	445	1,386
$3,000-$3,999	3,257	511	851	122	312	393	507	561
$4,000-$4,999	1,323	117	235	117	272	229	237	116
$5,000-$5,999	463	40	78	75	120	91	42	17
$6,000-$6,499	117	8	24	19	34	21	7	4
$6,500-$6,999	39	7	10	13	5	2	0	2
$7,000-$7,999	96	16	29	13	22	10	5	1
$8,000-$9,999	30	6	12	6	2	1	0	3
$10,000-$12,499	10	0	10	0	0	0	0	0
$12,500-$14,999	1	0	1	0	0	0	0	0
$15,000 and over	4	2	2	0	0	0	0	0
Total	12,032	2,427	2,553	509	1,083	1,354	1,435	2,671

TABLE 18.—*Percentage of time which staff members devote to graduates with reference to salary range*

Salary	Total number of cases	Percentage of time devoted to graduates						
		No data	No time	19 per cent or less	20 to 39 per cent	40 to 59 per cent	60 to 79 percent	80 to 100 per cent
1	2	3	4	5	6	7	8	9
No data	149	57	76	8	6	1	0	1
$1,999 or less	2,202	885	1,223	44	34	14	1	1
$2,000–$2,999	4,341	1,035	2,826	311	125	27	8	9
$3,000–$3,999	3,257	596	1,778	608	243	76	9	7
$4,000–$4,999	1,323	124	553	371	206	54	13	2
$5,000–$5,999	463	41	152	152	85	28	3	2
$6,000–$6,499	117	8	42	28	26	10	3	0
$6,500–$6,999	39	7	13	9	8	2	0	0
$7,000–$7,999	96	16	34	17	23	5	1	0
$8,000–$9,999	30	8	15	6	1	0	0	0
$10,000–$12,499	10	0	8	1	1	0	0	0
$12,500–$14,999	1	0	1	0	0	0	0	0
$15,000 and over	4	2	2	0	0	0	0	0
Total	12,032	2,719	6,723	1,555	758	217	38	22

TABLE 19.—*Percentage of time which staff members devote to research with reference to salary range*

Salary	Total number of cases	Percentage of time devoted to research						
		No data	No time	19 per cent or less	20 to 39 per cent	40 to 59 per cent	60 to 79 per cent	80 to 100 per cent
1	2	3	4	5	6	7	8	9
No data	149	56	66	10	6	7	1	3
$1,999 or less	2,202	803	851	126	156	145	34	87
$2,000–$2,999	4,341	1,031	2,367	382	234	119	64	144
$3,000–$3,999	3,257	540	1,693	452	256	134	63	119
$4,000–$4,999	1,323	129	625	292	157	63	33	24
$5,000–$5,999	463	41	186	109	83	28	9	7
$6,000–$6,499	117	8	50	29	22	5	2	1
$6,500–$6,999	39	7	16	6	5	4	0	1
$7,000–$7,999	96	15	40	13	18	8	1	1
$8,000–$9,999	30	8	16	4	2	0	0	0
$10,000–$12,499	10	0	9	1	0	0	0	0
$12,500–$14,999	1	0	1	0	0	0	0	0
$15,000 and over	4	2	2	0	0	0	0	0
Total	12,032	2,640	5,922	1,424	939	513	207	387

TABLE 20.—*Percentage of time which staff members devote to administrative work with reference to salary range*

Salary	Total number of cases	Percentage of time devoted to administrative work						
		No data	No time	19 per cent or less	20 to 39 per cent	40 to 59 per cent	60 to 79 per cent	80 to 100 per cent
1	2	3	4	5	6	7	8	9
No data	149	56	60	15	9	2	4	3
$1,999 or less	2,202	882	1,097	146	28	19	4	26
$2,000–$2,999	4,341	1,029	2,377	681	118	50	21	65
$3,000–$3,999	3,257	523	1,331	935	263	84	40	81
$4,000–$4,999	1,323	120	294	460	245	92	46	66
$5,000–$5,999	463	39	64	151	92	53	29	35
$6,000–$6,499	117	8	16	28	19	22	10	14
$6,500–$6,999	39	7	2	6	6	10	3	5
$7,000–$7,999	96	16	8	18	20	11	8	15
$8,000–$9,999	30	8	3	0	1	2	5	11
$10,000–$12,499	10	0	2	0	0	0	2	6
$12,500–$14,999	1	0	0	0	0	0	1	0
$15,000 and over	4	2	0	0	0	0	0	2
Total	12,032	2,690	5,254	2,440	801	345	173	329

TABLE 21.—*Percentage of time staff members devote to extension work with reference to salary range*

Salary	Total number of cases	Percentage of time devoted to extension						
		No data	No time	19 per cent or less	20 to 39 per cent	40 to 59 per cent	60 to 79 per cent	80 to 100 per cent
1	2	3	4	5	6	7	8	9
No data	149	57	74	6	1	1	0	10
$1,999 or less	2,202	892	1,141	68	19	8	3	71
$2,000–$2,999	4,341	1,033	2,267	302	46	23	23	647
$3,000–$3,999	3,257	539	1,624	444	79	41	30	500
$4,000–$4,999	1,323	128	772	257	54	19	13	80
$5,000–$5,999	463	42	307	84	13	7	1	9
$6,000–$6,499	117	8	92	13	3	0	0	1
$6,500–$6,999	39	7	22	7	1	1	0	1
$7,000–$7,999	96	16	71	5	0	1	0	3
$8,000–$9,999	30	8	19	1	1	0	0	1
$10,000–$12,499	10	0	8	0	2	0	0	0
$12,500–$14,999	1	0	1	0	0	0	0	0
$15,000 and over	4	2	2	0	0	0	0	0
Total	12,032	2,732	6,400	1,187	219	101	70	1,323

TABLE 22.—*Percentage of time staff members devote to creative work other than research with reference to salary range*

Salary	Total number of cases	Percentage of time devoted to creative work						
		No data	No time	19 per cent or less	20 to 39 per cent	40 to 59 per cent	60 to 79 per cent	80 to 100 per cent
1	2	3	4	5	6	7	8	9
No data	149	57	77	5	4	5	1	0
$1,999 or less	2,202	892	1,154	60	41	19	5	31
$2,000–$2,999	4,341	1,041	2,767	258	97	61	31	86
$3,000–$3,999	3,257	543	2,097	304	145	62	32	74
$4,000–$4,999	1,323	132	862	200	80	30	7	12
$5,000–$5,999	463	42	285	79	31	16	9	1
$6,000–$6,499	117	8	85	13	7	1	2	1
$6,500–$6,999	39	7	25	5	2	0	0	0
$7,000–$7,999	96	16	58	15	5	1	1	0
$8,000–$9,999	30	8	18	3	0	1	0	0
$10,000–$12,499	10	0	8	0	1	1	0	0
$12,500–$14,999	1	0	1	0	0	0	0	0
$15,000 and over	4	2	2	0	0	0	0	0
Total	12,032	2,748	7,439	942	413	197	88	205

TABLE 23.—*Percentage of time staff members devote to public contacts with reference to salary range*

Salary	Total number of cases	Percentage of time devoted to public contacts						
		No data	No time	19 per cent or less	20 to 39 per cent	40 to 59 per cent	60 to 79 per cent	80 to 100 per cent
1	2	3	4	5	6	7	8	9
No data	149	55	68	22	3	0	0	1
$1,999 or less	2,202	884	1,136	155	15	4	0	8
$2,000–$2,999	4,341	1,028	2,482	766	41	14	3	7
$3,000–$3,999	3,257	535	1,695	997	32	12	2	4
$4,000–$4,999	1,323	126	563	596	32	3	2	1
$5,000–$5,999	463	41	163	243	13	0	1	2
$6,000–$6,499	117	8	43	59	6	1	0	0
$6,500–$6,999	39	7	10	18	4	0	0	0
$7,000–$7,999	96	16	34	40	6	0	0	0
$8,000–$9,999	30	8	12	9	1	0	0	0
$10,000–$12,499	10	0	1	6	2	1	0	0
$12,500–$14,999	1	0	0	0	1	0	0	0
$15,000 and over	4	2	1	0	1	0	0	0
Total	12,032	2,710	6,188	2,911	157	35	8	23

Administrative officers sometimes state that salaries are adjusted somewhat in accordance with the family responsibilities of staff members. Tables 24 and 25 give the yearly salaries of staff members according to their sex and marital status and with reference to the number of their children.

TABLE 24.—*Yearly salary of staff members according to their sex and marital status*

Sex—marital status	Total number of cases	Yearly salary												
		No data	$1,999 and less	$2,000 to $2,999	$3,000 to $3,999	$4,000 to $4,999	$5,000 to $5,999	$6,000 to $6,499	$6,500 to $6,999	$7,000 to $7,999	$8,000 to $9,999	$10,000 to $12,499	$12,500 to $14,999	$15,000 and over
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Single male	1,876	26	767	715	272	57	25	7	0	4	2	1	0	0
Married male	7,771	102	723	2,450	2,618	1,192	412	108	38	87	26	10	1	4
Widower	29	1	0	11	9	7	1	0	0	0	0	0	0	0
Divorced male	119	2	4	26	44	22	13	2	1	4	1	0	0	0
Single female	1,889	15	574	981	272	37	10	0	0	0	0	0	0	0
Married female	230	3	95	105	18	6	2	0	0	0	1	0	0	0
Widow	20	0	5	11	4	0	0	0	0	0	0	0	0	0
Divorced female	98	0	34	41	20	2	0	0	0	0	1	0	0	0
Total	12,032	149	2,202	4,341	3,257	1,323	463	117	39	95	31	11	1	4

TABLE 25.—*Yearly salary of staff members with reference to number of children*

Number of children	Total number of cases	Yearly salary												
		No data	$1,999 and less	$2,000 to $2,999	$3,000 to $3,999	$4,000 to $4,999	$5,000 to $5,999	$6,000 to $6,499	$6,500 to $6,999	$7,000 to $7,999	$8,000 to $9,999	$10,000 to $12,499	$12,500 to $14,999	$15,000 and over
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
No reply	297	5	98	125	49	13	3	2	0	0	2	0	0	0
No children	5,761	66	1,663	2,482	1,099	295	107	23	9	13	4	0	0	0
One	2,068	16	221	765	651	279	82	21	6	21	5	0	0	1
Two	2,032	33	125	541	774	350	128	33	9	23	10	5	0	4
Three	1,108	18	62	249	413	226	77	27	8	20	5	3	0	0
Four	485	7	20	105	177	106	44	4	3	12	4	2	1	0
Five or more	281	4	13	74	94	54	22	7	4	7	0	0	0	2
Total	12,032	149	2,202	4,341	3,257	1,323	463	117	39	96	30	10	1	4

The economic pressures that arise from marriage and family responsibilities are frequently supposed to force college and university faculty members to turn their energies to outside employment in order to supplement their institutional incomes. Women are usually supposed to have fewer opportunities to secure outside employment than men staff members. The facts in regard to annual outside

earnings of land-grant college staffs are presented by Tables 26 and 27 with reference to sex and marital status and with reference to number of children.

TABLE 26.—*Yearly outside earnings of staff members according to their sex and marital status*

Sex—marital status	Total number of cases	Outside earnings								
		No data	$299 and less	$300 to $599	$600 to $899	$900 to $1,199	$1,200 to $1,799	$1,800 to $2,399	$2,400 to $4,999	$5,000 and over
1	2	3	4	5	6	7	8	9	10	11
Single male	1,876	1,617	71	132	21	17	11	3	2	2
Married male	7,771	6,263	499	469	159	126	71	40	99	45
Widower	29	22	1	0	3	1	0	1	1	0
Divorced male	119	96	4	6	5	4	1	1	1	1
Single female	1,889	1,802	35	20	7	5	9	7	3	1
Married female	230	220	5	3	0	0	1	1	0	0
Widow	20	17	0	2	0	0	1	0	0	0
Divorced female	98	91	3	4	0	0	0	0	0	0
Total	12,032	10,128	618	636	195	153	94	53	106	49

TABLE 27.—*Yearly outside earnings of staff members with reference to number of children*

Number of children	Total number of cases	Outside earnings								
		No data	$299 and less	$300 to $599	$600 to $899	$900 to $1,199	$1,200 to $1,799	$1,800 to $2,399	$2,400 to $4,999	$5,000 and over
1	2	3	4	5	6	7	8	9	10	11
No reply	297	274	11	5	2	2	1	1	0	1
No children	5,761	5,104	189	264	72	42	36	12	31	11
One	2,068	1,695	106	142	47	25	13	10	19	11
Two	2,032	1,599	148	128	35	45	16	14	31	16
Three	1,108	871	88	56	23	21	18	10	17	4
Four	485	370	48	27	10	13	8	2	3	4
Five or more	281	227	15	15	6	5	2	4	5	2
Total	12,032	10,040	605	737	195	153	94	53	106	49

Although recent studies tend to show that there is close correlation between the salaries of institutional staff members and the quality and effectiveness of faculties, many considerations in addition to that of earnings attract men to service in educational institutions. Scholarly tastes, desire for intellectual freedom, belief in the value of education, the wish to be of service, interest in and liking for young people, and many other personal reasons may induce men and women to accept and remain in college and university positions that are relatively unattractive from the standpoint of money compensation. Especially is this likely to be true of men whose interests lead them to acquire the higher academic degrees.

Presentation of staff qualifications and interests solely with reference to salaries and other earnings may tend, therefore, to distort somewhat the emphasis that should be given to evaluation of institutional faculties. It is desirable to consider some of the elements of training and experience of staff members in the land-grant institutions without reference to the salaries that they receive. The following tables, therefore, are concerned solely with the presentation of facts concerning the training, experience, affiliations, activities, and academic advancement of staff members.

One interesting basis for study of the staffs of land-grant institutions is that afforded by the distribution of degrees in the five geographic areas and in the United States as a whole. These data are presented by Table 28. The western area shows a smaller percentage of staff members with no degree than any other region, while the South Central States have the largest proportion of staff members who have never obtained even the bachelor's degree. It will be noted also that the North Atlantic States have the smallest proportion whose highest degree is the bachelor's and the South Atlantic the largest percentage with this amount of formal education. The South Central and South Atlantic States also rank low with reference to the proportion of staff members who have doctor's degrees. Although averages and general practices afford very unsatisfactory standards of judgment it would seem that the South Central and South Atlantic land-grant institutions might well give considerable attention to raising the level of training for staff membership.

TABLE 28.—*Degrees earned by staff members, according to major geographic divisions*

Major geographic division	Total number of cases	Highest degree earned									
		No reply [1]		No degree		A. B., B. S., or corresponding baccalaureate degree		M. A., M. S., or corresponding master's degree		Ph. D. or Sc. D. or corresponding doctor's degree	
		Number	Per cent	Number	Per cent	Number	Per cent	Number	Per cent	Number	Per cent
1	2	3	4	5	6	7	8	9	10	11	12
North Atlantic	2,079	109	5.24	64	3.08	706	33.96	714	34.34	486	23.38
North Central	4,883	230	4.71	151	3.09	1,834	37.56	1,777	36.39	891	18.25
South Atlantic	1,383	151	10.92	64	4.63	580	41.94	408	29.50	180	13.01
South Central	1,806	172	9.52	100	5.54	723	40.03	597	33.06	214	11.85
Western	1,881	121	6.41	56	2.98	700	37.21	586	31.15	418	22.22
Entire United States	12,032	783	6.51	435	3.62	4,543	37.76	4,082	33.93	2,189	18.19

[1] A few curious and unusual degrees are included in this classification.

The assertion is sometimes made that staff members have considerable training beyond that indicated by the highest degrees they hold. Table 29 was constructed to show the number of years training above high school that has been received by the land-grant college staffs in the five geographic areas and in the United States as a whole. It will be noted that upon this basis the South Atlantic and South Central States are high in the proportion of those who have not had more than four years of such training and low in the percentage that has seven years or more of training beyond the high school.

TABLE 29.—*Number of years training above high school by major geographic division*

Major geographic division	Total number of cases	Number years training above high school									
		No reply		No training above high school		1 to 4 years		5 to 6 years		7 years or more	
		Number	Per cent	Number	Per cent	Number	Per cent	Number	Per cent	Number	Per cent
1	2	3	4	5	6	7	8	9	10	11	12
North Atlantic	2,079	125	6.01	0	.....	557	26.79	613	29.48	784	37.71
North Central	4,883	184	3.76	14	0.28	1,190	24.37	1,783	36.51	1,712	35.06
South Atlantic	1,383	68	4.91	3	.21	464	33.55	456	32.97	392	28.34
South Central	1,806	143	7.91	3	.16	616	34.10	575	31.83	469	25.96
Western	1,881	102	5.42	1	.05	471	25.03	664	35.03	643	34.18
Entire United States	12,032	622	5.16	21	.17	3,298	27.41	4,091	34.00	4,000	33.24

Training of college faculty members in professional education subjects is being advocated very widely. In order to determine the extent of such training that the staffs of land-grant institutions have had, Table 30 was constructed upon the basis of individual questionnaire replies. It will be noted that the South Atlantic and the South Central States have the smallest proportion of staff members who have had no training in professional education subjects and that relatively large percentages have received 24 semester hours or more of instruction in this field. Apparently a considerable degree of dependence is being placed upon training in education by the land-grant institutions of these States. The question may be raised whether such training is regarded in some sense as a substitute for the usual academic degrees.

Table 31 shows for the entire United States the relationship of the number of semester hours of professional education to the highest degrees held by staff members.

TABLE 30.—*Training in professional education by major geographic divisions*

Major geographic division	Total number cases	Number semester hours of professional education subjects									
		No reply		No professional training		1 to 11 semester hours		12 to 23 semester hours		24 or more	
		Number	Per cent	Number	Per cent	Number	Per cent	Number	Per cent	Number	Per cent
1	2	3	4	5	6	7	8	9	10	11	12
North Atlantic	2,079	1,135	54.59	250	12.03	285	13.70	197	9.48	212	10.20
North Central	4,883	2,183	44.70	592	12.12	636	13.03	789	16.16	683	13.99
South Atlantic	1,383	807	58.35	79	5.71	149	10.78	145	10.48	203	14.68
South Central	1,806	878	48.62	139	7.70	222	12.29	276	15.28	291	16.11
Western	1,881	865	45.99	208	11.06	242	12.86	277	14.73	289	15.36
Entire United States	12,032	5,868	48.77	1,268	10.54	1,534	12.75	1,684	14.00	1,678	13.94

TABLE 31.—*Highest degree of staff members with reference to semester hours of professional training in education*

Semester hours of professional training	Total number of cases	Highest degree received				
		No reply	No degree	A. B., B. S.	M. A., M. S.	Ph. D., Sc. D.
1	2	3	4	5	6	7
No reply	5,868	692	308	2,336	1,685	847
None	1,268	16	36	395	395	426
1 to 11	1,535	22	27	551	582	353
12 to 23	1,683	25	31	681	691	255
24 and more	1,678	28	33	580	729	308
Total	12,032	783	435	4,543	4,082	2,189

Inasmuch as teaching or administrative experience in the public schools usually presupposes some instruction in professional education subjects, it is interesting to note the relationship that such experience on the part of land-grant college staffs bears to semester hours of professional training. The data are presented in Tables 32 and 33.

TABLE 32.—*Secondary school teaching experience of staff members according to number of semester hours of professional training received*

Semester hours of professional training	Total number of cases	Number of years spent teaching in secondary schools			
		No reply	None	1 to 2 years	3 years or more
1	2	3	4	5	6
No reply	5,868	1,793	2,762	585	728
None	1,268	192	804	114	98
1 to 11	1,535	348	636	271	280
12 to 23	1,683	375	414	388	506
24 and more	1,678	377	224	343	734
Total	12,032	3,085	4,900	1,701	2,346

TABLE 33.—*Number of years spent by staff members in a principalship or superintendency with reference to professional training*

Semester hours of professional training	Total number of cases	Number of years spent in principalship or superintendency			
		No reply	None	1 to 2 years	3 years or more
1	2	3	4	5	6
No reply	5,868	2,641	2,767	215	245
None	1,268	348	868	30	22
1 to 11	1,535	723	637	100	75
12 to 23	1,683	969	417	168	129
24 and more	1,678	230	937	215	296
Total	12,032	4,911	5,626	728	767

In connection with the teaching experience of staff members it is interesting to note the regions in which teaching of agriculture in the public schools is most frequently an element of staff experience. Table 34 presents the data available. It will be noted that a larger proportion of the staff in the South Atlantic States has such experience than is the case in any other region.

TABLE 34.—*Years spent teaching agriculture in secondary schools by geographic location*

Major geographic division	Total number of cases	Years spent teaching agriculture in secondary schools							
		No reply		None		1 to 2 years		3 years or more	
		Number	Per cent	Number	Per cent	Number	Per cent	Number	Per cent
1	2	3	4	5	6	7	8	9	10
North Atlantic	2,079	1,063	51.13	918	44.16	52	2.50	46	2.21
North Central	4,883	2,391	48.99	2,083	42.65	204	4.17	205	4.19
South Atlantic	1,383	669	48.37	546	39.47	90	6.53	78	5.63
South Central	1,806	669	37.04	969	53.66	95	5.26	73	4.04
Western	1,881	1,039	55.23	691	36.76	88	4.67	63	3.34
Entire United States	12,032	5,831	48.48	5,207	43.27	529	4.39	465	3.86

Another method of judging the interests and activities of university and college personnel is afforded by the records of their publications. Table 40 indicates for each geographic region the number and per cent of staff members who produced in 1928 research publications only, popular publications only, and those who produced both research and popular writings. Attention is called to the number that failed to furnish information in regard to publications. It appears probable that the large proportion of these omissions were due to the fact that staff members had no publications to report. In this connection it should be noted that the South Atlantic and South Central States show the largest percentage of failures to furnish

information and that they also show a small percentage reporting research publications and an even smaller percentage reporting both research and popular publications.

TABLE 35.—*Number and per cent of staff members who had publications during the year, with reference to geographic location*

Major geographic division	Total number of cases	Number who had publications during year									
		No reply		No publications		Research publications only		Popular publications only		Both research and popular publications	
		Number	Per cent	Number	Per cent	Number	Per cent	Number	Per cent	Number	Per cent
1	2	3	4	5	6	7	8	9	10	11	12
North Atlantic	2,079	1,032	49.64	38	1.82	401	19.29	270	12.99	338	16.26
North Central	4,883	2,666	54.60	32	.66	905	18.53	589	12.06	691	14.15
South Atlantic	1,383	904	65.36	7	.51	155	11.21	173	12.51	144	10.41
South Central	1,806	1,225	67.83	15	.83	236	13.07	156	8.64	174	9.63
Western	1,881	1,025	54.49	4	.21	342	18.18	177	9.41	333	17.71
Entire United States	12,032	6,852	56.95	96	.80	2,039	16.95	1,365	11.34	1,680	13.96

Another distribution of the publications of staff members in the land-grant institutions is shown by Table 36, which indicates the number of staff members holding various degrees who have produced research publications only, popular publications only, or both research and popular publications.

TABLE 36.—*Number of staff members who had publications during the year with reference to highest degree received*

Highest degree received	Total number of cases	Number who had publications during year				
		No reply	No publications	Research publications only	Popular publications only	Both research and popular publications
1	2	3	4	5	6	7
No reply	781	680	8	27	41	25
No degree	435	372	3	14	35	11
A. B. or B. S.	4,543	3,270	39	356	598	280
M. A. or M. S.	4,082	2,135	33	742	552	620
Ph. D. or Sc. D.	2,189	393	13	901	138	744
Miscellaneous	2	2	0	0	0	0
Total	12,032	6,852	96	2,040	1,364	1,680

Still another measure of staff participation in the intellectual activities of their craft is afforded by membership in and attendance at the meetings of professional and scientific organizations. Tables 37 and 38 present information in regard to these matters. It appears probable in the case of these data that failure to reply indicates for the most part lack of membership and failure to attend meetings.

This assumption is supported in part by the fact that the two regions showing the largest proportions of failure to reply show also the smallest percentages of memberships and the smallest proportion of attendance at meetings of professional and scientific organizations.

TABLE 37.—*Membership of staff in professional and scientific organizations by geographic location*

Major geographic division	Total number of cases	Membership in organizations							
		No reply		No membership in organizations		1 to 5 organizations		6 organizations or more	
		Number	Per cent	Number	Per cent	Number	Per cent	Number	Per cent
1	2	3	4	5	6	7	8	9	10
North Atlantic	2,079	442	21.26	7	0.33	1,383	66.52	247	11.89
North Central	4,883	1,194	24.45	10	.20	3,046	62.37	633	12.98
South Atlantic	1,383	542	39.19	4	.28	713	51.55	124	8.98
South Central	1,806	680	37.65	9	.49	980	54.26	137	7.60
Western	1,881	488	25.96	1	.05	1,124	59.75	268	14.24
Entire United States	12,032	3,346	27.82	31	.25	7,246	60.22	1,409	11.71

TABLE 38.—*Attendance of staff at professional and scientific organization meetings by geographic location*

Major geographic division	Total number of cases	Attendance at organization meetings							
		No reply		No attendance		Meetings of 1 to 5 organizations attended		Meetings of 6 or more organizations attended	
		Number	Per cent	Number	Per cent	Number	Per cent	Number	Per cent
1	2	3	4	5	6	7	8	9	10
North Atlantic	2,079	917	44.10	103	4.97	1,012	48.67	47	2.26
North Central	4,883	1,899	38.89	533	10.91	2,286	46.81	165	3.39
South Atlantic	1,383	768	55.52	79	5.73	503	36.37	33	2.38
South Central	1,806	986	54.59	186	10.29	603	33.38	31	1.74
Western	1,881	721	38.33	359	19.08	783	41.62	18	.97
Entire United States	12,032	5,291	43.98	1,260	10.47	5,187	43.11	294	2.44

Twenty or twenty-five years ago it was sometimes the custom for institutions to grant with considerable liberality honorary degrees to staff members who suffered from the academic handicap of not having earned graduate degrees. This practice has fallen into disrepute during the past generation, and honorary degrees may now be regarded as indicating the probability that those who receive them have rendered service of some distinction. It is interesting to note therefore, in Table 39, that a larger proportion of the staff members in the North Atlantic States hold honorary master's and doctor's degrees than in any other region. The obvious inference that the staffs of

land-grant institutions in the North Atlantic States contain a relatively large number of men of sufficient note to have won this form of recognition should not be accepted as conclusive. Private institutions continue to dominate the higher educational situation in this area and follow the practice of more liberal distribution of honorary degrees than is the case in regions in which public institutions set the fashion.

TABLE 39.—*Honorary degrees held by staff members according to geographic location*

Major geographic division	Total number of cases	Honorary degrees							
		No reply		No honorary degree		Honorary masters		Honorary doctors	
		Number	Per cent	Number	Per cent	Number	Per cent	Number	Per cent
1	2	3	4	5	6	7	8	9	10
North Atlantic	2,079	306	14.72	1,700	81.77	19	.91	54	2.60
North Central	4,883	506	10.36	4,281	87.67	26	.53	70	1.44
South Atlantic	1,383	122	8.82	1,227	88.72	8	.58	26	1.88
South Central	1,806	182	10.08	1,602	88.70	9	.50	13	.72
Western	1,881	169	8.99	1,676	89.10	4	.21	32	1.70
Entire United States	12,032	1,285	10.68	10,486	87.15	66	.55	195	1.62

Of the 12,032 individual members of the staffs of the land-grant institutions who reported 9,898 stated that they were employed by the institutions full time; 197 from 75 per cent to 99 per cent of their time; 572 from 50 per cent to 74 per cent; 166 from 25 per cent to 49 per cent; and 85 less than 25 per cent. No statements were made concerning the percentage of their time devoted to institutional work by 1,114 staff members. However, examination of other evidence contained in these reports indicates that with relatively few exceptions practically all gave full time to institutional duties. The data with reference to per cent of time staff members are employed by the institutions are presented by Table 40.

TABLE 40.—*Per cent of time staff members are employed by institution by geographic divisions*

Major geographic division	Total number cases	No reply	Time employed				
			Full time	75 to 99 per cent	50 to 74 per cent	25 to 49 per cent	Less than 25 per cent
1	2	3	4	5	6	7	8
North Atlantic	2,079	90	1,854	35	78	9	13
North Central	4,883	363	3,885	75	387	131	42
South Atlantic	1,383	216	1,085	30	29	11	12
South Central	1,806	294	1,4[illegible]	23	31	5	8
Western	1,881	151	1,629	34	47	10	10
Entire United States	12,032	1,114	9,898	197	572	166	85

Use of the time of staff members in the conduct of the various activities of the land-grant institutions is shown by Table 41 for the entire United States and Tables 42 to 48 give the same data distributed by geographic areas for each type of activity. It will be noted that the South Central and South Atlantic institutions have relatively small percentages of staff members that do no undergraduate work and relatively high proportions of staff members that conduct no graduate work. More than half of the members of the staffs of the South Atlantic and the Western States report that they do no research. Probably this is also actually the case in the South Central States since a larger percentage of the staff members in these institutions than in any other region failed to furnish information on this point. Experience shows that a considerable proportion of omissions upon points of this kind may safely be interpreted as replies in the negative. Apparently greater relative emphasis is placed upon extension work in the South Atlantic and South Central institutions than in other regions since a smaller percentage of their staffs do no extension work than is the case in the other areas. This conclusion is corroborated by expenditures given by Part III of this survey dealing with business management and finance.

TABLE 41.—*Distribution of staff members' time*

Percentage of time	Devoted to—						
	Undergraduates	Graduates	Research	Creative work	Administrative work	Extension	Public contacts
1	2	3	4	5	6	7	8
No reply	2,428	2,717	2,640	2,748	2,690	2,782	2,710
No time	2,554	6,725	5,922	7,440	5,255	6,401	6,190
1 to 9 per cent	138	692	578	477	1,535	803	2,316
10 to 19 per cent	369	863	846	465	904	383	592
20 to 29 per cent	571	540	628	283	519	152	125
30 to 39 per cent	513	218	310	130	282	67	32
40 to 49 per cent	485	129	204	95	167	30	14
50 to 59 per cent	875	88	310	102	178	71	21
60 to 69 per cent	681	24	123	45	76	31	5
70 to 79 per cent	752	14	84	42	98	39	3
80 to 89 per cent	682	9	66	36	57	42	2
90 to 100 per cent	1,984	13	321	169	272	1,281	22
Total [1]	12,032	12,032	12,032	12,032	12,032	12,032	12,032

[1] As may be seen from the above totals, the entire number of staff members reporting is considered for each of the kinds of work to which staff members devote time.

TABLE 42.—*Percentage of staff members' time devoted to undergraduates, according to geographic location*

Major geographic division	Total number of cases	No reply	No time	Per cent of time									
				1 to 9	10 to 19	20 to 29	30 to 39	40 to 49	50 to 59	60 to 69	70 to 79	80 to 89	90 to 100
1	2	3	4	5	6	7	8	9	10	11	12	13	14
North Atlantic	2,079	282	475	26	71	106	88	76	167	157	116	129	386
North Central	4,883	891	979	64	175	263	239	239	401	292	344	283	713
South Atlantic	1,383	333	455	13	32	44	45	34	54	68	75	49	181
South Central	1,806	570	295	16	32	53	47	48	106	66	106	96	372
Western	1,881	351	349	20	60	105	92	88	142	97	114	115	348
Entire United States	12,032	2,427	2,553	139	370	571	511	485	870	680	755	671	2,000

TABLE 43.—*Percentage of staff members' time devoted to graduates, according to geographic location*

Major geographic division	Total number of cases	No reply	No time	Per cent of time									
				1 to 9	10 to 19	20 to 29	30 to 39	40 to 49	50 to 59	60 to 69	70 to 79	80 to 89	90 to 100
1	2	3	4	5	6	7	8	9	10	11	12	13	14
North Atlantic	2,079	312	1,255	133	173	120	48	22	25	4	2	2	3
North Central	4,883	1,006	2,656	288	362	249	108	82	38	15	7	6	6
South Atlantic	1,383	348	837	59	81	36	9	5	3	0	3	1	1
South Central	1,806	594	932	68	101	66	23	8	10	1	0	0	3
Western	1,881	397	1,065	144	146	69	30	12	12	4	2	0	0
Entire United States	12,032	2,717	6,725	692	863	540	218	129	88	24	14	9	13

TABLE 44.—*Percentage of staff members' time devoted to research, according to geographic location*

Major geographic division	Total number of cases	No reply	No time	Per cent of time									
				1 to 9	10 to 19	20 to 29	30 to 39	40 to 49	50 to 59	60 to 69	70 to 79	80 to 89	90 to 100
1	2	3	4	5	6	7	8	9	10	11	12	13	14
North Atlantic	2,079	299	1,078	106	106	120	51	40	54	24	21	19	101
North Central	4,883	1,004	2,227	276	411	323	153	107	158	58	35	25	106
South Atlantic	1,383	346	771	55	64	45	16	17	17	6	5	5	36
South Central	1,806	594	890	64	86	55	24	10	27	9	7	8	32
Western	1,881	397	956	77	119	85	66	30	54	26	16	9	46
Entire United States	12,032	2,640	5,922	578	846	628	310	204	310	123	84	66	321

TABLE 45.—*Percentage of staff members' time devoted to creative work, according to geographic location*

Major geographic division	Total number of cases	No reply	No time	Per cent of time									
				1 to 9	10 to 19	20 to 29	30 to 39	40 to 49	50 to 59	60 to 69	70 to 79	80 to 89	90 to 100
1	2	3	4	5	6	7	8	9	10	11	12	13	14
North Atlantic	2,079	315	1,408	104	86	61	25	19	16	4	4	6	31
North Central	4,883	1,074	3,036	212	202	125	48	37	42	14	18	16	59
South Atlantic	1,383	349	873	35	37	22	10	9	7	6	4	3	28
South Central	1,806	603	996	58	50	28	11	9	13	8	5	5	20
Western	1,881	407	1,127	68	90	47	36	21	24	13	11	6	31
Entire United States	12,032	2,748	7,440	477	465	283	130	95	102	45	42	36	169

TABLE 46.—*Percentage of staff members' time devoted to administrative work, according to geographic location*

Major geographic division	Total number of cases	No reply	No time	Per cent of time									
				1 to 9	10 to 19	20 to 29	30 to 39	40 to 49	50 to 59	60 to 69	70 to 79	80 to 89	90 to 100
1	2	3	4	5	6	7	8	9	10	11	12	13	14
North Atlantic	2,079	309	964	276	187	117	47	41	33	12	19	10	64
North Central	4,883	1,051	2,080	714	379	205	118	55	72	35	44	28	102
South Atlantic	1,383	345	693	121	75	49	32	9	17	6	6	1	26
South Central	1,806	595	750	145	92	69	38	24	31	4	13	6	39
Western	1,881	390	768	279	171	79	47	38	25	18	13	12	41
Entire United States	12,032	2,690	5,255	1,535	904	519	282	167	178	75	98	57	272

TABLE 47.—*Percentage of staff members' time devoted to extension, according to geographic location*

Major geographic division	Total number of cases	No reply	No time	Per cent of time									
				1 to 9	10 to 19	20 to 29	30 to 39	40 to 49	50 to 59	60 to 69	70 to 79	80 to 89	90 to 100
1	2	3	4	5	6	7	8	9	10	11	12	13	14
North Atlantic	2,079	314	1,280	146	80	34	16	11	14	7	8	5	164
North Central	4,883	1,072	2,676	339	132	68	30	14	27	11	15	22	477
South Atlantic	1,383	346	559	55	40	14	13	3	14	6	13	9	311
South Central	1,806	598	861	106	52	14	2	1	2	4	0	3	163
Western	1,881	402	1,025	157	79	22	6	1	14	3	3	3	166
Entire United States	12,032	2,732	6,401	803	383	152	67	30	71	31	39	42	1,281

TABLE 48.—*Percentage of staff members' time devoted to public contacts, according to geographic location*

Major geographic division	Total number of cases	No reply	No time	Per cent of time									
				1 to 9	10 to 19	20 to 29	30 to 39	40 to 49	50 to 59	60 to 69	70 to 79	80 to 89	90 to 100
1	2	3	4	5	6	7	8	9	10	11	12	13	14
North Atlantic	2,079	311	1,151	466	111	23	4	3	4	2	1	0	3
North Central	4,883	1,059	2,516	991	235	41	16	6	8	2	0	2	7
South Atlantic	1,383	344	733	208	74	17	0	1	2	0	0	0	4
South Central	1,806	599	841	265	66	16	4	3	4	0	1	0	7
Western	1,881	397	950	386	106	28	8	1	3	1	1	0	0
Entire United States	12,032	2,710	6,191	2,316	592	125	32	14	21	5	3	2	21

An elementary act of judgment makes it perfectly evident that a staff member who holds the Ph. D. is not invariably a better teacher or investigator than a staff member who holds only the master's or bachelor's degree, but when a large group rather than an individual case is considered it seems to be a reasonably safe assumption that the group holding the higher degrees will perform academic functions more effectively than the groups with lesser amounts of training. The relationship of degrees held to the time devoted to various types of institutional duties makes an interesting study. Data in regard to these matters are presented for examination by Tables 49 to 55. It will be noted that a larger per cent of the staff members holding doctor's degrees than of any other degree group gives some time to undergraduate instruction. However, a smaller per cent of the doctors than of any other group gives from 80 to 100 per cent of their time to undergraduate instruction. Further, since only 18 per cent of the entire staff holds the doctor's degree it is apparent that undergraduate instruction is carried on in large part by other staff members.

Even more interesting and significant are the figures with reference to the degrees held by those who conduct graduate work. Attention is called to the fact that only 236 of 435 staff members who hold no degree report that they conduct no graduate work. If it is assumed that the 184 who made no reply to this question in fact conduct no graduate work, a total is obtained of 420 nondegree holders who conduct no graduate work. This leaves 15 who have not themselves obtained any degree conducting the work of students for advanced degrees. By making similar combinations and subtractions of figures it seems that in the land-grant institutions there are 383 staff members who hold the bachelor's degree as their highest earned degree who are giving graduate work to students. Further, if it is assumed that the graduate students instructed by those themselves hold the master's as their highest degree, are all students

seeking degrees no higher than the master's, the situation is such as to cause even more concern about the character of graduate instruction in the land-grant institutions as a group. Eight hundred and seventy-six staff members hold degrees no higher than those for which their instruction is intended to prepare students. Thus 1,274 staff members or slightly more than 10 per cent of the total are giving instruction to students who seek degrees as high or higher than those held by their instructors.

TABLE 49.—*Percentage of time devoted to undergraduates by staff members according to highest degrees received*

Highest degree received	Total number of cases	Percentage of time devoted to undergraduates						
		No reply	No time	19 or less	20 to 39	40 to 59	60 to 79	80 to 100
1	2	3	4	5	6	7	8	9
No reply	781	366	206	12	12	35	30	120
No degree	435	177	123	8	16	21	26	
A. B. or B. S	4,543	1,171	1,294	123	246	384	382	
M. A. or M. S	4,082	544	620	206	379	506	598	1,23
Ph. D. or Sc. D	2,189	169	310	160	429	408	399	314
Miscellaneous	2	0	0	0	0	1	0	1
Total	12,032	2,427	2,553	509	1,082	1,355	1,435	2,671

TABLE 50.—*Percentage of time devoted to graduates by staff members according to highest degrees received*

Highest degree received	Total number of cases	Percentage of time devoted to graduates						
		No reply	No time	19 or less	20 to 39	40 to 59	60 to 79	80 to 100
1	2	3	4	5	6	7	8	9
No reply	781	380	373	19	8	0	0	1
No degree	435	184	236	10	3	1	0	1
A. B. or B. S	4,543	1,298	2,862	275	71	25	8	4
M. A. or M. S	4,082	671	2,535	628	193	40	6	9
Ph. D. or Sc. D	2,189	184	717	623	483	151	24	7
Miscellaneous	2	0	2	0	0	0	0	0
Total	12,032	2,717	6,725	1,555	758	217	38	22

TABLE 51.—*Percentage of time devoted to research by staff members according to highest degrees received*

Highest degree received	Total number of cases	Percentage of time devoted to research						
		No reply	No time	19 or less	20 to 39	40 to 59	60 to 79	80 to 100
1	2	3	4	5	6	7	8	9
No reply	781	376	358	19	8	6	4	10
No degree	435	184	231	13	1	3	1	2
A. B. or B. S	4,543	1,263	2,543	306	175	109	40	107
M. A. or M. S	4,082	638	2,129	532	354	194	74	161
Ph. D. or Sc. D	2,189	179	659	554	400	202	88	107
Miscellaneous	2	0	2	0	0	0	0	0
Total	12,032	2,640	5,922	1,424	938	514	207	387

TABLE 52.—*Percentage of time devoted to other creative work by staff members according to highest degrees received*

Highest degree received	Total number of cases	Percentage of time devoted to other creative work						
		No reply	No time	19 or less	20 to 39	40 to 59	60 to 79	80 to 100
1	2	3	4	5	6	7	8	9
No reply	781	379	349	20	13	11	2	7
No degree	435	184	218	17	8	2	2	4
A. B. or B. S	4,543	1,309	2,711	247	118	58	26	74
M. A. or M. S	4,082	681	2,697	369	153	68	33	81
Ph. D. or Sc. D	2,189	195	1,463	289	121	58	24	39
Miscellaneous	2	0	2	0	0	0	0	0
Total	12,032	2,748	7,440	942	413	197	87	205

TABLE 53.—*Percentage of time devoted to administrative work by staff members according to highest degrees received*

Highest degree received	Total number of cases	Percentage of time devoted to administrative work						
		No reply	No time	19 or less	20 to 39	40 to 59	60 to 79	80 to 100
1	2	3	4	5	6	7	8	9
No reply	781	376	277	54	21	14	7	32
No degree	435	183	175	26	16	7	2	26
A. B. or B. S	4,543	1,287	2,095	607	230	120	63	141
M. A. or M. S	4,082	658	1,917	909	302	131	68	97
Ph. D. or Sc. D	2,189	186	790	843	232	72	33	33
Miscellaneous	2	0	1	0	0	1	0	0
Total	12,032	2,690	5,255	2,439	801	345	173	329

TABLE 54.—*Percentage of time devoted to extension by staff members according to highest degrees received*

Highest degree received	Total number of cases	Percentage of time devoted to extension						
		No reply	No time	19 or less	20 to 39	40 to 59	60 to 79	80 to 100
1	2	3	4	5	6	7	8	9
No reply	781	379	226	28	7	2	7	132
No degree	435	183	149	11	4	3	4	81
A. B. or B. S	4,543	1,294	1,936	284	92	50	30	857
M. A. or M. S	4,082	682	2,503	519	80	35	24	239
Ph. D. or Sc. D	2,189	194	1,585	344	36	11	5	14
Miscellaneous	2	0	2	0	0	0	0	0
Total	12,032	2,732	6,401	1,186	219	101	70	1,323

TABLE 55.—*Percentage of time devoted to public contacts by staff members with reference to highest degrees received*

Highest degree received	Total number of cases	Percentage of time devoted to public contacts						
		No reply	No time	19 or less	20 to 39	40 to 59	60 to 79	80 to 100
1	2	3	4	5	6	7	8	9
No reply	781	375	319	65	15	2	1	4
No degree	435	184	190	41	15	1	0	4
A. B. or B. S.	4,543	1,294	2,386	778	50	22	4	9
M. A. or M. S.	4,082	665	2,210	1,144	51	6	2	4
Ph. D. or Sc. D.	2,189	192	1,083	880	26	5	1	2
Miscellaneous	2	0	2	0	0	0	0	0
Total	12,032	2,710	6,190	2,903	157	36	8	23

The relationship of age to attainment of the various academic ranks is shown for the United States and for each of the geographic areas by Tables 56 to 59. For the United States as a whole the great majority of staff members became instructors between the ages of 20 and 29, assistant professors between the ages of 25 and 34, and associate professors when from 30 to 39 years old. However, attainment of professorships shows much less decided concentration of age groups. Of those who replied 17.6 per cent became professors between the ages of 25 and 29; 28.2 per cent between 30 and 34; 26 per cent between 35 and 39; and 14.6 per cent between 40 and 44.

TABLE 56.—*Age at which staff members become instructors, according to geographic location*

Major geographic division	Total number of cases	No reply	Age							
			19 or less	20 to 24	25 to 29	30 to 34	35 to 39	40 to 44	45 to 49	50 or over
1	2	3	4	5	6	7	8	9	10	11
North Atlantic	2,079	690	11	531	563	175	64	25	6	14
North Central	4,883	2,084	20	932	1,158	457	143	55	24	10
South Atlantic	1,383	830	14	211	225	71	18	9	4	1
South Central	1,806	1,006	12	328	292	97	38	24	6	3
Western	1,881	798	4	305	461	201	68	33	8	3
Entire United States	12,032	5,408	61	2,307	2,699	1,001	331	146	48	31

TABLE 57.—*Age at which staff members became assistant professors, according to geographic location*

Major geographic division	Total number of cases	No reply	Age							
			19 or less	20 to 24	25 to 29	30 to 34	35 to 39	40 to 44	45 to 49	50 or over
1	2	3	4	5	6	7	8	9	10	11
North Atlantic	2,079	1,169	0	26	349	328	133	42	19	13
North Central	4,883	3,050	1	171	606	687	310	100	48	10
South Atlantic	1,383	984	0	48	164	120	43	17	3	4
South Central	1,806	1,260	0	46	246	154	59	24	14	3
Western	1,881	1,098	0	43	257	281	116	51	18	17
Entire United States	12,032	7,561	1	234	1,622	1,570	661	234	102	47

TABLE 58.—*Age at which staff members became associate professors, according to geographic location*

Major geographic division	Total number of cases	No reply	Age							
			19 or less	20 to 24	25 to 29	30 to 34	35 to 39	40 to 44	45 to 49	50 or over
1	2	3	4	5	6	7	8	9	10	11
North Atlantic	2,079	1,687	0	5	58	141	109	50	18	11
North Central	4,883	3,846	0	10	167	335	295	146	57	27
South Atlantic	1,383	1,108	0	11	77	96	51	26	8	4
South Central	1,806	1,472	0	9	104	110	71	20	12	8
Western	1,881	1,400	0	8	71	144	142	78	25	13
Entire United States	12,032	9,513	0	43	477	828	668	320	120	63

TABLE 59.—*Age at which staff members became professors, according to geographic location*

Major geographic division	Total number of cases	No reply	Age							
			19 or less	20 to 24	25 to 29	30 to 34	35 to 39	40 to 44	45 to 49	50 or over
1	2	3	4	5	6	7	8	9	10	11
North Atlantic	2,079	1,485	0	14	79	160	165	100	49	27
North Central	4,883	3,856	1	33	172	286	291	150	64	30
South Atlantic	1,383	1,079	0	7	72	80	74	42	19	10
South Central	1,806	1,400	0	13	83	140	88	46	25	11
Western	1,881	1,357	1	14	97	151	124	79	41	17
Entire United States	12,032	9,177	2	81	503	817	742	417	198	95

All institutions reporting in this study have staff meetings of one kind or another. Two report biweekly meetings, and 16 monthly, and in 26 institutions meetings are called at irregular intervals as occasion demands. Nine report that the staff meetings are used for the systematic discussion of teaching problems and 32 that they are

not so used. Thirty-eight report that such meetings are given over largely to special cases of routine business, while three report that they are not. The example of the 9 that use staff meetings for a systematic discussion of teaching problems is worthy of emulation by the others.

Fifteen institutions report group discussions of teaching problems by the entire institutional staff, 27 by the agricultural staff, 35 by departmental staffs in the division of agriculture. Thirteen have had instruction in teaching problems in organized courses and 30 by occasional lectures from educational experts either from within the institution or from other institutions.

Two institutions report that all these methods are used, 7 use four of the five, 12 use three of the five, and the others two or one. This indicates that considerable effort and attention are directed to the general subject of professional improvement.

Opportunity for staff members to take courses in their own institutions either in the division in which they serve or in other divisions is another method of professional improvement practiced widely. This privilege is a universal practice in the 45 institutions reporting on this matter. In not all cases, however, is graduate credit given. In 21 of the 45, study may be done by informal enrollment without registration and without expense, while 24 apparently require a more formal procedure. This practice seems to be desirable, especially when applied to those in the grades of assistants, instructors, associates, and possibly assistant professors, and when there is a well-considered specified limit for credit for any one individual at any one time.

Of the institutions reporting with reference to the practice of enrollments for members of the staff, 45 permit registration for credit by instructors and assistants. In 34 of these 45 institutions, instructors, and in 30, assistants, may register for credit and take advanced degrees on the basis of such work in other divisions than those in which they serve as staff members, and in 31 and 28 institutions, respectively, in the divisions in which they are members.

In the higher ranks there are limitations for registration by staff members in many institutions. Of the 45 institutions reporting, 35 indicate that assistant professors may enroll for graduate work. In 17 institutions they may receive advanced degrees from the faculty in which they are included and in 20 from faculties in which they are not included. Permission to associate professors to register for graduate work and receive credit for advanced degrees is reported from 27 institutions, but only in 11 of these may they receive degrees from the divisional faculty in which they serve, the others per-

mitting registration with other faculties only. In nine instances no restriction of this kind is imposed.

In 27 institutions professors may enroll for class work, but only 11 report that they may receive advance degrees in the divisional faculties of which they are a part and 12 in faculties in other divisions, 8 of these instances being without restrictions as to faculty.

While undoubtedly it is a desirable practice for all institutions to permit informal enrollment on the part of members of all ranks in certain courses in the institution in which they are interested, it would seem to be doubtful practice, at least in those institutions where library facilities are limited and the staffs are small, to permit members of the rank of professor, associate professor, and assistant professor to enroll in courses for credit with a view to securing advanced degrees from the institution in which they serve. Embarrassment may well arise when a man's colleagues are called upon to pass scholastic judgment upon their friend and academic associate. It would be far better, if at all possible, to provide for sabbatical leave to such members so that they may spend time in study in some other institution where there are better library facilities, larger and more experienced staffs, and where breadth of vision may be gained by new experience. This is recognized more and more by the land-grant institutions, many of which already provide regular sabbatical leave, others of which are working to secure it, while still others are in the hopeful attitude.

Local limitations of finance, legislative or executive indifference or opposition, may make it impossible or at least very difficult to secure sabbatical leave for the staffs of some of the State-supported higher educational institutions. Every effort needs to be made by administrative officers to overcome these difficulties. Well-considered plans designed conservatively to build up the character of the teaching body may in many instances provide an economical means of educational development.

In this connection it is interesting to note that 19 of the land-grant colleges and universities report that sabbatical leave is provided for in part in their institutions, 24 that it is not provided, while 1 indicates that although there is no regular provision for sabbatical leave, a member of a department may be granted 6 months' or a year's leave of absence with full or partial pay, provided the department is able to carry his load during his absence. In this instance each case is decided upon its merits as it arises. Table 60 shows the practice of the various institutions with reference to sabbatical leave.

TABLE 60.—*Practices of various institutions with refence to sabbatic leave*

Institution	Sabbatic leave provided		Number years service required	Interval between successive leave years	Cumulative leave		Salary of substitute paid by—		Salary received by absentee refunded if he does not return to institution		Covered by contract		Sabbatic leave regarded as—		Plans for leave required to be submitted for approval			Report on use of leave required		Teaching elsewhere regarded as proper use of leave		Other paid position regarded as proper use of leave	
	Yes	No			Yes	No	Institution	Person on leave	Yes	No	Yes	No	Earned by past service	Related to future service	Yes	No	To whom	Yes	No	Yes	No	Yes	No
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
Alabama Polytechnic Institute		X																					
University of Arizona	X		6	6		X	X			X		X		X	X		President	X			X		X
University of California	X		7	1–7		X	X			X		X		X	X		Dean, president, regents.		X		X		X
Colorado Agricultural College		X																					
Connecticut Agricultural College		X																					
University of Delaware		X																					
University of Florida		X																					
Georgia State College of Agriculture.		X																					
University of Hawaii	X		6	6		X	X					X	X	X	X		President		X	X	X		
University of Idaho	X					X	X			X		X	X	X	X		do		X			X	
University of Illinois	X		6	7		X	X		X			X	X		X		Dean, president	X			X		X
Purdue University	X		6			X	X			X		X	X	X	X		President, dean	X			X		X
Iowa State College		X																					
Kansas State Agricultural College.	X		6			X		X	X	X				X	X		Dean or president	X			X		X
University of Kentucky	X		7			X	X		X				X	X	X		President	X			X		X
Louisiana State University		X																					
University of Maine		X																					
University of Maryland		X																					
Massachusetts Agricultural College.		X																					
University of Minnesota	X		6	6		X	X		X	X		X	X		X		President, regents		X		X		X

Mississippi Agricultural and Mechanical College.		×																				
University of Missouri	×		7	7		×	[1]×		×				×	×		President, dean, board.		×		×	×	
Montana State College	×		6	6		×	×		×	×			×	×		Dean, president, chancellor.	×			×	×	
University of Nebraska		×																				
University of Nevada		×																				
University of New Hampshire		×																				
Rutgers University		×																				
Cornell University	×		7	7		×		×		×	×		×	×		Dean to trustee		×		×	×	
North Carolina State College		×																				
North Dakota Agricultural College.	×		7			×	×				×		×	×		Dean, president		×		×		×
Ohio State University		×																				
Oklahoma Agricultural and Mechanical College.	×		7	7			×		×	×		×	×	×		Dean president, regents.				×		
Oregon Agricultural College	×		6	6		×		×	×	×			×	×		Dean, president	×		×	×		
Pennsylvania State College	×		7	7		×		×	×				×	×		Trustees		×		×		×
Rhode Island State College		×																				
South Dakota State College		×																				
University of Tennessee		×																				
Agricultural College of Utah	×		7	7		×			×	×		×	×	×		President	×		×		×	
University of Vermont	×						×					×	×	×		Dean, president		×		×		×
Virginia Agricultural and Mechanical College.		×																				
State College of Washington		×																				
West Virginia University		×																				
University of Wisconsin		×																				
University of Wyoming	×		6	6		×	×				×		×	×		Dean, president		×		×	×	

[1] One-half the salary is allowed to absentee and the substitute is employed for the remaining half.

Nineteen institutions regard sabbatical leave as related to future service, that is, as a preparation for improved service in the institution, while nine regard it as earned by past service. This is reflected in the conditions under which it is granted. Eleven institutions require that in the event the person on leave does not return, the salary which he received on leave shall be refunded to the institution. The other eight make no such requirement. In nine instances this provision is covered by contract.

That sabbatical leave also is regarded in the light of future service by many institutions is evident by the fact that 22 institutions require that plans for leave be submitted for approval before leave is taken. In only one instance is this not required.

Teaching elsewhere is regarded as proper use of leave by 5 institutions but is not so regarded by 19 institutions. Other paid work is regarded as proper leave by 6 institutions and is not so regarded by 12. In this connection certain desirable policies are laid down by several institutions. In one a person on leave may enter another paid position if it provides for professional advancement of the individual or gives opportunity for growth through productive research. Similar provisions are found in several others. It would seem, however, that accepting pay in another institution for teaching the subject taught in his own institution or doing work that takes physical and mental energy but which does not contribute to professional improvement are not regarded as proper use of leave. Even those who regard leave of absence as a traditional prerogative of the teaching staffs of higher educational institutions, and there is much in favor of this point of view, perhaps will be the last to look upon such occupations as proper use for sabbatical leave.

Faculty Welfare

Several land-grant institutions make special efforts to serve the faculty by providing faculty unions (5 institutions), faculty club rooms (14), faculty lunch rooms (9), or faculty reading rooms (7). A few institutions provide separate faculty equipment and facilities for physical exercise. One provides a faculty bowling alley; and 8 report faculty handball courts. Faculty tennis courts and locker rooms are maintained in 14 institutions. Three provide golf courses; 38 institutions allow the faculty access to gymnasium equipment and student facilities during certain hours. Ten land-grant institutions report provision for faculty housing. The record is of interest.

Alabama,—Eighty-five per cent of the faculty are housed in homes worth about $5,000 each. The rental charge is approximately $45 per month. Heat, light, and water are not furnished.

Connecticut.—About 30 houses provided for faculty members house 80 per cent of the faculty. The value of individual houses is about $12,000 with rentals of from $50 to $60 per month and water furnished free.

Delaware.—Thirteen houses house about 16 per cent of the faculty. Houses are valued at $6,000 each. Rental is $35 per month. Tenants pay for light, heat, and water.

Iowa.—Six faculty houses are provided, valued at $6,000 each. Rental is included as a part of salary and water is furnished free of charge, but tenants pay for light and heat.

Maine.—Six faculty houses accommodate 3 per cent of the faculty. Houses are valued at $6,000 each and rentals amount to $300 per year with water furnished free.

Minnesota.—A project is under way whereby a plot of land owned by the university will be leased to faculty members and assistance given in building residences.

Mississippi.—Forty-six faculty houses provide for 95 faculty members. These homes are valued at $4,000 each and rent for $8 per month. Light, heat, and water are furnished.

New Jersey.—One-third of the faculty women are provided for in two houses for unmarried women, and one for married.

South Carolina.—Ninety per cent of the faculty are provided with homes, but valuation and rentals are not stated.

Texas.—Fifty-five houses valued at $2,700 each are provided for 25 per cent of the faculty. Rental is $270 per year. Tenants pay for their own heat, light, and water.

Virginia.—Thirty-one per cent of the faculty live in 32 faculty houses and 4 faculty apartments. Individual houses are valued at $8,000 each and rent for $50 per month. Heat and light are furnished by the tenants and water by the institution.

No special provisions are reported for faculty health service, medical consultation, or treatment, except in the land-grant institutions located in the following States:

California.—Reduced rates in the University Hospital in San Francisco.

Connecticut.—Faculty may consult doctor at the college infirmary at the cost of $1 or $2. The doctor makes visits on the days he visits the college.

Delaware.—Arrangements are made with a local hospital to care for short illnesses, and special provision is made in cases of epidemics or contagious diseases.

Illinois.—University health service station is available for the faculty as well as for the students. The Mutual Benefit Hospital Association permits faculty membership.

Massachusetts Institute of Technology.—Faculty has full use of the department of hygiene and of the infirmary.

Minnesota.—Beginning in 1929, the same provisions became available to faculty members as are given students through the health service.

Mississippi.—Hospital with services of the college physician and surgeon and of a trained nurse, are available.

New Jersey.—Resident faculty women cared for by infirmary staff including nurses and physicians. Faculty men are not provided for.

Ohio.—Same as for students.

Tennessee.—Faculty members may go to the student infirmary.

Texas.—College physician and his staff are available at reasonable charges.

Virginia.—Infirmary and college physician with regular office hours are available at all times.

Wisconsin.—Faculty members may utilize the student health service, but must pay for it.

PART VIII.—THE LIBRARY

Chapter I.—Introduction

History

(1) *Before 1900.*—The libraries of land-grant institutions are to a large extent a development of the twentieth century. In size of collections, in use, and in relationship to instructional work, there is little resemblance in most institutions between the college libraries of 1890 and their successors of 1930. The older eastern colleges and universities, which were founded much earlier than the land-grant institutions, had assembled by 1890 collections of books fairly adequate for that period. Columbia University and the University of Michigan each had more than 75,000 volumes at that time, while many smaller colleges, such as Amherst, had more than 50,000. On the other hand, land-grant institutions had not the same opportunity to obtain similar foundations for their libraries, which in several cases, even in 1900, consisted of only 3,000 or 4,000 volumes.

The catalogue of the North Carolina State College of Agriculture and Engineering in 1890 states: "The library, like the college itself, is in its infancy, containing about 1,500 volumes. It will be steadily increased by the purchase of standard works." In 1895, exactly the same statement is repeated. Apparently the "purchase of standard works" was postponed during these years. In 1896, however, the library did show a slight growth, although still in the embryonic stage. The catalogue tells us that "The library, like the college itself, is in its infancy, containing about 1,900 volumes."

The catalogue of the Mississippi Agricultural and Mechanical College for 1886 informs us that "The library, with the additions made during the present year, contains 2,342 volumes, and affords facilities for scientific research." Ten years later (1896) the library had grown to 3,560 volumes, an addition of about 100 volumes a year. A more modest statement, however, is made in the catalogue for the corresponding year of "some facilities for scientific research." The conception of bibliographic needs for research has changed greatly since this catalogue was published. In 1893, the president's report of this college, "published for the information of the legislature,"

states frankly that the "library consists mainly of United States Government books. It is deficient in technical and literary books. There are but few books of reference even." [1] The expenditures for reading material for this library could not have exceeded a few hundred dollars a year at the most.

The character and use, as well as the size of these small libraries, are reflected, or perhaps in part explained, by the position of the librarian. Usually, the office was intrusted to some professor who gave to the library such attention as he could spare from his regular duties. In 1884, the librarian of the Kansas State Agricultural College stated, "During one hour of the forenoon and a few minutes at the close of the session, I have been in the library myself." [2] In one institution, at least, a clerk was hired to run the library. In 1876, a librarian was employed in Iowa State College at a fixed salary of $200 per year. "The year before the compensations of librarian and assistant librarians were increased from 7 to 9 cents per hour." [3] Many of the early catalogues of land-grant institutions do not indicate that anyone had charge of the library. W. J. Beal's History of Michigan Agricultural College states that "there are no records available, giving the names of persons who had served as librarians previous to 1872." [4] The early catalogues of many institutions do not even mention the library.

Early, however, the need was felt for greater library development. In 1873 the professor at Kansas State Agricultural College who was acting as librarian reported, "It will be noticed that, under the present arrangement, any time that I spend on library work is just so much added to the full work in the teaching. It seems as though the growth of the library must very soon bring the time when it will be desirable to secure some one whose work it shall be to make the library more useful to the students." [5] In 1894 the librarian at the University of Illinois reported, "* * * other considerations of importance, in my judgment, make it imperative that a trained librarian should be employed, and that cataloguers should be placed at his direction * * *. The board gave me the librarian's duty to perform, without my knowledge, until I was actually appointed. I have cared for it as faithfully as I could, but I do not feel that I can continue the work for another year, and accordingly ask to be relieved therefrom." [6]

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[1] Mississippi Agricultural and Mechanical College, biennial report, 1892–93, p. 10.

[2] Kansas State Agricultural College, fourth biennial report. Report of the librarian, 1883–84, p. 63.

[3] Quoted in an unpublished thesis by Evangeline Thurber, The library of the land-grant college, 1862–1900, Columbia University, 1928.

[4] Beal, W. J., History of Michigan Agricultural College, 1915, p. 472.

[5] Kansas State Agricultural College, fourth biennial report, 1883–84, p. 63.

[6] University of Illinois, board of trustees, seventeenth report, 1894, pp. 250–251.

Before 1900 the need for a full-time professional librarian and increased purchases of books were being strongly urged in many institutions. These rumblings presaged the development which took effect in most, but not all, of the libraries of land-grant institutions in the first quarter of the twentieth century.

Growth since 1900.—The libraries of land-grant institutions in their development since 1900 fall into three groups. Institutions of the first group have apparently only started on the development of their libraries. In some cases the duties of librarian are even now assigned as an additional duty to a member of the instructing staff. In other cases clerks are employed. The expenditures for books and periodicals in these institutions show little or no increase since 1914, although the cost of books, binding, and periodicals has nearly doubled. The libraries of this group naturally show little use as compared with the growing collections of other institutions. They are still in the status that existed generally in 1890.

Institutions of the second group have started the development of their libraries since 1920. Professional library staffs have been employed, new buildings erected, and library expenditures increased. Louisiana State University was spending less than $6,000 on its library in 1915, but is now allotting $40,500. Iowa State College was spending $20,000 in 1915 and now has a budget of $110,000. Oregon Agricultural College, from $8,500 in 1915, has risen to $46,000 in 1927. The libraries of these institutions have shown encouraging growth. However, since they started their development so recently, their collections have not reached the adequacy of those libraries which had the advantage of many years of more liberal support.

Libraries of the third group, which had had these advantages, started on their modern development early in this century, or even before. During the first 10 years of the century rapid progress was made. In 1910 the University of California was spending more than $46,000 on its library, the University of Illinois more than $62,000, and the University of Nebraska more than $26,000. Since 1910 the development has been greatly accelerated. In 1927 the Universities of California, Minnesota, and Illinois spent considerably more than $200,000 each for library service.

Growth of libraries in these second and third groups is well illustrated by the number of new library buildings. More than three-fourths of the institutions have either erected new buildings or additions within the past 10 years or are planning such buildings.

Increase in use.—The most noteworthy fact in the history of most libraries of land-grant institutions, however, is not the growth in collections of volumes, the increase in expenditures, or in number and size of library buildings, but the increase in use of books. The

need of reading and research material for students and faculty is the underlying cause for the larger collections, the larger buildings, and the larger expenditures.

The increase in use is indicated by the attention given to the library in the catalogue of the institutions. Before 1900, the library was listed incidentally after farms, shops, and museum collections, if, indeed, it was mentioned at all. Now the library is given prominence as one of the important factors in the educational resources of a college.

The number of books loaned for home reading emphasizes more strongly the increasing library requirements of modern education. George A. Works, in his study made of university and college libraries, reported that only 2 out of 18 libraries could give statistics of the number of books loaned in 1900 for home reading.[7] The practice of many libraries may have been similar to that of the University of Michigan, which loaned no books for home reading by students before 1906. At present the average student in many land-grant institutions is borrowing from the library from two to four books a month for home reading, in addition to his use of books within the library building.

College libraries have also been obliged to increase the hours during which they are open. The college catalogue of the past century made almost no statement as to the hours during which their libraries were available for the use of students. Occasionally a note was made that the library is open two or three hours a day. One college annual in 1894 referred humorously to the fact that a mouse, more daring than the college students, ventured into the library and was suffocated. The libraries of the past century were practically never open in the evening. To-day a majority are open 14 hours a day, from 7.30 or 8 in the morning until 10 or 10.30 in the evening. At present the library in many institutions is the one building most used for educational purposes—one to which students go daily.

The increased use in most libraries has been caused by modifications in methods of instruction which demand more and better library service. Instructors are directing their students to the authorative sources of knowledge, rather than restricting them to one textbook. They are encouraged to search for material and methods personally rather than to memorize formulæ or the pages of a single text. These modifications in methods of instruction require libraries whose functions emphasize service to the individual rather than the collection of books for safe preservation or the erection of buildings chiefly as architectural memorials. The question of use has become paramount.

[7] Works, George A., College and university library problems, 1927, p. 123.

This increase in use is not uniform in all institutions. In the first group, those institutions which have not started on the development of their libraries, students apparently do comparatively little reading from library books, borrowing an average of two or three books a year instead of two or three a month. These libraries are closed in the evening and possess meager book collections.

Functions of Libraries

A library of a land-grant institution has five functions, more or less overlapping. These functions are: (1) To aid directly in the instruction of students, both graduate and undergraduate, by supplying reading material, with suitable facilities for its use; (2) to provide for and to aid research by making available the necessary source material; (3) to aid faculty members to familiarize themselves with current developments in their respective fields; (4) to make possible and to encourage general reading by faculty and students; and (5) to aid in the extension service of the institution by supplying printed material and information to persons beyond the campus.

The library in relation to effective teaching.—During the past 25 years the "seminar" method of instruction, formerly used only in graduate colleges, has been extended to undergraduates; reading has replaced much of the instruction formerly given by lectures or study of textbooks. Doctor Meikeljohn, of the University of Wisconsin, has strongly emphasized the importance now given to reading as a means of instruction.

> College men after four years of lecturing are not in the true sense educated men. The most obvious, striking, and universal characteristic of the uneducated graduate of the American college is that he does not read books. We have got to stop the lecture procedure * * * and begin our instruction by reading. In my opinion that is the only fundamental method of instruction.[1]

Extensive reading by college students is largely dependent upon adequate library facilities. It is not surprising, therefore, to find that educators to-day agree that an efficient library is necessary to effective teaching in colleges and universities. The case is well stated by Dr. G. W. Rosenlof as an introduction to his "Library facilities of teacher-training institutions."

> Certainly to-day, we look upon the library as one agency that most truly supplements the work of the teacher in the classroom * * *. Literature, history, science, art, and all the subjects of our curricula, including professional courses in teacher training, to be effectively taught, depend more and more upon unlimited library resources. The textbook will no longer suffice. The college library is now generally admitted the sine qua non of scholarship, both academic and professional. If teaching is to be interesting, virile, and com-

[1] A. L. A. Proceedings, 1928, p. 334.

manding, there will have to be a very complete supplementing of its activities by a live and growing library, properly selected, classified, and administered. If the final test of education is to be measured in terms of general intelligence, efficiency, and high ideals of citizenship, then there is a real place and function for the library in every school, no matter what may be that school's purpose or the type of student it seeks to train.[9]

The library in relation to research.—Progress in a research field depends largely upon a knowledge of what has been accomplished previously in that field. Such knowledge is obtainable from a search of the literature in the field to be covered. An editorial in the Experiment Station Record states:

> The investigator should be familiar with what has been done in his State or elsewhere on the problem he proposes to study. * * * Failure to build upon the past frequently means aimless wandering about in fields previously explored in the same desultory fashion.[10] In 1912, Dr. A. C. True, then director of the Office of Experiment Stations, stated, "A necessary preliminary to all successful research work is the examination of the records of similar or allied work. These records are contained in books and periodicals."[11]

The function of the library in its aid to research is to make available these records of the past. The book collections are fully as important as the laboratories. The work of a library is not confined merely to the collection of suitable material. Such material must be indexed, adequate arrangements must be made for its use, and material not locally available must be located elsewhere and borrowed. These processes are essential to a successful research program.

The library in relation to intellectual development of the individual instructor.—For the continued effectiveness of a teacher, intellectual growth is essential. An instructor can not teach adequately the subject matter in his field unless he knows the recent developments in that field and the changes which are taking place, whether such developments are published in English or in foreign journals. To acquaint himself with progress in his field he requires not only the latest books but, even more, the periodical publications. Unless he uses such material he will be teaching the subject matter of his own school days rather than that of to-day. This statement holds especially in the fields of the pure and applied sciences.

An illustration of the need for periodical literature is the attempt of Profs. P. L. K. and E. M. Gross to ascertain for the field of chemistry what files of scientific periodicals are needed "in a college library successfully to prepare the student for advanced work, taking into consideration also those materials necessary for the stimulation and intellectual development of the faculty."[12] As a result of their

[9] Rosenlof, G. W., Library facilities of teacher-training institutions, 1929, p. 7.
[10] Experiment Station Record, 55: 303, September, 1926.
[11] A. L. A. Proceedings, 1912, p. 334.
[12] Science, 66: 386–387, 1927.

study they listed 28 scientific periodicals which they believe necessary to the chemist not only in a university with a graduate school but also in a small undergraduate college. The subscriptions to some of these journals vary from $50 to $100 per year and are beyond the financial resources of the average instructor. Unless the library supplies this type of material as well as books many in the teaching staff will be deprived of sources of knowledge that are essential to their progress.

Dr. F. A. Ogg, in speaking of college libraries, states:

> A more generous outlay of money is required to make them very much better than they are; and it is a matter of simple fairness to the scholars who are in the service of the institutions concerned, as well as a necessary guarantee of higher quality of that service, to do all that can possibly be done to enrich their opportunities for a fruitful intellectual life."

The library in relation to general reading of students.—The importance of general reading has received considerable emphasis during the past few years. Wide reading by college students has been urged not only as a necessary means of gaining adequate knowledge of any subject, but also as the most important means of broadening interests and establishing lasting reading habits—the most important contributions a college can make to the liberal education of the individual. President Glenn Frank stated in 1927, "Even though a man have as many degrees as a thermometer, even though he be graduated with the highest of honors, he is grossly uneducated if he halts his reading and learning with his graduation. * * * The best thing the university can do for the 'rah rah college man' is to waken in him a zest for thinking and the habit of reading."[14] Many an individual owes the inspiration which directed his career to the incidental reading of a book.

It is an important function of a library to purchase and supply books for general reading. But its duty does not end there. It should use every means possible to encourage the reading of such books. They should be so placed that students can see them and handle them. They should be made "easy to use." Special shelves or special rooms should be reserved for books of general interest. All new books of this kind that are added to the library should be displayed for a week or two where all can examine them.

The library in relation to the State at large.—The land-grant institutions are publicly supported. The citizens of a State regard it as their institution and as a source of aid on many and various problems. Extension services were established in recognition of this fact. In extension courses, which require reading, study, and research, the library has an opportunity to render valuable assistance by extend-

[13] Ogg, F. A., Research in the humanistic and social sciences, 1928, p. 365.
[14] A. L. A. Proceedings, 1928, p. 334.

ing its service beyond the campus. In most cases its aid will take the form of cooperating with the extension and home-study departments, having material that is readily available as it is needed. However, it would not be fulfilling its complete function if it simply cooperated with these departments. Individuals who are not undertaking systematic training may have need of library facilities. This assistance consists of the loan by mail of books and pamphlets directly to groups, such as debating teams and women's clubs, study groups of any sort, or to industrial concerns that are conducting research investigations.

The service of this type that the library of a land-grant institution can render will depend greatly on the local library conditions in the State. In any State, however, the State college library has or should possess material, especially in the fields of agriculture and engineering, that would, if made available, afford most excellent facilities for educational advancement to many citizens and organizations of the State. The information desired may be supplied directly to individuals or by loans through local libraries or through county agents. The extension services have to a considerable degree successfully taken the college to the people. The library has a similar function independently and in cooperation with the extension services.

Summary—Importance of library.—The necessity of an efficient library for effective instruction, for research and investigation, for the intellectual growth of the faculty, and for general reading is generally recognized by those of high standing in the educational field and is accepted as fundamental in this survey. There is general agreement as to the position of the library as the heart of the college. The object of this study, therefore, is not to justify this conception of the library but rather to ascertain the present status of libraries in land-grant institutions and the means and methods necessary to obtain and maintain efficient library service in these institutions.

Requirements for Good Library Service

A library, to function effectively, requires an understanding by college administrators of the following necessary conditions: (1) Adequate book collections, (2) suitable buildings and equipment, (3) satisfactory relationships of library to institutional administration and to faculty, (4) competent and sufficient library personnel, and (5) adequate financial support.

These requirements are not new. All were emphasized, for example, in the reports of the librarian of the University of Illinois in 1894 and, in part, in reports of Kansas State Agricultural College

and Louisiana State University some years earlier. They were again emphasized by Dr. A. C. True in 1912. Where they prevail, the library is the actual center of the intellectual life of the institution.

The data collected in the survey were used to ascertain in so far as possible (1) the extent to which the libraries of the land-grant colleges are meeting the requirements mentioned, and (2) recommended methods by which the requirements may be met. In the following section of this report the actual use made of libraries at the present time is given first consideration as a necessary introduction to successive studies of books, buildings, administrative control, personnel, and financial support. The term instructor is used in this report to signify any member of the instructing staff.

Chapter II.—Usability of Libraries

Use of Books the Sole Purpose of Libraries

The efficiency of a library is measured by the service which it renders to faculty and students. Librarians understand—what was not understood 50 years ago—that large book collections, well-arranged buildings, scholarly and willing personnel are essential solely in order that books may be used. Measurements of the actual use of the libraries included in this survey are statistically possible. Such measurements as were reported or otherwise ascertained provide the basis for the conclusions reached and the recommendations made for improvement of service. The measurements are considered in succeeding paragraphs in terms of (1) proportion of students using the library daily, (2) loans for home reading, (3) books for assigned reading, (4) number of interlibrary loans, and (5) seating capacity and utilization of seats.

Measurements of Use

Proportion of students using the library.—The number of individuals who use the library is an indication of the quantity and perhaps also of the quality of service. On account of the work involved actual count was not requested in the survey. A few libraries, however, reported statistics. Excluding students who come for classes or for "dating" parties, one librarian reported that the average student used the library four times a week. Another institution reported an average of six times per week. These figures can be used by any institution as a basis for comparison with the attendance in its own library. The two reporting libraries represent a high standard of use, judged by the figures reported of books loaned for home reading and use of seating capacity, both of which are far above average. The figures, therefore, may be taken as a tentative standard. It should be noted in addition that these two libraries are open 13 and 14 hours a day, respectively. A personal examination of some other libraries justifies the statement that the attendance of students at these libraries is generally far less than that of the two reporting libraries. This conclusion is further strengthened by the fact that these other libraries are open 7 hours per day, instead of 14, and are closed during most or all of the evening hours when students are most free to use books.

Number of books borrowed for home reading, not overnight use.—Data were requested as to the number of books loaned for reading outside of the library building, excluding books borrowed solely for overnight use. In order to obtain figures which would be somewhat comparable for the various institutions, the number of books loaned at each reporting institution was divided by the number of full-time students at the institution. The results are given in Table 1. The figures obtained are, it is true, a general rather than an exact criterion of the use of the libraries and of the reading by students. Not all books loaned by a library are loaned to students. Nevertheless, as the basis is the same for all institutions, the results have certain significance, especially in the extreme cases of loans less than an average of 7 a year by each student or greater than 15, figured on the basis of the total number of books loaned divided by the total number of full-time students. The average number of books loaned each student by the various institutions varied from 3 to 33 a year. The average was 12.

TABLE 1.—*Total number of books loaned per year, excluding overnight loans, divided by number of students enrolled*[1] *as of October 31, 1927*

Institution	Number of students	Number of books loaned	Number loaned per student
Alabama Polytechnic Institute	1,610	10,900	7
University of Arizona	1,740	16,275	9
University of California	17,005	204,049	12
Colorado Agricultural College	1,160	15,296	13
University of Delaware	707	19,310	27
University of Florida	1,904	20,625	11
University of Hawaii	666	18,701	28
University of Idaho	1,912	25,422	14
University of Illinois	12,033	165,131	14
Purdue University	3,623	36,558	10
Iowa State College	4,033	80,978	20
University of Kentucky	2,393	23,421	10
Louisiana State University	1,970	10,805	5
University of Maine	1,346	16,922	13
Massachusetts Agricultural College	593	9,659	16
Massachusetts Institute of Technology	2,712	35,929	13
Michigan State College	2,741	19,945	7
University of Minnesota	11,050	60,090	5
Mississippi Agricultural and Mechanical College	1,397	11,856	8
Montana State College	905	4,495	5
University of New Hampshire	1,658	36,338	22
Cornell University	5,671	45,509	8
North Carolina State College	1,432	11,208	8
North Dakota Agricultural College	1,059	12,283	11
Ohio State University	10,183	63,361	6
Pennsylvania State College	3,854	43,675	11
Rhode Island State College	626	1,500	3
Clemson Agricultural College	1,212	9,600	8
University of Tennessee	2,725	34,258	13
Virginia Agricultural and Mechanical College	1,251	19,841	16
West Virginia University	2,459	27,791	11
University of Wyoming	1,044	34,418	33

[1] The number of students was taken from U. S. Bureau of Education Bulletin, 1929, No. 13, p. 30.

A comparison of financial expenditures for libraries with the number of books loaned for home reading was made in order to determine if any relationship existed. The expenditures were reduced to an average for each student in order to form a basis for comparison. Nine of the 14 institutions that expended annually less than $12 per student for library purposes showed an average loan of 8⅓ volumes per student per year. The remaining 5 could not report the number of such loans. The average number of loans to the average student by 6 institutions—Massachusetts Agricultural College, University of Hawaii, Iowa State College, Universities of Tennessee, Wyoming, and Illinois—which reported annual library expenditures of more than $20 per student was 20 volumes per annum. In certain of these institutions the average student withdrew from five to ten times as many books a year as is the case of the group with the lowest expenditures. Two of the three institutions with the lowest average number of loans for each student were also the lowest in financial support. although other factors than expenditures influence the use of the library by students, it is apparent that the amount of expenditure bears some relationship to use.

Too definite conclusions can not be drawn solely from the number of books loaned. Several factors may affect such loans. A large number of departmental libraries may lessen the withdrawal of books for home use. Also, it may be assumed that inadequate library buildings with limited seating capacity would increase the number of books borrowed, while on the other hand adequate seating facilities would lessen the necessity of withdrawal of books for use outside the building. This supposition does not seem to hold true. Five libraries with known inadequate facilities as to library buildings and also with limited financial support showed an average loan of fewer than 7 volumes per student as compared with an average of more than 12 for the whole group of land-grant colleges. It is apparent that inadequate buildings, as well as lack of financial support, are associated with relatively slight use of books. On the other hand, four of the six institutions mentioned above, with loans per student much above the average, have recently erected new buildings.

Amount of assigned reading.—The number of books withheld from circulation for assigned reading in the library may provide a rough indication of the use of books in a library. It might be supposed that a large number would cause a decrease in the loan of books for home use. The opposite is true. In the six institutions previously mentioned with annual expenditures of more than $20 per student and with average loans per student of 20 volumes per annum, an average of 90 books was on reserve for each 100 students. In the eight institutions with annual expenditures less than $11 per student and with average loans of 7⅓ volumes per student, 60 books were on

reserve for each 100 students. Indeed, if Kansas State Agricultural College, which seems to have developed extensive use of its library with limited financial resources is excepted, the books in the assigned reading room for the second group is fewer than 50 per 100 students—not much more than one-half as many as in the case of the libraries in the first group. Libraries, in general, with loans of books above average have also a greater number of books available for assigned reading per student than do the libraries with loans below average.

Use shown by books borrowed from other libraries.—The number of books borrowed from other institutions also gives some indication of the use of library material in a given institution. A library with inadequate collections would ordinarily, it would be supposed, need to borrow much more material from other libraries than would institutions with strong collections. This supposition also proves to be contrary to the facts. Institutions borrowing more than 200 volumes each in 1927–28 from other libraries were University of Illinois, Iowa and Kansas State Colleges, Massachusetts Institute of Technology, Universities of Minnesota, Missouri, New Hampshire, and Ohio State. These are chiefly institutions, in so far as the libraries reported figures, with the stronger collections and with use of their own collections generally much above average. On the other hand, the seven colleges which reported loans much below average and also with book resources known to be most limited borrowed an average of eight books per year from other institutions. Again it is apparent that faculties in this latter group are not using published material as are the faculties in the first group, even after allowances are made for the size of the institutions.

The inference seems logical that a number of libraries are not supplying material which is demanded of libraries in other land-grant institutions. Possibly the faculties in the institutions of the second group have become discouraged in their attempts to obtain material, or possibly they are content with poor library service and lack of material. If the latter is the case, the quality of the instruction may be open to question.

Ratio between seating capacity of library and number of students—Exhaustion of seating capacity.—Some indication of the use of libraries may be obtained from the number of available seats in proportion to the number of students, compared with reports as to whether seating capacity is sufficient. The University of Florida, with one seat for every five students, reports crowding at certain periods, especially in the evening. Iowa State College, with a ratio of one seat for every eight students enrolled (560 seats for 4,200 students), reports all seats filled at times. Oregon Agricultural College, with the same percentage (480 seats for 3,780 students), also reports seating capacity not sufficient at peak times; University of

Hawaii has 152 seats for 840 students (one seat for 6 enrolled students). These institutions are above average in loans.

On the other hand institutions reporting loans far below average show in cases where reports are made: (*a*) 1 seat for 21 students; (*b*) 1 seat for 12 students; (*c*) 1 seat for 10 students; (*d*) 1 seat for 11 students; and (*e*) 1 seat for 14 students. This group has also few or no departmental libraries, while most libraries of the first group mentioned supplement their central library by additional seats in departmental reading rooms.

It appears that libraries with limited use as shown by loans have, in general, limited seating capacity within the library buildings.

Summary

These five tests of the use of libraries, considered independently, do not seem to give an adequate basis for definite conclusions. A consideration, however, of all these criteria taken together reveal certain facts which are significant. One group has loans much above average (20 per annum). A second is much below the average in books loaned to each student for home reading (7 per annum). Institutions in the second group also have fewer books available for assigned reading for each student than have those in the first group. In addition, their borrowings from other libraries are small, and the seating capacity of their libraries is less than 1 to every 10 students enrolled. New library buildings are noteworthy in the first group but are lacking in the second. In each of these five tests every library in the first group, in so far as figures are reported, ranks higher than any library in the second group. Objection may be made to the absolute validity of any one of these tests, yet the fact that certain institutions are much above average and that other institutions are much below average in every one of these tests can not be attributed to chance. This fact is emphasized further by the fact that the average expenditure per student for library purposes for institutions in the first group is more than double the expenditure in the second group.

The inability of many librarians to give statistics of the use of their libraries is noted later in this report. Several did not report the number of loans of books to students, the amount of interlibrary loans, and the seating capacity. The following conclusions are based on the data submitted: (1) Certain land-grant institutions show indications of comparatively little use of the library by the average student; and (2) a definite relationship exists between lack of use and financial support. Libraries with small use showed average library expenditures of less than $11 per student; libraries with use well above average had expenditures of more than $20 per student.

Chapter III.—Methods of Facilitating Use

While in general the lack of use of most libraries of land-grant institutions is due to inadequate financial support, which results in inadequate books, buildings, and personnel, the data collected for this survey by questionnaires and personal visits indicate some practices in various libraries which tend directly to increase or to discourage the use of books. These methods deserve consideration, independent of the question of books, buildings, and personnel.

The card catalogue and the delivery and reference desks are the most important points of contact between the reader and the library. Such subjects as instruction in use of books and special aids to research workers also demand some attention.

Use of Card Catalogue

"*Look it up in the catalogue.*"—The average student in the land-grant institution does not know how to use a card catalogue. Raymond L. Walkley in a study made of the knowledge of students in regard to use of books and libraries reported:

> Out of 343 freshmen, only 163 claimed any previous acquaintance with either card catalogue, Dewey classification, or magazine index; only 40 per cent had ever used a library card catalogue, less than 15 per cent knew what the Dewey classification meant, and only 20 per cent had used magazine indexes.[15]

A personal observation at loan desks of several institutions revealed the fact that the not uncommon reply to an inquiry for a definite book was "Look up the call number in the catalogue." Several of these students were followed to watch results. Generally, they went to the catalogue, were unable to find what they desired, and left the library without either the desired material or encouragement to make future use of the library. The material, nevertheless, was there. In several cases the comment was heard, "I never can find anything in this library."

In view of the inability of students to use the card catalogue as an effective tool, one of the clear indications of poor library service is the conventional phrase, "Look it up in the catalogue." If a student can be given some assistance at the beginning of his college course, he will be able to help himself later. Otherwise, the probabilities are that the library catalogue may be an unknown tool to him throughout his life.

[15] Library Journal, 45: 775–777, Sept. 15, 1924.

Dr. D. A. Robertson, of the American Council on Education, notes at the University of Richmond the frank and friendly resort of students for suggestions and assistance to a library attendant.[16] The John Crerar Library has had for 20 years an assistant whose special duty it is to assist readers in the use of the card catalogue. The information desk in the New York Public Library is well known. The University of Illinois has an information desk with an assistant whose special duty it is to show readers how to use the catalogue. Iowa State College has started such a service. In a large institution a special assistant for this work will prove invaluable. In the smaller institutions a sufficient staff at the loan desk can perform this service.

Efficiency of Catalogues

Satisfactory use of the catalogue requires that it be an efficient tool. Too often it is not. Three books on farm engines of about the same scope were entered in one catalogue under three different headings—Farm engines, Agricultural engineering, Gas engines—with no references to guide the seeker from one heading to another. Any reader might have found one of the three books; it is doubtful if he would have found all three. A special assistant at the catalogue of the larger libraries, or the loan assistant in the smaller, may be as valuable in informing the cataloguing staff of the needs of readers as in interpreting the catalogue to readers.

It is due to the Library of Congress that the catalogue is as efficient as it is. For the past 30 years, printed cards have been available, making it possible for libraries to secure at far less cost card records which are more satisfactory in accuracy and scholarship than any which they can produce independently. The large use of these cards by land-grant colleges is indicative both of the extent to which they are attempting to maintain the effectiveness of their catalogues and also of the value of the service rendered. Only three institutions report that they are not obtaining Library of Congress cards for at least 50 per cent of their accessions. One institution reports it obtained cards for 99.8 per cent of its accessions. Three institutions report 95 per cent, and several others 90 per cent. The larger institutions that are purchasing considerable material in foreign languages report the lowest percentage of printed cards obtained. The University of Illinois receives only 50 per cent, Ohio State 54 per cent, Cornell about the same. An examination in one library of titles for which printed cards are not available reveals the fact that the greater proportion of such titles are in foreign languages. It is apparent that many libraries are cataloguing independently the same titles in foreign languages. To this extent work is duplicated.

[16] "The college library." Educational Record, 10: 22–23, January, 1920.

If arrangements could be made to enable the Library of Congress to print cards more generally for publications not in its own collections but available in university libraries, many assistants in land-grant institutions could be released for necessary work in other library departments, and in addition the accuracy of the catalogue would be improved.

The fact that the income from the sale of cards reverts to the Federal Government presents difficulties in the more general printing of catalogue cards by the Library of Congress. The proceeds from the sales of cards go directly to the Treasury Department. Increased sales involve increased expense to the Library of Congress, with no compensation from the sales. A change in the Federal statutes which would permit receipts from the sales of cards to be used for printing would seem desirable.

Not only the question of sales, but also the entire subject of cooperative cataloguing needs intensive study. This question has been often discussed in library circles but does not seem to have received effective consideration. The increasing need of some study is shown by the fact that the annual number of additions to land-grant college and other libraries of publications in foreign languages is increasing rapidly. T. F. Currier, of Harvard College, states the problem as follows:

> The question that the investigation must answer is this: Can practicable methods be introduced further to centralize cataloguing? If so, who is to be responsible for managing the proposition on a sound financial basis, the American Library Association, a committee of librarians, or a commercial firm in it for profit?[17]

Instruction in Use of Libraries and Books

To freshmen.—The inability of many college freshmen to use card catalogues and library indexes has been noted in a previous paragraph. In order to familiarize them more quickly with the use of books and library tools, some class instruction has been given to freshmen at many land-grant institutions. The form and extent of this instruction vary greatly. The principal argument for it is that the use of books can be taught more economically and satisfactorily to students in groups than to individual students as they come to the desk for help with their problems.

Only two institutions are giving such instruction to all freshmen as required courses. One of the two requires one hour for six weeks, using primarily assignments of problems. In the second, instruction is given one hour every other week for the first semester. In addition, the College of Arts and Sciences in the University of Mary-

[17] Currier, T. F., Extension of centralized cataloguing. Library Journal, May 15, 1929, p. 438.

land requires one hour each week of library instruction for a semester. The Women's College of Rutgers University has a required course.

The universities of New Hampshire, Minnesota, Illinois, and Pennsylvania State College have elective courses of one or two hours for a semester. It is obvious, however, that elective courses do not meet the requirements, because such courses are not elected usually by those who need the instruction most. Required instruction for a few hours for all freshmen would seem preferable to one or two quarter or semester hours as an elective. Seven colleges note that instruction is given by the English department as part of the regular work. Three colleges have recently dropped courses by the library staff and substituted instruction by the English department as part of the course in freshman English. The reason given in one reply to the questionnaire is as follows:

> Funds were not available for the hiring of an additional staff member, and the librarian recommended that the course be discontinued if such help could not be furnished, as we were forced to neglect the regular work of the library if we continued to carry on a creditable scholarly course. The English department is now introducing a few lectures on the use of some of the more important reference books in the library.

In view of the diversity of practice in regard to instruction in the use of the library, it is desirable to attempt to state the objectives of this instruction and to determine the most effective means of attaining them. W. F. Headley, professor of education at Carleton College, states:

> Every freshman should make it his early business to find his way among the materials of his college library as much as among the buildings on his campus. A few hours given to a study of the library and its use will save him untold time and anxiety, render more efficient his work in every course, and stamp upon him for life one of the marks of a scholar.[18]

The attempts of many colleges to provide some instruction in these tools indicate that the need is realized.

Tests have shown that college students are not sufficiently familiar with library tools to enable them to find bibliographic material needed in their courses. Freshmen should acquire early in their college course the ability to use periodical indexes, such as Readers' Guide, Engineering or Agricultural indexes, the most common encyclopædias and reference books, and the card catalogue. They should be familiar with such works as Murray's Oxford Dictionary, Stevenson's Home Book of Verse, Granger's Index to Poetry, dictionaries of quotations, and statistical abstracts. The objectives of such instruction are to enable the student to use with ease the card catalogue and the more common bibliographic tools.

[18] A. L. A. Education Committee, School Library Yearbook, No. 1, 1927, p. 99.

The means generally used to attain these objectives are not entirely satisfactory. A lecture or two during freshman week may be valuable as a means of familiarizing the students with the library building. At this time instruction in regard to the use of definite books does not seem feasible. Neither are lectures alone a satisfactory method of instruction. A study was made of the results of a lecture to 30 students on the use of a library building as compared with results obtained by the assignment of a problem requiring the use of the building given to another section of 31 students. In an examination the following week, 28 of the 30 students using the lecture method failed to average 50 per cent. In the examination of the second section following the completion of the problem, 29 of the 31 students averaged more than 50 per cent.

The purposes of this instruction can be accomplished by the assignment of certain definite library problems to all freshmen, to be worked out as laboratory exercises. The problems will require the examination by each student of the catalogue and the most important reference books. Typical problems can be found in the School Library Yearbook for 1927. The students should meet in small sections for preliminary direction and should do their work under supervision. No fewer than four nor more than six problems would seem necessary. This work might well be incorporated in other courses, such as the freshman orientation courses or freshman English, but direction and supervision should be given by professional members of the library staff. Librarians should be familiar, far more than other members of the faculty, with the difficulties of students in the use of the library. For satisfactory instruction in most land-grant institutions, both a careful scheduling of sections to avoid overcrowding of the library and a strengthening of the library staff will be necessary.

Instruction in Use of Books

To graduate students.—The need for familiarity with bibliographic tools is not confined entirely to freshman. A knowledge of source material is essential to satisfactory instruction in the graduate college. Discussions with many graduate students and a cursory examination of some theses indicate clearly that there are many students in land-grant colleges who are not acquainted with the important indexes and abstracts in their own field. Master's examinations at one institution revealed recently (*a*) a candidate, minoring in psychology, who was unaware of the Psychological Index; (*b*) candidates in agriculture who did not know of the compilation of "Classified list of projects of the agricultural experiment stations"; (*c*) a candidate in sociology who did not know the defintion of a legal code nor the difference between primary and secondary sources.

The lack of knowledge of bibliographic sources is the chief cause of many "blind" citations, which can not be identified. Anyone who has attempted to verify references in master's and doctor's theses of many land-grant institutions will realize the difficulties in identification of citations. An attempt to identify six misstated references to bibliographic sources revealed the fact that in all the cases the individuals in charge of the major work could not identify the references. In three cases the authors could not identify the references which they themselves had made. Some faculty members also show a lack of knowledge of bibliographic sources. An assistant professor in home economics hunted in vain for a bulletin of the "United States Dental Association," only to learn eventually that she had misinterpreted the abbreviation "U. S. D. A."

To familiarize graduate students with bibliographic tools, certain institutions are giving special courses for graduates and advanced students in the use of research material. The University of Illinois requires a course on the use of chemical literature for those majoring in chemistry. The Massachusetts Institute of Technology has courses in chemical literature and chemical library technique. Ohio State University offers a course in bibliography of social science. Iowa State College has given special courses in subject bibliography to graduate students which were elected by 80 students in 1928. Many courses in various departments at the University of Chicago in the use of source material are listed in its catalogue. It is probable that many other institutions are giving similar instruction through seminars. The number of such courses is increasing rapidly in American universities. They should be definite aids in acquainting graduate students with the literature of their subjects and with bibliographic methods. In certain universities instruction is given by departments; in a few universities, by members of the library staff.

Graduate courses on bibliographic subjects are not given, however, in many of the graduate colleges of land-grant institutions. Departments in many land-grant institutions can facilitate and improve the work of their graduate students by giving instruction of this kind. This instruction can be given in formal courses or in seminars. At the University of Illinois bibliographic courses in chemistry have been given by the librarian of the chemistry department. The library staff in most land-grant institutions is not at present qualified to engage actively in this instruction. The addition to the library staff of specialists in certain fields of knowledge would remove this disqualification.

Instruction in Use of Libraries

To prospective teachers.—Another phase of instruction in use of the library is concerned with the familiarity of prospective teachers with

books and libraries. A county superintendent in an unpublished address stated the case as follows:

> Students go through high school with little knowledge of books and how to use them. The colleges give them no instruction. Graduates accept teaching positions still ignorant of the part books and reading should play in the educational objectives of the modern school. It is a vicious circle.

A further need for instruction in the use of books is shown by the fact that certain teachers, especially in the more thinly populated States, are and will be required to serve as part-time librarians, until more rigid requirements for school librarians are in force. If such teachers are to possess any knowledge of library methods, the information must in many cases be obtained during their college course. Even one or two elementary courses in librarianship offered for a few hours would be of decided assistance.

The Carnegie Foundation for the Advancement of Teaching recommends for prospective teachers the requirement of a course in the use of libraries for one hour a week for a term. "There can be little doubt that the work is important enough to merit a separate course that may well be a constant in all curricula and given soon after the student enters the school."[19]

Ten land-grant institutions are offering such courses, but in no institution are the courses required by the school or college of education. In several cases instruction is given only in the summer session. The failure to give courses in the use of libraries and books may be due to the fact that few library staffs at present are fully qualified in education or sufficient in numbers to teach these courses. The fact, however, that the library staff may not be qualified is no reason for the omission of courses deemed desirable or necessary, but is a justification for a strengthening of the staff.

As a preparation for teaching, a greater knowledge of the use of books as a means of instruction in secondary schools is desirable. Schools of education should recognize the growing importance of such knowledge, either by a required course as recommended by the Carnegie Foundation or by some other effective means.

Delivery or Supply of Books to Readers

The not uncommon direction to a user of a library to "Look it up in the catalogue" has served to introduce a somewhat extended discussion of the card catalogue and instruction in the use of the resources of a library. A whole series of other standardized replies used by many loan-desk assistants deserves some attention in the consideration of the supply of books to readers. A few minutes

[19] Carnegie Foundation for the Advancement of Teaching. Bulletin 14. The professional preparation of teachers for American public schools, 1930, p. 246.

spent at the loan desks of many libraries will reveal difficulties experienced by readers and students. Much more assistance, much more encouragement to use of libraries, and much more service to efficient instruction would follow the substitution of informational replies for the mechanical ones now frequently given. "The attendant (or I) will show you how to find it in the catalogue"; "If you need this special book, we will call it in for you"; "The magazine went to the bindery three weeks ago and should be back next week. If you are in urgent need, we will rush it"; "The book can not be found, but we are ordering another copy, which should be here next week." Instructions to loan-desk assistants to give some such replies would create a decidedly different attitude on the part of faculty and students toward the library. It is presupposed that the promise will be fulfilled.

Prof. C. B. Joeckel, of the University of Michigan, himself a librarian, referring to "occasions where we librarians cease to serve others and are ourselves patrons," tactfully states the case as follows:

> Some of the most humiliating experiences I have ever had have been at times when some precise and efficient young woman has answered politely every question I had intelligence enough to ask and has still left me in complete ignorance of what I really wanted to know. Such individuals, whether they be loan assistants or counter clerks for public utilities or railroad information assistants or what not, have not passed beyond the eye-for-an-eye or the tooth-for-a-tooth stage.[20]

Some of these difficulties in the use of libraries have been given little attention in library publications. No statistics of unsatisfactory use have been published. Nevertheless, such matters are believed to be of major importance to the individual user for whom college libraries are primarily intended—the ordinary everyday student. An interesting case study might be made of the results of stereotyped replies made by loan-desk assistants. The lack of determination to obtain for a reader the book he requests and the lack of personal interest in the individual reader are two of the greatest detriments to good library service to-day. An observation of the work at the loan desks of many libraries will disclose this fact.

Proportion of requests not supplied.—What proportion of books called for at the loan desk is not supplied? Twenty-six institutions reported that over one-third of the books called for were not supplied; of 3,953 calls, 2,501 were supplied and 1,452 were not supplied. The proportion seems large. Of the 1,452 calls not supplied, 474 were, however, in the assigned reading room and presumably available, which reduces the number to 978—about one-fourth of the total

[20] Library Journal, 54: 527, June 15, 1929.

called for. The chief reason for the nonsupply of books was the fact that books called for were charged out to other readers.

The reply, "The book is out."—One of the most annoying features to a user of a library, second in importance only to the reply, "Look it up in the catalogue," is to be told a book is "out." Such a reply without additional information is not uncommon. In public libraries it is of little advantage to know who has the book; in colleges and universities this information may be invaluable, especially in cases where absent-minded professors refer students to the library for books which the professors themselves have personally withdrawn. Only a few libraries report a consistent practice of notifying the student of the name of the individual who has the desired book or of offering to call in any book charged out for over two weeks.

Reports have been made of books locked up in professors' offices for months (years in several cases) and unavailable for students or junior members of the faculty. Twelve institutions report collections of books charged out to professors for more than a year; in some cases, 6, 7, and 8 years. Complaints by graduate students of books locked up in offices and unavailable have been noted. Extensive loans for long periods affect service to many readers and are a serious detriment to use of books. Although nearly all libraries reported that books charged out are recalled once a year or more often, yet many of these libraries showed the inconsistent practice of permitting many books to remain charged out for several years. A book is certainly of more value if being read by a student than if it is lying idle on a shelf in some office.

A few libraries report a remedy for these conditions. The University of California, for example, has the rule that if a book requested is "out," the name of the borrower will be given and an offer made to call the volume in, if it has been loaned for any considerable period. On the other hand, a loan-desk assistant in another library stated, "We would never think of recalling a book from a professor for a student."

There is apparently a need of a more strenuous effort on the part of libraries to give the student or the instructor the book desired.

"The book is lost." Charges for lost books.—Another annoying reply to an inquirer for books is the conventional phrase, "The book can not be found," or "The book is lost." The loss of books presents more than financial difficulties. It results in the inability of readers to obtain books when needed. Losses are a serious detriment to library service. Charges for books lost by students and faculty have proved a decided aid in effecting more prompt return of books and a reduction in the number lost. After a rigid system of charges was put into effect, one professor returned to a library

more than 100 books which he previously had reported he could not find.

It is more than futile to charge for lost books unless these charges are collected. One librarian reported that her library charged for lost books but never collected. Thirty-three out of 48 institutions reported that they charged faculty members for lost books. In most cases, however, no satisfactory methods were noted of collecting such charges. In 14 cases out of 48 bills were rendered by the treasurer or business manager. This method is apparently effective. Washington State College reports the following practice. The departments are held responsible for the return of the books. Inventory is taken once a year. "If the faculty member does not promptly pay for losses incurred, the matter is referred to the bursar to collect out of last month's salary."

Charges to students were collected in 10 institutions through the treasurer's bills, in 20 through withholding of grades, and in 12 by charges against student deposits previously made. To avoid the billing of small accounts, charges in many cases were held in the library until the amount of such charges was 50 cents or more.

Many of the difficulties caused by "lost books" will be removed if charges for such books, whether against faculty or students, be forwarded to the treasurer and collected exactly in the same manner as other institutional bills. This method of collection is recommended.

"*The book is being bound*," "*The book has been ordered*," "*The book can not be taken from the library*."—Librarians and faculty disagree as to the hindrance to service caused by the withdrawal of material for binding. Librarians in general reported few calls for magazines at the bindery and gave in only six cases the requested figures for calls during one average day for magazines withdrawn for bindery but not yet forwarded. One library reported 17 called for in one day and 16 supplied. Most of the others reported "No demand," "Rarely called for," etc. Less than one-half of the institutions knew the average length of time books were at the bindery. Yet in the reported tests made at one loan desk, 10 per cent of the material requested and not supplied was due to the withdrawal of publications from the shelves for binding. Furthermore, 170 members of the faculties of the institutions (about one-third of those reporting) stated "delay at the bindery" as being an important cause of difficulties in their use of library facilities. Obviously many librarians do not appreciate the difficulties caused library users by the withdrawal of material for binding. Binding is essential, but the time required can undoubtedly be reduced at many institutions.

Nine institutions have their binding done by contract, in four cases through a State department under State law or by State printer.

The time at bindery of all reporting ranged from four weeks to three months, the average being between five and six weeks. Books bound under contract required over eight weeks on the average. The awarding of binding by contract through price competition does not seem to produce the best service either in regard to speed of binding or of quality of the work. If contracts are necessary, fully as much attention should be paid to length of time required and the quality of work done as is paid to price. Poor binding and long delays are expensive in any case.

Delays in ordering of books are noted by faculty members in a few cases, but not as important factors. The University of California loans books awaiting cataloguing. Another institution reports that any book which is in process of cataloguing and needed by a reader will be made available in 24 hours. A third library, however, replied to a reader who urgently needed a certain publication that "the book is being catalogued, and we don't know when it will be available."

The use of certain material, such as popular periodicals and reference books, etc., is so great that such material is needed in the library constantly. The fact that these publications are unavailable for home or office use is at times a hindrance to the use of books. Some libraries have purchased additional copies of popular magazines and have duplicated material such as census reports, etc., for circulation. This procedure makes available the most used publications for use outside of the library building. This duplication is at least in some cases not expensive and may prove an effective aid in the use of books.

The failures to meet requests because of books withdrawn for binding, books not available on account of cataloguing, and books too popular to loan, are further instances of the need for more consideration for the individual reader. The effectiveness of many libraries can be increased by speeding up the binding and ordering of books, by loaning books even if in process of cataloguing, and by making available for home or office use duplicates of certain inexpensive material.

Speed in delivering books to readers.—Of the 26 institutions reporting on the time required to supply books to readers, 14 filled over one-half the requests within two minutes. The institutions with the larger collections of books naturally required more time. In all the institutions, three-fourths of the material was supplied within three minutes. The complaints often heard that service at the loan desk is too slow do not seem to be justified by the data submitted.

Telephone and Messenger Service

The use of the telephone and the delivery of books to faculty members by messenger service show a great variation in land-grant

institutions. A few complaints of failure to obtain information from the library over the telephone were noted. Three institutions indicated telephone calls for library service in excess of 30 a day. Twelve stated that books were customarily delivered by messenger. Other institutions reported no telephone or messenger service.

The time of faculty members and research workers is valuable. It is much more valuable than the time required of a student assistant to answer telephone calls or to deliver books. These services in some institutions have been commended by faculty members as being distinct aids to the use of libraries.

Assigned Readings

Books assigned but not supplied.—The assignment by instructors of certain books for required reading is not a recent development, but its wide extension to many departments of instruction is an expansion of the past 10 years. At present all college libraries are making special provisions for such assignments; in the large institutions by the use of special rooms known as the assigned or required reading rooms.

Upon the basis of the reports of libraries that were able to furnish figures, it would seem that the number of books needed for required reading has doubled in the past few years. The University of Tennessee reported an increase from 600 in 1923 to 1,800 in 1928; Rutgers from 1,000 in 1925 to 2,200 in 1928; Montana State College from 50 in 1914 to 500 in 1928. It is probable that such use has not reached its maximum in most land-grant institutions and will continue to increase as instructing methods change and efficiency of library service increases.

The use of textbooks as a sole means of instruction is becoming obsolete. Of 598 instructors, 573 stated that they used in their nonlaboratory courses as a method of instruction, assigned topics and references to library books.

The great increase in assigned readings which has already arisen has caused immediate difficulties in the use of books by students. The data submitted for this survey indicate clearly that these difficulties are caused by three factors: (1) Failure of instructors to notify the library of their assignments to classes of books for required reading; (2) lack of funds for purchase of necessary books; and (3) assignment by instructors of rare and out-of-print books. Of these three factors, the first is by far the most important.

Dean Charters, in an address before the faculty of one land-grant institution, referred as a matter of good instruction to the necessity for each instructor to ascertain that the library material to which he referred his students is actually available for use in the library before the list of books is given to the students. Practically all land-

grant college libraries reported that many classes were referred to the library for definite books without prior notification being given. Thirty-eight out of forty-seven libraries reported that the greatest difficulty in the use by students of books for required reading was due to this failure by instructors. Seven libraries reported that one-half or more instructors did not send such notification. If prior notification is not given the books needed are not available, either because they have not been purchased or because they have been withdrawn for home use by the first student to reach the library after the assignment has been made.

An analysis by one institution of call slips for books "charged out" showed that the inability to supply more than one-half of the calls for books charged out was caused by the fact that instructors sent classes to the library for definite books without consulting the library staff and making arrangements to have the necessary material placed on reserve or even to make sure that the material is available in sufficient quantity.

Any librarian can collect for a few days the statistics of the proportion of books not supplied to students on account of failure of instructors to notify the library. A presentation of actual figures might convince instructors of necessity for action. One exasperated librarian gave certain figures to a sympathetic president who in the presentation of the matter at the next faculty meeting added a comment that he had requested the librarian to notify him of any instructor failing to send advance notice to the library of assigned readings. The difficulties were immediately removed—for the time being. In another case the library committee was able to convince the faculty of the difficulties in service experienced by failure to check assigned reading lists with the library. It is believed that as soon as the average instructor fully understands the reasons for the failure of his students to obtain desired material the difficulties will be removed.

The second hindrance to the satisfactory use of assigned readings is inadequate provision for the purchase of duplicate copies. Thirty-seven libraries report a lack of funds for this purpose. The proper use of funds available is intimately related to the question of the number of duplicates to be bought. Several institutions report that all duplicates must be bought from the funds of individual departments. This solution is not satisfactory. If the books are needed, they should be bought by the library, since the library has accurate information, not available to departments, of the demands and actual use of library books by students. The books necessary for required reading for all courses offered by a college should be made available by the college as a regular part of the library service, as is

now done at many institutions. The amount of duplication should be decided in each case from the actual use. Some libraries have a rule of a maximum duplication on the basis of one copy to every 10 students. A report of the number of requests for books for assigned reading which are not supplied will justify the allotment to the library of sufficient funds for purchase of the necessary material.

The third problem affecting the use of assigned readings, at least in the larger institutions, is due to references by instructors to rare books and periodicals. The results can be imagined if a class of 300 is given individual access to the account of the Battle of Gettysburg in the New York Tribune for 1863, as was requested in one case. No class reference to the Gutenburg Bible has yet been noted, but other fifteenth-century books have been requested for reading by large classes. Even recently published periodicals and society publications are to a large extent irreplaceable if worn out. Much valuable material published in out-of-print periodicals and society publications will become very quickly worn out, if used intensively by a considerable number of students. The assignments of volumes of these sets to classes have resulted in the permanent loss of this material, causing many gaps in valuable sets. Yet it is not expensive to photostat or mimeograph the pages needed. The possibilities of mimeographing or photostating irreplaceable material do not seem to be appreciated. Only five libraries report that they are taking advantage of these methods.

The reported data on the various phases of assigned reading indicate clearly a need for closer relationships and a thorough mutual understanding between the faculty and the library. An active and efficient library committee can improve the instructional work of an institution by emphasizing repeatedly to the faculty the requirements just mentioned. The data also indicate the need in many institutions for a greater duplication of books.

Hours Libraries Are Open

The increased number of hours which college libraries are open is a noteworthy commentary upon their use as well as upon their changed functions. In the early history of agricultural colleges, "it was not unusual for the new libraries to be open only an hour or two in the morning and the same length of time in the afternoon." [21] At the beginning of the century, many libraries were open 10 to 12 hours a day. During the past few years, there has been a still further increase. The American Library Association Survey

[21] Thurber, Evangeline, "The library of the land-grant college," p. 34. Unpublished thesis. Columbia University, 1923.

(1926) reports no college library open after 10.30 p. m., nor more than seven hours on Sunday. Rutgers is now open from 8 a. m. to 11 p. m. on week days. The University of California is open from 9 a. m. to 10 p. m. on Sunday. Twenty-one of forty-eight reporting libraries close before 10 in the evening. Three are not open at all in the evening. One closed at 8 p. m. Twenty-three are closed all day Sunday.

A comparison of the hours libraries are open indicates that some libraries in the land-grant group are not being used sufficiently to justify in the eyes of the administrators the longer hours which libraries of other institutions, with less enrollment, find necessary. Some land-grant college libraries do not meet the standards in this respect which existed in other libraries in 1900. Those which for the most part show the smallest loan service are open the least number of hours. If the use of the library is not sufficient to justify keeping the library open 12 or 14 hours a day and at least 4 hours on Sunday, the efficiency of the library and the methods of instruction at the college are open to question.

Access to Books

The opportunity afforded students actually to handle books has long been recognized by modern libraries as an important factor in the use of books. However, as collections increase in size beyond 50,000 volumes, difficulties arise if stacks are opened to all undergraduates. To meet the need for examination of books and to give opportunity to students to "browse" among them, shelves have been placed in various public rooms of the library. In the larger libraries these shelves contain more volumes than were found in many libraries 25 years ago. The University of Illinois has 19,000 volumes in reading rooms open to all students; University of Minnesota, 13,000; Iowa State College, 18,000; University of California, 20,000, not including departmental or reserve reading rooms. The returns of this survey show that no complaint was made of closed stacks where 10,000 or more volumes were available in public reading rooms.

The five institutions which noted student complaints of closed stacks were institutions whose total book collections numbered from 16,000 to 109,000, and whose collections available in public reading rooms numbered, respectively, 4,998, 6,200, 1,100, 1,500, 1,420. All these institutions, in so far as reported, also show loans per student that are below average. Twelve institutions do not have 10,000 volumes on open shelves available to students. Several have fewer than 2,000 volumes so available.

Book collections in libraries of fewer than 30,000 volumes will be used more if the stacks are open to all students. The difficulties

which arise in open access in large libraries can be removed in smaller collections by adequate supervision. In large libraries not fewer than 10,000 volumes should be placed on shelves open to all undergraduates.

General Reading of Students

The easy access to a considerable collection of books is obviously a decided encouragement to students to read, to browse among, and to examine books, not only for special courses of study but also for general and cultural information. The importance of such general reading by students has been emphasized during the past few years. Departments of instruction are urging, to an increasing degree, extensive reading, not only of technical books but also of those books of a general nature which will widen the viewpoint and enlarge the perspective and increase initiative of individual students.

The library has certainly a much greater opportunity in this field than simply to fill requests. It must not only meet the more exacting demands for required reading and special scholarly service; it should also encourage in the individual a love of books and reading; it should stimulate the desire to read; it should make books tempting to read and easy to obtain. How far are the libraries encouraging such general reading?

It is obvious that libraries which are adding only a few hundred books a year can not meet even the demand for technical instructional work, much less the requests for general reading. These libraries are in the elementary stage of library development.

A list of books generally much in demand was checked by land-grant institutions for this survey. Eight libraries did not have This Believing World, 4 did not have Microbe Hunters, 4 did not have Why We Behave Like Human Beings, 12 did not find Trader Horn necessary, 8 did not purchase Fruit of the Family Tree, although this volume is considered by some faculty members as especially valuable for general reading and was placed on the required list for students at Purdue. On the other hand, the Agricultural and Mechanical College of Texas has placed exceptional emphasis upon such books. It reports 9 copies of This Believing World, 4 copies of Why We Behave Like Human Beings, 2 copies of Fruit of the Family Tree, etc. Of a list of 14 books of popular interest this institution had all. Certain other land-grant institutions had not one on the list; others had two or three.

There is noted a great variation in the use of books for general reading. The Agricultural and Mechanical College of Texas reports that, in spite of its rather extensive duplication, it had 154 names on the waiting list for 8 of the books of popular interest listed in the questionnaire. More than three-fourths of the land-grant institu-

tions, although they duplicated much less freely, reported practically no names on the waiting list for the same books. The importance of the subject justifies a consideration of the methods used by libraries to encourage students to read.

Many public libraries have recognized the lure of books by placing collections in various parts of the library where they will be readily accessible and "easy" to look over. Especially is this true of the more recent publications. Shelves of such books seldom fail to attract attention. The interest in new publications may well be utilized as a means to interest students in reading and the use of books. College libraries have not taken advantage to the same extent of this natural interest in recent additions. Only 13 of 48 reporting institutions placed all new books of general interest on a display case for a week or so. True, many of them had a display case, but the new publications went, not to it, but to faculty members when requested by them. This very fact robs the display case of its most interesting material. One student, on looking over a shelf of recent additions, remarked, "It looks like a survival of the unfit." If all publications of general interest are displayed for a week, those interested can sign up for them and withdraw them in turn. These signatures may be an indication of the need of duplication, and will insure not only that the books can be examined but that all who desire to read them will have the opportunity.

Most libraries keep a waiting list for books of general interest. Four libraries of land-grant institutions reported that they kept no such list. In other words, if an individual desired a certain book for general reading and if the book was "charged out," he would not be notified when the book was returned. His only chance of obtaining the book would be to happen in the library when the book came back.

Lists of new additions inserted in college newspapers or mailed to members of the faculty assist in stimulating the use of books. Lists should be used as an additional incentive and not as a substitute for the opportunity actually to handle the volumes.

"Browsing" rooms or sections of shelves for "browsing" purposes have been mentioned as a decided stimulus to general reading. But in some cases the incentive has been materially lessened by refusal to allow books so shelved to be loaned outside the building. If it seems desirable to retain in the library books for general reading, duplicate copies of these books should be provided and made easily accessible.

The lack of general reading among college students of several land-grant institutions is undoubtedly due to a lack of funds for books of general interest. In more instances, however, it is probably due to a lack of interest on the part of the librarian and possibly to a desire to serve the faculty at the expense of the students. The librarians of

the larger land-grant institutions especially can well give more attention to the encouragement which the library should give to increased general reading by students. The college student should be given not only the opportunity but also the encouragement to read. This phase of library service is one of major importance which has received the least emphasis and is most generally inadequately covered by land-grant institutions.

Books on a Rental Basis

In an attempt to increase the number of books available for general or assigned reading, recourse in a few cases has been made to special fees or rental charges. Three colleges report books loaned on a rental basis. In one case special fees for required reading are charged by two departments. In a second duplicate fiction is loaned at 5 cents per copy. A third institution reports a "faculty reading club."

General and technical reading is so intimately associated with efficient instruction that it would seem to be as much a function of the college to supply material for reading assignments as to supply instructors. The only justification for special fees or special charges would seem to be to supply material which can not generally be regarded as a legitimate part of the general library collection, such as the loans of textbooks for personal use or of duplicates of recent fiction. Even in such cases it may be questioned whether such service should not be assigned to the bookstore.

Informational Service and Reference Work

"Where can I find it?" Service to research workers.—Many individuals, both students and faculty, who come to a library do not have definite books in mind. They wish information on certain detailed subjects not indexed in card catalogues nor always in periodical indexes. To aid such inquiries most libraries have established "reference departments." The inquiries may be simple, such as increases and decreases in number of hogs in a certain State during the past 10 years, or more complex, such as a list of the earliest references to transmission of Malta fever through cow's milk. An observer who spends two hours at a reference desk during a day can judge very quickly of the efficiency of this phase of library service. How many students come naturally and easily to the desk? How many are afraid? How many members of the faculty consult the reference librarian, either personally or by telephone? How many books written by members of the faculty express in the customary "acknowledgments" an appreciation of the services of the librarian? An observation of this branch of library service at an effective library will show its importance.

Twenty-eight of the forty-eight reporting libraries have reference librarians. These 28 include the 11 libraries which show the greatest use by the average student as measured by loans. The 28 also include some institutions with relatively small student enrollment, such as the universities of Hawaii and Wyoming, the two institutions which showed the most loans of books per student. Twenty institutions do not employ a reference librarian. Among them are included the nine libraries which showed the lowest number of books loaned per student.

The educational qualifications of reference librarians, as a class, have an important relationship to the services they can render. Three of the institutions which employ reference librarians reported that such assistants have no collegiate degree. Of the 11 institutions with indications of comparatively large use of their libraries, 8 reported not only that they had reference librarians with college degrees but that the reference librarians had spent an average of nearly two years in study after their first degrees were obtained.

A well-educated and bibliographically trained library personnel is of decided service. Much valuable time can be saved to a research worker in many cases if the mechanical drudgery of working through abstracting journals, such as chemical abstracts, can be done for him, and if the material can be collected in an office or seminar room for his personal examination. A knowledge of subject matter by the reference librarian is almost essential in this work. Only eight institutions reported that they are attempting to compile material on research projects when such requests required work involving more than three hours, although 33 librarians regarded such work as a proper service of the library. Apparently the best-equipped of the land-grant colleges are not rendering the services which their librarians think should be rendered in this field.

Although abstracting journals cover the many fields fairly well, especially so in pure and applied sciences, yet at times abstracts are very slow to appear. Often a year or two elapses before an article is abstracted and noted. If a reference librarian has sufficient familiarity with the subject matter to call to the attention of the research worker books and articles immediately upon publication, much aid can be rendered. Inasmuch as many of the land-grant institutions are concerned especially with the field of pure and applied science, it should be noted that reference librarians in general have not majored in science.

Data were collected by this survey to determine the extent to which members of the library staff were translating articles in foreign languages for members of the faculty. Nine librarians reported that they are doing such work. Twenty institutions considered translating a legitimate demand on the library. Whether

legitimate or not, there is no question that a knowledge of French and German by library assistants is an essential of satisfactory service to research workers in land-grant institutions.

Many commercial concerns have found the extensive employment of librarians in their research departments desirable. Much of the searching and abstracting of bibliographical material in these commercial firms is done by librarians. The du Pont Co. is spending for library services for its research departments more than $100,000 per year. Unless these services were commercially valuable, the money would not be so used. Libraries of educational institutions might well render part of the service now offered by libraries of many commercial corporations.

The special needs of research workers for adequate book collections and office facilities adjacent to the books are discussed under "Books" and "Buildings."

Service to Citizens of the State

Most State universities and colleges are not confining their instructional activities to registered students. Extension services have been organized, especially by land-grant institutions, to extend educational opportunities to those living in rural communities. Many living in rural communities consider the State college as the institution which can assist them, not only in practical methods of agriculture but also in satisfying their other educational desires.

A slogan in extension, "If you can not come to the college, the college will come to you," has been applied also to library service in various ways. Some State universities and colleges have recognized the opportunity. The services vary in different States. In some institutions, such as the University of Wisconsin and the University of Michigan, collections have been formed to meet special needs. These collections consist in part of "package libraries"—collection pamphlets, articles clipped from periodicals, and similar material arranged under subjects and sent out in "parcels" or bundles to debating clubs, women's clubs, and individuals. The material comprises a wide range of subjects, from debating material on agricultural credits to articles on the Shakespearian stage. Collections of plays for the country theater are loaned to encourage this growing form of entertainment and instruction. Books are loaned not only to debaters, but also to correspondence students, to industrial firms, and to individuals who are pursuing special courses of reading. These forms of loans may overlap. One inquirer may receive better service through the loan of a "package library," another by the loan of books, a third by the loan of both.

Institutions conduct this service through different agencies. In the University of Michigan the university library has charge of the

loan of package libraries. In the University of Wisconsin it is the extension service. In the University of North Carolina there is joint control by the extension service and the library. Is this service a proper function of the college library or of the extension service? The general extension and the agricultural extension services are in close touch with local conditions throughout the State. On the other hand, the library has the books and the expert knowledge of available material. Both agencies should be used in cooperation, as is at present the case at the University of North Carolina. The organization of the library extension service under the joint control of the extension service and the library would utilize the familiarity of the extension service with local conditions and the librarian's knowledge of the book collections.

In many States, however, the library commission or State library has an extension department which frequently provides reading matter of popular interest to individuals throughout the State. In such cases there should be a definite understanding between the college and other agencies. Irrespective, however, of the activities of State departments, the land-grant college library has a special opportunity in rendering library service outside the campus which can not be as well performed by any other agency. In many States the State university or State college library is the only library in the State which contains considerable collections in certain fields such as engineering and agriculture; and in all States it should be the outstanding library in these fields. Furthermore, there are specialists available at these institutions who can aid and advise in the selection of the most useful books for any special technical problem. Industrial firms through their research departments, as well as many individuals, can benefit greatly if given access to large collections.

In many States, where other agencies are not functioning, libraries of land-grant institutions can render a decided service to citizens beyond the campus by the loan of the more general reading material, such as plays, collections for debaters, etc. In all States they have an opportunity to provide the more scientific and technical publications which may be of great service to the individual in his personal study as well as to corporations which are developing the resources of the State.

Service as Seen by Faculty, Librarians, and This Survey

What the faculty says.—Through the questionnaire used for this portion of the land-grant college survey, inquiries were directed to selected members of the faculties to ascertain the chief difficulties in the use of the library by them and by their students. The replies, together with the opinions of the librarians, are given in Table 2.

The results are not in complete accord with popular opinion, although they are generally consistent with the facts reported in other portions of the survey. The greatest number of complaints (492) is in regard to unsatisfactory book collections. The next highest (312) has to do with the library building; 231 stated that the library staff was insufficient in numbers, and 77 spoke of the need of greater educational qualifications for the library staff; 180 complained of the loss in use of material because of the considerable length of time that books and periodicals are withdrawn from the shelf for bindery. This last point is one that librarians minimized.

It is commonly supposed that faculty members generally would like to see greater decentralization of books, although not necessarily greater decentralization of administration. The returns did not sustain this opinion. Sixty-two reported that the book collections were overcentralized; 94 reported that there was too much decentralization. This subject is discussed later under "Control."

TABLE 2.—*Opinions by members of faculty and research staffs of difficulties in use of library*

Department	Book collections inadequate	Building inadequate	Insufficient library staff	Too much delay at bindery	Too much decentralization of books	Books can not be found	Inadequate educational qualifications of library staff	Department library not open enough hours	Too much centralization of books	Books can not leave library	Central library not open enough hours	Slowness in delivery of books
1	2	3	4	5	6	7	8	9	10	11	12	13
THE INSTRUCTING STAFF												
Agronomy	24	14	10	8	9	5	3	7	2	5	2	2
Bacteriology	29	12	9	11	8	5	5	3	5	4	4	3
Chemistry	25	11	11	12	4	6	2	5	7	2	3	0
Civil engineering	24	14	9	7	1	3	3	5	5	2	1	1
Economics	26	18	13	8	4	5	5	1	2	1	5	2
English	28	20	17	7	3	3	6	2	3	3	5	1
History	27	16	12	10	2	3	6	1	4	2	3	0
Home economics nutrition	18	13	10	7	2	2	1	4	2	0	4	3
Home economics textiles	18	11	9	4	2	2	2	1	4	1	1	1
Psychology	26	15	14	7	2	7	0	2	3	1	4	0
Rural education	13	12	8	6	1	2	2	0	0	1	1	0
Total of faculty	258	156	132	87	38	43	35	31	37	22	33	15
THE RESEARCH STAFF												
Agronomy	21	16	7	7	9	5	4	5	1	3	0	2
Animal nutrition	17	11	7	8	5	2	4	2	1	1	0	2
Bacteriology	20	14	8	9	8	4	4	2	4	5	2	1
Chemistry	18	11	9	10	3	3	6	1	4	3	4	1
Civil engineering	17	14	7	8	2	1	3	4	5	2	1	2
Dairy	21	11	6	5	7	3	2	3	0	0	0	1
Economics	22	18	11	11	3	6	3	2	2	2	1	1
Education	21	15	9	6	2	4	2	2	1	0	1	1
Entomology	23	12	15	9	3	5	6	2	2	2	1	1
Home economics nutrition	18	13	7	10	5	5	4	3	2	1	3	0
Plant pathology	23	15	10	7	7	4	3	3	3	0	3	0
Rural education	13	9	3	3	2	4	1	0	0	0	0	1
Total of research staff	234	156	99	93	56	46	42	29	25	19	16	13
Total of both faculty and research staffs	492	312	231	180	94	89	77	60	62	41	49	28
Opinions of librarians	17	14	16	5	7	0	3	10	1	1	2	1

What the librarians say.—Librarians who submitted their opinions generally agreed with the faculty that the greatest need of the libraries was concerned with books. The librarians, however, probably from more intimate knowledge, placed the need for additional members of the library staff ahead of the building needs. They did not emphasize need of higher educational qualifications for members of the library staff, possibly because the need for these increased qualifications was not so obvious to them as to faculty members.

Comparison of faculty opinion with data collected in this survey.—The data collected in other portions of this survey justify the conclusions expressed by members of the faculty, with one exception. The need for a stronger library staff both in numbers and in educational qualifications, appears much greater than the emphasis given it by faculty members or by librarians. It is possible that neither faculty nor librarians are altogether aware of the services which could be rendered by an efficient staff, while they are fully cognizant of the more apparent but not more necessary needs for books and buildings. These various needs are considered under their respective headings in following chapters.

Lack of Information Concerning Use of Libraries

The outstanding characteristic of this study of the use of books is that few facts and almost no accurate statistics on the use of libraries from the standpoint of those who use them are available or obtainable. The same lack is noted in other surveys and in professional literature. Much of the desired information does not fall within the field of librarianship. Accurate fact-finding studies on the instructional value of reading and the exact relationship of the wide use of books to educational objectives, would be invaluable in an attempt to evaluate the service rendered by libraries. What progress, for example, is made by freshmen in required English through use of a textbook and writing of themes, as compared with progress through a combination of wide reading of standard literature and theme writing? Librarians should know, however, the demands made upon them, the growth in demands, failures to meet demands, and the causes of these failures.

The conscientious attention which librarians as a class gave to the questionnaire in this survey speaks well for their professional spirit. Almost without exception they spent many hours in attempting to supply the information sought. Their failures were due to the fact that much of the information requested was not in existence.

Fourteen librarians did not know how many volumes were loaned during the preceding year. Some of those who did report "number of loans, excluding overnight," reported exactly the same figures to the American Library Association as including overnight. According

to Dr. D. A. Robertson, "The circulation statistics ought to be available, if they are not; the fact is significant."[22] Twenty-two librarians did not know how many volumes were loaned to other institutions. Twenty institutions did not know the number of volumes they borrowed from other institutions, although such borrowings are a direct guide to the book needs of their own libraries. One librarian replied, "Staff too small to keep statistics." Only 14 librarians could report the length of time periodicals were away from the shelves for binding, although delays at the bindery were noted by 180 (out of 500) faculty members as being a hindrance to their use of the library. The University of California and a few other institutions keep a close check on the length of time publications are unavailable on account of binding, but many librarians, in some cases where the complaints of the faculty were the most numerous, did not know how long binding required, and did not regard statistics on this subject as of any importance. The attitude of some librarians was expressed by one who stated in his reply to the questionnaire that such studies were "too trivial," and their object only "to satisfy curiosity."

Few librarians are able to give, for any appreciable length of time, the percentage of requests for books and information which are not met, with an analysis of the reasons for failures. No case studies of individuals who leave the library without obtaining the material they desire have been found in professional literature or elsewhere. A lack of agreement as to terms is also noted. There is no agreement as to what is meant by "volume," "periodical," "serial." What does "number of volumes" mean? Does it include pamphlets placed in pasteboard covers? The lack of agreement as to terms should have had the attention of the American Library Association. There is need of careful consideration by some body of university librarians of the subject of the statistics which are significant and should be carefully kept.

Actual figures of delays in binding and ordering of books may well show the need of more assistants or changes in methods or even changes in State laws. Statistics as to the number of interlibrary loans, both incoming and outgoing, the proportion of books not supplied at the loan desks, the growth in number of books loaned, the number of volumes discarded and the reasons, should have a marked influence on the administration of the library and be important factors in presenting data for a library budget. Yet comparatively few libraries kept such records, although all report carefully the number of volumes in the library. In many cases these statistics of "number of volumes in library" can have no significance, since all volumes discarded in past years are counted as still in the library.

[22] Robertson, D. A. The college library. Educational Record, 10: 18–19, January, 1929.

The great discrepancy among colleges in presenting data for this survey is noteworthy. The larger institutions where the data were more complicated were able to present much more satisfactory figures than the small colleges.

Possibly the great emphasis laid in the past on the "internal" work of libraries, the cataloguing, accessioning, and ordering, has overshadowed the study of the use of libraries. Possibly, the fact that most library school courses deal with methods of library routine may account to some extent for a lack of knowledge, and even occasionally a lack of interest in studies of a library from a user's standpoint.

Highway experts in progressive States know the traffic load on every main highway. They are studying the failures of pavements to withstand use. They count the cars and from their count determine the width of road, type of construction, and necessity of improvement. They are carefully estimating the future load and are planning construction to correspond.

Similar studies are needed by college and university libraries. What difficulties are found by students in the use of books? What proportion of publications requested by faculty members are not available at the time needed? How many requests for information from books are fully met, partially met, or not met at all? It is the duty of the library to know what service is not rendered. In case of failure to meet any request for books and information the library should be able to give a satisfactory reason. The burden of proof that requests are unreasonable is upon the library, not upon the inquirer.

In addition to these studies three definite means are afforded to librarians to see library service from the standpoint of the reader. They, as readers, can use other libraries where they are not known and note the difficulties. This method used by two librarians resulted in the rather searching question, "Is the service to readers in my library like this?"

A second method afforded to chief librarians is to schedule themselves for certain hours a day at the loan and reference desks. Even an hour a week at each desk will prove a revelation of the difficulties some individuals have in the use of libraries. Deficiencies in service actually seen are remedied more quickly than are the same difficulties when reported by assistants. Many an assistant at a loan desk has remarked, "I wish the librarian would work here a few minutes. There would be a change." This recommended method has also been tried successfully by some librarians.

A third method is to visit departmental seminar meetings or special classes of students and engage in a frank discussion of the failures of readers to obtain service. This method at one institution

resulted not only in improvements in the routine work of the library, but also in recommendations from instructional departments to university administrative officers for increased library appropriations.

Summary

Means of increasing usability of libraries.—(1) More attention to the individual inquirer. Abandonment of such phrases as, "Look it up in the catalogue," "We do not have the book," and "The book isn't in." The assumption by librarians that any failure to furnish material requires explanation, that the burden of proof is upon the library in case of failure in service or refusal of request.

(2) Adequate assistance in use of card catalogue.

(3) A provision that every freshman by the end of his first semester understands the use of bibliographic tools, the card catalogue, and the most important reference books.

(4) Active interest by faculty members in the use of books by their students. More consultations of faculty and library staff to improve instruction in connection with reading.

(5) Prompt messenger service to faculty.

(6) Libraries open not fewer than 14 hours a day and several hours on Sunday as use requires.

(7) The availability on open shelves of 10,000 volumes, including books for general reading. Display for one week of all new books for general reading.

(8) Skilled assistance to students, faculty, and research workers, in search for informational material.

(9) Liberal policy in use of library material by citizens of the State.

(10) Participation by chief librarian in work at loan desk and reference desk, if only for a few hours each week, in order to obtain direct contact with readers and first-hand information of failures in service.

(11) An occasional use by chief librarian of other libraries where he is not known in order to ascertain by actual experience the difficulties encountered in the use of a library.

Few, if any, libraries of land-grant institutions reach the ideal in service rendered. Many are failing in a majority of the items mentioned. It is obvious that the ideals of the library service which have been outlined in this section require ample provision for purchase of books and periodicals, an adequate building, and a sufficient library staff with special bibliographic and educational qualifications. The needs for these provisions are discussed in the three following chapters.

Chapter IV.—Books and Periodicals

False Standards

Quantity v. quality.—The inadequacy of book collections is noted by faculty members as the most important cause of difficulties in the use of libraries. For years administrators and librarians have emphasized in catalogues and publicity circulars the number of volumes in libraries. On the other hand, little emphasis, in print at least, has been given to such subjects as the type of book needed, the type purchased, methods of selection of books for university libraries, the relationship of books purchased to educational needs, and objective tests as to the use of material.

The North Central Association of Colleges and Secondary Schools requires a minimum of 8,000 "live, well-distributed" volumes. Any secondhand bookstore would be glad to furnish what might be called such a collection at 10 cents per volume. A search of old attics would doubtless yield a much larger number at much less cost. The addition of such material in the past has resulted in the swelling of collections to meet a mechanical standard, rather than an addition of usable books. The president of a small college remarked to one librarian, "We now have 10,000 volumes. We more than meet the demands of the North Central Association; we need to buy no more."

No fixed number of volumes is satisfactory as a standard. The number and type of books needed will vary as instruction and research in different institutions vary and, even within an institution, the books needed will change continually as new material is published. The actual number of volumes should have less weight than the adequacy of the collection to meet the need of every instructional course and every research project on the campus. The amount spent annually for additions of suitable material and the number of subscriptions for current periodicals are more significant than the number of books in the library.

A new standard has recently been emphasized by the proposed compilation of lists of "best books" which should presumably be purchased by all college libraries. It is clear that such lists, per se, will not provide a permanent, adequate solution of the problem of the selection of books for college libraries. Lists may be a guide as to whether the selection has or has not been well done in an

institution. They can aid selection but can not replace the initiative of the individual instructor and the librarian. Methods of teaching and use of supplementary reading matter will and should vary with different instructors as subject matter of courses varies in different types of institutions. One of the most important desiderata for the land-grant college is to develop and retain the interest and the initiative of the individual instructor. Reading lists may tend to deaden two of the most valuable features of American higher education—the individual characteristics of the American colleges and the deep interest of the instructors in their work. Standard lists of books to be purchased by all institutions, valuable as they may be as guides, are therefore dangerous if they are interpreted as offering an easy substitute for methods which will insure an adequate book collection for the specific programs of instruction and research conducted by individual institutions. Each institution should attempt to determine for itself the adequacy of its book collections rather than rely blindly upon lists or attempt to meet a standard based on number of volumes.

Selection of Books

The selection of suitable books for public libraries has received much deserved attention in professional literature. Practically no consideration has been given in printed literature to the question of methods for the selection of books for college libraries and the mutual relationship of instruction and library staffs to the purchase of books. The lack of material on this subject justifies the following extended discussion of (1) the faculty and book selection; (2) the librarian and book selection; (3) allotment of funds; and (4) summary of recommended methods.

The faculty and book selection.—If all instructors and all research workers are actively concerned with the availability in the college library of the published material in their fields, and if funds are available for the purchase of this material, the library collections will be adequate and will be kept alive. The process will be a continuing one. The initial recommendation for books and periodicals needed by students is a duty of the instructors responsible for the teaching. The instructor may be aided in his selection, but his interest in reading in his field can not be replaced.

Many departments in some of the larger institutions have appointed library representatives whose special duties are to see that the library meets adequately the needs of the department. This arrangement works well if it supplements and does not curtail the activities of other members of the department in recommending desirable purchases. Heads of departments should realize their

individual responsibility to stimulate the interest of their instructors in the publications in their fields and in the addition of these publications to the library.

Relation of librarian to selection of books.—The responsibility for the selection of suitable books for the library is not the concern of instructors alone. It is equally the duty of the librarian and of his assistants. It is apparent, however, that in many land-grant institutions neither the librarian nor library assistants are engaged as active agents in the selection of a majority of the books which go into the library. In 33 institutions librarians indicated that their only relation to book selection was to avoid purchase of duplicates. In at least 10 institutions library books were ordered by departments without any supervision whatsoever by librarians. Indeed, supervision by the librarian over selection of books has been considered by some librarians themselves as "dangerous," "a practice which would cause a vacancy in the position of librarian," etc. Mr. F. K. Walter, librarian of the University of Minnesota, states, "Librarians have little authority to control purchases or recommendations." [23]

Librarians and library staffs should know books and the library needs of those who use books. They are, or should be, familiar with the type of material as well as with the individual books most used by students. They should know in what fields books are insufficient to meet the demands and in what fields students are having the most difficulty in obtaining material. They should know the amount of duplication required, what books are always "out," what books in the assigned reading room are the most used, and what books are seldom called for. They should be able to encourage the instructor to familiarize himself with the literature of his subject. The librarian has a unique opportunity in this respect which should be, and has been in some instances, far-reaching in its influence upon the whole institution. He can increase the interest of faculty members by bringing to their attention new publications and announcements of new books, by book display, by discussions of recent publications at faculty or seminar meetings, and especially by personal conversations with instructors. Urging faculty members merely to send in lists of books is not a satisfactory substitute for the awakening of real interest in the individual instructor. On the other hand, the librarian should be able to act as a safeguard against the exceptional man who would buy wildly and indiscriminately every item listed. Usually, however, to every instructor who recommends unwisely, more than 10 can be found who do not recommend at all.

Librarians have valuable sources of information which are not available to the individual instructor. Every library receives lists

[23] Library Journal, 54: 617, July, 1929.

of new books and periodicals. Through the publisher's weekly, publisher's circular, experiment-station record, catalogues of second-hand books, and many other sources, the librarian can obtain information concerning books published and about to be published, which should be of value to the various instructors.

The objection has been made that the librarian is not qualified to take an active part in book selection. Such a statement unfortunately seems valid in many cases. The solution is, of course, either to educate the librarian so that he can make available the knowledge he should possess or to obtain a new librarian.

A few institutions require approval of book orders by a library committee. This method delays orders and was abolished at the University of Illinois and many other institutions 30 years ago. It can not be a satisfactory substitute for obligations that should rest upon the instructor and the librarian.

Allotment of book funds.—The lack or active interest on the part of many librarians in the selection of books may be due in part to the allotment to departments of a large proportion of the institutional book funds.

In 35 out of 48 institutions, funds are allotted to departments of instruction at the beginning of the financial year. These funds are usually considered as the particular perquisites of the departments, to be spent without question as the departments may desire. In only five institutions do librarians report that they exercise supervision (other than to avoid duplication) over recommendations of members of the faculty for purchases from allotted book funds.

It would be supposed that the institutions with book expenditures of from $50,000 to $150,000 would have more justification in the allotment to departments of their comparatively large amounts than would institutions with expenditures for books of less than $10,000. However, the converse holds in many cases. One institution which is spending $2,300 for books, etc., is allotting all of its funds; another with expenditures of $1,200 is allotting 85 per cent; a third with expenditures of $2,600 is allotting all except $400. Twenty-two institutions allot 50 per cent or more of the book funds to departments. On the other hand, one institution with book expenditures of $50,000 makes no allotments. The University of Wisconsin allots less than half, the University of California, about one-third, Iowa State College, none.

Allotments are defended as a means of insuring the systematic and coordinate distribution of the purchases of books among various departments. To this extent they are of value, although it might be possible to obtain the same results through accounting methods or by an apportionment of funds. Allotments may, and sometimes do, lead to a rush at the end of the year to "use up the allotment,"

with resulting decisions more hasty than sound. They result in nearly all cases in the shifting of all responsibility for selection from the librarian who is the one who should be primarily and directly responsible for the effectiveness of the library. The assumption is that an instructor's recommendation is sound, and fortunately such assumption holds in most cases. Unfortunately there exist exceptional individuals who are either not always sound in their judgment or not always unselfish in their recommendation of books. The purchase of a large number of books of special personal interest to only one instructor has been noted in some institutions which are notably lacking in books for students' use.

Another objection to the extensive allotment of book funds is the supposition that books bought from the allotment are the exclusive property of a department and are not accessible to members of other departments. With the present wide interlocking between various fields of knowledge, this supposition results in much unnecessary duplication. Plant physiologists need chemical journals; physical chemists use engineering journals. No longer are even the most technical journals used only by the specialists in the field covered.

With small book appropriations, the allotment to any one department is not sufficient to purchase expensive sets. One university which allotted practically all of its funds was notably lacking in such sets. With the interlocking of sciences, sets covering several fields of knowledge are likely to be neglected, as no one department wishes to use its funds for these sets. One institution which had collections above the average in certain fields of science was notably lacking in such scientific journals as the Proceedings of the Royal Society of London and the Comptes Rendus de l'Académie des Sciences. The departments could not agree as to which one was to pay for them.

The allotments of book funds may enable the librarian to withstand pressure for the purchase of more material for certain departments than the budget can stand or than can be purchased with due regard to other departments. On the other hand, a strong and able librarian will not need this artificial device; he will know the sections of the book collection which are the weakest and the departments in which the demands for books are the greatest. He will make his decision, not mechanically, but from a knowledge of facts.

Summary of recommended methods.—(1) The responsibility for the initial recommendations of books to be purchased falls primarily upon the individual instructor or research worker and the instructing or research department. They should be aided by lists, suggestions, book notices, and advice by the librarian and library staff. Every instructor and every head of a department should regard it as his

responsibility to see that the library possesses the basic books and subscribe to the basic periodicals in his field.

(2) The librarian, since he is responsible for the effectiveness of the library, should exercise final authority (subject to the limits of the budget) over book purchases and the proper distribution of book expenditures. If the validity of recommendations of books is questioned by him, the burden of proof that the book is not needed rests upon him. He is responsible for the failure of any department to build up the collections in its field in so far as he fails to call its neglect to the attention of the department. He should regard it as his special duty to work with the faculty to make the selection of library books effective.

(3) Book funds should be apportioned among various fields of knowledge rather than allotted to departments.

These methods are in satisfactory use at present in several of the larger universities, which according to the tests considered in the following sections possess exceptional book collection.

Present Status of Book Collections

The status of the book collections of land-grant institutions, as noted in data reported in this survey, is indicated by four different characteristics. These characteristics, which are considered in sequence, are (1) number of volumes added by purchase each year, (2) holdings of typical books, (3) number of subscriptions to current periodicals, and (4) holdings of certain scientific sets.

Number of volumes added by purchase.—Satisfactory book collections are acquired chiefly by purchases. Gifts may be a supplementary means of acquisition. Especially in the field of agriculture, much valuable material can be obtained without charge. Nevertheless, the chief dependence of a satisfactory collection, especially in the basic sciences and engineering, must be upon the volumes purchased.

The number of volumes added by purchase during the year is shown in Table 3. In four cases the additions annually amount to fewer than 523 volumes. A library can not meet the demands of adequate instruction with an addition of 500 purchased volumes a year for 30 departments and 50 instructors. If these purchases are distributed equally over the various departments, each department will have 17 new books each year. Certainly the book needs of any department, as for example, physics, chemistry, agronomy, and economics, can not be met by the annual addition of 17 volumes. While numbers have little significance, yet a certain minimum is necessary if the collections are to be kept up to date. This minimum obviously exceeds 500 volumes a year for any land-grant institution.

TABLE 3.—*Status of book collections, 1928*

Institution	Volumes added by purchase	English periodicals received	Foreign periodicals received	Paid subscriptions to periodicals	Number of complete sets of 21 fundamental scientific periodicals
1	2	3	4	5	6
Alabama Polytechnic Institute	1,349	150	35	165	1
University of Arizona	1,986	411	41	346	8
University of Arkansas					8
University of California	14,719				21
Colorado Agricultural College	2,194			195	4
Connecticut Agricultural College	517	241	6	192	1
University of Delaware	2,117			200	0
University of Florida	4,654	347	14	307	2
Georgia State College of Agriculture	122	250		85	2
University of Hawaii	1,341	409	61	420	5
University of Idaho	2,954	456	32	488	8
University of Illinois	25,930				21
Purdue University	2,935	963	50	663	13
Iowa State College	10,949	1,313	318	1,244	19
Kansas State Agricultural College	2,450	710	140	550	16
University of Kentucky	4,730	573	54	607	12
Louisiana State University		375	50	325	2
University of Maine	1,996	538	32	335	
University of Maryland	2,702	368	8	319	3
Massachusetts Agricultural College	2,496	600	50	320	15
Massachusetts Institute of Technology	3,595	672	293	665	11
Michigan State College	2,985	353	50	403	11
University of Minnesota				2,081	21
Mississippi Agricultural and Mechanical College	627	300	7	200	2
University of Missouri				1,305	18
Montana State College	1,313	233	9	219	8
University of Nebraska	17,643				19
University of Nevada		464	19		7
University of New Hampshire	3,317	506	25	325	16
Rutgers University	7,155			468	15
Cornell University				1,275	21
North Carolina State College	2,396	530	9	443	1
North Dakota Agricultural College	1,788	327	26	349	1
Ohio State University	10,950	1,858	598	1,952	19
Oklahoma Agricultural and Mechanical College	6,683	509	8	250	0
Oregon Agricultural College	5,743	1,025	73	838	13
Pennsylvania State College		575	59	361	14
Rhode Island State College	425	200	5	86	5
Clemson Agricultural College	410	160	2	162	4
South Dakota State College	1,234	260	10	210	7
University of Tennessee		685	110		17
Agricultural and Mechanical College of Texas	1,219	215	4	180	1
Agricultural College of Utah	1,553	195	8	203	4
University of Vermont	1,590	412	45	346	8
Virginia Agricultural and Mechanical College	2,393	211	3	184	10
State College of Washington	11,289	575	55		11
University of Wisconsin					21
University of Wyoming		615	28	518	8

Holdings of typical volumes.—Institutions were requested to show their holdings of some books which were regarded as essential. The returns, widely variable, show surprising deficiencies. Murray's Oxford Dictionary, referred to as the greatest dictionary ever published, is not in 13 land-grant college libraries, 3 of them universities with liberal arts colleges. Doctor Robertson states that if this

dictionary " is not in the library, both the library and the English department will require special investigation." [24] The Union list of serials, generally recognized as one of the most useful tools ever published for the professional librarian, is not found in 15 libraries. Of books for general reading, it has been noted in section 3 under General Reading of Students, that Fruit of the Family Tree is not in 8 land-grant college libraries. Trader Horn is not in 12. Microbe Hunters is not in 4.

Subscriptions to current periodicals.—In science, the dependence upon periodical literature is much greater than in the humanities. Many of the scientific investigations of the past are found only in journals or publications of learned scientific societies. It would seem to be impossible to teach the science, the engineering, the agriculture of to-day without a knowledge of the progress revealed only in periodic literature.

Table 3 gives the number of paid subscriptions to periodicals. Thirteen libraries are subscribing to fewer than 250 periodicals. The University of California takes 180 in psychology alone; the University of Minnesota subscribes to a total of 2,081.

Table 3 also gives the number of subscriptions to periodicals in foreign languages. The discovery of truth is not confined to the English-speaking nations; scientific data are not published solely in English. Eleven institutions are taking fewer than 10 periodicals in foreign languages. Compare this number with 293 in foreign languages received at Massachusetts Institute of Technology, 598 at Ohio State University, and 318 at Iowa State College. Many of these periodicals, such as the Berichte der Deutschen Chemischen Gesellschaft, are generally regarded as fundamental and necessary in advanced courses. Amherst College, Bryn Mawr, and Dartmouth, in the field of psychology alone, are taking more periodicals in foreign languages (21, 36, 52, respectively) than do 13 of the land-grant college libraries in all fields of knowledge. Many of the land-grant institutions do not make available to their students and faculties the latest studies in the sciences.

An attempt was made to ascertain how many libraries are taking a special list of 21 periodicals regarded by certain instructors as fundamental to their work. Many libraries, such as the Universities of Illinois, Rutgers, Minnesota, Wisconsin, California, Cornell University, and the State Colleges of Oregon and Iowa, were taking all, and in many cases duplicate copies of several on the list. Three libraries have annual subscriptions to less than half on the list; 19 had one-fourth or more lacking. One library was taking only 3 of the 21. More than one-half of the libraries do not take the much-

[24] Educational Record, 10: 12, January, 1920.

used Annales de l'Institut Pasteur. It is difficult to see how a department of chemistry in any land-grant institution can teach without the Journal of Biological Chemistry, but, apparently, it is done.

Holdings of scientific sets.—The need for periodical literature is not confined to current volumes. Much material is contained in the back files. An examination of the use made of these sets in any progressive scientific institution will justify the statement that bound volumes of these periodicals are in continual demand, not only by former and graduate students but also by students majoring in the subject.

Two separate studies were made to ascertain the holdings of scientific periodicals by the institutions included in this survey. The field of science was selected because in the type of institutions represented by the land-grant universities and colleges science pure and applied is of primary importance. It is impossible to conceive of a land-grant college or university which does not place major emphasis upon instruction and investigation in the scientific and technical fields of agriculture, engineering, and home economics. The holdings of land-grant institutions were checked to ascertain the extent to which they had complete sets of the 21 scientific periodicals regarded by some instructors as fundamental in their work. Five of the 46 institutions reported complete sets of all the 21 periodicals listed; 26 had less than half; and 15 had fewer than 5 of the 21. The results of the data reported in this survey are given in Table 3.

For a further determination of the holdings of scientific periodicals the list of the 28 most important chemical periodicals as given in Science, volume 66, page 389, was selected for checking, because chemistry is a fundamental science upon which agriculture and engineering are based. Chemistry should be one of the strongest departments in land-grant institutions. The list was published to indicate the chemical periodicals that are needed by a professor who wishes to keep himself and his students familiar with progress in this field. The list was compiled on the basis of a count of periodical citations in articles in American chemical journals. The validity of the list has apparently not been questioned.

For use in this survey the list was checked with the data given in the Union list of serials, which gives the holdings of 250 of the leading American libraries in so far as periodical and society publications are concenred. Of the 52 land-grant institutions studied, 20 are represented in the Union list; the checking was confined to these 20 institutions. The holdings of some of the leading American universities were also checked for purposes of comparison. Harvard was omitted, as its holdings are not completely reported in the Union

list. Libraries such as the Library of Congress and the New York Public Library, not connected with colleges and universities, were also omitted.

The holdings of these sets by the 20 land-grant institutions as compared with the holdings of leading American universities are reduced to a numerical basis and given in Table 4. Ten points were allowed for each complete set, 8 for three-fourths of a set, 6 for each one-half set, 4 for one-fourth set, 3 for current subscriptions and no bound volumes, and 1 point for less than one-fourth of a set without current subscriptions.

TABLE 4.—*Holdings by Certain University Libraries of Chemical Sets, Rated as Explained in Text* [1]

[The first 20 represent institutional libraries with the most complete holdings of any in the United States in so far as ascertained. The last 17 are chiefly land-grant institutions, but include a few other well-known universities. Many institutions whose holding would entitle them to be rated between twenty-one and thirty-seven on this list are omitted. All land-grant institutions are included.]

1. University of Illinois	278	20. University of Nebraska	252
2. Princeton University	278	21. Brown University	238
3. University of California	278	22. University of North Carolina	234
4. University of Wisconsin	276	23. University of Missouri	206
5. Cornell University	276	24. Dartmouth College	205
6. Columbia University	274	25. Northwestern University	181
7. Yale University	274	26. Amherst College	180
8. Leland Stanford Junior University	274	27. University of Oregon	179
9. University of Michigan	272	28. University of Tennessee	157
10. University of Minnesota	270	29. University of Arizona	147
11. University of Texas	269	30. Kansas State Agricultural College	147
12. John Hopkins University	268	31. Massachusetts Agricultural College	128
13. University of Washington	265	32. Oregon Agricultural College	120
14. Massachusetts Institute of Technology	262	33. University of New Hampshire	120
15. Ohio State University	262	34. University of Idaho	109
16. State University of Iowa	256	35. Land-grant university	88
17. University of Pennsylvania	254	36. Land-grant university	67
18. Iowa State College, Ames	252	37. Land-grant college	47
19. University of Chicago	252		

The first significant fact is that of the 250 American libraries whose holdings were considered to be of sufficient value to be given in the Union list, only 20 of the 52 land-grant institutions are included. Thirty-two institutions covered by this survey are not included. The supposition is, therefore, that only 20 of the land-grant institutions in their holdings of periodical publications can be ranked among the first 250 American libraries. These 20 are supposedly, by reason of the fact that they are represented in the Union list, among the stronger of the land-grant colleges in their holding of sets.

[1] Science: 66, 386–387. 1927.

Ten land-grant institutions had nearly complete sets of all the publications listed. Among 20 American universities with the most complete holdings of these chemical periodicals are found 9 land-grant institutions, the Universities of Illinois, California, Nebraska, Wisconsin, Minnesota, Cornell, and Ohio State, Massachusetts Institute of Technology, and Iowa State College—a most excellent showing. These institutions in their holdings of chemical journals are well equipped for the teaching of chemistry. Their faculties have the facilities to keep themselves informed of developments in this important field. Among some of the other 20 institutions included in the Union list conditions were much less satisfactory. Several of them had less than one-fourth of the volumes listed. Nine had less than half. If the statement in Science is correct that these periodicals are needed by faculty and students for instruction, only one-fifth of the land-grant college libraries are equipped to render the service needed.

Methods by which adequacy of its collections can be determined by each institution have been described in the preceding paragraphs. The more extensive use of these and similar methods is recommended. Another method of determination of book needs is to list all material requested by students and instructors and not supplied. One institution from a compilation by titles of all books borrowed from other libraries decides the most important titles to be purchased.

Summary.—The results of this study of four characteristics of the book collections of land-grant institutions agree to a remarkable extent in indicating the strength or weakness of individual libraries and justify definite conclusions. A college which has meager additions to its book collections also subscribes to few periodicals and has few complete files of scientific sets. More than three-fourths of the land-grant institutions do not possess book collections which are adequate for their needs. Ten institutions have fairly satisfactory collections. There is a wide gap between the leading 9 or 10 institutions and the remaining 42.

Loans From Other Libraries

Many institutions with insufficient book collections state that they rely on borrowing from other institutions. The data submitted do not justify this statement. It is in most cases the institutions which have the better collections that are borrowing the most. The number of books borrowed by the nine institutions which were shown to have exceptional collections as measured by the checking of the union list of serials averaged more than 200 a year. On the other hand, seven libraries whose collections are greatly inadequate borrowed an average of fewer than eight volumes per year. The institutions in

the most need are not borrowing to a large extent. Apparently in these institutions there is no great demand for books.

Borrowing, however, can not be regarded as a successful substitution for the possession of the most needed sets. An experiment can not wait until a publication is received from a distant kindly disposed university. The needs of professors and students can not always be met by the intermittent supply of desirable material after a delay of two or three weeks. With the development of research the demand for interlibrary loans in general has grown greatly. The practice of interlibrary borrowing will eventually break down by the mere fact that lending libraries can not meet the increasing demand without curtailing the service to their own faculties and students. This stage, however, has not been reached by most land-grant institutions. Faculty and students in such institutions are not using library books sufficiently to cause any great demand for interlibrary loans.

The many proposals in library literature to assign to different institutions the purchases of little-used sets are worthy of consideration by libraries which possess the basic material. The large majority of land-grant institutions do not yet possess this basic material and are not in a position to consider the cooperative purchase of less-used material.

There is one class of material in land-grant institutions which offers opportunity for improvement in use through interlibrary loans. Some institutions reported difficulties in obtaining as loans from other institutions manuscript copies of masters' and doctors' theses. Nine institutions will not loan such theses, thus limiting the use. Other institutions require the deposit of two copies, one of which is available for loan. The deposit in the library of two copies of every thesis would require little additional work and would make possible increased use both to the university's clientele and to students of other institutions.

If lists of these were published by each institution, or if some national agency would publish the titles of all theses in various special fields, these theses would be more widely known, the use increased, and duplication of research avoided.

Gifts

Gifts of books may be expensive. They require space; to be available they require cataloguing which averages, according to estimates, from 50 cents to $1 per volume. If gifts are unrestricted by the donor, and if the librarian can dispose by sale, exchange, or burning of the material not needed, these gifts will prove an asset instead of a liability. When the gift of a second set of the War of

the Rebellion to a small, poorly supported library of a few thousand volumes is hailed as a public benefaction, one is inclined to question. The University of Illinois added 47,515 volumes by purchase and 3,817 by gift or exchange—about 8 per cent. In contrast to Illinois, a smaller institution added 1,197 by purchase and 1,092 by gift; in another case, 413 volumes are added by gift and 238 by purchase. In these two institutions the quality of the book collection may be open to question. The library has been in some cases used as a place of interment not only for unemployed individuals, but also for useless books from some friend who must not be offended.

Many libraries, especially in the East and South, have been benefited—or in some cases injured—by the gift of large collections of books, the libraries of deceased clergymen, plantation libraries, and other collections. Such gifts customarily were incorporated bodily into the college libraries. There might be some reason for the largest libraries to collect the various sermons preached on divers occasions in a certain State; certainly the finances of the average land-grant college library do not justify holding this little-used material. Many libraries can reduce the number of volumes on their shelves very greatly with a corresponding increase in efficiency of service.

It is recommended (*a*) that gifts be as a general rule not accepted unless made unconditionally, and (*b*) that gifts so made be rigidly examined as to their future usefulness before being catalogued and placed in the library.

Books Withdrawn or Discarded

Books, if used, wear out. They also become out of date. Several duplicate copies of Who's Who in America or American Men of Science, may be needed when the new editions first appear. It does not follow that all duplicate volumes are needed as a permanent accession, to be retained after their usefulness is ended. Furthermore, other material not duplicated may become antiquated and seldom used in the average land-grant institution, since such material is replaced by new editions or by publication of results of later investigations. This fact holds true especially in the fields of pure and applied science.

Some large institutions should collect widely, and hold exhaustively, material even of secondary value. Most of the land-grant colleges, however, do not need to hold little-used material to this extent. Material very rarely needed can be borrowed.

A study of the reported number of volumes withdrawn raises several questions. The University of Illinois reports 525 withdrawn during the past two years; Iowa State College, 2,000; Mississippi Agricultural and Mechanical College, 918 in 1927; Louisiana State

University, 3,964 for 1928; and Massachusetts Institute of Technology, 575. Only 14 institutions out of 48, however, report more than 100 volumes discarded in one year. Sixteen do not report any number of volumes withdrawn, in many cases stating that no record is kept. One institution makes the pathetic report of very few volumes discarded and many worn out but still in use. With the addition to this library of 363 volumes last year, the worn-out volumes could not be replaced and must still remain in service.

In some cases where no records are available of books discarded, the question arises as to whether the records of the library are kept up to date. Certainly no library is entirely free from book losses. If these losses are not noted in the catalogue, the loan desk is compelled to report to readers that certain titles can not be found, and that no record is available.

It is recommended (*a*) that care be exercised to withdraw useless material from the library collections, and (*b*) that more attention be given to withdrawals of missing or lost books from the records of the library with simple statistics as to the cause of withdrawal, such as "out of date," "lost and paid for," "missing," etc.

Exchanges

All land-grant institutions are issuing from time to time publications of value not only to their institutions but also to the faculties and students of other colleges. The publications of a college offer a valuable means by which important publications of other institutions can be obtained if a system of exchanges is ably organized and administered. The means of distribution of these publications, however, is in many cases unorganized and unsatisfactory. Every librarian who handles serial publications is familiar with the difficulties of obtaining current issues regularly and promptly. Often faculty and students are deprived temporarily or permanently of the use of much valuable material through a lack of a satisfactory exchange system.

In many cases, publications are mailed to libraries from a dozen or more different offices on a campus. A request to one office is referred to a second and then to a third, if it is not lost in the meantime. Some offices do not maintain a mailing list. Fifteen libraries reported that they do not receive copies of all publications issued by their own institutions. Others state that they obtain these publications only as a result of "eternal vigilance." One librarian denied vehemently that a certain publication was ever issued by his university, although the publication in question was so issued some years earlier. Many institutions do not have anywhere on the campus

copies of publications appearing in former years. One librarian stated that "The library of this institution is the last office to be considered when publications of this institution are distributed."

Requests to other institutions for their publications often meet the stereotyped reply, "A copy was mailed to Professor ———, of your institution." Reference to the professor usually brings the statement that the publication in question is regarded as his own personal property. Service to one individual in this instance is at the expense of the many.

The universities of Minnesota and Illinois have met difficult conditions with great satisfaction to other institutions by the organization of exchange departments with a professional library assistant in charge. If every library would regard itself as obligated to see that exchanges were mailed out to other libraries, this arrangement would correct the difficulty. If the librarian is so to act, he must be given authority and some measure of control by the administrators of the college.

The handling of incoming publications is in some institutions not any more satisfactory, however, than that of distribution. In typical cases incoming publications are received by the dean of agriculture or the station director and referred by him to various members of the experiment station staff. Eventually, they are supposed to find their way to the library. Actually, the publications seldom reach their destination; none of the students and only few of the faculty have the opportunity to use or to examine them. In other cases the publications are retained in the director's office, either inaccessible or easily lost.

The conclusions from an examination of the methods used at most universities, colleges, and experiment stations in regard to exchanges of publications suggest a real need for careful consideration of reorganization of the collection and distribution of these publications.

It is recommended (*a*) that the librarian of the college be held directly responsible for the satisfactory exchange with other institutions of available publications of his institution, including the publications of the experiment stations, and that he be given authority and necessary assistance for this duty; (*b*) that incoming publications be forwarded to the librarian immediately upon receipt, with notes, when desired, that such publications be loaned to certain members of the faculty; (*c*) that a mailing list of libraries on the exchange list be maintained; (*d*) that every issuing department on the campus be required to deposit two copies of all publications in the college library and that the rule be enforced; (*e*) that a reserve stock of publications of value for exchange purposes be placed in the library.

Duplicates

What shall be done with material, usually duplicates, not needed in one library but which might be of value elsewhere? Many valuable duplicate numbers are being received at times by many institutions which might be of much use in other colleges. The Societa chimica di Roma is reported to have sold, as old paper, duplicate copies of its own publication, La Gazzetta chimica Italiana. Libraries are now willing to pay $1,000 each for a complete set of the scientific reports of this society. No satisfactory clearing house for duplicate material has been organized, although proposed many times. In many cases the holding of duplicates by an individual library is expensive and not to be recommended. The union list of serials will furnish information as to the need of nongovernmental periodicals in certain institutions. Unfortunately, only 20 of the land-grant institutions are represented in this union list.

It would be of material advantage to the land-grant colleges not in the list if a union list of their holdings could be published. This list would enable other institutions to discover at once what their sister institutions need. In many cases such needs could be supplied without charge.

The Superintendent of Documents has been willing to accept the return of Government publications and automatically acts as a clearing house for duplicates of such publications. If space permitted, the United States Department of Agriculture might perform a useful service by acting as a clearing house for agricultural literature, especially bulletins of the various experiment stations. It is of course possible to return experiment station bulletins to the office issuing these publications. However, the return may mean that these publications will later be distributed to individuals and that copies for libraries may be as unavailable in the future as in the past. A clearing house in the United States Department of Agriculture would make this material available for permanent preservation in libraries. It is possible that eventually some commercial house may be willing to act as a clearing house for scientific and technical periodicals. Many libraries have disposed of periodicals, bound and unbound, to the H. W. Wilson Co., receiving not only a cash payment, but also the assurance that this material would be transferred later to a library for permanent use.

It is recommended (1) that as a general policy duplicates of no value to the library be immediately destroyed or otherwise disposed of; (2) that Government documents not needed be returned to the Superintendent of Documents; (3) that land-grant colleges arrange some cooperative means of exchange of experiment station bulletins and the publication of union lists or want lists of material desired.

Summary of Books and Periodicals

(1) More attention by individual institutions should be given to the determination of the adequacy of book collections to meet the instructional and research needs of an institution. Reliance should not be placed upon any fixed mechanical standard of number of volumes or lists of best books.

(2) Instructors should be responsible for the initial recommendation of books for their students and for their research work. The final responsibility should be the duty of the librarian.

(3) The book and periodical collections of a large majority of land-grant institutions are not adequate for instructional work in these institutions. A few land-grant institutions have exceptionally strong collections, ranking among the best of American universities. Improvements of the book collections require not only satisfactory methods of selection, as noted above, but also adequate financial support.

(4) Gifts should be accepted only if needed. Books not needed, whether duplicates or otherwise, should be immediately disposed of and not allowed to accumulate. A clearing house for the transfer of duplicates to institutions needing them would be of value. An exchange department under the control of the library for the publications of each college is recommended.

Chapter V.—Buildings

In the presentation of difficulties in the use of libraries, the inadequacy of library buildings, in the opinion of faculty members, ranks next to deficiencies of book collections. The rapid changes and increase in services required of libraries at many institutions during the past 10 years are well indicated by the complaints as to inadequate buildings and by the demands for more adequate quarters for the housing of libraries. Fifteen land-grant institutions have erected new buildings for their libraries during the past six years (1923–1929). At least 10 institutions are now planning either new buildings or extensions of buildings already in use.

Desirable and Objectionable Features

The inadequacy of buildings erected before 1915 and some objectionable features in buildings erected since that date are noteworthy. The objection that applies almost universally to older buildings is the difficulty or impossibility of enlargement. Twenty-eight institutions out of forty-eight, nearly all with buildings erected before 1920, reported that their library buildings could not be easily enlarged. Book collections have been increasing steadily and will continue to increase. The use of the library by the individual student has also showed a marked increase in the well-equipped libraries and probably has not yet reached its maximum in any institution.

Even concerning the buildings erected during the last few years, reports are made of "inadequate space for bookstacks," "inadequate office and administrative space," and "stack and readers capacity exhausted four years after erection." The conclusion is sound that in the future no plans for a library building should be made without definite provision for later enlargement both for stack capacity and for additional space for readers. The mere assumption that the building can be enlarged is not satisfactory. Sketches should be prepared to show exactly how additions can be built. This plan if adopted in the past would have saved heavy expenditures.

The difficulties reported in the use of library buildings recently erected show great variations. Rooms are not planned for adequate economical supervision or for ease of use by students. The incon-

venient relation of rooms to each other, to the loan desk, and to the public catalogue causes loss of time and confusion. More general were the complaints of a lack of quiet necessary for study. Marble floors cause unnecessary noise; poor arrangements of halls cause confusion. There are complaints that classrooms and lecture halls in the library building tend to increase noise. The undisturbed use of books is so important that no other factor should be allowed to interfere with the primary purpose of the library building. If classrooms are to be placed in the library building, they should have a separate entrance or be placed near the main door, as far as possible from the reading and service rooms.

Architects have given generally more attention to architectural features than to use. It is known that in some buildings which later presented difficulties in use the advice of competent librarians was not obtained or was not followed. The necessity of a constant reminder of the primary object of a library building is well stated by Klauder and Wise: "Buildings erected as enduring monuments at some of the larger institutions have soon been found so inadequate that drastic remedies must be applied, and it would be easy to point to a number of conspicuous library buildings erected from 15 to 25 years ago which it is already proposed to rebuild * * *. The problems of the public library differ essentially from those of the institutional library. In the former the emphasis is upon circulation; in the latter upon study. The character of the books, the character of the persons using the library (requiring less oversight), the additional space per reader needed at the tables (study requiring more table space than mere reading), the open-shelf demands, and the need of segregating books on a given subject for students in seminar rooms or elsewhere are but a few of the conditions distinguishing a college library. Ever present in planning a library is the problem of housing books, but even more vital is that of facilitating their use." [25]

Ratio of Seats to Students

Formerly it was estimated that seats for 10 per cent of the student enrollment would be satisfactory. From the reports presented in this survey, this estimate no longer holds in institutions where the libraries are really functioning in instructional work, Oregon Agricultural College, with 488 seats for 3,800 students, reports that its seating capacity is at certain hours fully utilized. Kansas State Agricultural College in its new building allows 628 seats for 3,300 students, seats for practically one-fifth of the student enrollment.

[25] Klauder and Wise. College architecture in America, 1929, ch. 5, Libraries, p. 70.

North Carolina State College of Agriculture and Engineering has 258 seats in its main reading room and a student enrollment of 1,428, approximately 17 per cent. It should be remembered that the above figures do not include seminar rooms or seats in departmental libraries. The number of seats needed in the main reading room of the library will be affected considerably by the number of libraries outside the building. Libraries with seats for 15 per cent of the student enrollment may prove inadequate; 20 per cent would be none too high a standard. Klauder and Wise quote various authorities as recommending from 20 per cent to 33 per cent.[26]

Square Feet Per Reader

The amount of floor space per seat varies greatly. Long tables can be used and tables and chairs placed close together, although such an arrangement is not conducive to quiet or to ease in the use of books. The newer buildings have allowed not less than 20 square feet per reader. The University of Minnesota allows 24 square feet per reader; the University of Illinois, 26.

Upon the basis of these tentative objective standards it is found that practically all library buildings at land-grant institutions erected before 1920 and some of the buildings erected since that time are inadequate.

Special Rooms for Private or Group Study

Additional seats for students are obtained by the establishment of group or departmental libraries outside of the library building or by the arrangement of seminar rooms within the building. Seminar rooms with permanent collections have been found troublesome in some institutions when funds are not available for employment of supervising assistants. Special rooms are needed for temporary assignment to professors and to research workers for their use in connection with books and to debating and other classes who use intensively a considerable amount of library material. In order buildings complaints of lack of small rooms for group study and also lack of carrels or cubicles in the stacks were general. "Few of our university libraries * * * are planned with any proper provision for isolation and with conveniences for continuous study.[27]

Equipment

Although no special study was made of library equipment in this survey, certain information was supplied which would justify the

[26] Op. cit., pp. 78–79.

[27] Ogg, F. A. Research in the humanistic and social sciences, 1928, p. 365.

conclusion that in many cases unsatisfactory and even unusable equipment has been purchased. Either a competent librarian was not consulted or his advice not followed. One institution attempted to save by the insertion of the card catalogue underneath the loan desk; the location was not conducive to use of the catalogue, and as a result this card catalogue was never used. Thin-legged chairs, easily broken, are an expensive luxury, as are loan desks which are too high or too low or poorly arranged for effective use. Many a library basement is the burial place of much unsuitable library furniture. Standard library equipment can be obtained from a number of well-known firms. Suitable library furniture may be higher in its original cost but will be less expensive eventually than substitutions by the local carpenter.

Library supply houses are usually well qualified to give advice in regard to equipment. A study of the satisfactory and unsatisfactory equipment in the more recently erected libraries should be of aid, but no plan should be slavishly copied. A loan desk excellently arranged for the return of books at the east end and requests for books at the west end utterly failed when placed in a library with the entrance on the west and the catalogue on the east.

Many, if not all, of the difficulties in the use of library equipment would be avoided if the advice of a competent librarian had been followed.

Summary

In the reports of many land-grant institutions note was made of the fact that a new library building would be the next building to be erected. Some institutions, however, with the poorest library accommodations do not seem to have given any consideration to the need for an adequate building. There were several that did not supply one seat for 20 students as compared with seats for 15 per cent or 20 per cent of the student enrollment as noted in the newer buildings. Many institutions seem content with poor service in so far as their library buildings are concerned.

It is recommended that administrators planning new buildings study the objectionable features of buildings erected in the past 10 years and that careful attention be given to the use, which is the main purpose for which library buildings are erected. It is also recommended that no library building be erected unless the final plans have received the approval of a competent college or university librarian who has had experience in planning and building a library. Similar advice in regard to equipment should be obtained. It is possible for any institution to check its library building with the

following requirements, which are recommended especially for the consideration of those planning new buildings:

(1) Possibility of easy enlargement of building without heavy expense for tearing down walls.

(2) Seating capacity in central library for 20 per cent of student body; 25 per cent if no or few department libraries.

(3) Floor space at least 20 square feet per seat; 25 would be preferable. Exclude shelving space.

(4) Arrangement of rooms with card catalogue near loan desk, reference room, and catalogue workroom.

(5) Arrangement of rooms and exits for satisfactory supervision; desks near doors and centrally located.

(6) Arrangement for easy access to books; 10,000 volumes at least on open shelves. Carrels in stacks. At least two or three small rooms for every group of 40 on the faculty, for private study, etc.

(7) Corridors arranged for service, not for show. Floors that will be conducive to quiet.

(8) Adequate stack capacity for at least 15 years without the need of additions. Figure eight books to a running foot of shelving; deduct one-fifth for "working capacity."

(9) Adequate lighting and ventilation. Plan before building is started. Consult experts.

(10) Adequate equipment. Allow for it. It will be expensive.

(11) No lecture halls or classrooms in the building except near entrance and remote from reading rooms. A special entrance is desirable, if possible.

Chapter VI.—Administrative Control

The relationships of the librarian, both to the administrative offices and to those employed in the libraries, are primarily problems of personnel. It is desirable, however, to consider these important questions independently and prior to consideration of qualifications and salaries, which are affected by the authority given the librarian.

The lack of control by many librarians in land-grant institutions over the selection of books was noted in the discussion of that subject. Allusion was also made to the control over book selection exercised by the library committee. The general subject of control over and by the librarian is much broader than the special question of book selection. If there is no administrative officer in charge to whom the librarian can go for final unbiased decisions on many subjects, the service may become disorganized by the conflicting claims, policies, and rivalries of various departments. Inasmuch as a library committee with certain administrative powers is not uncommon, the relationship of this committee to the library administration must be considered.

In direct relationship to the control over the library exercised by administrative officers is the control exercised by the librarian. Poor but expensive service is likely to develop when the librarian has no control over separate libraries on the campus and over the funds expended for maintenance of these libraries. Under control by the librarian arises the question of who should be responsible for the administration of departmental or school libraries. The question of control is divided conveniently into two sections: (*a*) Control by the administration, including duties of a library committee; and (*b*) control by the librarian, including the question of departmental or group libraries.

Control by Administrative Officers

The library is of importance to every instructional department, to every experiment station, to every instructor and research worker. It is not limited to any special college or division or to any selected group of departments. It is a necessary and important laboratory for every phase of work conducted by an institution.

Most of the land-grant colleges have wisely recognized this fact by placing the library directly under the administrative control of the president. Out of a total of 48 reporting institutions 39 have direct presidential control. In 6 colleges the librarian reports to and is under the direction of a library committee, and in 3 cases he reports to a dean.

A dean represents ordinarily only certain limited phases of the work of an institution. A library committee, unless it is so large as to be unwieldy, also is limited in its membership to certain fields. The president of the institution is not so limited. Unless exceptional circumstances prevail, direct control by the president, without the intervention of a library committee or a dean, is the more desirable form of organization. It is supposed that the president understands the necessary relationship between library service and good instruction and will employ and depend upon the services of a thoroughly competent librarian.

Duties of a library committee.—What are the functions of a library committee? Is there any real need for such a committee? Most universities and colleges recognize the need but disagree as to the functions. Only 7 out of 48 institutions report no such committee. In 26 institutions the committee acts in an advisory capacity, generally on matters referred to it by the president or the librarian. In 20 cases it makes allotments to departments for the purchase of books; in 10 cases it approves recommendations before books are purchased. In a few cases it approves recommendations for the appointment of library assistants.

It is apparent that a successful library requires the services of a capable librarian to whom authority is given. If authority to decide administrative details is given to a committee, divided responsibility will result. In all effective libraries of land-grant institutions the library committee acts only in an advisory capacity. The administration of a library in whole or in part by a library committee is not recommended as conducive to good service. This positive statement is made with the proviso that the librarian is qualified to fill his position. If he is not, one who is should be selected.

A library committee, however, has some functions. It can serve as a link between the library and the instructional staff. The work of the library is necessarily closely interwoven with teaching, but the library staff may not be familiar with the educational policies of the various departments. A library committee, meeting with the librarian, can coordinate the work of the library with that of the instructional faculty. There will be in all probability changes in the future, in instructional method as well as in content of courses, which will affect the functioning of the library and which should have the mutual consideration of members of the instructing and library staffs.

As a library develops many questions of general policy demand attention from various viewpoints. How important is the collecting of art material as compared with books in other fields? In what fields should the institution collect extensively; and in what fields should such extensive collecting be left to neighboring institutions?

A library committee can aid in the use of books by reporting to the faculty the possibilities and limitations in the use of libraries. The committee, by reports to the faculty, can stimulate interest in books and recommendations for purchase.

In a small institution such a committee should be fairly representative of all the departments of the institution. In the larger universities all the colleges or divisions should be included. The librarian, of course, as is the case in 33 of the 41 institutions which report library committees, should be a member of the committee. Several of the larger universities have not only general library committees but also special library committees for the various colleges or divisions, acting in an advisory capacity chiefly in regard to the selection of books for purchase.

It is recommended (*a*) that the president exercise control over the library without any intermediary; (*b*) that a library committee representing all phases of campus activities meet at regular intervals to discuss interrelations between instruction and research and library service, and to discuss matters of general policy, including book selection; and (*c*) that the committee act in an exclusively advisory capacity and refrain from consideration of administrative matters, such as decisions in regard to purchase of individual books and recommendations as to appointment of library assistants.

Many of the land-grant institutions are administering their libraries in accordance with the foregoing recommendations. There is much more variation in the fixation of responsibility in the librarian and in the control exercised by him.

Control by the Librarian

Among universities and colleges in general there is great variation in the authority given the librarian. In few cases is he directly responsible for all the library-book purchases, the selection of all library assistants, the location of books where they will be most useful, and the general administration of all the libraries of the institution. One of the largest American universities has written into its catalogue the following statement:

> **There shall be a director of university libraries, appointed by the trustees, who shall be the general executive officer, in subordination to the president, of all libraries under the control of the university. * * * The librarian * * * shall have immediate charge of the expenditure of all moneys appropriated by the trustees for the purchase of books and supplies therefor;**

* * * he shall appoint all needed assistants and subordinate officers and fix their titles, duties, and compensations, provided that the total amount shall not exceed the appropriation of the trustees for that purpose * * *. All books, maps, charts, and other printed matter (except laboratory manuals) shall be deemed a part of the library, and shall be stamped and catalogued as such. Such books and other material shall be purchased by the librarian.

There shall be a library council, of which the president shall be chairman and the director of university libraries, secretary, composed of not to exceed 15 officers designated by the trustees. It shall be the duty of the library council to consider the plans and policies recommended by the administrative officers and to advise with them in regard to the administration of the library.

No such authority is given the librarians in most of the land-grant institutions. In 22 of the 48 reporting land-grant institutions departments generally may buy books for library use independently of the library and in most cases without even the librarian's knowledge. In 10 cases in which departments forward their book requests to the library, the requests must be passed on again by a committee. In only 16 institutions is the responsibility for book purchases placed upon the librarians. In about one-half of the institutions the librarian can not transfer permanently books between departmental libraries, and in 9 of the institutions he can not transfer from departmental libraries, even for temporary use, books needed elsewhere. In many colleges the assistants in charge of various departmental libraries are independent of the librarian of the college. In 25 out of 48 land-grant institutions separate libraries are administered independently of the central libraries. In 15 of these institutions the books in these separate libraries are not entered in the catalogue of the main library. This failure means that there is no place on the campus where an instructor or student can find listed all the library books belonging to the university. To ascertain definitely that a certain book is not available in the libraries of the universities he would be obliged to consult each separate library. Of the remaining 33 institutions several have small libraries, apparently hidden in professors' offices, closed in the evening and in many cases equally inaccessible during the day.

Most of the colleges and universities with library expenditures ranging from $50,000 to $300,000 have placed full responsibility upon the librarian as the head of all the libraries on the campus. In only one of the six institutions with library expenditures in excess of $80,000 do departments buy library books, independently of the library. In five of the six institutions with library expenditures of less than $10,000, departments so buy.

The hindrances to good library service shown in division of authority over the libraries of an institution are many. If various agencies are ordering books independently much duplication and resulting waste will arise, for no one agency knows of the orders of

others. A more serious difficulty, however, is the lack of knowledge of what books are possessed by the institution. With no catalogue of all the books on the campus, instructors in one department have no means of knowing of the books in another department of the institution. Books when needed can be located, if at all, only with great difficulty. The data submitted in this survey showed that several librarians had no information of periodicals in some of the libraries on their campus.

Even if all books are catalogued in the central library the books may be inaccessible. In collecting data for this survey several typical instances appeared. The graduate students of one college complained that the books they needed for their work were locked up in offices of professors and could not be obtained. In another case, an instructor at 8 o'clock in the morning desired 5 books for a 1 o'clock class. All 5 books were in different offices on the campus. It was only by 4 hours of searching that he was able to obtain 4 of the 5 books. In a third institution, a graduate student reported that he spent more time trying to find books in different departments than he did in the actual use of the books. In several cases, where the purchase of books was solely a matter for the departments, a tendency was noted to select books for the use of individual professors rather than for service to students and to members of the departments generally. With 30 or more departments buying library books independently and forming small collections, decentralization of library administration means usually duplication, wastefulness, small inaccessible collections in professors' offices, and generally poor service.

In the most successful libraries practically full authority over purchase of all library books and employment and direction of all library assistants is given to the librarian. Some administrators have stated that they would hesitate to trust their librarians with so much authority. The solution, of course, is to find librarians who are capable of assuming this responsibility. If the University of Illinois and Columbia University can find librarians who can be responsible for and capably manage centrally administered libraries with expenditures averaging more than $260,000 per year, surely librarians can be found to assume responsibility for libraries with expenditures running from $10,000 to $50,000. A capable librarian will not abuse such authority and will be eager to take advantage of the expert knowledge of faculty members.

Authorities generally recognize the value of a centrally administered system of libraries. Dr. A. C. True, as Director of the United States Office of Experiment Stations, in 1912, wrote:

> It would seem obvious, therefore, that, since the station is a department of the college, the station library should be considered a part of the college library and thus come under the general direction and control of the college librarian.

This involves the presumption that the college authorities appreciate the importance of a well-managed library and, therefore, employ a well-trained and efficient librarian, and have a good library organization.[28]

Doctor Works in his College and University Library Problems recommends:

(1) All books purchased should be part of the general library; (2) purchases of printed resources will be made by the librarian * * *; (4) the cards for books should be found both in the general and the departmental libraries * * *; (6) the librarian should be charged with the responsibility of selecting the persons in charge of the branch libraries * * *; (7) those in charge of branch libraries should be on the pay roll of the library * * *; and (10) college libraries (including law) should have no different administrative relationship to the central library from that of the other libraries * * *.[29]

Dr. C. H. Judd's report on the Survey of Institutions of Higher Education in West Virginia states:

The action taken when departmental libraries were under discussion, placed the responsibility for working out a library policy where it belongs, in the hands of the librarian. * * * In the opinion of the survey staff, a university library organization should be just what the name implies—an organization that serves the library needs of the entire institution. There is no reason why the law library should be an exception and there are cogent arguments against such independence. These become more cogent as the institution develops. Especially is this true where professional and graduate schools are developed.[30]

Departmental or divisional libraries.—The question of centralization of library administration is quite distinct from that of centralization of book collections. The larger libraries have placed departmental or group libraries in various buildings on the campus under the supervision of the chief librarian. Such collections consist of several thousand volumes each (in some cases 20,000 or 30,000), with special attendants and with separate catalogues. They are open from 12 to 14 hours per day and often have a competent librarian in charge at a salary of from $1,800 to $3,000. The books are to a considerable extent duplicated in the central library, but in any case are always entered in the catalogue of the central library and are ordered through the order department of the library. The advantages of this system are that (1) the books are brought nearer to the laboratories or the rooms of instruction; (2) the students have a more intimate association with books if collections on special subjects are shelved by themselves in special rooms; and (3) the library assistant in charge should have a more intimate knowledge of the departmental field and should be able to give more expert help to students, research workers, and faculty than would the general reference assistants in the central library.

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[28] A. L. A. Proceedings, 1912, p. 216.
[29] Works, George A. College and university library problems, 1927, pp. 77–78.
[30] Survey of education in West Virginia, Vol. IV, 1928, pp. 91–92.

Some universities have met the need for special collections by establishing group libraries. This system reduces the expense while providing most of the advantages of departmental collections. The University of Missouri has a special library for biology. The University of California is expecting to open a large biological building with a biological library. The location of departments, as well as the amount of the library budget, will determine the feasibility of this system. The increase in number of individuals using a central library may compel adoption of some such plan in large universities. In a university with 8,000 or 10,000 students, a large library all centralized in one building without separate reading rooms is not conducive to an "easy familiarity" with books in special fields. The organization of group libraries should not, however, conflict with the principle of centralized administration.

On the other hand, some colleges with far less funds for library purposes have carried decentralization of books much further than these larger libraries. Some institutions with book expenditures of less than $25,000 a year report from 14 to 45 departmental libraries. In one institution, there are four department libraries in chemistry: A general chemistry reading room, and individual rooms for organic chemistry, physical chemistry, and chemical engineering. Departmental collections with limited expenditures for administration give far from ideal service. This system may have been caused by inadequate library quarters, but even so, the formation of two or three group libraries, pending the erection of a new building, would seem to have been preferable. In institutions with limited funds, the need for small laboratory collections can be met by the loan of books for which the department is responsible and which may be recalled at any time by the librarian for the use of other readers. Such collections are not considered departmental libraries.

Specialized library service to special groups in special fields of knowledge has many distinct advantages. It does require, however, ample funds for assistants and for duplication of books. Where adequate funds have not been provided, this system of decentralization of books has many more disadvantages. The attempt to organize such a system with insufficient funds has often resulted in "concealed decentralization": Books locked up in professors' offices and unavailable to the average students.

The sciences to-day are closely interwoven. It is impossible to say that certain books will be used only by chemists or by bacteriologists. In one day, volumes of the Journal of Biological Chemistry were requested by chemists, a plant physiologist, a bacteriologist, a nutrition expert in home economics, a zoologist (physiologist), and a veterinarian. If a library can afford to duplicate

such material and provide special library assistants, departmental libraries are desirable. If not, the books should be kept where they are generally available to all who desire to use them. If the distant location of some departments requires departmental collections, this fact should be recognized by suitable library appropriation for this purpose.

The opinion of faculty members in regard to centralization of book collections has been mentioned under the use of books. It will be noted in Table 2 that all departments which had any considerable experience with department libraries favored greater centralization of books except chemistry and civil engineering.

Conclusions and Summary

The organization and administration of libraries of a large majority of the land-grant institutions are decidedly unsatisfactory. The statement of Dr. F. A. Ogg in regard to university library administration as related to research applies with much force to the library administration in three-fourths of the land-grant institutions as related both to institution and research. "The situation in general is unsatisfactory—in many reputable institutions notoriously bad; and it is with satisfaction that one notes the present stress in various quarters upon improvements in library administration, which, when realized, can hardly fail to better research conditions."[11]

It is recommended that: (*a*) The librarian, subordinate only to the president, be placed in direct charge of all libraries (including experiment-station and law libraries) connected with the institution; (*b*) the library committee or council, of which the librarian is a member, act in an advisory capacity only and on matters of general policy such as the correlation of the library service with the instructional and research activities of the institution; (*c*) all library assistants in the institution be appointed only after favorable recommendations of the librarian; (*d*) all purchases of books for any libraries connected with the institution be approved and made by the librarian; (*e*) all books be entered in catalogue of central library; (*f*) departmental or school libraries be not organized (unless distance renders imperative) where expenditures for library purposes are less than $100,000 per year.

The foregoing recommendations do not imply that expenditures for books and salaries of library assistants should not be carried on the budget of any department, school, or station, if it be so desired. It does mean that the librarian shall have jurisdiction over these expenditures. The expenditures for library purposes from departmental funds should be shown also under the heading, "Library Expenditures."

[11] Ogg, F. A. Research in the humanistic and social sciences, 1928, p. 366.

Chapter VII.—Personnel

Importance

Questions in regard to the personnel of the library arise in the consideration of nearly every phase of the activities of a library. The preceding discussions on control and book selection emphasize the importance of placing responsibility for the administration of a library upon the librarian. The preceding section on usability of libraries noted the opportunities of a library staff in increasing the use of books.

A statement by Mr. Arnold Bennett in regard to the need of an adequate staff for public libraries applies equally to college libraries.

> Public libraries are either insufficiently used, or misused, or (sometimes) not used. Just as 80 per cent of the heat of a coal fire is wasted, so is 80 per cent of the value of a public library wasted. And the reason is the inadequacy of the staff. One hears that public libraries do not spend enough on books. I would reply that if they spent less on books and more on an educated staff far better results would be obtained. It is not books that lack in the libraries; it is the key to their effective employment. That key is the individualities and the attainments of librarians and their staffs.[32]

If the library is a major factor in education, if the library is actually the "center of the intellectual activities of the campus," then it follows that the qualifications and compensation of the members of the staff which supervise this important center should receive careful consideration. Appointments to library positions should be regarded as of as much importance as any in the institution. The qualifications include both general and professional education, professional experience, business and administrative abilities, a human interest in students, a willingness to serve, and a thorough sympathy with, and understanding of, educational processes. In institutions interested in research, additional scholarly qualifications are necessary. Salaries should correspond with the duties and the qualifications.

A library staff is measured best by the service the library renders. Do students and faculty consult the library staff? What is the influence of the librarian on the campus? What aid does the library staff render in the selection of books? Do the assistants give the students an opportunity to see and use the new books that are received or do they distribute them to favored members of the faculty

[32] Publishers' Circular, Nov. 3, 1928.

as soon as received? Does the loan attendant make a decided effort to see that a student receives the book he wants or is he sent upon useless wanderings? Is the instructional work of the institution conducted with little reference to the library or are the resources of the library utilized? If these statements are recognized as fair criteria, then data collected in this survey and noted in Chapters I and II on usability of libraries clearly indicate that the personnel of the library staff is the one element in the library service of land-grant institutions that needs the most careful attention and the greatest emphasis.

Without an efficient staff funds spent for books and buildings may be and have been wasted. An efficient library staff will know book and building requirements and will emphasize the importance of use of books in instructional work. Through this emphasis an efficient staff will affect decidedly the amount allotted for books and periodicals, since it will be able through presentation of facts to support budget recommendations. Books and buildings are worthless unless used. An efficient library staff is an absolute necessity in securing adequate use.

The characteristics of the library staff are treated under (*a*) Duties, (*b*) General and professional educational qualifications, (*c*) Professional experience, (*d*) Salaries, (*e*) Faculty status, (*f*) Hours of service, (*g*) Educational opportunities, library schools, (*h*) The clerical staff, (*i*) Size, number of assistants on staff, and (*j*) Reorganization of staff.

The work of a library falls into two divisions. Much of it requires expert knowledge; other portions such as shelving of books, labeling, etc., do not require any special education or training. Several libraries have, upon this basis, divided their staffs into (*a*) the professional class, and (*b*) the clerical class. The clerical staff is given separate consideration later in this section; the qualifications of the professional staff alone are considered at this point. For convenience in discussion, the duties, qualifications, and salary of the librarian are considered first separately.

The Professional Staff—The Librarian

Duties.—The important duties required of the head of a modern college library are not understood in all institutions. In the introduction, reference was made to the fact that, in the nineteenth century, libraries were considered of so little importance that the duties of the librarians were assigned to professors as part-time work. This practice still exists in four land-grant institutions. In two of them, professors of English are serving as part-time librarians. In one, 50 per cent of the time of the librarian is given to the directorship

of the extension service. In the fourth, the assistant professor of German is giving part-time service to the library. In one of these four institutions a professor is teaching 15 hours a week and giving the balance of his time to library administration.

A library can be made of direct service to every faculty member and every student. It can be a revelation of what modern education means. Doctor Robertson states, "What is true of the high school is true even more of the college, the library is 'an integral part of the educational scheme.' The trained librarian can make it so."[33] Through the library, the student can acquire an insight into methods of self-instruction which will serve him throughout his life, not only as a necessary aid to progress in his career, but also as a means of personal growth and development. Through the library, instructors have found means to keep their teaching alive, to avoid ruts, and to guide their students in sound habits of acquiring knowledge.

The librarian should be primarily and directly responsible for the administration of the library. The selection of assistants, the promotion of the efficient, the discontinuance of the services of the inefficient, the efficient administration of departmental libraries—these are some of the duties the librarian should perform.

One dean, some years after the reorganization of a library, stated that the greatest incentive to improvement in the instructional work in his college, and the marked progress in this work, were due to the influence of the librarian. The fact that many libraries have not reached this ideal of usefulness has been shown. It has also been shown that many librarians do not perform all of the duties noted as properly belonging to the office.

The causes for these failures will become evident if the following questions are answered: What are the present qualifications in education and experience of the librarian? What is his salary?

General and professional educational qualifications of the librarian.—In some respects library service has followed the evolution seen in the profession of medicine. Fifty years ago an embryo doctor could obtain his education by interneship and by association with a practicing physician. No formal professional education was necessary. This same status formerly existed in the library profession but is rapidly disappearing. Now, certain outstanding libraries require a bachelor's degree and a year at a professional library school before appointment to the position of even senior assistant. The University of California, as an example, requires of a candidate for appointment to any of its professional library positions a bachelor's degree, a knowledge of two foreign languages, and a course of training in a recognized library school. In addition, some years

[33] Educational Record, 10: 23, January, 1929.

of library experience are required of all but junior assistants. Several other institutions have made the same requirements as California.

In more than half the land-grant colleges and universities, however, the chief librarians do not meet the minimum standards for even a junior assistant at such institutions as California. Eleven librarians of land-grant institutions do not have a bachelor's degree. More than 20 have had no library school training.

Doctor Works reported that in 11 institutions studied by him 12.3 per cent (7 out of 57) of the heads of library departments had no bachelor's degree.[34] In land-grant institutions a much higher percentage (22.5 per cent) of the much more important chief librarians do not have bachelor's degrees.

In the case of librarians with bachelor's degrees a report of the number of years spent in formal study after the degree was earned is of interest. In land-grant institutions the median number of years so spent by chief librarians is one year; in the 11 institutions surveyed by Doctor Works the median for heads of departments is two years.

The educational qualifications of the chief librarians in most land-grant institutions are below those of the less important heads of library departments in Doctor Works' group. It should be noted, however, that in certain land-grant institutions librarians without library school training or college degrees were appointed many years ago, before professional library education reached its present development.

In contrast to the practice of many of the instructional staff, few librarians continue their formal studies after their one or two years at a library school. Members of the instructional staff feel the need of continuing study in their fields; doctors take time for clinical work at various hospitals. The question arises whether it would not be conducive to the more efficient functioning of libraries if it became the custom for librarians and heads of departments to spend occasionally three months in formal study at some graduate school. Why should librarians be the only members of a university faculty who almost universally discontinue their formal professional study after a year or two at a professional or graduate school? There might well be a library "clinic" or institute for three months if qualified leaders could be found to conduct it. Instructors have opportunities for graduate study without deduction from their salaries; why should not librarians be on the same basis? The question of courses of study to be pursued is discussed in the consideration of library schools.

[34] Works, George A., College and university library problems. 1927, p. 90.

The present librarians in some of the smaller land-grant colleges, and possibly a few selected assistants, could improve their professional educational qualifications if six months could be spent in a well-administered technical library. This experience would give them a knowledge of the most useful publications and of methods of increasing use of books. The expenses might well be borne by both libraries, as both would be benefited.

From the returns made in this survey the need of better educational preparation for the librarian is obvious. The education of the librarian in the typical land-grant institution at present is not a satisfactory preparation for his duties.

Professional experience of the librarian.—Experience in other libraries is of value because of the opportunities afforded for study of methods actually in operation and for the development of the latent abilities of the individual. In the appointment of librarians, as well as of assistants, the most important measures of ability are the work actually accomplished and the services actually rendered—much more so than the grades received in library school. A librarian should be judged by what he is accomplishing. Important positions in the instructional staff are filled only by those who have proved their ability to teach by the positions they have held. Many institutions require from a candidate experience in more than one institution before appointment as head of an instructing department. Equivalent experience in libraries should be required of librarians.

Many libraries do now require previous successful library experience for all positions except the lowest—that of junior assistant (salary $1,500–$1,800). The American Library Association recommends not less than two years of successful experience (in addition to a bachelor's degree and one year at library school) for the position of librarian of a college with fewer than 600 students. For the position of senior assistant "one year of successful experience in a scholarly library of more than 50,000 volumes" is suggested.[35]

In 10 land-grant institutions the librarians had no library experience previous to their appointment, and in nine of these cases they had no library school training with the exception of courses at summer school. It follows, therefore, that in these nine institutions librarians were appointed who had neither previous library training nor experience. In such cases a complete lack of understanding by administrators of the functions of the library and of the qualifications needed for library positions is evident.

The fact that individuals have received college degrees and have successfully completed a year at a professional library school does

[35] A. L. A., Budgets, classifications, and compensation plans for university and college libraries. 1929, pp. 19–22.

not necessarily mean that they are qualified to act as librarians or even as heads of departments or senior assistants. The medical profession has long recognized that a period of interneship is necessary before a man can be considered equipped for the independent practice of medicine. Since the library profession has succeeded in obtaining recognition for the professional status of librarians, it may be worthy of consideration whether the example of the medical profession should not also be followed in the arrangement for a period of interneship prior to assumption of important library responsibilities. It would not be difficult to select certain colleges and universities that are preeminently qualified to assist in the training of future professional librarians by giving them practical experience in scholarly libraries. If such opportunities were afforded, university and college presidents would have an opportunity to judge the qualifications of candidates, not only from their scholastic record at library school, but also from their ability as proved in actual employment.

Salaries of librarians.—From the discussion in the two preceding sections, it is apparent that in many land-grant institutions the qualifications of librarians in formal education and experience do not meet the requirements of the positions nor are their qualifications equal to those of the less important heads of library departments in another group of institutions. Are the salaries paid librarians in land-grant institutions sufficient to attract candidates with the required qualifications?

Several of the larger institutions, outside the land-grant college group, have placed the salaries of their labrarians at from $8,000 to $12,000. No similar salary is paid to any librarian of a land-grant institution, although, as shown elsewhere in this report, a few of the land-grant college libraries are among the strongest of any in this country in the character and use of their book collections.

Doctor Works, in his survey, found that 3 out of 14 reporting institutions gave their librarians a salary status equal to or above the average for deans. In 9 out of 15 institutions, he states that, "the position of librarian is better financially than that of the full professor. It is in the majority of cases intermediate between the full professorship and the deanship." Doctor Works concludes that "the position of librarian is fairly comparable with the position of dean. In the smaller institution, it perhaps is more fairly compared with the directorship of a school or the headship of a department."[86] In this comparison, it should be noted that librarians and library assistants are not given the three months' annual leave which is the

[86] Works, George A., College and university library problems, 1927, p. 87.

perquisite of the instructor. The instructor may be able to increase his salary by teaching in a summer session. The librarian can not.

The salaries of librarians in land-grant institutions are much below the salaries in the institutions studied by Doctor Works. One of 48 institutions, only 2 (as compared with 3 out of 14 in Doctor Works's group) pay their librarians the typical salary of a dean. The typical salary of a librarian of a land-grant institution is not intermediate between the full professorship and the deanship; it is the typical salary of an associate professor. The salaries paid at certain institutions are far below the typical median. Four institutions are paying their librarians a typical salary of $1,775 for a position which should require (1) a bachelor's degree, (2) a year of graduate study at a library school, and (3) several years of professional experience. One institution allows $2,200 for a librarian who also serves as a language teacher. Four land-grant institutions pay their librarians (*a*) $1,500 (students 626), (*b*) $1,700 (students 980), (*c*) $1,980 (students 1,219), (*d*) $1,850 (students 1,610). These colleges are among those which in the discussion on usability of libraries were shown to have the lowest use per student.

This report has emphasized the failure of certain libraries to function, the little use of books, the complaints of faculty members as to poor service, the lack of confidence of the faculty in the librarian, the lack of unified administration, faulty selection of books and lack of control of the library activities by the librarian. These failures are explained by the fact that the salaries paid are commensurate neither with the duties which should be performed, nor with the educational and professional qualifications which should be required. Grossly inadequate salaries are insufficient to attract candidates who are equipped educationally and who have proved their value.

The salaries paid are indicative of a lack of understanding by college administrators of the value of the college library and its relationship to good instruction, despite the fact that the importance of the library is generally recognized by college administrators, in print and in addresses. The customary excuse by college administrators for such salaries is "we ought to pay more, the librarian is worth more, but we do not have the funds." The facts do not justify this statement. The failure is not caused by the limited amount of funds available for the educational work of the institution; the deficiency is due to the proportion of educational funds used for library support. Amherst expends on its library (excluding expenses for care of building, light, heat, etc.) more than 7 per cent of the noncapital expenditures of the college; Bowdoin more than 8 per cent. The 4 land-grant institutions with salaries of librarians of less than $2,000 are spending, respectively, 1 per cent, 1.3 per cent,

1.9 per cent, and 2.3 per cent. It is apparent that the difference lies not in the total funds available, but in the proportion of such funds used for library operations.

The conclusions should not be understood as implying that all the present occupants of these positions should receive the financial compensation suggested. The data do not justify such a conclusion. Some librarians are not effective in the administration of their libraries and are not qualified to receive the salaries which should be paid to the occupants of these positions. The position may be worth $8,000, but the librarian may not. In the same position $6,500 may be too low for one individual and $2,000 too much for another.

It is recommended that the position of librarian in all land-grant institutions be given a salary status not below that of the typical academic dean. This salary will be in most land-grant institutions equal to the more highly paid full professors. An academic dean is defined as the administrative head of a school, college, or division, consisting of several departments. This recommendation, which is based solely on independent study of conditions in land-grant institutions, is in general agreement with the conclusion reached by Doctor Works.

Summary.—(1) The librarian's position is one of great responsibility. It should require, as a minimum, a college degree, not less than a year of library school, and some years of experience. No position of librarian should be filled in the future except by one possessing these qualifications. Librarians in few land-grant institutions meet these qualifications at present.

(2) Some arrangements for a continuation by librarians of their formal education are desirable.

(3) The assignment of a member of the instructional staff to duties in the library or the assignment of a librarian to instructional work (other than library or bibliographic courses) is wholly inconsistent with the duties required of the head of a functioning library.

(4) Salaries paid heads of libraries should correspond with the salaries paid deans or the group of most highly paid full professors.

The Library Staff, Exclusive of Librarian

Duties.—With the exception of the librarian, the most important positions on a library staff are those of heads of library departments. Certain departmental heads (loan and reference librarians) are in charge of the immediate service to students and faculty; others (catalogue, order, and serial librarians) are responsible for the acquisition and proper entering of material. Senior and junior assistants serve in the more detailed work of these departments.

The loan and reference librarians are in charge of direct contacts with students and faculty. The use of the library by the average student will depend to a large extent upon the knowledge both of books and people possessed by these two departmental heads. Guidance in individual reading, as well as meeting direct instructional needs depends greatly upon the efficiency of these two heads of departments. They should not only know books in general and bibliographic tools in particular; they should also have the ability to give that knowledge to others. In large libraries these two heads of departments have administrative duties in the organization of the work of their departments.

Catalogue, order, and serial librarians are charged, respectively, with the efficiency of the catalogue, the prompt and economical buying of books, and the acquisition of periodical literature, of special importance in a scientific institution. The vexing question of binding is often assigned to the serials librarian.

Education and experience.—A study of the qualifications of heads of the loan, reference, and catalogue departments in land-grant colleges was made. These departments were selected because they were found to exist more commonly than order and serials departments. Certain libraries had no departmental heads; the use of books in such libraries and the book additions were slight. Of 95 heads of departments, 18 (19 per cent) did not have a bachelor's degree, 28 (30 per cent) had no experience before appointment to their present positions, 23 (24 per cent) could not read either French or German, 44 (46 per cent) could not read German, and 27 (28 per cent) could not read French. Doctor Works reported that only 12 per cent of heads of departments in his group did not have the bachelor's degree.

The suggestion that it might be desirable for librarians of the smaller land-grant colleges to spend six months in a much-used library applies also to certain heads of departments and to other professional assistants. In schools where agriculture is of major interest, such experience would be an excellent preparation for their duties, and would to some extent remedy the lack of educational preparation existing at present. The question of possible internship as a preparation for librarianship would also seem worthy of consideration as a preparation for the duties of heads of library departments. One year's experience in a functioning library would be more valuable in training and experience than several years in a little-used library.

A study of the service a modern library is rendering through its loan and reference departments, and a consideration of the knowledge of books and languages and bibliographic tools required in cataloguing, serials, and order work, justify the statement that for the headships of all departments in the smaller land-grant colleges, the

minimum requirements should be a bachelor's degree, a year at library school, a knowledge of two foreign languages, one of which must be German, and one year's library experience. These are the requirements for a senior library assistant at many institutions. The requirements in the larger institutions are, of course, much higher. These minimum requirements are not met at present in a majority of the land-grant institutions.

Salaries.—The salaries paid heads of library departments fall further below any satisfactory standard than do the educational and professional qualifications of the individuals occupying these positions. The average salary paid the head of a catalogue department is $2,080, the reference department $2,060, the loan department $1,762. There is great variation. Thirteen institutions are paying heads of some departments less than $1,500. On the other hand, the typical salary of heads of library departments at the University of California is $3,000, at the University of Wisconsin $3,250, at Iowa State College $2,400, at Ohio State University $3,000. These salaries are also typical of the salaries paid assistant professors in these institutions. Corresponding salaries are paid by only a few of the land-grant institutions. The insufficient salaries account for the unsatisfactory educational qualifications of library staff members. It is impossible to obtain, at salaries ranging less than $1,500, satisfactory professional library assistants, but many heads of library departments are paid no more.

The duties and requirements of positions as heads of library departments justify a minimum salary in colleges with fewer than 1,000 students equal to that of an instructor and in larger institutions equal to that of an assistant professor. In the largest institutions in which research is a major interest the educational qualifications and salaries of heads of library departments should approach more nearly the typical salary of the associate professor.

This conclusion, reached upon the basis of the survey returns, is in general accord with the American Library Association "Budget classifications and compensation plans."[87] Doctor Works's opinion is as follows:

> The headship of such departments of the library as order, cataloguing, reference, etc., in large libraries, would seem to be fairly comparable in responsibilities carried with the assistant professorship.[88]

The education and salary status of other members of the library staff do not offer the same problems. The smaller institutions at present have few professional assistants; some of the large institu-

[87] A. L. A. committee on classification of library personnel. Budgets, classification, and compensation plans for university and college libraries, 1929.

[88] Works, George A. College and university library problems, 1927, p. 86.

tions have adopted a scale of from $1,500 to $1,800 for junior library assistants (requirements bachelor's degree, two foreign languages, one year at library school). These requirements and salaries are believed to be reasonably satisfactory and are recommended for adoption.

Summary.—(1) A professional library staff should be divided into junior and senior assistants and heads of library departments.

(2) The minimum educational requirements for junior assistants should be a bachelor's degree, knowledge of two foreign languages, and one year at library school. The salary should range from $1,500 to $1,800.

(3) The professional requirements for senior assistants and heads of departments in smaller libraries, in addition to those mentioned above, should include at least one year of satisfactory experience, with a minimum salary of not less than $1,800.

(4) For heads of departments in the larger libraries additional formal education after the first degree is earned and additional experience should be required. The salaries should correspond with those of assistant or associate professors.

(5) The qualifications and salaries of the library staffs in most land-grant institutions do not at present meet these requirements.

Faculty Status

The preceding discussion compares duties, qualifications, and salaries of professional members of the library staff with corresponding members of the instructional staff. Should members of the library staff be given the actual titles of "professor," "associate professor," etc.?

Librarians in general have shown considerable interest in the question of faculty titles and rank. Twenty-three librarians of land-grant institutions have the rank of professor; 4, the rank of associate professor; 5, assistant professor; 1, instructor; the remainder have no rank at all, although 3 state they are "members of the faculty." In 9 cases, heads of library departments are "instructors" or "assistant professors."

If faculty rank is intended to include the title of professor, associate professor, etc., the question does not appear as important as the emphasis which has been given it in professional library literature seems to indicate. This opinion is based in part upon the fact that, of the 23 librarians who have the title "professor," 12 do not receive the typical (median) salary of the position. Three librarians, who report that they have the title "full professor," do not receive the minimum salaries listed under the scale of full professors in their institutions. In these cases the titles are of little

importance. A librarian's position on the campus is determined by his performance of his duties and by the success of his activities. The title "librarian" should be of more importance and should have more significance than that of "professor." Some librarians have made it so.

If faculty rank is intended to include, not titles, but relative salaries and opportunities to attend and take part in meetings of the senate, academic council, faculty, or other governing or deliberative bodies, the case is quite different. The library is an integral part of the instructional work of an educational institution. To enable it to function effectively the staff should be familiar with educational needs, aims, and development; the library personnel should be present and take part in discussion of educational policy. One example can be quoted. It was proposed at one land-grant institution to give graduate work in English. The matter was decided without the knowledge of any member of the library staff. The book collection was totally inadequate for this instruction. The cost of purchases necessary to make this collection even fairly adequate would have been in excess of $50,000. The presence of the librarian at the deans' meeting, where this matter was decided, might have saved an embarrassing situation.

The actual titles to be held by members of the library staff are not considered important. In regard to membership on governing and deliberative bodies of the faculty, members of the library staff should be placed on the same basis as the members of the instructing faculty to whom their salaries and duties correspond.

Hours of service and vacations.—The hours of service of the professional staff in the libraries of land-grant institutions vary from 37 to 45 hours per week. The typical (median) is 40. Eight out of 48 reporting require 44 and three require 45. It is noted that in many institutions librarians and library assistants voluntarily greatly exceed these hours. One librarian reported her hours of work from 44 to 70 per week. Personal observation shows that many members of library staffs averaged voluntarily 10 hours per day for 6 days in the week.

Library work is at times exacting, requiring a high degree of concentration. The pressure of work in an efficient library is heavy. The average individual can not work at full speed for 8 hours per day, much less can he have sufficient energy for additional study after spending from 8 to 12 and 1 to 5 at a busy loan desk. Librarians, if they are not to stagnate, should have certain free time for reading and study. There is no time during regular hours for the activities necessary to keep an individual abreast of his profession. The typi-

cal schedule of 40 hours for the professional staff should be the maximum in all institutions.

Vacations.—In more than three-fourths of the institutions a vacation of one month is allowed the library staff. Some institutions allow a month for their professional staff and two weeks for their clerical assistants. In a few institutions the librarian has two months' leave. One month's vacation is almost the only matter which seems to have become fairly well standardized in college library administration.

Under "Librarians' salaries" allusion was made to the fact that instructing members of the faculty customarily have from three to four months' vacation, while professional members of the library staff have one month. Under "Educational qualifications" was noted the fact that librarians customarily do not continue their formal studies after accepting their first professional positions. The failure of librarians to continue their formal studies may be due to a large extent to the fact that their vacations are more limited than are those of members of the instructing staff. The remedy, however, is not so much to increase the regular vacation allowance as to provide special leave occasionally for advanced study. An occasional three months' leave with pay, for purposes of formal study and research by certain exceptional members of some library staffs, qualified for such study, should increase the effectiveness of the service of a library. This formal study should be considered an opportunity to work in the graduate field, and not a means to remedy deficiencies in fundamental educational qualifications. These deficiencies should be removed at the expense of the individual, but with the utmost encouragement by the institution through permission to take courses in the institution and leaves of absence for study at other institutions.

Preparation for professional librarianship—Library schools.—Emphasis has been laid on the needs for professional education by those preparing for librarianship and for continuation studies and research by librarians. Are there at present facilities in this field that are satisfactory for the special requirements of land-grant institutions?

Lack of a scientific background in library-school students.—The American Library Association in recent years, possibly as a result of a study under the auspices of the Carnegie Foundation, has given much attention to the question of library training. Nevertheless in one important phase of education for librarianship the library schools are not supplying certain needs of the land-grant institutions. In all these institutions pure and applied sciences are major activities. Yet a graduate of a library school who has had a major in the

sciences is almost unknown. An inquiry of several library schools in 1929 brought out the fact that they had no student who had a major in science. Library work has seemed attractive almost exclusively to those who have majors in English, history, or in other of the so-called arts groups. In its emphasis on observation and accuracy as well as in knowledge of subject matter, science should give an excellent general training for librarianship.

Library assistants with a knowledge of the sciences would seem to be necessary in land-grant institutions. Assistants with this knowledge are not obtainable at present. If a student early in his collegiate work can decide on librarianship as his life work, as students now do in engineering or in medicine, and if he can be persuaded to take a major in science as a preparation for this profession, the present conditions will be relieved. One university president noted as a special need for the library staff that professional librarians should be definitely committed to librarianship as a permanent occupation. If this commitment occurs early in the collegiate life of the individual and proper courses are taken, the library staff will have a greater familiarity with the major departments of instruction at land-grant colleges. In the meantime, deficiencies in assistants' knowledge of the sciences can be partially remedied by study in the institutions in which they are employed.

Need of a different type of library school course.—Courses now given in library schools do not seem to be designed to give students the ability to form judgments objectively from a study of the facts rather than subjectively from personal opinion. This ability is obviously badly needed by college library personnel. Failures to report data for this survey have shown that many librarians do not know essential facts in regard to the library service of their own institutions. Library schools are giving excellent instruction, as they have for more than 30 years, on cataloguing, classification, and the internal work of library service. They have not progressed in accordance with the development of educational methods to teach some of the fundamental factors which underlie successful operation of a college library.

For those who expect to qualify for positions of librarians in land-grant college libraries there are many important aspects of preparation that are not listed in library school catalogues at the present time. In addition to present courses, instruction should be offered in (*a*) business methods in college libraries, (*b*) literature of various sciences, (*c*) objective methods in determination of library needs and future library development, including tests on use of books, (*d*) methods for determination of most valuable periodical publica-

tions,[39] and (*e*) place of reading in instructional work in various departments, and many other similar subjects. These courses might take the form of seminars and be given during the second graduate year.

Need for advanced continuation courses.—The need for continuation courses after graduation from library school has been mentioned under educational qualifications of the librarian. Library schools could be of service in the development of strictly graduate courses and in emphasis on the need of research. The courses now offered fail, with very few exceptions, to offer attractive media through which professional librarians and heads of departments, who have completed their fundamental education, can pursue studies which will better equip them for their work. Such courses, in addition to those mentioned in the preceding paragraph, would include, for example, a study of research technique in education, the application of research methods to investigation of library processes, research in relationship of reading to instruction, psychological determination of the most important qualifications for various library positions, etc.

Library schools have an opportunity to lead in the development of research in the field of library administration. Little research and little careful investigation in detail of the functions of a library, its relation to instruction, objective studies of library use, and exact qualifications needed for library assistants have been made. Librarians should develop these fields not only for their own future usefulness but, even more, for the extension and growth of library science.

Library school students unaware of necessity of adequate experience.—Many students leave library school apparently with the conviction that their library education is completed, and that they are fully prepared and qualified to act as chief librarians. Several students at present at library school stated that they wanted positions as "chief librarians" and that they were unwilling to accept subordinate positions; they wanted "executive work." Some have gone directly from library schools to the headship of college or university libraries. Library schools should make it clear to their students that after graduation they will still have much to learn before they are fully qualified to fill the important positions of librarians of college and university libraries. Too many men immediately or within a year after graduation from library schools consider themselves competent to be administrative heads of college or university libraries.

Summary.—There is need of: (*a*) A greater emphasis on science in the training of candidates for positions in libraries of land-grant

[39] Cp. methods used in Science, 46: 385–89, 1927.

institutions; (*b*) additional courses which will emphasize fundamental factors in library administration, rather than technical routine methods; (*c*) research in the field of library science and research courses for those at present serving in library positions; and (*d*) more emphasis by library schools on the need of experience in subordinate positions as a necessary preparation for the higher positions.

Administrators and chief librarians can aid in the attainment of these objectives by emphasizing in their correspondence with library schools relative to vacant positions the need for applicants with the qualifications indicated.

The Clerical Staff

Much of the work in a library is of a clerical nature which does not require professional education or experience. This work consists, for example, of the pasting of labels in books, the collection of magazines for binding, the copying of catalogue cards, the delivery of books on the campus, and the printing of call numbers on the backs of books. The items in the budget for these services are oftentimes called "wages," or "student assistants." Some institutions include under this item all employed as clerical assistants.

It is a decided waste to use a highly trained professional librarian for purely clerical duties. Most colleges are taking advantage of the possibility of the employment of students for these duties. A few colleges do not seem to take advantage of the fact that clerical assistants can do much of the routine work. A considerable financial saving and much relief to what should be a highly trained professional personnel can be obtained by the employment of clerical help. On the other hand, some institutions have relied too greatly on clerical assistance. These facts are noted in the succeeding chapter on financial support under the heading "Distribution of the budget."

Failure to distinguish between the clerical and professional assistants in budgets and in titles is noted in many institutions. The failure to make this separation is responsible for much of the misunderstanding of the nature of library employment. This fact may be one of the reasons why the professional library staff is not regarded as on the same plane as the instructional staff. More serious, however, is the fact that these failures too often result in highly trained personnel doing clerical work which could be performed more cheaply by others.

It is recommended that there be a distinct separation of the clerical work of the library from the professional duties of the trained assistant and that such separation be recognized in the budget.

Size of staff.—How many assistants are required for a library staff? How can the number needed be determined for a library which shows a fair amount of use?

An examination of the minimum amount of work to be done, the desks to be covered, the books to be catalogued, will give some indication of an answer to these questions for the smaller institutions. This examination will give a number of members of the library staff which is regarded as an absolute minimum and not a standard. It is presupposed that in the determination of number of assistants by this method, the library is open from 12 to 14 hours per day (8 a. m. to 10 p. m.); that not less than $6,000 is spent for books, periodicals, and binding each year, and that the library is used in accordance with the requirements of effective instruction, as noted in the introduction to this study of libraries.

In a library of an institution with fewer than 600 students, open 12 to 14 hours per day, the loan desk which must be covered all the time will require two assistants. Part of the day a student assistant will be required to obtain books for readers. The reference desk will need an attendant at least half of the time. There must be someone to catalogue the books. The librarian should not be confined to any of these duties, although he should be prepared to attend to them occasionally and to keep in close touch with the work. It follows, therefore, that a staff of at least five will be required in the land-grant institutions with enrollments of 500 or 600. The American Library Association sets the standard at 5½ for a student body of 600. This number is an actual minimum and is not regarded as a standard or as necessarily satisfactory.

Another method of determination is to ascertain how many assistants, say for 500 students, are employed by libraries that show efficient use and fairly satisfactory service. In determining the number of employees, some difficulty was found on account of the part-time employment of student assistants and the necessity of ascertaining what would be the equivalent of such part-time assistants expressed in number of assistants working full time. The typical student assistant receives 35 cents per hour. On the basis of a typical week of 40 hours and a typical year of 50 weeks, $700 spent for student assistants would mean the equivalent of one full-time clerical assistant. This basis is not absolutely accurate for any institution, but is believed to be satisfactory for the purpose of this study. It should not be used, however, as a basis for future additions to the library staff without regard to type of assistant required or salary to be paid. It is used solely for a determination of number of assistants needed and does not take into account the variable compensations for various grades of service. On this basis, the University of

Hawaii employs 8 for an enrollment of 840, Massachusetts Agricultural College, 8 for an enrollment of 570, and Amherst College, 14 for an enrollment of 700. These libraries are much used. These figures indicate that a library staff of 5 or 5½ is not too high a minimum for an enrollment of 500 or 600 students.

What increase in library staff is needed as the enrollment increases? The University of California has 4 assistants to every 500 students; Illinois, 4.5; Iowa State College has 4. These institutions show above average use. Two of the three report arrears in current cataloguing. No institution which reports a loan of books per student above the average for the group (in so far as circulation statistics were reported) has fewer than 4 assistants for each group of 500 students.

The minimum requirement proposed, therefore, is 5 assistants for a college of 500 students, 10 assistants for 1,000 students, and 4 additional assistants for each additional 500. These figures include student assistants on the basis given above.

How does the number of assistants in land-grant institutions as a whole correspond with the tentative minimum suggested above? Nine land-grant institutions, with an average student enrollment of 1,034, employ a library staff of four or fewer. These institutions do not meet the minimum requirement for a student enrollment of 600. Two institutions employ a librarian with no assistants; one employs a professor on part time with two full-time assistants. It is not surprising to note that these libraries show little use. The five institutions which reported the fewest number of books loaned to the individual typical student per year had an average of 2.1 assistants for 500 students.

It is apparent that the faculties of these institutions with limited library staffs are not using library readings in connection with their instruction, and to this extent their instruction is not in accord with modern methods of education. It is suggested that in these cases a special study be made of the instructional methods used and the ability of the library to meet generally accepted methods of instruction.

For a library that is functioning in the educational program of an institution using modern methods of instruction, a minimum of a library staff of 5 for 500 students, 10 for 1,000 students, and 4 additional assistants for every additional 500 students is recommended. The number of assistants should be figured on the basis mentioned above.

Reorganization of Library Staff

It is apparent that the library staff can be regarded as satisfactory in only a few land-grant institutions; in certain others it should be

strengthened and enlarged. In many institutions complete reorganization is necessary. It is not desirable, even if it were possible, for a reorganization to take full effect at one time. If a library is not functioning, it can not be transformed into an effective organization in 30 days. Two or three years may be required. Book collections must be built up and a start made in the employment of an efficient staff.

The first step in the process should be to obtain a fully qualified and experienced chief librarian. An attempt to develop the book collection, to plan a building, or to appoint assistants before a capable librarian is obtained may, and probably will, waste funds. An able librarian will start the foundation of an effective service on a permanent basis and if supported will within a few years change completely the position of the library in the instructional scheme of the college. He is the one who can best guide the acquisition of material, the selection of the best-qualified assistants, the plans of a new building, if one is to be built; but, more important, he can with adequate financial support so organize both material and personnel—books, building, equipment, staff, book selection, and use—so as to make all such factors serve the one end—effective instruction to students.

One college president with a library showing great improvement in the past few years stated in connection with this survey that his solution for the library problems was to find a capable librarian, to give him authority, and to support him. This somewhat exceptional president might have added that, from an exceptional knowledge of the functions of a modern library, he also supplied constructive leadership, suggestions of general policy, and the administration necessary to relate the library to the instructional and research work of the college. The first step in the reorganization of the library, therefore, is to obtain an efficient librarian.

The chief difficulty in definite recommendations as to the library staff is the question of what to do with the present librarian and library assistants when they are not qualified for the positions they are holding. This question must be decided in accordance with the policy of each individual institution. Since the salaries of these individuals probably do not correspond with the positions they are holding, it may be a satisfactory solution to give them the actual positions in the library service to which their qualifications and salaries entitle them and to fill the positions they are now holding with individuals better qualified and better paid. Another solution is to transfer them to other departments of the college.

Summary

Findings in regard to library personnel.—(1) A study of the activities of library staffs, the duties performed, and the use of books

justifies the statement that the library personnel in many land-grant institutions is not measuring up to the full possibilities of the positions held. Librarians and assistants in many cases have neither the educational qualifications nor the professional experience which are necessary for the full functioning of libraries.

(2) The library staff is insufficient in numbers in most land-grant institutions; the salaries paid professional members of all library staffs with the exception of three or four institutions are inadequate.

(3) The library schools are not supplying candidates for positions in land-grant institutions with fully satisfactory educational equipment; neither are the courses generally offered for advanced work entirely satisfactory.

Recommendations

(1) The librarian and all members of the professional library staff appointed in the future should have a bachelor's degree and a year at library school. In addition, chief librarians and heads of departments should be able to show successful professional experience and professional accomplishments. The experience of the chief librarians should have been in important positions in ably administered libraries of more than 100,000 volumes.

(2) The salaries paid the librarians should be not less than the typical (median) paid the deans or the highest grade of full professors. The salaries paid heads of library departments should be not less than the typical (median) paid instructors in institutions with fewer than 1,000 students. In larger institutions the salaries of heads of departments should equal the typical salaries paid assistant or associate professors.

(3) In many land-grant institutions the library staff should be reorganized and enlarged; in others it should be strengthened. The first step in reorganization is the appointment of a capable librarian.

(4) Members of the professional library staff should be included in such councils, senates, or faculties as admit deans, professors, associate, or assistant professors, and instructors, with corresponding salaries.

(5) More emphasis should be given by administrators and librarians to the need for a knowledge of the sciences by candidates for positions in land-grant institutions and to the organization of strictly advanced graduate and research courses for those who would qualify to fill the higher positions in libraries of land-grant institutions.

Chapter VIII.—Financial Support and Library Budgets

It has been shown that some of the libraries of land-grant institutions are being used slightly as compared with others. It has also been shown that these less-used libraries have inadequate book collections and inadequate staffs, both in numbers and in educational and professional qualifications. The fact has been noted that the salaries paid library staffs are less than the salaries paid to the occupants of similar positions in the group surveyed by Doctor Works. It has been shown that salaries in the least-used libraries of land-grant institutions are grossly inadequate.

In view of these facts, the following questions require consideration. What financial support do libraries of land-grant institutions receive? What are the library expenditures in proportion to the number of students enrolled? How do the expenditures in the less-used libraries compare with those with much greater use? In order that the present tendency may be ascertained, some attention is given to the increase in expenditures for library purposes during the past 20 years. The question of special fees for library purposes also requires discussion, as these fees have a direct relation to support. An examination of items included in library budgets and the preparation of budgets is desirable as a preliminary to the consideration of financial support.

What Do Library Budgets Include?

The failure to centralize in the librarian authority for library administration in many institutions is paralleled by a corresponding failure to indicate in the library budget the total expenditures for library purposes. The experiment station and law libraries are often administered independently of the general library; their expenditures are carried on the budgets of the experiment station or law school, respectively. For the remaining libraries on the campus there seems to be no consistent policy in a majority of the institutions. Twenty-five out of forty-three reporting institutions do not include in the library budget all expenditures for library books and periodicals. Seventeen of forty-three do not include salaries of all library personnel. In one institution, books for a department library may be bought in part from funds available in the library budget and in

part from funds available in the department budget. A library assistant's salary in one department may be carried on the library budget and in another department on the department budget.

In five cases institutions stated frankly that the amounts spent for library services (books and personnel) in their institutions could not be given, except by examination of every separate voucher in the institution. One institution stated that it had no budget, but that every requisition was considered on its merits. Apparently 10 of the 48 reporting institutions did not know what their libraries were costing them and could not give the amount spent for library purposes for the last fiscal year covered by the survey. Twenty-two institutions could not give their library expenditures for 1910.

If a financial report is designed to show how the funds of a college are expended, the item "Library expenditures" is misleading and deceiving in these cases. If a budget is drawn up as a guide to the expenditures of funds in an institution, it should presumably include all of the funds to be expended for a given purpose. If changes occur during the year, the budget should be modified to correspond. It may not be possible to include in a library budget, prepared at the beginning of a fiscal year, all funds which may be expended for the library during the year. Additional funds may become available. These funds, however, can be added to the budget during the year.

If it is desirable or legally necessary to carry expenditures for the law and experiment-station libraries on the budgets of the law schools and experiment stations, it should be possible to indicate these entries also in the library budget and to show in the financial statement under library expenditures the amount spent for these libraries. This method is used in the excellent financial report of the University of Illinois.

The budgetary conditions in many institutions, in so far as the libraries are concerned, may have arisen also from the inadequacy of the funds made available directly for library purposes and the desire of departments to supplement such funds by the use of their own allotments. In some cases unexpected departmental balances during the closing months of the year have been used for the purchase of books. In other cases, when a department desired a departmental librarian and the library had not sufficient funds, the assistant was supplied by the department.

However justifiable the immediate motive may be, it is believed that the failure in many institutions to show exactly all expenditures for library purposes is unsound. If departmental funds are available for library purposes at any time during the year, these funds should be transferred from the department budget to the library budget. The heading "library expenditures," in the financial re-

port should certainly show all expenditures for library personnel, books, periodicals, and binding (not including, of course, laboratory manuals for laboratory use).

TABLE 5.—*Library expenditures, 1928*

Institution	Number of students [1]	Library expenditures	Library expenditures per student	Ratio of library expenditures to total expenditures
1	2	3	4	5
Alabama Polytechnic Institute	1,610	$8,384	$5	0.8
Alaska Agricultural College and School of Mines	64	819	12	.8
University of Arizona	1,740	29,168	17	2.8
University of Arkansas	1,555	53,733	35	4.7
University of California	17,005	331,004	19	4.0
Colorado Agricultural College	1,160	19,218	17	2.2
Connecticut Agricultural College	509	7,022	14	.8
University of Delaware	707	11,346	16	2.5
University of Florida	1,904	37,624	20	2.3
Georgia State College of Agriculture	1,084	7,399	7	.9
University of Hawaii	666	22,429	34	5.8
University of Idaho	1,912	23,631	13	2.3
University of Illinois	12,033	221,870	20	3.6
Purdue University	3,623	31,215	9	1.0
Iowa State College	4,033	99,121	25	3.0
Kansas State Agricultural College	2,825	53,250	19	2.5
University of Kentucky	2,393	34,636	14	1.9
Louisiana State University	1,970	38,170	20	2.8
University of Maine	1,346	18,448	14	2.0
University of Maryland	2,660	22,467	----------	1.5
Massachusetts Agricultural College	593	17,854	30	1.7
Massachusetts Institute of Technology	2,712	44,747	16	1.7
Michigan State College	2,741	33,455	12	1.4
University of Minnesota	11,050	288,079	26	5.2
Mississippi Agricultural and Mechanical College	1,397	11,092	8	.9
University of Missouri	4,421	75,978	17	2.7
Montana State College	905	10,122	11	1.4
University of Nebraska	6,340	78,463	12	2.7
University of Nevada	984	13,415	14	2.8
University of New Hampshire	1,658	21,197	13	2.5
Rutgers University	2,685	39,925	15	1.9
New Mexico College of Agriculture and Mechanic Arts	292	4,175	14	1.0
Cornell University	5,671	82,249	15	1.4
North Carolina State College	1,432	22,300	16	1.5
North Dakota Agricultural College	1,059	16,551	16	1.7
Ohio State University	10,183	159,784	16	3.5
Oklahoma Agricultural and Mechanical College	2,500	27,073	11	1.9
Oregon Agricultural College	3,762	47,049	13	2.6
Pennsylvania State College	3,854	27,501	7	.9
University of Porto Rico	1,279	17,251	13	3.0
Rhode Island State College	626	2,559	4	.7
Clemson Agricultural College	1,212	9,878	8	1.7
South Dakota State College	908	10,550	12	1.1
University of Tennessee	2,725	54,611	20	3.6
Agricultural and Mechanical College of Texas	2,444	15,129	6	.6
Agricultural College of Utah	980	8,877	9	1.4
University of Vermont	1,219	10,436	9	1.4
Virginia Agricultural and Mechanical College	1,251	12,317	10	1.0
State College of Washington	2,685	39,212	15	2.5
West Virginia University	2,459	25,827	10	1.3
University of Wisconsin	8,942	109,151	12	1.9
University of Wyoming	1,044	27,857	27	3.7

[1] Number of students was taken from the U. S. Bureau of Education Bulletin 1929, No. 13, p. 30, and the figures used were the enrollment on Oct. 31, 1927.

In the case of library expenditures other than books, periodicals, and services there is not the same difficulty. The upkeep of the library building, janitorial service, heat and light are in practically all cases not charged against the library budget. This practice appears to be uniform and consistent among the different college departments. The budget headings against which are entered charges for permanent library equipment other than books vary considerably. In some cases these items are entered under the library budget, in other cases under such headings as "Equipment" and "Communication." This practice causes some confusion in a few cases. The more general custom seems to be to consider permanent equipment as capital expenditure and not as a part of library administration or support.

In this discussion of "Financial support of libraries," and in Table 5 an attempt is made to include under library expenditures all expenditures for library personnel, books, periodicals, and binding for all libraries on the campus. Permanent library equipment is not included.

By Whom Are Library Budgets Prepared?

In nearly all cases (40 out of 46 who reported data) the library is responsible for the preparation of the library budget. In two cases the responsibility is given to the library committee, and in four cases to the library committee and the librarian.

There is more variation in the routine of the submission of the budget after it is prepared. In 20 of 48 reporting institutions the budget is submitted directly to the president. In 15 institutions it goes to the library committee for approval and in 13 cases to various officers (dean, business manager, etc.).

If the librarian is capable, he will be in possession of the facts needed to draft the original budgetary recommendations. The library committee, with its knowledge of instructional needs, may be able to assist and support. But the chief responsibility should be the librarian's. If he is not capable of assuming such responsibility, he should be replaced by one who is competent.

It is recommended (*a*) that all contemplated expenditures for personnel, books, periodicals, and binding for all libraries connected with the institution be shown on the library budget and in the financial report; (*b*) that any funds on department, station, or school budgets expended during the year for library purposes be transferred and indicated in the accounts as a transfer to the library budget; (*c*) that the financial report show under library expenditures all expenditures for library purposes; and (*d*) that the budgetary recommendations for library service be prepared by the

librarian and submitted directly to the president or other budgetary officer.

Growth in Library Expenditures

The remarkable growth in financial expenditures of many libraries of the land-grant college group shows an increasing realization of the importance of the place of the library in the educational program of the land-grant college. Rutgers has increased its expenditures from $1,560 in 1910 to $39,926 in 1928 (2,500 per cent); Oregon State Agricultural College from $4,027 to $27,046 (572 per cent); University of Kentucky from $2,600 to $34,636 (1,232 per cent); and Louisiana State University from $7,452 in 1910 and $11,040 in 1920 to $38,700 in 1928 (419 per cent since 1910 and 250 per cent since 1920). It is noteworthy that the presidents of three of the institutions which have shown the greatest increases in library expenditures have strongly expressed the need for considerable further increases in the future. Much growth is noted in recent years and over a relatively short period of time. The University of Florida spent for library purposes in 1927, five times as much as in 1920. Louisiana State University and the University of Maryland have tripled the expenditures for their libraries since 1920. The University of Kentucky and Clemson Agricultural College have doubled. A few institutions show no increases since 1920.

In the consideration of the growth of libraries, the growth of the institution must be considered. It should be remembered that the budgets of the various colleges listed show from two to six times more funds available in 1928 than in 1910. If the library expenditures have doubled since 1910 and the college expenditures have increased fourfold, the library is probably not keeping up with the growth of the college, even if library facilities were fairly adequate in the earlier year.

A large growth in library expenditures does not necessarily mean that the present expenditures are satisfactory for library purposes. The original basis in 1910 may have been so low as to be almost negligible. One institution, for example, which has increased its library expenditures 2,600 per cent, started from a basis of $1,560 spent on its library in 1910. Its library has certainly developed greatly, but it is known that the administration and faculty of this institution do not regard their library service even yet as entirely satisfactory. Indeed, it is those institutions which show the greatest increase in library expnditures that are most actively planning still further development of their libraries.

A study of the growth of library expenditures as compared with services rendered and with the growth of the institutions indicates: (*a*) That a few (four or five of those reporting) of the land-grant college libraries have received fairly adequate support during the past 20 years; (*b*) that a much larger number (the emerging libraries) have lately increased their expenditures rapidly and have started a period of development; and (*c*) that there are still many libraries (the submerged class) whose expenditures have not increased sufficiently to enable them to function at all adequately.

Factors Which Govern Library Support

What does an efficient library cost? Upon what factors does the cost depend? How should the library funds be distributed between personnel, books, periodicals, and binding? How do the land-grant institutions as a whole compare with other classes of institutions in relation to their library expenditures? What bases can be used for judging the expenditures necessary to meet the needs of libraries?

Direct comparison of total expenditures for library purposes by land-grant institutions is futile. The library needs for a college of 500 students are quite different from the needs of a university of 10,000 students. The number of students at a college will directly affect the requirements for financial support of the library. The financial needs of the library also have a direct relationship to the extent of the instructional and research work which in turn depend largely upon the operating funds available.

The relationship of library expenditures to the number of students and the percentage of the total operating expenditures devoted to library service seem, therefore, of more importance in a study of the status of a group of libraries than a direct comparison of library budgets in themselves. A study of library expenditures for all institutions can not be satisfactorily made, however, until all report under the heading "Library expenditures," all expenditures for library purposes and until there is a general agreement as to what is meant by the term "student." If the term signifies a full-time student, what allowance shall be made for part-time students? Until accounting methods are more satisfactory and definitions more exact, calculations of library expenditures per student and of ratios of the library expenditures to total instructional and research budgets must be used with great caution. These calculations are used in this survey, however, since they do give a general approximation for most land-grant institutions of the comparative expenditures for library purposes in relation to numbers of students and general budgets.

Library Expenditures Per Student and Relations of Library to Total Budget

Several attempts have been made by various authorities to ascertain (*a*) what is being spent in various colleges for library service per student, (*b*) what is the present percentage of the total budget used for library purposes, and (*c*) what should be the proper amount per student and the proportion of institutional funds which should be allotted to library support.

A study of actual library expenditures of 59 teachers' colleges, by Dr. G. W. Rosenlof, gives an average of $9.52 spent per student for library purposes and a ratio between the library budget and the total budget varying by groups from 2.92 per cent to 4.43 per cent. The study lays down definite standards as follows:

> Each teachers college of less than 1,000 students shall apportion to the library not less than 7 per cent of the entire college budget, exclusive of capital outlay. Each teachers college of more than 1,000 students and less than 1,500 students shall apportion to the library not less than 6 per cent of its total college budget, exclusive of capital outlay. Each teachers college of more than 1,500 students shall apportion to the library not less than 5 per cent of its total college budget, exclusive of capital outlay.[40]

The methods by which the figures of 5 per cent and 7 per cent are arrived at are not stated.

A committee of the American Library Association attempted to arrive at tentative figures by means of a questionnaire to members of faculties, graduate students, and others who were familiar with libraries in various institutions. "Those libraries, whose services to the faculty and students were considered above the average of the group, were marked with a plus; those below average were marked with a minus. It was found that those which were generally checked as above average had an income in practically every case equal to or in excess of $25 per student ($20 per student in universities of more than 8,000). The income was also more than 4 per cent of the total income of the university, as defined in the specifications. On the other hand, all which were checked minus, with two exceptions, fell below one or the other of these standards." The income of the university was defined as excluding additions to endowment, funds for new buildings, and other capital expenditures, athletic funds, etc. The number of students included the total number of full-time students registered at one time.[41]

Dr. T. W. Koch, of Northwestern University, some years ago made a study of the relation between library and university expenditures in 16 selected universities. The figures reported varied from

[40] Rosenlof, G. W. Library facilities of teacher-training institutions. Teachers College, Columbia University Contributions to Education No. 347. New York, 1929, p. 152.

[41] A. L. A. Committee on classification of library personnel. Budgets, classification, and compensation plans for university and college libraries, 1929, p. 4–5.

a minimum of 2.5 per cent to a maximum of 11.4 per cent with an average of 4.9 per cent.[42]

Prof. W. P. Lewis, of the University of New Hampshire, stated that the average expenditures for library purposes of 14 New England colleges were 3.3 per cent of the total institutional budgets, including nonoperating expenses. These nonoperating expenses apparently included capital expenditures which are not included in the figures of the American Library Association nor in the figures of the land-grant colleges given later in this report. If the capital expenditures were excluded, the ratio would be much higher. The per capita student cost for these 14 New England libraries was $23.69.[43]

A standard of library expenditures per student and a definite ratio of library expenditures to total budget can not be fixed without an individual study of the widely different conditions at various institutions. There is certainly, however, a minimum amount below which expenditures can not go and still make possible good library service. Above this minimum, the amount needed must be determined by study of the needs of the individual institution.

Table 5 gives an estimate of the library expenditures per student and the ratio of library expenditures to the total expenditures of land-grant institutions, not including capital outlays, etc. Great caution must be exercised in using these figures or in drawing definite conclusions from them. Rutgers University does not report the expenses of its library for the New Jersey College for Women. Maryland does not show its expenses for libraries in departments at Baltimore, and expenditures for these departments, as well as the number of students in Baltimore departments, are necessarily excluded in the figures. Several other institutions could not report all their library expenditures. In so far as posible, however, the column of library expenditures shows all library expenditures of the institution.

It will be noted that several land-grant institutions are meeting the American Library Association proposals as just given. The University of Hawaii shows $34 expended per student for library purposes, a ratio of 5.8 per cent for its library. The University of Illinois, with a large enrollment, shows $20 expended per student and a ratio of 3.6 per cent. Massachusetts Agricultural College, with a small enrollment, shows $30 expended per student. The University of Wyoming shows $27 per student with a ratio of 3.7 per cent.

[42] A. L. A. Survey of libraries in the United States. Chicago, 1926, vol. 1, p. 211.
[43] Library Journal, 51: 576, Jan. 15, 1926.

In 10 institutions less than $10 per student for library purposes is spent; 33 are spending between $10 and $20 per student for library purposes; and 8 in excess of $20.

If the ratio of library to total noncapital expenditures be considered, 8 out of 45 institutions spend on their libraries less than 1 per cent of the total expenditures; 20 are spending between 1 and 2 per cent; 14, between 2 and 3 per cent; 6 between 3 and 4 per cent, and 4 are spending 4 per cent and more. Forty-two land-grant institutions are not spending on their libraries as great a percentage of their total funds as does the minimum groups of teachers colleges in Doctor Rosenlof's study, although Doctor Rosenlof states that the amount so spent in teachers colleges is greatly inadequate. Only four are meeting the recommendation of 4 per cent made by the American Library Association. Only 7 of the land-grant institutions equal the average ratio of the 14 New England colleges studied by Mr. Lewis and only 2 exceed the average of Doctor Koch's selected group of universities. More than half of the land-grant institutions are not spending on their libraries as great a percentage of their total expenditures as the institution with the lowest percentage in Doctor Koch's group.

A comparison of one land-grant institution serving 500 students with Amherst College, a liberal arts college serving 700 students, may be of interest as showing two extremes in library service. The first has an institutional budget 50 per cent higher than the second, but is spending not more than 1 per cent on its library, as compared with 7 per cent by Amherst. The first institution has a librarian and two assistants. The second has a librarian and the equivalent of at least 11 full-time assistants. The first institution spent in one year slightly more than $1,000 for 306 books. Amherst spent $10,000 for about 3,000 books. The first institution is spending $14 per student on its library. Amherst is spending more than $50 per student. The reports on service in the library of the first institution are very critical. The reports from Amherst by both faculty and students are unusually commendatory. A still more extreme case is an institution with an enrollment of 1,000 students which has two library attendants, and an annual expenditure of $1 per student for new books.

It is apparent that the present financial support of many land-grant institutions is insufficient to permit of good library service. One institution, with a student body of more than 1,500, reports annual library expenditures of about $10,000; another, with an enrollment of about 2,400, reports less than $15,000 for its library; a third added to its library in one year 425 purchased books for 500

students and subscribed to 86 periodicals at a cost of $404. A fourth had sufficient funds to purchase only 122 books last year with paid subscriptions to 85 periodicals (including annuals) and employed but one full-time worker in the library. It is obvious that a library can not function properly with such financial support.

It is not known whether it is a land-grant institution which "advertises a million-dollar recreation building containing three gymnasiums, a swimming pool, squash courts, bowling alleys, and a golf course and possesses a library containing 7,500 volumes." [1] Corresponding cases, however, nearly as extreme, can be cited from several of the land-grant institutions. In some institutions, hundreds of thousands of dollars for a new stadium does not seem to be inconsistent with a library building with 96 seats for a student body of 1,200, nor with annual expenditures of $10 per student for library books.

It was noted in Chapter I on the Usability of Libraries, that libraries which showed considerable use include those with the larger library expenditures per student and the larger percentages of college funds expended for library maintenance. The converse also held. The failures of libraries to function are generally closely related to and in most cases caused by a lack of financial support.

The statement is often made in regard to inadequate library development that a given college "does not have the funds available for its library which other colleges and universities enjoy." In colleges with undeveloped libraries, the cause for inadequate service is not a lack of institutional funds. The actual fact as shown in this survey is that land-grant colleges and universities with undeveloped and little-used libraries have alloted for library purposes a much smaller proportion of their funds than do institutions with well-developed libraries. All institutions may not have the total operative funds which the University of Minnesota, as an example of a large institution, or the University of Hawaii, as an example of a small college, receives. But few land-grant colleges and universities allot from the available funds the 5.2 per cent which Illinois or the 5.8 per cent which Hawaii allots. It is not a case of lack of funds available to the institutions; it is a failure to allot to the library the same percentage of these funds which other institutions with highly developed libraries have found desirable. The failure of so many libraries in land-grant institutions to function, the pitiful showing made by their inadequate book collections, and the poorly equipped, understaffed and underpaid library personnel can be laid directly to the failure of administrators to apportion for library purposes the same

[1] Robertson, D. A. *In* Educational Record, 10 : 24, January, 1929.

proportion of their funds which college administrators with adequate library service have done.

The facts given in the preceding paragraph, considered in connection with the portions of this report dealing with "Books and Periodicals" and "Personnel," clearly indicate that (*a*) the libraries of most land-grant institutions as compared with other groups of colleges have inadequate financial support, (*b*) the expenditures for library purposes are not sufficient to provide for adequate book collections and personnel, and (*c*) the lack of funds for library purposes is due to the failure to allot to the library as large a percentage of funds available to the institution as do the institutions with well-developed libraries.

It is recommended: (*a*) To all land-grant institutions, that careful attention be given by the individual institution to the question whether the financial support of the library has been consistent with and sufficient for the needs of the educational and experimental work of the institution; and (*b*) especially to such institutions whose library budgets are below 4 per cent of the total college budget or less than $20 per student, that they consider carefully the question as to whether the library is meeting the demands made upon it, and if so, whether the faculty is following the accepted methods in education as noted in the introduction to the library section of this survey.

Library Fees

Fourteen of the reporting land-grant institutions charge a special library fee. This fee varies from $1 to $5 per year. Six institutions charge $5. In two cases attempts are apparently made to cover the library expenses solely by means of funds received from such fees. A tendency is noted in certain institutions (Rutgers University and Iowa State College) to abolish all special fees, combining them into one. Special difficulties arise when the library is solely or chiefly dependent upon fees for its support. These fees are not sufficient in amount to provide adequate service.

The library is a necessary and integral part in the educational and research work of the whole institution. It should serve every instructional and every research department. There is grave danger in regarding library service as distinct from the educational and research fields and as a service which must be met by a special charge. Laboratory fees may be justified as applicable only to certain classes of students, athletic fees may be defended as used for extracurricular activities. Library fees, however, do not belong to either of the aforementioned classes. As a necessary part of the educational work of an institution, the library should be recognized as entitled to a

certain proportion of the funds appropriated by the State for educational purposes, to a certain proportion of the regular tuition charges, and to a certain portion of the research funds.

Distribution of Library Expenditures

What is and what should be the distribution of the funds available for library purposes for personnel and books? Statements have been made that the college library hardly ever spends as much for service as for books. The reports indicate that in nearly all cases land-grant institutions spend more for services than for books and that, in a majority of institutions with insufficient library support, books have suffered equally with personnel.

The actual distribution of library expenditures of 14 New England colleges was 38 per cent for books, periodicals, and binding; 56 per cent for salaries; and 6 per cent for incidentals.[45] Doctor Rosenlof's recommendations for teacher-training institutions are 55 per cent for salaries and wages; 35 per cent for books, periodicals, and binding; and 10 per cent for incidentals.[46] Prof. W. M. Patton suggests that 40 per cent of the total expenditures be used for books.[47] In general, authorities agree that about 50 per cent more should be spent for salaries and wages than for books, periodicals, and binding.

In most of the land-grant institutions with large expenditures it will be noted that salaries and wages vary from 50 per cent to 60 per cent of the total budget, while books, periodicals, and binding run from 40 per cent to 50 per cent. In many institutions with small library expenditures salaries and wages are more than double the amount spent for books. Apparently a minimum amount of service is required in these institutions, merely to keep the libraries open, and little funds remain after that minimum is used. In a majority of land-grant institutions larger funds are needed for both books and personnel.

Relationship of salaries to wages—Student assistants.—Many institutions are taking advantage of the opportunity to employ students (both graduate and undergraduate) for the clerical work at comparatively low rates, thus releasing the professional library staff for professional duties. The universities of Minnesota and Florida and Iowa State College are spending one-fifth of their personnel budgets for assistants on an hourly basis; Arkansas, one-sixth; Illinois, one-seventh; Wisconsin, one-eighth. The percentage which can be spent wisely for such services would seem to be limited to about the aforementioned figures. One college, which is spending well over one-

[45] Library Journal, 51: 576, June 15, 1926.
[46] Library facilities of teacher-training institutions, 1929, p. 158.
[47] Libraries, 31: 155, March, 1926.

fourth, reports that this amount of student help is too large for satisfactory results. Many other institutions, however, use this form of service to a very limited extent, one-twentieth in some instances. Satisfactory student assistants can ordinarily be obtained readily and are capable of doing much of the routine work. Furthermore, many librarians found their life work as a result of their employment as student assistants in college libraries. This employment offers a valuable opportunity to secure desirable recruits for librarianship.

It is recommended that in most institutions equal attention be given to the further development of both personnel and books. It is also recommended that librarians employing comparatively little student help give consideration to the use of this form of service.

Summary

The one outstanding fact in the financial support of libraries of land-grant institutions, which requires emphasis to the exclusion of all others, is the inadequate financial support of the group as a whole.

More than 50 per cent of the libraries in the land-grant college group are receiving less than half the funds deemed necessary for adequate service, some less than one-fourth.

The lack of funds in these institutions is due directly to the failure of administrators to allot for library purposes the same proportion of institutional funds which is allotted in institutions with satisfactory library services. Until sufficient funds are allotted the library service in most land-grant institutions will remain inadequate for instructional and research needs. If the many authorities, a few of whom have been quoted, are correct in their statement of the dependence of adequate instruction and research upon library service, the value of the instruction and research in many land-grant institutions, as compared with other institutions, is open to serious question, as are the instruction and research in the group as a whole as compared with the group of 14 New England colleges or the group of 14 colleges and universities, surveyed by Doctor Works.

Chapter IX.—General Conclusions

This study has been based on the conception, stated repeatedly by leading educators and research workers, that an effective library is essential for the instructional and investigational work of every institution of higher education. This conception is no longer considered open to question. The statement in the conclusion of Doctor Rosenlof's study of libraries of teacher-training institutions applies with equal force to land-grant institutions.

> It has not been thought within the province of this study to challenge the place of the library in its relation to the newer theories and conceptions of educational philosophy or of the educative process. The newer methods of teaching and learning, the passing of the textbook as the only source of information, and the coming of the new approaches to learning through the avenues of many supplementary reference materials have been accepted as prima facie evidences of a new day and a new responsibility in the field of library service.[48]

The five requirements for good library service have been stated in the introduction to this study, as follows: (1) Adequate book collections; (2) suitable buildings and equipment; (3) satisfactory relationships of library to institutional administration and to faculty; (4) competent and sufficient library personnel; and (5) adequate financial support.

As a preliminary to a study of the extent to which these requirements are met by land-grant institutions attention was also given to the use at present made of libraries. The following summary of recommendations under these headings is offered as a means for the improvement of service of libraries of land-grant institutions.

Summary of Recommendations

Use of libraries.—(1) More attention should be given to the individual reader in order to see that he obtains needed material.

(2) Librarians should make additional studies, statistically and otherwise, of the use of their libraries, and especially of failures of students and faculty to obtain adequate service.

(3) Further studies by librarians are also needed to ascertain factors which affect present development and should direct future growth.

[48] Rosenlof, G. W. Library facilities of teacher-training institutions, 1929, p. 150.

Books and periodicals.—(1) The selection of books should be organized; all instructors should see that the needed material in their fields is available. The final responsibility should be placed upon the librarian.

(2) Inasmuch as it has been found that institutions with well-used libraries are expending not less than $10 per student for books, periodicals, and binding, this amount is suggested as a tentative standard. This need is shown by the pitiful condition of the book collections in more than one-half of the land-grant institutions.

Buildings.—(1) Institutions which have not erected library buildings within the past 10 years should make a careful study to determine if their present buildings are fully conducive to the satisfactory use of books.

(2) In the erection of buildings in the future much more attention should be given to the use to be made of the building. Adequate provision should be made for future growth of the library and enlargement of the building.

Administrative control.—The control of all libraries on the campus should be placed directly upon the librarian, who should be responsible only to the president for their administration. All purchases of library books and all appointments of library assistants should be made only upon his recommendation.

Personnel.—(1) The library staffs of many land-grant institutions should be enlarged. The number of persons found necessary by well-used libraries is 5 for the first 500 students, 10 for the first 1,000, and 4 additional for each additional 500 students. Part-time assistants are to be included and are to be figured on the basis given in this report.

(2) For all future appointments to positions on the professional staff of the library a college degree and one year of library school should be required. In addition, adequate experience in scholarly, well-used libraries is recommended for all positions except those of junior assistants. More extensive educational and professional qualifications should be required for the higher positions.

(3) Salaries of librarians should correspond with the average salary paid academic deans or the salaries paid the most highly paid group of full professors. The salaries of heads of library departments should correspond with the salaries of assistant or associate professors.

(4) Many library staffs need reorganization. The present members of those staffs should be given positions for which they are qualified; new members should be appointed at salaries based upon the requirements of the positions and the qualifications of the appointee.

(5) There is need of a clear understanding of the duties of professional library assistants and a distinction between the duties of the professional and clerical staffs.

Financial support.—In more than three-fourths of the land-grant institutions much increased financial support is needed. In the group of libraries with the least use and smallest support the library budget should be increased to about four times the present amount. Institutions which are allotting less than 4 per cent of their funds for library purposes or which are spending less than $20 per student should carefully examine the use made of their libraries, the adequacy of the book collections, and the efficiency of the personnel as compared with libraries with larger ratios of expenditures.

Need for Better Understanding

The failure of administrators to allot for their libraries a sufficient amount to enable the library to function effectively may be caused by: (1) A lack of knowledge of what constitutes adequate library facilities. (It is hoped that the recommendations given in this survey will contribute to a knowledge of the facilities needed for good library service.) (2) A failure fully to appreciate the place of the library in the educational system.

The relation of the library to the educational system has been emphasized. As a final summary, it is desirable to give an additional statement of the necessity for adequate library service if the research and instructional activities of the land-grant institution are in any way to approach desired objectives.

Klauder and Wise, from the standpoint of the library building, make an excellent statement of the library's needs which is applicable not only to the building but to all elements in the development of libraries.

> The library is the intellectual central power plant of the college or university. It is related to all departments and it must keep pace with all departments in supplying to each branch of study the books and references needed. Hence the library must be sensitive to the expansion of any teaching unit of the institution. If a new department is added, there must be a corresponding increase in the library's volumes; and this means, if there is not space for the addition of new stacks within the original building, an increase in the size of the structure itself. Thus it is seen that the comparison of the library with the central heating plant is not merely figurative, for the heating plant must increase its service as soon as a new building with its additional "load" is erected.[40]

This statement presupposes that the "power plant" is sufficient for the original load. This implication, however, does not hold in many libraries of land-grant institutions.

[40] College architecture in America, 1929, p. 170.

PART IX.—AGRICULTURE

Chapter I.—Introduction

Legislative provision for colleges of agriculture had been made in a number of States before the land-grant college bill was passed in 1862. This was the case in Michigan (February 12, 1855); Pennsylvania (April 13, 1854), amended (February 23, 1855); and in Maryland (March 6, 1856), amended 1858. Pursuant to such legislation, agricultural colleges were established and opened their doors for enrollment in Michigan, May 11, 1857; in Pennsylvania, February 16, 1859; and in Maryland, September, 1859. Definite movements toward the establishment of colleges in which agriculture was to be taught were on foot in New York in 1853, in Ohio in 1854, and in some other States during the early fifties, and in some instances preliminary steps for their organization had been taken. However, the land-grant act crystallized the thinking of the leaders of the time as to the type of education that had most promise for the welfare of the industrial classes, of agriculture as an industry, and of society as a whole.

It is clear from the land-grant act itself and from interpretations placed upon it by Mr. Morrill that the emphasis in education by the institutions under this act should be on science that might be applied in practical life and not on the humanities which had been emphasized in the colleges up to that time. It was not the thought that the humanities should be discarded or neglected, but that the sciences relating to the affairs of every day should receive major attention and that the scientific attitude should be encouraged.

Further, the land-grant act made it clear that in the future education was not to be for the well-to-do classes alone. The agricultural and industrial classes were to have an equal opportunity for higher education. That science should be used as the basis of this new education and that it should be made so democratic that everyone might have an opportunity to attend a college, constituted a marked departure from the accepted conception of higher education.

Educators generally were contemptuous of the land-grant college movement and of science as a medium of educational value. They were entirely unsympathetic with the idea of universal education or

of education for anyone except the predestined leaders of society. In the words of Dean Eugene Davenport:

> Science at this time had no standing among educators. It was considered incapable of giving mental training and discipline and at best was looked upon as a commercializing of education.
>
> Not a few, too, held to the old doctrine that one of the chief purposes of education is to create an educated class for leadership, and any attempt to educate the masses is an attempt to educate the incapables, or if it should succeed it would only deprive us of the hewers of wood and drawers of water, making the masses "dissatisfied with their lot" and leaving nobody to do the "rough and menial labor of the world." The extent and intensity of these views and their bearing upon the education of the times are now incapable of realization.

Objectives and Aims in Agricultural Education

While the provisions of the land-grant act were clear and were ably interpreted by Representative Morrill and others, its intent was not fully understood during the early history of the colleges established under its provisions. Ruling boards and administrators in several of the colleges thought vocational training should receive primary emphasis in the new system of education. In the State legislation applying to some of the institutions provision was made that students should perform manual labor on farms or in shops for a certain number of hours a day or during certain periods of the year. The legislative act for the establishment of the Michigan Agricultural College (1855) specified:

> The board of education, upon consultation with the board of instruction, shall from time to time, fix and establish rules as to the number of hours which shall be devoted to manual labor and to study, which may be different in different terms or seasons; but during the first term in each year, the time devoted to labor shall not be less than three nor more than four hours each day; and no student or pupil of said college shall be exempt from such labor, except in case of sickness or other infirmity.

Similar provision was made by Tennessee, which specified that all able-bodied students were to work two hours a day on the farm.

Since the Michigan College was the first agricultural college in the United States its policies and conduct naturally were examined widely and were influential in shaping public opinion when other land-grant colleges were established. Moreover, agricultural science was not in existence during the early period of agricultural education. Although the sciences of chemistry, entomology, geology, biology, and botany had attained considerable development, their application to agriculture had not progressed far. The early teachers of agriculture, therefore, necessarily talked and lectured about the practice and art of farming rather than about the application of science to agriculture. Agricultural students were given vocational

practice work which in only the slightest degree could be regarded as of laboratory character.

No one who looks carefully into the history of land-grant colleges can fail to be impressed by their early struggles, by the groping character of educational policies, by the changing point of view of successive administrations, and by the progressive evolution of their objectives. Should agriculture be taught in the colleges specifically and primarily to make good farmers? Some administrators and faculties believed so and fought for the idea. Should it be taught primarily from a professional standpoint to develop teachers and leaders? This point of view was held by many. Much argument, much debate, and much shifting of institutional policies resulted.

Then came the agricultural experiment stations and with them a gradual building up of a body of agricultural science which helped to clarify thinking about the place that the agricultural institutions should hold in the educational system. The first of these experiment stations was organized in Connecticut in 1875. It was followed by 16 others in as many States within the next 10 years. The Federal Government was appealed to for funds for agricultural experiment station work in the several States and the Hatch Act of 1887 was the result. Many of the teachers who had training and experience in the basic sciences were eager to do experimental work relating to agricultural applications. Agricultural science now began to develop and brought new life to the work of teachers and students alike. Progress, at first slow, accelerated as the institutions caught the spirit of research and experimentation and as more funds became available from State and Federal sources. The colleges whose early practice it had been to emphasize strictly vocational teaching now acquired scientific information about plants and animals, soils, and management which fitted into the scheme of education of college grade intended by the land-grant act. Those in administrative authority in the colleges came to understand better the meanings and implications of the act.

The Federal Smith-Lever Extension Act in 1914 made specific provision for extension work in agriculture and home economics. The Smith-Hughes Act of 1917 further made possible agricultural teaching in the high schools for young men interested in the vocation of farming. As a result the land-grant colleges are now in a position to emphasize work of college grade, work dealing with basic sciences and agricultural science. On the other hand, no land-grant college curriculum in agriculture in 1927–28 specifies that the work shall consist exclusively of agricultural subjects. The sciences basic to agriculture, and the subjects of economics, sociology, English, and military education constitute more than 60 per cent of the subject-

matter offered in the majority of the 4-year agricultural curricula to-day.

Simultaneously with the development of agricultural science, thinking about the purposes and objectives of agricultural education was clarified. While many outside of the colleges still have but a hazy notion, those responsible for the management and policies of these institutions have fairly clear conceptions about the aims and purposes of the work entrusted to them. This understanding has been promoted by annual conferences of the administrative officers of these institutions, at which objectives, aims, and purposes of agricultural education have been debated and discussed from many angles. Opinion has, therefore, crystallized to a point where a remarkable similarity of general objectives will be found in entirely different parts of the country. Almost invariably these objectives will be defined in terms of a broad education with specific training for work in the agricultural field and for service to society.

General aims.—The following are representative statements of the general aims as given by the catalogues of various institutions:

The 4-year plan of study offers an opportunity for a broad scientific education and for a certain amount of specialization in some chosen field of agriculture. * * * While the agricultural courses are designed to train students for the farm and life in the country they offer also an opportunity for a very broad, well-balanced education and at the same time may serve to fit men for a variety of very excellent positions in educational, scientific, and commercial work in connection with institutions and industries closely allied with agriculture.—PURDUE.

The object of this instruction is to train men and women for success in the vocation of agriculture. The college aims to educate farmers, farm managers, fruit growers, grain growers, dairymen, poultrymen, and stockmen. It prepares men for responsible positions as teachers in agricultural colleges, investigators in experiment stations, for extension work in agriculture and home economics, as teachers of vocational agriculture, and for service in the United States Department of Agriculture.—MISSOURI.

The regular 4-year course in agriculture has as its main objective the preparation of young men for the business of farming, for the pursuit of scientific investigation along some line of agriculture, for becoming county demonstration agents or extension workers, and for teaching in the high schools and agricultural colleges, and affords excellent preparation for young men who intend to follow business pursuits, especially for merchants and bankers.—TEXAS.

Our 4-year curriculum has two outstanding aims, preparation for actual farm management and preparation for rural leadership. We are not aiming to prepare scientific investigators, but say to all who enter the field of investigation that they must do graduate work. Since ours is a pioneer State it needs rural leadership. Our curriculum aims to train men to become county agents and teachers of vocational agriculture in Smith-Hughes high schools for these workers stand in positions of leadership.—NORTH DAKOTA.

It is the aim of the 4-year curriculum to train persons going into farming and into professions closely related to agriculture.—CORNELL.

The primary aim of the college in training men in agriculture is to fit them for service in which they will develop into agricultural leaders, either as farmers or in some other capacity, and as such, contribute to the up-building of rural institutions and the improvement of American country life.—KANSAS.

The aim of the 4-year curriculum is to provide such training in the scientific agriculture and the cultural subjects as will best prepare graduates to engage in the pursuit of practical agriculture or related activities and to furnish the background and foundation for research or teaching.—MINNESOTA.

The aims of the college of agriculture are: (*a*) To give students a broad, liberal education with agriculture as the basis; (*b*) to prepare them for the agricultural profession, especially for the farm and for business closely related to agriculture; (*c*) to develop the ability and the desire to lead; and (*d*) to foster a spirit of service to society.—WASHINGTON.

Specific aims.—Specific aims of agricultural education were given by some 40 institutions participating in this study. The majority of these specified preparation of persons for the following callings as a major objective of the 4-year curricula: Farmer, high-school teacher, county agent and extension specialist, florist, landscape architect, nurseryman, plant quarantine inspector, seed company salesman, sales manager for fertilizer companies, farm real estate agent, city milk inspector, rural banker, editor, and agricultural journalist.

Research and experiment station work in connection with the land-grant colleges, the United States Department of Agriculture, and commercial and industrial organizations where research is required is a specified aim of many institutions. In such cases it usually is made clear that to enter upon occupations of this character more than the four years' work in undergraduate agriculture is necessary. Graduate work over periods of from one to several years must be pursued in order to qualify for positions of this kind.

Preparation for such work as managing farm organizations, managing irrigation districts, serving as plant-breeding specialists with seed companies, and as technical workers with farm machinery manufacturers are other enterprises mentioned as specific aims by a number of institutions.

Within the past few years 4-year curricula entitled "agricultural business," "agricultural administration," and "agricultural economics" have been introduced by a number of institutions. The specified purposes of these curricula are preparation for rural banking, marketing of agricultural products, the appraisal, sale, and development of land, hardware and farm implement retailing, and agricultural journalism.

The examples of general and specific aims here given indicate clearly the comprehensive purposes of the regular undergraduate in-

struction in agriculture in the land-grant colleges from the educational, vocational, and professional standpoints. Broadly summarized, these purposes are: (*a*) To provide a well-balanced education built on agricultural and basic sciences with economics, English, and the arts as a background; (*b*) to prepare young men and women for interesting, useful, and remunerative work in the broad field of agriculture and agricultural business; and (*c*) to help them to become interested in and give service to society by successfully conducting the agricultural work and enterprises in which they are engaged.

Aims of short courses.—Shorter courses than four years are given in the majority of the agricultural colleges. Practically all of them, whether of college grade or subcollegiate, have specific vocational aims. They are intended for those who are eager to avail themselves of the opportunities for agricultural instruction but who, for one reason or another, are able to attend college for comparatively short periods only. Training is given in such work for the occupations of farmer, farm foreman, forest ranger, herdsman, gardener, florist, milk inspector, ice-cream maker, cheese maker, hay dealer, lumber dealer, and other vocations. Thousands of men and women who have taken such courses show in their daily vocations that the aims and objectives of this work have been realized.

Chapter II.—Organization

Purpose and type.—While there is much similarity in organization in all the land-grant colleges and universities there is one difference between them that is of major importance. In the typical university form of organization, one individual known as the dean of agriculture is usually responsible directly to the president for the agricultural work of the institution in the three fields of resident teaching, research, and extension. In the college type of organization three officers known as directors or deans of resident teaching, directors of research and of extension, are each responsible for one division of work. In a number of instances one of these officers is responsible to the president for two divisions, such as resident teaching and research. He then usually has the title of dean and director.

Where a dean of agriculture is responsible for all of the agricultural work of the institution it usually is necessary for him to have three officers reporting to him, each one directly responsible for the details of administration of one of the three divisions of work. They may have the titles of assistant deans, assistant directors, or directors, in accordance with the terminology that best fits the institution as a whole. Under this type of organization one of the important duties of the dean is to see to it that the work in the three lines of service under his supervision and direction is fully coordinated so that resident teaching, research, and extension function as one team for the best interests of the students and people of the State.

Where the college type of organization is used, the responsibility for coordination and teamwork in the three divisions rests directly on the president of the institution. Where his other duties are not too heavy for him to give ample time to this very important function and where his training, experience, and point of view are such that he naturally and easily performs it, this system is workable and effective. Where this is not the case there is little doubt that the agricultural work of the institution is best served if one officer is given the responsibility for the organization and coordination of the three functions of resident instruction, research, and extension.

Both in the college and university type of organization, the work of resident instruction in agriculture normally is further subdivided

into departments organized on the basis of subject matter, such as agronomy, animal husbandry, horticulture, etc. At the head of each of these departments is an officer known as a department head. The department head may be immediately responsible for all the work in the subject matter of the department in teaching, in research, and in extension, and all the workers in this field be members of the department. Where this is the case, the department head is responsible to the director of resident instruction for the resident teaching work, to the director of research for the research and experiment station work, and to the director of extension for the extension work. It is his duty among other things to coordinate all these types of work in his department. This is known as the departmental basis of organization and is in operation in 19 of 46 institutions reporting on organization.

In 22 institutions the divisional basis of organization is the primary one. Here the head of the resident subject-matter department is not directly responsible for all of the corresponding work in research and in extension. He may have direct charge of the resident teaching of his department alone, or of resident teaching and of one or the other of the two remaining phases of agricultural activity. Where the latter is the case, the department head is responsible to the director of resident instruction for the teaching work and to the appropriate director of research or of extension for the other portion of his departmental functions. The individual carrying on extension work in the subject matter of the department is known typically as the extension specialist and is primarily responsible to the director of extension.

The essential differences in the two plans may be stated as follows: Where the departmental plan of organization is primary, the department head is directly responsible for all the subject-matter work of the department whether in teaching, research, or extension. Where the divisional plan is primary he is directly responsible for only a part of the work in his subject-matter field, and coordination of the work in the various lines must be provided for in other ways.

In three institutions neither the divisional nor departmental basis of organization can be said to be primary, a combination of both being used. One of these is a large institution and two are small.

In whatever manner the institution may be organized, full coordination of work, of subject matter, and of policies in teaching, research, and extension is not only desirable but essential. Only where this condition prevails can the institution effectively serve its students, develop agricultural science, and be of the greatest help to the rural population through its extension and service work.

In addition to administrative organization other methods of coordination of the different lines of work in agriculture are employed. In 23 institutions the same or contiguous offices are used by those engaged in resident teaching, in research, and in extension in the various subject-matter fields. In 25 institutions formal and informal conferences between those in the three different lines of work are depended upon to secure coordination. In 13 the workers themselves are expected to arrange such informal conferences as seem to them necessary to teamwork.

In 24 of the 46 institutions under consideration the head of the subject-matter teaching department is responsible for the coordination of the subject matter presented by all the workers in his field in resident teaching, research, and extension, although the extension representative may be administratively responsible to the director of extension, and the research worker to the director of research.

Experience in many States indicates that the matter of coordination of the work of the research staff, the teaching staff, and the extension staff is an ever-present problem and that every means that can be used to harmonize the policies and the recommendations of these groups should be employed. There is no doubt that the use of the same or contiguous offices by all representatives of the same subject-matter field where contacts come naturally and informally between all the workers may contribute greatly to fine personal relationships, completeness of understanding, and agreement in recommendations. This is even more important in many States than the advantage of staff cohesion obtained by maintaining all members of the extension staff in offices at a distance from the departments whose subject-matter field they represent. Under whatever plan an institution is organized contacts formal and informal between the workers in all lines should be encouraged to the utmost by administrative officers and department heads.[1]

The departmental unit.—The first units for instruction in agriculture organized in the land-grant institutions were known as departments of agriculture or of horticulture.[2] A department of agriculture is now rare. It has been divided into several departments such as agronomy or farm crops and soils, animal husbandry, dairy husbandry, and poultry husbandry. Many new departments have been organized as the special fields of agricultural science have developed. As a result of the high degree of specialization almost

[1] See Vol. II, Part VII, "Extension services."

[2] At the University of Minnesota the entire agricultural unit is known as the department of agriculture. This, however, is a local provision and the "department" is divided into departments or divisions just as in other institutions.

120 different names are applied to departments in the agricultural units of the various institutions. The subject matter in many lines has been so divided into a large number of specialties that it is sometimes impossible for students in undergraduate years to take sufficient courses in any one department to get a comprehensive view of the entire field.

There can be no hard and fast rule on the basis of which departments should be organized. Local conditions of specialization in agriculture, of support of the institution, and sometimes of personnel, determine what these departments are to be. They should not be organized on the basis of the ambitions of certain members of the staff, of political considerations, or of the special interests of administrative officers. All of these may change while the institution goes on. The primary justification for the organization of departments is that they may contribute to the effectiveness of agricultural instruction in the institution, to the agricultural interests of the State, and to ease of administration. Evidence that departments in agriculture have actually been created upon such grounds is difficult to obtain. Forty out of forty-four institutions reporting on this point maintain that the relative development of the number of teaching units in their institutions corresponds to the development of the agricultural interests in the State, while 4 indicate that this has not been entirely the guiding principle. It may be seriously questioned whether multiplication of departments has not sometimes hampered instruction upon the undergraduate level and complicated administrative problems. It is certain that excessive departmentalization in some institutions has made extremely important the problem of creating devices of coordination both in the interests of unity of instruction and in the interest of simplified administration.

Similar departments in two or more divisions of the institution.—There has been a tendency in a number of instances to develop similar departments in two or more major divisions of the institution, such as chemistry and agricultural chemistry, botany and plant physiology, engineering and agricultural engineering. In some cases this is advisable and desirable. Where much of the agricultural work is located on different campuses, as at the University of Minnesota, the University of Nebraska, and the University of California, such parallel departmental organizations often are a necessity. However, it would seem to be possible and practicable even in such cases to maintain central departments, of which the units based on location are branches. This might contribute toward a close coordination of the work in the various subject-matter fields and tend to maintain a single common standard of scholarship.

Such organization in two or more major divisions of distinct units within a single field may be fully justified in the larger universities and colleges on the basis of the type of work done and the number of students taught, as well as on the different emphasis given to the subject matter. For instance, in an institution where there are thousands of students enrolled in chemistry from the college of arts and sciences, from the college of engineering, and from other major divisions, it may be advisable to segregate agricultural chemistry. Costs of equipment and of personnel may not be increased thereby. Instruction may be improved for students with a special interest. However, in the smaller institution where means are limited and students are comparatively few the organization of parallel departments in two or more divisions would not seem to be justified. In such institutions the work can usually be given the emphasis that will meet the needs of all types of student interest by means of individual attention to students and by wide understanding and sympathies on the part of instructors.

To avoid parallel departmental organization in two or more divisions many institutions resort to departmental organization on the basis of responsibility of one department to two or more major divisions. Thus, in 21 out of 43 institutions reporting, some departments of instruction are listed as of more than one college teaching organization. For example, agricultural engineering may be listed in the division of agriculture and in the division of engineering; entomology, in arts and sciences and in agriculture; bacteriology in agriculture and in veterinary medicine, or in arts and sciences and in agriculture, and so on. This may be desirable and sometimes contribute to coordination of work, and emphasis on those phases of the subject matter which would seem to fit the student body and local needs to the best advantage. The same principle holds true of the policy of assignment of work as between the departments of basic sciences and the departments of application like those in agriculture. There is no uniformity in the various institutions in this respect. Sixteen report that as much of the work as possible is assigned to the departments of basic sciences, 13 that as much as possible is assigned to the departments of application, and 14 that the practice is varied and is determined by many factors.

Junior divisions.—In addition to the organization of the colleges into divisions and departments as described by preceding pages, in recent years there has been much discussion of the desirability of the so-called junior divisions in colleges and universities, that is, a horizontal division of the institution into junior and senior colleges.

It is thought that by such divisions a curriculum can be organized for freshmen and sophomores that will be better adapted to their needs and that more attention can be given to good teaching and supervision of instruction than in the traditional 4-year curricula. It is argued also that students who are unable for one reason or another to spend four years in college find here a convenient stopping place. Further, the development of separate public junior colleges in many States from which students come to the land-grant colleges indicates that ultimately some adjustment of the 4-year college will be necessary.

While the agricultural divisions of the land-grant colleges are interested in this movement only a few thus far report the organization of junior divisions, namely: Iowa State College, Oregon Agricultural College, Clemson Agricultural College, the University of Tennessee, and the Agricultural College of Utah. Iowa State College, Oregon Agricultural College, and the Agricultural College of Utah report that the junior division is operated as a division of the institutional organization, while in South Carolina and Tennessee it is operated in connection with the agricultural organization.

The present high specialization throughout the four years of the agricultural curricula makes difficult the organization of a junior division with a more or less uniform curriculum. Students now enroll for work in landscape architecture or in dairy manufactures, for instance, and it is said that they would not be content to take the same subjects during the first two years as students in general agriculture or in horticulture. In the same way there is force to the argument that students in plant pathology would not wish to take identical work with those who plan to enter the field of agricultural business or agricultural engineering. It is frequently advantageous to give the junior division student some choice of work dealing with the specialty in which he is to do his major work. His interest is thus maintained. Institutions that have insisted that the work in basic sciences should come during the first two years and the applied subjects later, usually have found it necessary to modify their position and to permit students to have considerable leeway in the selection of subjects in the various applied fields. On the other hand, successful specialization should be based upon fundamental physical and social sciences and should be undertaken only after exploratory investigation of the general fields to which the specialization is related. Some of the real difficulties involved in the upper-lower division form of organization may be cared for by group electives and by free election under advisement. The plan does not necessarily in-

volve exclusion from fields of special interest to the student during his first years in college; it is designed to prevent high, early specialization at the expense of a sound basis for such specialization.

Agricultural faculty relationships to institutional faculties and to other major divisions of the institution.—All members of the resident agricultural staff are attached to departments. In addition they may hold membership in institutional faculties or faculties of other major divisions of the institution. In this respect there is little variation in practice in the land-grant colleges.

Those with the rank of full professor in the agricultural faculty generally are members of institutional faculties, although there are a few exceptions where a smaller number are on the institutional than on the agricultural faculty. However, the exceptions are too few to have any special significance. Associate professors and assistant professors are reported as members of the institutional faculty in almost every instance. Instructors are so reported in 17 instances only and assistants in 8.

The most common requirement for membership in the institutional faculty apparently is the attainment of the rank of assistant professor or above, although to a considerable extent instructors are granted this recognition.

Where a legislative body known as the senate exists, as in the universities of Arkansas, California, Kentucky, Minnesota, Nebraska, and Vermont, the North Dakota Agricultural College, and the State colleges of Pennsylvania and Washington, with few exceptions, all full professors are members.

In California 39 out of 42, and in Pennsylvania 16 out of 34, are reported as members of this body. In Kentucky, Nebraska, Washington, and Minnesota, associate professors also are members of the senate. California, Kentucky, Vermont, and Washington report the same number of assistant professors in the senate as in the agricultural faculty. In the other institutions apparently assistant professors are not senate members. Instructors are reported as members of the senate in California only, while assistants are not found in the senate in any institution.

Since the institutional faculty, or the senate, usually is the legislative body of the institution, it seems entirely logical that certain experience in college teaching as indicated by the attainment of the rank of assistant professor should be a prerequisite to membership in the institutional legislative body.

Granting membership in the faculties of more than one major division is a fairly common practice in a number of institutions.

Twenty-nine report 168 individual cases where professors of the agricultural faculty hold membership in other divisional faculties; 79 of these are members of the faculty of arts and sciences, 5 of home economics, 11 of commerce and business, 34 of education, 2 of veterinary science, and 40 of engineering. Twelve institutions report from 1 to 9 members of the agricultural staff as members of the staff in engineering, 9 institutions from 1 to 12 members of the agricultural faculty as members of the division of education, and 16 represented in arts and sciences. Eight institutions report a total of 43 associate professors

who are members of the agricultural faculty and some of the other divisional faculties; 13 institutions report a total of 46 assistant professors who are members of some divisional faculty in addition to the agricultural faculty. Seven institutions report a total of 18 instructors who are members of the faculty of more than one division, and of assistants only one institution with a membership of 2 in other divisions.

From the standpoint of subject matter or economy of time and funds, crossing of divisional lines at times may be desirable. For instance, a professor of farm crops who is not on the research staff and who has a light teaching load may serve also in the department of botany, and a professor in agricultural engineering may function for part time in the college or school of engineering. Where there is a separate school of education, agricultural education undoubtedly is best served in many instances by having regular members from the agricultural staff also on the staff of the school of education. While administrative problems are increased where divisional lines are crossed, this should not stand in the way if either the service to students is improved thereby or if economy is involved.

The dean of agriculture generally is a member of the institutional faculty, the senate, and the agricultural faculty, although omissions in reporting on this phase would indicate some exceptions. The director of resident instruction, where there is such an officer, also is reported generally a member of the institutional faculty, the senate, and the agricultural faculty, although here also there are some exceptions. The director of research is reported as a member of the agricultural faculty in 17 instances and the director of extension an equal number of times. This is a desirable practice since both officers in this way are better able to keep in touch with institutional programs and policies, and the faculties have the benefit of the advice of these men who are in intimate contacts with agricultural conditions not only within the State but regionally and nationally.

Faculty membership of extension staff and experiment station staff.—The practice of including State leaders and assistant State leaders, extension specialists and extension professors, associate and assistant professors and instructors in the agricultural faculties undoubtedly contributes to good understanding, unity of purpose and program of the staff both in undergraduate teaching and in extension, and helps to coordinate the work of the two groups and to maintain good fellowship and high morale in the entire staff. It is a practice to be commended.

Extension professors are reported as members of the agricultural faculty in 10 instances, including the universities of California, Illinois, Kentucky, Missouri, Ohio State, and Wyoming, Massachusetts Agricultural College, Pennsylvania State College, and Virginia Agricultural and Mechanical College. Extension associate professors are reported as members of the agricultural faculty in 7 institutions—the universities of California, Illinois, Minnesota, Missouri, and Wyoming, Pennsylvania State College, and Virginia Agricultural and Mechanical College. Extension assistant professors are reported as members in the same institutions as associate professors, and in addition in the University of Delaware, Massachusetts Agricultural College, and in Ohio State University. Extension instructors are reported as members of the agricul-

tural faculty in 4 institutions and extension assistants in 4, extension specialists in 9, extension State leaders in 11, and assistant State leaders in 8. Institutions including State leaders in the faculties are Connecticut Agricultural College, Georgia State College of Agriculture, University of Idaho, University of Maine, Massachusetts Agricultural College, University of Minnesota, University of Nebraska, North Carolina State College, South Dakota State College, West Virginia University, and the University of Wyoming. Those including extension specialists are: The University of California, Connecticut Agricultural College, Georgia State College of Agriculture, University of Idaho, University of Maine, North Carolina State College, South Dakota State College, West Virginia University, and the University of Wyoming.

The same holds true with reference to the inclusion of the experiment station staff in the agricultural faculties. In most institutions experiment station and college staffs are much the same in personnel since the agricultural faculties usually serve both the teaching work and the experiment station work. Even where this is not the case, agricultural faculty rank would seem desirable for all.

Curricula and instructional activities of less than four years.—Curricula and instructional activities of less than four years, ranging from the farmer's week of a few days devoted to inspirational and educational lectures, demonstration and entertainment features, to intensive short courses of from 1 to 12 weeks in length and curricula of 1 or 2 years, are reported from 42 of the 46 institutions replying to the questionnaire.

In 34 of these, farmers' weeks are held; in 31, intensive short courses of 2 weeks or less; in 13, 8-week courses; in 9, 12-week courses; in 10, 1-year courses; and in 18, 2-year courses.

The organization for the administration of this work is similar to that for the 4-year curricula, except that a separate director for these courses, responsible to the dean, is in charge in a few institutions. The department concerned is directly in charge of a considerable number of the 2-week courses and the director of extension is responsible for the farmer's week in approximately one-half of the institutions. Table 1 shows the details of organization of this work.

TABLE 1.—*Administration of curricula and instructional activities of less than four years*

Length of curriculum	Number of institutions reporting short courses	Administered by—							
		Dean or director of resident instruction	Separate director responsible to dean	Department concerned	Dean or director of resident instruction and department concerned	Separate director and department concerned	Director of extension	Director of extension and department concerned	Dean and director of extension
1	2	3	4	5	6	7	8	9	10
2 years	18	13	4		1				
1 year	10	7	2	1					
12 weeks	9	3	2			2	2		
3 weeks	13	8	2	1	1			1	
2 weeks or less	31	6	4	12	5		2	1	1
Farmers' week	34	9	2				16	2	5

Chapter III.—Lands Owned and Controlled by the Land-Grant Colleges

Land is essential to the agricultural work of a land-grant college for a number of important reasons. Plantings of orchards and small fruits, truck crops, field and forage crops are needed for student observation and occasional practice and for demonstration purposes. Land is needed also for the study of the history of soils and soil types. Pasture, forage, and other feeds for the stock usually can be produced more cheaply on college-owned land than when purchased, and far more conveniently.

High-class herds of representative breeds of dairy and beef cattle, horses, hogs, sheep, and flocks of poultry are very necessary in connection with undergraduate agricultural instruction. They might be classified as laboratory equipment in animal husbandry, dairy, and poultry husbandry. Flocks and herds can be maintained with economy only if there is sufficient land for pasture and for the production of the roughages needed. Land for production of grain for feed, while very desirable, usually is less necessary since such feed often can be purchased from the surplus of adjacent farms or even shipped in for little more than it would cost to produce it on college-owned farms.

The other very important need for land controlled by the institution is for experimental and research use in connection with the experiment station system and for service work in the production and distribution of pure seed. Quite commonly this land also contributes to the instructional work by serving as a source of forage and feed for livestock, and for illustration and demonstration for college classes. Land of representative type institutionally owned or controlled and adequate for resident instruction and for experimental and research purposes is essential in every State.[3]

Twenty-eight institutions report that some rented land is used and 15 institutions that there are additional lands owned by private interests but worked by the institution. Sixteen institutions report that the land used is in excess of the amount actually needed for teaching and research and that it is handled for the income obtained.

[3] See Part III, Business management and finance.

Development of instructional equipment beyond the needs of teaching and research and its use for income purposes may be necessary in individual cases. However, where this is the practice it may be at considerable expense to the institution in time devoted to management by department heads or others. Often what seems like a profit may resolve itself into a loss when all costs are considered. There is also the possibility of difficulties with commercial firms where the business of the college plant is developed beyond the needs specified. Five institutions indicate that such difficulties have been encountered. Further commercialization of educational facilities may very easily distort educational objectives. Only where it seems necessary to develop a unit of land, plant, herd, or flock to a certain size in order to make for economy and efficiency in management and in volume of business handled should the college plant be enlarged beyond the needs of instruction, research, and service.

On the other hand, where an institution develops its plants and farms only in accordance with the needs of instruction, research, and service, it must have the right to dispose of the products from its farms and plant to the best advantage commercially. Any other practice would be wasteful, and in the long run would not be tolerated by the taxpaying public. The commercial firms which may feel that the institution is in unfair competition with them, usually upon investigation will find that they have small reason for complaint.

The management of the land adjacent to the institution is in control of a central unit directly responsible to the administration of the agricultural division in 29 of the 43 institutions reporting on this point, while in 14 this is not the case.

In Florida the departments of agronomy, animal husbandry, and horticulture are responsible for the management of the farms. The same departments, plus forestry, are responsible in Georgia. In Montana the professor of animal husbandry is in charge. In Wisconsin the departments of agronomy and animal husbandry are responsible. In Virginia the department of agronomy is responsible to the dean for the management and the same is true in Washington. Other institutions where the land is not handled as a unit do not indicate which departments are responsible for the management.

In every instance but one, Tennessee, it is reported that land is assigned more or less permanently to departments for their special use. Administratively, it is easier to handle land belonging to an institution when it is assigned to the departments that have need for the land. That the department itself is responsible for the use of land assigned to it may be an incentive to good planning for the acreage allowed, particularly when the income from such land may be used directly for the maintenance of the department's work. However, there is on the other hand danger that the department will overemphasize the "income" aspects of such management, to the neglect of instructional and research uses.

The fact that in the majority of institutions the land is handled by one unit rather than by a number of departments undoubtedly is due to the greater economy with which land when limited in amount can be handled in this way. There is less duplication of equipment and less lost motion of man and horse labor and machine power where the land contiguous to an institution is handled as a unit rather than by departments. Both types of management are feasible. Where institutions are large with large numbers of stock and with sufficient land, the advantage of dividing the land into animal husbandry, dairy, and agronomy farms, for instance, may outweigh the disadvantages of duplication in equipment. In the smaller institutions and where the land is limited the unit system would seem to be most desirable.

Chapter IV.—The Staff in Undergraduate Instruction in Agriculture

Training and experience.—The personnel of an institution is its most important asset. Training, experience, age, ability, and interest in the agricultural teaching profession are determining factors in the qualifications of the teaching staff. The first three factors are measurable and are shown in Table 2 for a large group of the teaching staff from the institutions which gave comprehensive reports on this matter. While the tabulation speaks for itself there are some outstanding points that may be emphasized. First, of 491 professors, 176 associate professors, 351 assistant professors, and 251 instructors, 72, 70, 54, and 56 per cent, respectively, were farm reared, while 23, 24, 21, and 22 per cent, respectively, were not so reared, but have had farm experience. In other words, 98, 94, 75, and 78 per cent, respectively, or 84 per cent of the total of those who are teaching undergraduate agriculture have had farm experience.

Farm experience apparently has played a large part in directing the agricultural teacher into the profession he has selected. It is to be expected then that his interpretation of agricultural facts and problems are those of a man from within and not of one who lacks intimate touch with and understanding of the field in which he serves.

TABLE 2.—*Training and early experience of the teaching staff in undergraduate agriculture in land-grant institutions, 1927-28*[1]

Staff	Number of institutions reporting	Total number of staff	Farm reared	Not farm reared, but with farm experience	Number now operating farms	Attendance at college of agriculture[2]			Attendance at other types[2]	Number with doctors' degrees from present institution	Number with masters' degrees from present institution	Number with first degrees from present institution	Number who have served as county agents or as extension specialists
						Entire course with graduation	Part of course with graduation	Part of course without graduation	Entire course with graduation				
1	2	3	4	5	6	7	8	9	10	11	12	13	14
Professors	36	491	354	113	93	329	35	20	167	47	84	99	86
Per cent			72	23	19	60	6	4	30	9	17	20	18
Associate professors	29	176	123	43	14	128	13	6	36	12	47	39	28
Per cent			70	24	8	70	7	3	20	7	27	22	16
Assistant professors	34	351	190	72	22	230	11	4	70	31	79	76	46
Per cent			54	21	6	66	3	1	20	8	23	22	13
Instructors	32	251	141	54	12	187	9	5	46	18	76	107	19
Per cent			56	22	5	75	4	2	19	7	30	43	8

[1] Data of table derived from institutional reports.

[2] The number of staff members whose attendance at a college of agriculture was reported does not correspond exactly with the number reported under degrees obtained in the returned questionnaires. The percentages in these columns, therefore, have been calculated on the basis of the total number whose undergraduate college attendance has been reported rather than on total numbers given in the second column.

The small number who operate farms, 19, 8, 6, and 5 per cent of the professors, associate professors, assistant professors, and instructors, respectively, may be accounted for by the fact that even though many faculty members might be interested in operating farms there are certain obstacles in the way of such practice. To manage a farm properly takes more time than the teacher can find, or indeed than he should use for private business. When the management as well as labor and other expenses on a farm are paid for, there is little or no surplus left for the absentee owner. Further, good farms cost money, more than the average faculty members can find and use for the purchase of land.

While the same academic degrees do not indicate an equal degree of attainment, and degrees must never be confused with ability, practical experience, or personal qualifications, nevertheless, degrees are a measure of certain educational requirements and of professional ambition. Other qualifications being equal, the man who has the degrees has an advantage in progress in the ranks, in the esteem of his fellows, and in the influence that he wields.

Of 1,849 members of agricultural staffs who made individual reports,[4] 29 (1.5 per cent) reported no degree; 795 (43 per cent) had none higher than the bachelor's; 728 (39 per cent) held the master's as their highest degree; while there were in this group 221 (12 per cent) with doctors' degrees. Seventy-five failed to give the information requested and it is probable that the number of those who held no degree or the bachelor's as the highest would have been increased somewhat if the information were available for this group. Nine of the 1,849 reported honorary masters and 21 honorary doctors' degrees.

These figures concerning degrees are confirmed in general by data showing for the same staff members the number of years training received after high-school graduation. Six hundred and nine had 4 years or less; 700 had 5 or 6 years; 471 had 7 or more; 69 did not furnish the information requested.

It is apparent that a relatively large proportion of the staff of the agricultural divisions have no degrees higher than those for which they are preparing undergraduate students. On the other hand this proportion is probably smaller than it was 10 years ago and the number of doctors' degrees is relatively larger. The present emphasis upon advanced training for the staff in undergraduate agriculture is clearly resulting in decided improvement. This emphasis should be continued. There is still need to reduce the proportion of staff members with bachelor's degrees only.

Sixty per cent, 70 per cent, 66 per cent, and 75 per cent, respectively, of the professors, associate professors, assistant professors,

[4] Approximately 80 per cent of the total number of staff members teaching undergraduate courses in agriculture.

and instructors acquired their undergraduate training in colleges of agriculture. (Table 2.) In addition, 10 per cent of the professors, 1 per cent of the associate professors, 4 and 6 per cent of the assistant professors and instructors, respectively, secured a part of their undergraduate training in agricultural colleges. These facts are significant from two standpoints: First, the point of view and the interest in agriculture fostered in these institutions apparently are desirable assets for those who wish to teach agricultural subjects; and second, the agricultural institutions up to this time have furnished an important part of the training to the larger proportion of those who are engaged in agricultural teaching. They should be expected to do even more in the future than they have done in the past.

The question as to the number on a staff who have received their training in the institution they serve is an interesting and an important one. The facts as shown by Table 2 indicate that department heads often select and recommend for positions as instructors men from their own institutions of whose ability they are certain, through personal knowledge and experience, rather than others who must be accepted on credentials from elsewhere. Since funds usually are limited and the home product often can be secured at less cost than if selection is made from another institution, the home-trained person is appointed. Institutions, however, need to be on guard against excessive inbreeding.

The last column of Table 2 shows that of 1,269 members of the staffs slightly more than 14 per cent had served as county agents or extension specialists. Data were furnished by 1,849 individual members of the agricultural staffs concerning other types of experience. Of these 460 (25 per cent) had experience as high-school teachers, and of this number, 356 had experience as high-school teachers of agriculture. Of the total number reporting, 154 had experience as school principals or superintendents.

It is interesting to discover from the same data that 640, or almost 35 per cent, of the total number of staff members reporting had taken courses in professional education subjects. Of this number, 301 had taken less than 11 semester hours; 203 from 12 to 23; and 136 had credit for 24 semester hours or more in education. This is by no means an unfavorable display of emphasis upon preparation for teaching as compared with similar data for other groups engaged in university and college teaching.[6] While method can easily be overemphasized in the busy training period when subject matter must receive attention by those who want to become well informed in agricultural fields, nevertheless the agricultural teacher of the future

[6] See Parts VII, "Staff"; X, "Engineering"; XI, "Home economics"; and Vol. II, Part III, "Teaching training" for comparisons, and also North Central Association Quarterly, IV: 213–225, September, 1930.

more and more will need to familiarize himself thoroughly with teaching methods and practices and with the historic background and philosophy of educational progress.

The survey inquiry affords some slight indications concerning two additional measures of the interests and contacts of staff that are of importance in estimating the character of the agricultural staff, the number that have written for publication and membership in professional or other scholarly organization. Of the 1,849 staff members submitting a record, 274 had published research investigations during the past five years but publications of no other type; 361 had publications of popular character only; and 492 had published both scientific and popular material. Eleven hundred and sixty-three belong to from 1 to 5 organizations that are not primarily social in character, while 221 belong to 6 or more. Only 231 stated that in 1927–28 they had attended no professional meeting, but the fact that 741 failed to record attendance may indicate that this number should be considerably larger. However, 876, or more than 47 per cent, attended at least one meeting of a professional or scientific organization, and in many cases several were attended.

It is apparent that the publications and the organization memberships and attendance of the agricultural staff indicate active and alert interest and participation in scholarly matters.

Appointments and Promotion of Staff

An institution will be as great as the personnel of its staff and its students make it, and no greater. It will contribute to the education of students who come to it and to the progress of learning and be helpful and influential in direct proportion as the staff is able, devoted to its work, and provided with a satisfactory institutional environment. Selecting the staff and retaining those who are superior are tasks worthy of the most devoted effort. No responsibilities of administrative officers are larger or more far-reaching than those involved in the appointment and promotion of staff members.

This responsibility usually is subject to careful administrative procedure. While institutions differ somewhat in methods used, the essentials of procedure are similar in all, and methods of appointment to the agricultural staff differ little from those to other divisions of the land-grant institutions.

With one exception only in all institutions that reported on methods or procedure in the selection and promotion of staff members, the president takes the first steps and exercises the major responsibility in the selection of the dean of agriculture. In one institution when the president has selected a suitable candidate or candidates, he refers the matter to the agricultural faculty for consideration and advice, and then to the board of trustees. In another institution the college faculty may suggest a candidate or name directly

to the board of trustees which then takes action. In two other institutions apparently, the board of trustees takes action on their own initiative in the appointment of the dean.

In the appointment of directors of teaching, research, and extension, the centering of the major responsibility varies with the type of organization. Where the dean is responsible for the work in all three lines, he finds suitable candidates for these positions and recommends to the president. Major responsibility of this character on the basis of reports received in this study is exercised by the dean in 18 institutions. In 22 institutions, mostly the separate land-grant colleges, the president is reported as taking the initiative and exercising the major responsibility in the selection of these officers.

The dean of agriculture recommends appointment of department heads in 38 institutions out of 45 reporting on this practice. The president apparently takes the initiative in seven instances (usually in smaller institutions). Where the dean recommends he does so directly to the president, except in one case where his recommendation first is considered by an institutional committee and in another case where his recommendation goes direct to the board of trustees.

In the appointment of professors and assistant professors the department head takes the initiative in 26 institutions reporting, the dean in 13, and the director of resident instruction in 2. The department heads' or directors' recommendations normally go to the dean and his in turn to the president. The appointment and promotion of instructors and assistants usually takes the same route as in the case of professors and assistant professors.

It is clear that the appointing power and the power of promotion should lie in large part where the major responsibility for the work is lodged. Since the dean is held responsible for the functioning of department heads his should be the responsibility of finding and recommending department heads for appointment or promotion. Since the department heads are held responsible for the work of the members of their departments they should function primarily in finding and recommending to the dean and he in turn to the president suitable candidates for faculties, and promotions of members of the department. The governing board and the president in the final analysis carry the responsibility for the functioning of the institution as a whole. They, therefore, must have final authority in all appointments and promotions. Any tendency for governing boards to appoint or promote except through the president, or for the presidents, deans, or directors to appoint or promote without consultation with or recommendation from those immediately responsible for specific units of work weakens the administrative structure, and is likely to cause friction and misunderstanding.

Professional requirements for appointment to the agricultural staff.—In connection with staff selection it is interesting to note the professional requirements of the different institutions for appoint-

ments to the agricultural staff. While sufficient specific detailed reports on this point were not received from the land-grant institutions to justify a tabulation, it is clear from the data available that requirements to-day for appointment to the agricultural staff are comparatively high and considerably higher than a decade ago. California, Louisiana, Maine, South Carolina, and West Virginia, as examples, definitely specify that the doctor's degree is required for an appointment to a professorship. Others specify at least a master's degree, while a few indicate that those with only a bachelor's degree may be appointed professors. The requirements for associate professor are similar, the doctor's or master's degrees being required by 60 per cent of the institutions reporting. For appointment as assistant professor, the master's or doctor's degree is required in a considerable number of institutions, although in many selection and promotion to this rank can be made of persons with only a bachelor's degree. A standard requirement for instructors is the bachelor's degree, although several institutions will appoint no one as instructor who has not had advanced work as indicated by the master's degree.

Coupled with advanced work as indicated by the doctor's and master's degrees, experience and personal characteristics are taken into consideration when appointments are made, especially to the more advanced positions. There is no uniformity of requirements in this respect and there can be none. For the higher positions of the better-supported institutions, successful experience in teaching or research in the specialty is a universal requirement for appointment. In the lower ranks this is not regarded as equally necessary, since there are others on the staff to guide such appointees and they are thus able to acquire experience on the job. No young man to-day, however, who contemplates taking up the teaching of agriculture in a land-grant college or university, and who is ambitious to succeed, can expect to get very far in the profession unless he takes advanced work leading to the master's and doctor's degrees and acquires suitable experience while so doing.

The progress of the agricultural staff.—The progress of the agricultural teacher through the ranks from the time he begins college teaching and the age of the teachers in the various ranks are shown in Table 3. Records of professors were obtained from 40 institutions, associate professors from 30, assistant professors from 35, associates from 1, and instructors from 14. It is evident that the large majority of professors in undergraduate agricultural teaching are in the productive period from 30 to 60. Only 11 out of 583 are less than 30 years of age, and only 41 are more than 60. The ages would indicate that it is a mature, seasoned, and vigorous group of

men. The majority, 380 out of 485 for whom records are available, began college teaching before 30 years of age.

Teaching agriculture in colleges and universities is a profession not easily adopted in advanced years after other professions have been tried. It is a calling requiring certain aptitudes and outlook, and specific training and experience. This has a tendency to limit the group to those who definitely choose this as their work because of the interest they have in it and the qualifications they possess. The large majority of the 420 professors for whom records on the period of instructorship were obtained began college teaching and became instructors at the age of 20 to 30, assistant professors at 25 to 35, associate professors at 25 to 40, and professors at 25 to 45, the large majority being 35 to 50 years of age, with a median of 42. The median years' service spent in each rank is 2 as instructor, 3 as assistant professor, 2 as associate professor, and 9 as professor. For example, the typical professor who started college teaching as an instructor at 26 became an assistant professor at 28, an associate professor at 31, and a professor at 33.

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TABLE 3.—*Age in 1928 of various ranks and age when the different ranks were attained*

Staff	Number institutions represented	Number of cases	Present age range											Median age professor	Number of cases	Began collegiate teaching							Number of cases	Became instructor					
			21–24	25–29	30–34	35–39	40–44	45–49	50–54	55–59	60–64	65–70				20 and under	21–24	25–29	30–34	35–39	40 and over	Median age commenced teaching		20 and under	21–24	25–29	30–34	35 and over	Median years service of instructor
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	
Professor:																													
In present institution	40	583	1	10	43	108	164	102	70	44	24	17	42	485	7	164	209	59	30	16	25⅔	420	2	67	61	26	8	2	
In another institution																							4	97	122	24	9		
Associate professor:																													
In present institution	30	183		7	38	66	53	8	7	1	3		40	162	12	57	51	31	6	5	26	123		20	29	12	5	2	
In another institution																								22	25	7	3		
Assistant professor:																													
In present institution	35	309	6	38	106	90	41	13	10	2	2	1	34⅙	250	3	71	113	42	15	6	26⅔	249	2	37	80	33	7	3	
In another institution																							2	30	48	7	3		
Associate:																													
In present institution	1	15		1	5	7	1	1					34½	15		4	4	6	1		28	12			6	4	2	2	
Instructor:																													
In present institution	14	109	14	45	28	8	11	2		1			27½	81	1	28	33	13	3	3	26⅓	112	1	31	50	13	9		
In another institution																								4	3		1		
Total		1,199	21	101	220	279	270	126	87	48	29	18																	

Staff	Number of cases	Became associate							Became assistant professor								Became associate professor								Became professor							
		21-24	25-29	30-34	35-39	40 and over	Median years service of associate	Number of cases	21-24	25-29	30-34	35-39	40 and over	Median years service assistant professor	Number of cases	20 and under	21-24	25-29	30-34	35-39	40-44	45 and over	Median years service associate professor	Number of cases	21-24	25-29	30-34	35-39	40-44	45-49	50 and over	Median years service of professor
	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61
Professor:																																
In present institution	38	3	8	6	2		2	353	16	115	72	21	10	3	223		3	45	65	32	13	6	2	568	5	68	168	126	78	19	11	9
In another institution		3	5	5	1				17	63	33	4	2				3	28	26	2					7	37	29	14	5	1		
Associate professor:																																
In present institution	13		4	6			1	134	10	39	44	15	8	3	189	1	2	40	63	45	18	9	4								
In another institution			3						8	7	3					1	3	3	4													
Assistant professor:																																
In present institution	14		6	6			2	339	22	110	112	54	17	3																	
In another institution					1	1			1	12	9	2																				
Associate:																																
In present institution	15		4	6	4	1	3																									
Instructor:																																
In present institution																																
In another institution																																
Total																																

The tabulation of the median service of associate professors who have become professors indicates that progress from one rank to the next higher is somewhat slower than was formerly the case. The median has been lengthened from two years for those who are now professors to a median service of four years for those who are serving as associate professors. It appears also that the rank of assistant professor is obtained somewhat later in life to-day than was the case of those who are now professors, associate or assistant professors. This is in part due to the fact that institutions are now demanding more advanced work before regular appointment is given on college staffs. Moreover, the upper ranks are filled in the majority of cases by men who, as shown above, are still comparatively young and vigorous. Promotion in rank, therefore, necessarily is slower than during the period when the agricultural divisions were expanding rapidly.

Promotions.—The appraisal of the staff members for promotion in rank and salary is a knotty problem everywhere. There is no standard measure or method of procedure. Nevertheless, in 37 of 42 institutions reporting on this point it is indicated that careful appraisal is made for the purpose of promotion. The other five report that appraisal is not carefully done.

Some of the methods of procedure in arriving at judgment are: (1) Appraisal by the department head or other supervising officer on the basis of knowledge of the work done by the staff member, 18 cases; (2) student opinion as determined by means of questionnaires, 5 cases; and alumni opinion, 2 cases; (3) conferences of administrative officers, 3 cases. (While this is reported in three instances only, undoubtedly it is practiced more widely.)

That there is room for developing some more effective methods of appraisal in the several institutions is quite clear from the lack of uniformity in methods now followed. If one method may be said to be used more than others, it is a general appraisal on the part of administrative officers on the basis of personal contact and observation.

The factors most frequently operating to bring about promotions are better defined than the methods of arriving at these factors. They are numerous and varied. The following is a statement of the factors named by the various institutions and the number of times each is mentioned: (1) Teaching ability and efficiency, 32; (2) research ability, 13; (3) length of service, 11; (4) scholarly attitude and keeping up in subject matter, 10; (5) opportunities to go elsewhere, 7; (6) advanced study for degrees, 5; (7) ability to cooperate, 5; (8) personality, 5; (9) openings in institution giving opportunity for promotion, 5; (10) ability to make contacts, 4; (11) production

of creative material, 3; (12) service and usefulness to institution, general influence, loyalty, willingness to assume responsibility, 2 each; (13) initiative and industry, previous salary increases, production, interest, general reputation as a teacher and administrative ability, 1 each.

The factors mentioned at the head of the list, namely, teaching ability and efficiency, research ability, length of service, and scholarship, are undoubtedly taken into consideration almost universally when promotion is considered. Initiative and industry, and ability to cooperate within and without the institution and to make contacts are highly prized almost everywhere and doubtless receive more consideration than the reports would indicate.

Salaries of the agricultural staff.—While the salary range of the agricultural staff, especially in the better supported and larger institutions, is more nearly adequate to-day than at any other time, only 18 professors out of 562 receive a salary of $6,000 per year or more and only 68 from $5,000 to $6,000 per year. In other words, only 15 per cent of the total number of professors receive as much as $5,000 per year. Approximately 43 per cent receive between $4,000 and $5,000 and 41 per cent less than $4,000. See Table 4.

TABLE 4.—*Salary range for staff of undergraduate instruction, with number of institutions reporting for each rank and salary grade (full-time staff members only)*

Staff	$750–$999	$1,000–$1,499	$1,500–$1,999	$2,000–$2,499	$2,500–$2,999	$3,000–$3,499	$3,500–$3,999	$4,000–$4,499	$4,500–$4,999	$5,000–$5,499
1	2	3	4	5	6	7	8	9	10	11
Deans								3	4	6
Directors of resident instruction							4	3	3	3
Professors				3	5	44	181	152	91	50
Associate professors				4	52	107	61	24	1	
Assistant professors		1	6	50	130	102	26	2		
Instructors		5	60	84	19	7				
Assistants	12	10	20	5	2					
Total	12	16	86	146	208	260	272	184	99	59

Staff	$5,500–$5,999	$6,000–$6,499	$6,500–$6,999	$7,000–$7,499	$7,500–$7,999	$8,000–$8,499	$8,500–$8,999	$9,000–$9,499	$10,000 and more
1	12	13	14	15	16	17	18	19	20
Deans	6	3	1	2	1		1	1	3
Directors of resident instruction		1		1					
Professors	18	8	5	4					1
Associate professors									
Assistant professors									
Instructors									
Assistants									
Total	24	12	6	7	1	0	1	1	4

Of the total number of cases thus reported (1,398) by the institutions for all ranks, including high-salaried deans, 468, or 33 per cent, received less than $3,000, and only 115, or 8 per cent, more than $5,000.

Reports received directly from 1,849 staff members permit a somewhat more complete analysis. Of these, 1,550 were full-time employees, 21 employed from 75 per cent to 99 per cent of their time; 68 from 50 per cent to 74 per cent; and 33 less than half time; 176 did not state for what percentage of their time they were employed by the institution. Salaries were distributed among 1,849 as follows: 7 received from $100 to $400; 38, from $500 to $999; 39, from $1,000 to $1,499; 90, from $1,500 to $1,999; 245, from $2,000 to $2,499; 356, from $2,500 to $2,999; 436, from $3,000 to $3,499; 285, from $3,500 to $3,999; 153, from $4,000 to $4,499; 93, from $4,500 to $4,999; 48, from $5,000 to $5,499; 20, from $5,500 to $5,999; 5, from $6,000 to $6,499; 8, from $6,500 to $6,999; 4, from $7,000 to $7,999; 2, from $8,000 to $9,999; and 2 received $10,000 or more. Seventeen did not furnish data. Thus from these data it is evident that upon the basis of salaries alone 775, or 42 per cent, received less than $3,000 per year while only 89 or less than 5 per cent received $5,000 or more.

Nor were these salaries supplemented in any large number of cases by perquisites. Only 115 reported perquisites ranging in 23 cases from $100 to $200; in 52, from $300 to $500; in 19, from $600 to $800; in 21, from $900 to more than $1,200. A few (140) received in addition to their regular salaries compensation for evening classes, extension work, or summer school. These additional earnings amounted in 47 cases to from $100 to $200; in 65 cases to from $300 to $500; and in 28 cases to more than $500.

Considerably larger numbers supplemented their institutional earnings by outside work, but the total number does not constitute a large proportion of the 1,849 cases, nor, except in a few cases are outside earnings large. One hundred and eleven earned less than $200; 58, from $300 to $500; 22, from $600 to $800; 23, from $900 to $1,700; 4, from $1,800 to $2,300; 7, from $2,400 to $4,900; and 1 more than $5,000.

It is clear that the salaries of the agricultural staff are comparatively low when the long training necessary and the apprenticeship period are considered. The situation is presented only in part by the data given; it is further complicated by the fact that the period served each year varies from 9 to 12 months. The salaries paid to the agricultural staff should be compared with those received by members of the staff of land-grant institutions as a whole.[6]

Because the agricultural staff is not unusually upon a pay period and service basis different from that of other divisions it is necessary to consider this matter in some detail. In the majority of the institutions (33 out of 44 reporting) the larger proportion of the agricultural staff is employed on the 11 months' basis with one month's annual vacation. In the others provisions for vacation periods differ. For instance, in California, Colorado, Connecticut,

[6] See Part VII, "Staff," p. 569.

Iowa; Massachusetts Agricultural College, Montana, Nebraska, Vermont, Virginia, and West Virginia, both the 9 and 11 months' bases are used. Usually where the 11 months' basis is used the staff members also are on the experiment-station staff and devote part time to experiment sation work during two months when the college is not in session. In Oregon and Washington, respectively, one member of the staff only is on the nine months' basis.

At Cornell University the members of the staff are given three months' vacation with the understanding that it is to be used in large part for professional improvement. One month only is given administrative officers. In Mississippi the vacation period varies from two weeks to three months in accordance as the staff member may be needed or not needed at the college. In Louisiana the appointment is on the 9 months' basis with extra pay for teaching in summer school. In Wisconsin the salary is on the 10 months' basis. If the staff is on pay beyond 10 months, 15 per cent of the previous year's salary is allowed for 6 weeks' teaching, and 12½ per cent for administrative or extension work.

Vacation periods are movable in 28 out of 43 institutions. The summer session is regarded as separate by 24 out of 41 institutions and additional salary is paid for teaching during that period in the majority of instances. Generally, however, very little undergraduate agriculture is taught during the summer session. The additional salary paid to the regular agricultural staff for summer-school teaching is very small.[7]

Determination of salaries.—The determination of salaries of the agricultural staff members normally follows much the same procedure as recommendations for appointment and promotion and is controlled in the agricultural division as in others by institutional procedure. Those who exercise authority or influence on salary determination and control need all the guidance available from authoritative sources. Certainly the dean will wish to confer with the department head and have his best judgment and recommendation with reference to all members of the department. On the basis of such conferences and recommendations and in the light of service performed by those recommended, as well as in the light of salaries for similar ranks in the various departments, the dean will make his recommendation to the president. The president in turn makes his decision in the light of these recommendations and of his knowledge and judgment of funds available and salaries in the institution as a whole. Nothing so quickly injures the morale of a group or adds to the difficulties of administration as departure from the

[7] See Part VII, "Staff," for comparison of salaries of staff members on 9 and 12 months' basis.

policy of acting only on recommendations that have come through such regular channels.

Outside activities of staff members.—Outside activities of the agricultural staff members are numerous and in some institutions very extensive. Usually they are in the nature of extension work or service to the public, to organizations, and to individuals, performed without extra pay as a part of the regular activities of the institution. There are other activities of a less public character, some of which are in the nature of private undertakings engaged in by staff members here and there. Included among these are the preparation of texts for colleges and high schools, editing departments in agricultural journals, giving professional advice to individuals and organizations, managing farms, and engaging in business enterprises of various kinds. While some institutions have had very little experience in such activities, the majority at one time or another have found it necessary to adopt policies or take action with reference to most of them.

The preparation of a text or texts may, if well done, add to the prestige of the staff member and to that of the institution which he represents. That text book writing should be generally approved and encouraged, therefore, is to be expected. It is definitely encouraged in 31 out of 44 institutions reporting and is discouraged in none, while a neutral attitude is maintained in 13.

Editing departments in agricultural journals also may be regarded in part as public service. However, it may consume so much time that teaching, research, and other institutional duties are neglected. Further, it is difficult to disassociate editorial policies from those of the institution in the minds of the public, hence difficulties sometimes arise from such work by staff members. This practice is encouraged in 13 institutions, discouraged in 3, and not permitted in 2, while 26 hold a neutral attitude.

Giving professional advice for pay can only with difficulty be dissociated from advice given by the institution free of charge in its extension activities, in service work, and in published material. Sometimes it leads to entanglements in law cases and in settling controversies where enmities are incurred. Usually this practice is not regarded with favor by agricultural institutions. It is not allowed in 8, is discouraged in 18, and a neutral attitude is maintained in 18.

Engaging in business enterprises is discouraged in 31, not allowed in 2, and a neutral attitude is maintained in 11.

The management of farms while on the teaching staff has been a debatable practice for many years. While on its face it would seem that such practice might be of professional value to staff members in the various agricultural specialties, the time so used is likely

to encroach upon institutional duties and general activities that otherwise are better cared for. This is indicated in the lack of uniformity in policy with regard to this practice. Three institutions do not permit it, 12 discourage it, 22 are neutral, and only 4 give definite encouragement.[8]

Professional improvement.—Keeping abreast of the times is not an easy matter for a faculty member. First, he is supposed to be well trained in his special field of work; second, he is expected to read all new published material in his own field in the English language and in such foreign languages as he may command; third, he will wish to keep informed about the fields closely related to his own; and fourth, he will need to keep in close touch with the agriculture of his State and section, particularly as it relates to his own specialty. This requires reading and study of texts, bulletins, and articles in the scientific and the agricultural press. Moreover, of necessity it involves considerable travel in the State and immediate section if not nationally as well.

But this is not enough, for one who is to be a real teacher must be broader than his specialty. He should be well informed in other fields than his own. He should be acquainted with the progress being made in the educational field. He should know how things are done in other departments and divisions of his own institution and in other institutions.

This requires constant individual and group effort. Therefore, the teaching and administrative staffs of many institutions have organized and developed specific plans and methods for assistance in this direction. Details of these procedures are presented by the part of this report dealing with the staff of the land-grant institutions,[9] since groups for the discussion of teaching problems, special courses for college teachers, opportunities to enroll for advanced degrees in their own institutions, and leaves for study usually apply to the agricultural staff in no peculiar sense, but are matters of general institutional control or arrangement.

Staff growth.—With increased output of dependable agricultural information resulting from the activities of the experiment stations, with some increase in student enrollment, and with growing demands for extension work and for such special service as agricultural institutions give, the number of agricultural staff members has increased rapidly. The growth of the staff in 43 institutions is shown in Table 5. Between 1902–3 and 1907–8 there was an addition

[8] In California for those on a 9-month basis the attitude is neutral in respect to all of these activities; for those on the 11-month basis the attitude is neutral with reference to the preparation of texts, but managing farms and giving professional advice for pay are not permitted.

[9] See Part VII, "Staff."

of 280 members. This was a period of increased enrollment in agriculture and of development of specialization that resulted in the organization of new agricultural departments. The agricultural student body increased from 2,405 in 1903 to 4,247 in 1908, or more than 75 per cent; the staff increased in size during the same period by more than 100 per cent.

TABLE 5.—*Number of members of teaching staffs in undergraduate agriculture in 43 institutions by 5-year periods from 1902–3 to 1927–28* [1]

Staff	Year					
	1902–3	1907–8	1912–13	1917–18	1922–23	1927–28
1	2	3	4	5	6	7
Dean	12	19	22	30	32	33
Vice dean or director of resident instruction	4	5	6	8	9	12
Other administrative officers	3	6	13	17	19	19
Professors	121	204	291	449	621	717
Associate professors	14	32	63	153	233	288
Assistant professors	32	69	150	319	375	425
Associates			5	6	35	26
Instructors	38	128	240	339	383	358
Assistants	27	68	225	156	149	207
Total	251	531	1,015	1,851	1,856	2,085

[1] From data furnished by institutional administrations.

The part-time experiment station and teaching staff grew with increased specialization. The student body continued to increase and by 1916 it was more than three times as large as in 1908. During this period also the colleges began to give more attention to extension work. The teaching and experiment station staffs were called upon to give much time to the preparation of material for extension use and to give help in extension meetings and in organization work. The result was an increase of 250 per cent in the number of persons on the agricultural staff from 1907–1917. Then came the war period and with the decrease in enrollments the number on the teaching staff declined somewhat, but by 1922–23 again had increased. Because of the large enrollment of agricultural students in 1920–21, the great demand for research and service work of all kinds and the beginning of training for Smith-Hughes teaching, the staff was the largest up to that time. From 1923–1927 there was a small increase due in part to additional appropriations for experiment station work.

Just how the agricultural staff spends its time is indicated in Table 6. The table is derived from data furnished by 1,849 individual members of agricultural staffs.

It is apparent at once that in addition to undergraduate teaching, the agricultural staff has many duties and renders service in many lines. The teaching of graduate students, creative work and research

(primarily experiment station work), extension teaching, and public contacts are all of them services of great value to the students and to the public.

TABLE 6.—*Number of agricultural staff giving different percentages of time to various activities*

Activity	No part of time	Per cent of time										No answer
		1–9	10–19	20–29	30–39	40–49	50	60	70	80	90	
1	2	3	4	5	6	7	8	9	10	11	12	13
Undergraduate	634	39	109	132	125	92	117	82	57	45	87	329
Graduate	1,083	171	154	47	15	7	5	0	0	0	0	366
Research	843	83	100	84	59	55	78	50	28	27	97	344
Other creative work	1,079	64	64	54	39	33	32	19	15	15	70	364
Administrative	853	198	164	95	66	31	32	13	14	4	16	362
Extension	622	255	145	50	28	8	18	12	7	6	336	361
Public contacts	920	391	136	20	7	4	6	0	0	0	2	362

It is essential that administrative officers and the public thoroughly understand this situation when attempting to secure data about cost per student. Frequently factors that are not properly chargeable to undergraduate instructions are included in computations of how much it costs to educate a student. These distinctions must also be clearly understood when effort is made to determine the load carried by staff members and when budgets and fund allotments for various types of work are considered. Accurate records of time distribution among the several types of duty performed are difficult to obtain, but suitable record blanks may well be prepared on which every staff member will indicate to the best of his ability, at least once each semester or quarter, how his time is used. With such records on file in the administrative offices of an institution, including the offices of each dean and director for the staff under his charge, it is possible to evaluate the approximate time devoted to any one of several groups of activities by any staff member or by the staff as a whole.

Because much of the time of the agricultural staff has been required for activities other than those of teaching, all agricultural institutions have a much larger staff than would be required for undergraduate instruction only. This has made possible specialized work of a high character that would have been impossible if teaching had been the sole function of the staff. The continuous development of new facts in agricultural science which almost immediately find their way into the classroom, has raised the standard of the subject-matter material presented to the student body.

Experimental and research work, as well as extension work, also have profited greatly by this relationship since it has made possible the joint employment and use of a greater variety of better qualified

specialists than would have been possible if these units had been limited solely to the employment of full-time persons.

Staff losses.—Excessive losses from the staff make it difficult to maintain high standards and continuity of effort. In the 5-year period for which staff losses have been reported, July 1, 1923, to June 30, 1928, 2 deans, 13 professors, 3 associate professors, and 7 assistants were lost by death, 1 professor and 1 associate professor by illness, and 7 professors and 2 assistant professors by retirement on account of age. Eighteen institutions were affected in these changes. Losses for other reasons are indicated in Table 7.

The largest staff losses are due to transfer of members from one institution to another. These amounted to 196 individuals, or 44.14 per cent of all staff losses in agriculture during the 5-year period July 1, 1923, to June 30, 1928. When vacancies occur, if candidates suitable for promotion are not available, it is necessary to look to some other institution. Usually selections are made from institutions where the salary scales are lower or from candidates of suitable qualifications but of lower rank than that carried by the positions to be filled. Transfers of this kind are frequently of decided immediate disadvantage to the institution from which the staff member is taken. On the other hand, the advantages of promotion for the individual and of securing faculty members with college experience make the net result of such movement of the staff a healthful condition. It is by no means disadvantageous for a small institution, with a relatively low salary scale, to establish a reputation of furnishing staff members opportunities for advancement to other and bigger jobs. The opportunity for advancement to staff members in this manner acts as a stimulation to good work, and attracts good men who have little previous experience.

TABLE 7.—*Staff losses in the ranks of assistant professors and above for the period July 1, 1923, to June 30, 1928, in 43 institutions*

Rank	To other institutions	To farming	To agricultural organizations	To other professions	To Federal Government	To State government	To business	Total
1	2	3	4	5	6	7	8	9
Dean	3	----------	1	----------	3	----------	----------	7
Other administrative officers	6	2	2	----------	----------	4	----------	14
Professor	42	8	12	5	6	16	22	111
Associate professor	40	6	6	5	8	5	17	87
Assistant professor	105	10	6	17	14	30	43	225
Total	196	26	27	27	31	55	82	444
Per cent of total	44.14	5.85	6.08	6.08	6.98	12.38	18.46	.....

That the "pull" of business is strong is evident from the fact that 82 staff members were lost to institutions because of business in the 5-year period considered. In addition, 27 left the institutions to affiliate with agricultural or-

ganizations and the same number to enter the professions. The National and State governments were able to attract 31 and 55, respectively, or a total of 86. The majority who make such transfers go into agricultural research, control, or administrative work. They are not lost to agricultural education or the agricultural industry since their work in the new positions usually makes for progress in these fields.

It is interesting to note that losses by transfer of staff members to farming are comparatively few, only 26 from all ranks taking this step in the 5-year period under consideration.

It would be very unfortunate for educational institutions if there were not opportunities for staff members to move from one institution to another or into other walks of life. That these opportunities are present makes possible deserved promotions and gives opportunity to staff members for growth and advancement. Under such conditions the best work is done.

Chapter V.—Courses and Curricula

The aims and purposes of undergraduate instruction in agriculture have been discussed in detail in a previous chapter. Attainment of these purposes is dependent in part upon the courses and curricula offered to students who enroll. This being true, the more careful the consideration given to the content of courses and to the organization of curricula the better will be the likelihood that objectives will be attained.

The courses are prepared by a number of different individuals of the instructional staff, but they are usually inspected by other officers or committees. The procedure varies somewhat in different institutions but usually is as follows: The individual teacher prepares an outline of the material to be presented in a course together with texts or references that will be used, and indicates the number of hours of class-room work required per week. This is reviewed by the department head and is submitted by him to the dean who may refer it to a committee of the agricultural staff or the staff as a whole for approval and to an institution faculty committee or institutional faculty for final approval. In some cases it is referred from the dean or from the agricultural committee or staff direct to the institutional faculty.

Four institutions report that courses to be offered must first have the approval of the individual staff member, after which they go to the department head for approval. The department head is reported as first approving courses in 16 institutions. When a course comes to him he considers it, and if he approves forwards it to the dean for approval in 11 institutions, to an agricultural faculty committee in 5, to the agricultural staff in 2, and to the director of resident teaching in 2. The director of resident teaching gives final approval in 1 institution but in the other he forwards the course to the dean.

The dean of agriculture is the first to receive courses and act on them in 4 institutions, second in 12, third in 1, and fourth in 2. He has final authority on courses in 3 institutions and refers them to others in the 16 instances in which he considers them.

An agricultural faculty committee is the first to receive and approve or disapprove proposed courses in 7 institutions, second in 3, and third in 6. The agricultural faculty as a whole is the first to receive and consider courses in 9 institutions, second in 7, third in 3, fourth in 5, and fifth in 1. It, therefore, acts on courses in 25 institutions but has final authority in only 8.

An institutional faculty committee is the first to receive and act on courses in 2 institutions, second in 2, third in 5, fourth in 2, fifth in 3, thus acting on courses in 14 instances. It has final authority in 5.

The president is the second to receive and act on courses in 1 institution, third in 2, fourth in 2, fifth in 4, and seventh in 1, thus acting on courses in 9 instances with final authority in 6. The board of trustees gives final approval to courses in 1 institution and the State board of regents in 4.

The setting up of curricula is a more complicated process than the preparation of individual courses. Usually no one of the staff is a specialist in this work, and there are no invariable rules to be followed by the individual, committee, or group that undertakes it. On the other hand, a number of guides are commonly used. These are listed as follows in the order of their reported use by the institutions.

Guide	Number of institutions
Study of the curricula of other colleges	38
Analysis of occupations of graduates and former students	37
Staff discussion of objectives of agricultural training	34
Study of elements of basic sciences essential to understanding of the technical courses	33
Analysis of the agricultural industries of the State	30
Study of range of opportunities in agricultural occupations and their frequency	26
Systematic inquiry of agricultural graduates and others as to the purposes college training should meet	20
Study of reasons for which students abandon the study of agriculture	12
Study of the nontechnical activities of those in agricultural vocations	9
Study of the causes of failure in agricultural vocations	6

Curricula with certain aims or objectives may be decided upon as desirable and courses outlined and arranged to give the desired material in the proper place, or the curricula are built out of the courses already offered by the various departments, those being used that seem to be closely related and to contribute the type of material that is desired in the curriculum. While the former plan would seem to be the most desirable from the standpoint of the results that are likely to be obtained, comparatively few institutions follow this practice. The majority construct the curricula largely from the courses already outlined and made available by the different departments. In the one instance the material for the course is planned and shaped to fit into a structure of a certain architectural design. In the other the materials available are examined and the best possible under the circumstances are selected; out of these a structure is built which may or may not follow a well-designed plan. In one case curricular objectives are decided upon and courses are prepared on the basis of desired content with a view to coordination with other similarly prepared courses in a finished curriculum. In the other case the curricula are prepared by arranging combinations of courses already available in the various subject-matter departments. Most institutions have found it impossible to outline courses which will meet fully the objectives in any single curriculum, since the courses usually must be given at one and the same time to many students enrolled in different curricula.

The building or setting up of curricula usually is a complicated process and involves several agencies in practically every institution. The first planning

is done by department heads in 11 institutions. In all cases the curricula are submitted for approval to the dean and agricultural or institutional committees or faculties or several combinations of these. The agricultural dean is the first to plan the curricula in 2 institutions, reviews and acts on them second in 8 instances and third in 2. He has final authority in 3 instances. The director of resident instruction acts second on curricula in 1 instance and third in 1 and has final authority in 1. An agricultural faculty committee plans the curricula in 16 institutions, acts on them second in 3, and third in 2 instances. It has final authority only in 1. The agricultural faculty sets up the curricula in 10 instances, acts second in 17, third in 4, and fourth in 2. Thus this faculty considers the curricula in 33 instances and has final authority in 11. An institutional faculty committee sets up the curriculum in 2 instances, acts second in 2, third in 4, fourth in 1, fifth in 2, and has final authority in 3. The university senate acts first on curricula in 1 instance, second in 2, third in 2, fourth in 5, fifth in 1, and sixth in 1 institution, and has final authority in 5. The institutional faculty acts second on curricula in 2 instances, third in 6, fourth in 2, fifth in 1, and sixth in 1, and has final authority in 7. The president acts first on curricula in 1 instance, third in 2, fourth in 2, fifth in 2, sixth in 1, and seventh in 1, and has final authority in 6. The board of trustees acts third with reference to curricula in 1 instance, fourth in 1, and fifth in 1, with final authority in each case. The board of regents acts on curricula third in 2 instances and eighth in 1, with final authority in all; and some other State agency acts last in 2 instances with final authority in both.

It is clear that both in courses offered and in curricula care is taken that no individual may act alone. In the majority of instances they pass for review before an individual and committee, two or more committees or faculties before they are approved and placed in the catalogue.

Trends in Agriculture Curricula

It is not possible to show full details of the various trends in instruction in the colleges since their organization, because reports were not sufficiently complete with reference to curricula or groups of subjects to draw a finished picture. This is true even when courses were listed with names, numbers, and credit hours and curricula were given in full. To evaluate with certainty the emphasis placed on any subject or group of subjects would involve going back of the names of the courses and the catalogue descriptions. These are indicative of the content of courses but of necessity omit much detail required for judgment. Complete course outlines or syllabi would be more useful, but even these would not furnish a basis for estimate of classroom emphasis. Such study is very desirable and might be conducted by individuals or groups within the institutions themselves but is not feasible in a national study. However, from the data on subjects and curricula reported in more or less detail for this survey, supplemented by the use of catalogues some of the major trends are indicated for the general curriculum in agriculture, or for the curriculum in agronomy where there is no general curriculum.

These curricula perhaps have been weighed and considered more than any others in the agricultural group. The major changes that have taken place since 1880 have been the gradual elimination of

foreign languages as a requirement, the reduction of the requirements in mathematics, physics, and chemistry, and increases in economics and in electives.

Ten institutions, including the universities of California and Maine, Massachusetts Agricultural College, the Mississippi Agricultural and Mechanical College, the universities of Minnesota, Nebraska, Tennessee, and Cornell, Rutgers University, and the Agricultural and Mechanical College of Texas, reported curricula as early as 1880–81. In all cases but four (Maine, Nebraska, Mississippi, and Tennessee) foreign languages were required at that time, ranging from 6 hours at the University of Minnesota to 15 hours at Cornell University. The average requirement of the group was 12 credit-hours. By 1890–1891 Cornell had reduced the foreign-language requirement from 15 to 6 hours, and by 1900 had dropped it altogether. The other five institutions mentioned retained the foreign-language requirement until 1910–11, and 18 other institutions (42 institutions reporting) then required foreign languages averaging a little more than 11 credit-hours. Between 1910–11 and 1920–21, 17 of the 23 had dropped the foreign-language requirement altogether, and the other six with one exception, had reduced the amount required. Of these 6 only 1 (Massachusetts Agricultural College) belonged to the group with the foreign-language requirement in 1880. By 1927–28 the foreign-language requirement had been dropped as a requirement in the general course by all except two institutions (Massachusetts Agricultural College and the University of Vermont).

Mathematics was reported as required in 10 institutions in 1880–81, including all institutions reporting curricula at that time; in 14 institutions, all reporting, in 1890–91; in 29 or 33 institutions reporting in 1900–1901; in 35 or 42 institutions in 1910–11; in 29 of 46 institutions in 1920–21; and in 28 of 46 reporting in 1927–28. From 1900 to 1927 the credit-hour requirement in mathematics decreased from an average of 9.5 hours in 29 institutions to an average of 2.5 in 28 institutions.

Physics was reported as required in the same 10 institutions as mathematics in 1880–81, in 12 out of 14 in 1890–91, in 27 of 33 institutions in 1900–1901, in 28 out of 42 in 1910–11, in 31 out of 46 in 1920–21, and in 25 out of 46 in 1927–28. The credit-hour requirement in 1900–1901 varied from 2.8 to 12, with an average of 6.2; and in 1927–28 from 2.4 to 8, with an average of 4.

Chemistry was required by every institution reporting for 1880–81 and for each year thereafter. In the first year mentioned the credit-hour requirement ranged from 2½ hours in one institution to 30 hours at the University of California, with an average requirement of approximately 18 credit-hours. In 1920–21 the requirement ranged from 6 to 20, with an average of 16 and an approximate median of 14. In 1927–28 the chemistry requirement ranged from 5 to 20 credit-hours, with an average of 11.7 and an approximate median of 12. Chemistry will remain as one of the important subjects in the agricultural curricula dealing with production and manufactures, since it is basic to much of the work given in such subjects as soils, nutrition, feeding, plant physiology, and a number of the dairy-manufactures courses. There is a well-defined tendency, however, in some institutions, to reduce the number of hours required by the elimination of certain subject matter in chemistry not considered essential to a proper understanding of the applied courses.

Work in economics was required in the general course in 1880–81 in the universities of California and Maine, Massachusetts Agricultural College, Rutgers University, the universities of Cornell and Tennessee, and the Agricultural and Mechanical College of Texas with a range of 2 to 4 credit hours and an average of 2.6. By 1900–1901, 16 institutions, out of 33 reporting, required economics in the general course with a range of 1⅔ to 7 credit hours, and an average of 4 hours. In 1910–11, 28 of 42 institutions reporting indicated economics as required in the general course with a range of 1.5 to 8 credit hours and an average of 4 credit hours. In 1920–21 economics was reported as required by 35 institutions of 46 reporting with credit hours ranging from 2 to 11 and an average of 4.5, and in 1928–29 this subject was reported by 35 of 46 institutions with credit hours required ranging from 2 to 11 and an average of 4.8. The increasing emphasis on subjects in economics is indicated both by an increase in the number of institutions in which they are required in the general course and in the number of credit hours required.

While there is a large variation between institutions in the strictly required hours of work in what are classified as agricultural subjects extending all the way from 20 to 59 hours, the average of 37 representative institutions in 1910–11 was 38.26, and in 1927–28, 39.25 credit hours, with an approximate median of 40 and 38.5 respectively. In the institutions where the least number of hours in agriculture is required generally, many more hours than those strictly specified may be elected and thus become a part of the curriculum of the student.

While the situation with reference to foreign languages, mathematics, physics, chemistry, economics, and the agricultural group indicate the trend of the requirements for these subjects in the general course, too much significance can not be attached to the figures given for the reason that electives have increased in larger proportion than the decrease in the credit hours in the subjects specified. In other words, while a student in the general curriculum is not now held to courses in languages, except in two institutions, or for as many hours in mathematics as formerly and is required to take fewer hours in physics and in chemistry, but more hours in economics, he has greater freedom in elective courses. If he is so inclined he may take as much or more work in the subjects named than formerly or he may take more work in English and literature, in economics, sociology and education. In order to determine what students are actually receiving in agricultural curricula detailed studies of student schedules are highly desirable but such investigation is beyond the scope of the land-grant college survey. Studies of this kind may well be undertaken by individual institutions or better by a considerable group of institutions in collaboration with each other.

Relative emphasis on the various subject-matter fields in agricultural instruction.—The emphasis given in agricultural instruction to the various subject-matter fields has been the subject of much discussion within institutions and by the general public. Do the colleges give too much attention to production and not enough to marketing and economic relationships between agricultural and other industrial groups or between agriculture and business? Are recent trends in the use of power on the farm and the development of commercial agriculture given the consideration that they should have? Are rural education and the social relationships of rural people given sufficient emphasis?

One significant indication of the trend with reference to these matters is found in the departmental organization within the agricultural group. In the areas of agricultural economics and marketing especially the agricultural divisions show a significant develop-

ment of departments appropriate to these fields. From 1916 to 1927–28, a period of 12 years, 25 departments in agricultural economics (under different names, such as agricultural economics and farm management, rural economics, economics and sociology, marketing and rural finances) have been organized in as many colleges out of 42 reporting on this point, while during the entire previous history of the institutions only 7 such departments were reported. Although courses in economics were given in practically all these institutions before the departments were organized and are now given universally in the land-grant colleges, larger emphasis on these subjects has come with the organization of departments whose primary function it is to study and teach phases of economics which have a special and intimate relationship to agricultural marketing and finance, the use of land, farm organizations, and rural movements. Rural social conditions also are given considerable attention in these or other departments of many institutions.

The emphasis on subjects relating to the rapid development of farm machinery and to the increasing use of power in agriculture is indicated by the organization of agricultural engineering departments (under such names as agricultural engineering, farm mechanics, farm machinery, and rural engineering) in 24 institutions since 1901, 17 of which have been established since 1911. Where such departments have not been organized agricultural engineering subjects are taught in other agricultural departments or in the engineering group.

Beginning with the period 1906 to 1910 much thought has been given to problems of rural education. Departments of agricultural education (under such names as agricultural education, rural education, vocational education, vocational teaching, and rural vocational education) have been organized in 22 institutions of the 44 reporting. Three of these came during the period 1906–1910, 6 from 1911 to 1915, and 13 from 1916 to 1928. In the remaining institutions this work is given in some other department. The development of agricultural instruction in the high schools of the country under the Federal Smith-Hughes Act since 1917 has given much impetus to this work.

In addition to the evidence of development in instruction afforded by creation of departments devoted to specific fields the facts regarding course offerings furnish significant testimony concerning emphasis and distribution among subjects. From the data that have been assembled concerning the type and number of courses offered and the enrollments in them for 1927–28, Table 8 has been prepared showing certain major groups of courses, the number of institutions reporting on each group, the average number of courses with credit hours and the average number of student credit hours of enrollment. The result is an indication of the work given during 1927–28 in

economic and other fields. Although the table represents the offerings of no single institution it is of interest as indicating the national situation with reference to agricultural offerings. In the groupings used, crops and soils are included in agronomy, plant and animal breeding with genetics, although in most institutions they are offered in agronomy or animal husbandry; feeding courses with nutrition; farm buildings with agricultural engineering; agricultural economics with economics; and bees with entomology.

TABLE 8.—*Courses in the 4-year curricula in agriculture conducted in 1927–28 with the number of institutions reporting for each group, average number of courses and credit hours given, and average undergraduate student credit hours enrollment*

Courses given	Number of institutions reporting	Average number courses given	Average number credit hours	Average number student credit hours enrollment
1	2	3	4	5
Agricultural engineering	37	10.	22.1	361.2
Agronomy	43	13	30.5	615.4
Animal husbandry	42	10	22.8	415.7
Bacteriology	27	5	13.1	238.7
Dairy production	39	9	15.4	239.1
Dairy manufactures	38	5	11.3	111
Economics	36	11	27.2	721.4
Entomology	33	7	17	224.7
Farm management	35	3	6.7	114.6
Floriculture	20	4	11.3	107.5
Forestry	20	13	29.2	501.6
Genetics and plant and animal breeding	40	5	13	182
Horticulture	40	11	26.7	332.9
Landscape gardening	27	4	12.5	222.6
Nutrition and animal feeding	33	2.9	7.9	132.1
Plant pathology	26	5	12.8	117.8
Poultry	38	5	11.4	166.6
Veterinary science	29	3	9.1	132.9
Vocational education	25	8	17.7	286.9

The table shows that a larger emphasis as indicated by student credit-hour enrollment is given to agronomy than to any other group of subjects. Agronomy deals with plants and plant growth, field and forage crops and the soils in which they are produced; in other words, plant life, its environment, and many of its relationships. These matters are basic to the agricultural industry and, therefore, will always be emphasized in agricultural curricula. Horticulture, plant pathology, and entomology also deal primarily with plant production and add further to the emphasis given to production.

Next come animal husbandry, dairy production, and poultry production. These with veterinary science, nutrition, and feeding constitute a group of subjects dealing with animal production. They will always receive emphasis for the same reason that plant production is emphasized. Genetics and plant and animal breeding are closely related to plant and animal growth and development and

will remain in offerings for agricultural students. It is clear that only when plants and animals have been produced is there anything to market, and economy and efficiency in production in themselves are of large importance.

What the table shows about offerings in the economics group, including general and agricultural economics, is of special interest. The average total number of student credit hours of work in economics in 1927–28 as shown by the table is larger than in any other single group. Agricultural economics to-day generally receives more attention in agricultural curricula than at any previous time. Not only are the students in many curricula required to take a certain number of credit hours in economics, but special curricula or groupings have been arranged in many institutions in which a student may either specialize in agricultural economics, agricultural business administration, or agricultural administration, or take a large number of elective hours of work in this field in connection with general and special curricula. For instance, dairy manufacturing in many institutions is now a highly specialized marketing group although many courses listed in it are taken by students in the more general curricula. Moreover it should not be overlooked that in the so-called production course much time is devoted to the study of standards, preparation for market, market handling, market requirements, and market outlets. These phases are emphasized and receive consideration, therefore, both in production and in marketing courses and much is contributed in this way to the understanding of the economics of agriculture.

Agricultural engineering holds an important place in many of the agricultural curricula with an average of 361.2 student credit hours for the 37 institutions reporting on this group. This is more than half as much work as is given in agronomy which includes both crops and soils, and is evidence of the emphasis on this subject in agricultural instruction. The progress made in recent years in the use of machinery and of power to lighten human labor have made it necessary that the institutions emphasize increasingly the operation and use of machinery and equipment and the application of power to farm tasks.

Landscape gardening and floriculture are finding a permanent place in agricultural curricula in many institutions. As the country grows older more and more attention is given to home surroundings. Orderly and beautiful farmyards, homes, and countrysides contribute much to rural contentment and happiness. The professional curricula in these subjects are proving attractive to a considerable number of students, both men and women, as preparation for a distinct profession or as interesting curricula of general educational value.

Forestry is one of the major lines of emphasis in many land-grant colleges, 20 reporting an average of 13 courses in forestry with a total of 29.2 credit hours and 501.6 student credit hours enrollment. The comparatively large number of courses is due to the fact that all phases of forestry are included. The average student credit hours enrollment in the 20 institutions is larger than in any of the other subject-matter groups with the exception of agronomy and agricultural economics. Not only are there many enrollments in professional forestry and a considerable number of graduates in forestry from the land-grant colleges each year (see Table 17), but forestry courses are required as service courses in connection with farm forestry and range management. With the increasing emphasis upon reforestation, replanting of denuded areas, the planting of waste lands with forest trees, forest grazing, prevention of soil erosion, flood control, and protection of growing forests, the interest in forestry is likely to continue.

The comparatively large emphasis on the subjects in vocational education, as already indicated, is the result primarily of the establishment of agricultural instruction in the high schools under the Smith-Hughes Act. It was early realized that to teach agriculture in the high school satisfactorily is perhaps more difficult than to teach many other subjects, since this involves not only classroom and laboratory instruction but practical work on the farms in the communities where the Smith-Hughes schools are located. It has been considered necessary, therefore, to develop a technique or method of teaching which makes possible a close correlation between what a boy of high-school age does in school and his work on the home farm. Those who are planning to teach vocational agriculture are required to take considerable work in vocational education.[10]

Specialization in courses and curricula and class enrollment.— Specialization in subject matter in agricultural courses and in agricultural curricula is the general practice and is the result of a number of causes. First is the general necessity for specialization in practically all lines of endeavor in professional work, in industry, and in practical agriculture. The general practitioner in medicine, for instance, has given place more and more to the physician who specializes in certain diseases and to the surgeon in certain types of surgical cases. The merchant no longer sells meats, groceries, clothing, shoes, oil, and gasoline, but meat shops, fruit stores, groceries, men's haberdasheries, shoe stores, and service stations for gasoline and oil are now the rule. The farmer, in spite of much exhortation to the contrary, keeps right on specializing in the production of

[10] See Vol. II, Part III, "Teacher training," pp. 113, for more detailed discussion of agricultural teacher training.

grain or hay, in poultry, milk, apples, pears or cherries, truck crops, flowers, and even foxes. He has found that with a reasonable degree of specialization he obtains the largest economic return.

The agricultural institutions are called upon to meet the new situation and to provide instruction relating to the many specialties on the farms and to many business enterprises such as the feed and seed business, the fertilizer business, and the farm machinery business and others closely associated with the farming industry. For this reason if for no other, the agricultural institutions have found it necessary to offer numerous courses, many of them highly specialized in character.

Agricultural teachers to become authorities in their lines have found it necessary to specialize in comparatively narrow fields since the subject matter in any one field now is so voluminous that no one can hope to be fully informed in many. The student who comes to study agriculture wants work in some particular line. He is interested in dairying, poultry, horticulture, animal husbandry, or other specialized fields, and thus reflecting the situation on the farms and in agricultural business. All these forces and influences have been working in one direction—specialization in courses and in curricula.

There are also some less legitimate reasons which have had considerable influence in this direction. A teacher who does much research as a member of the staff of the agricultural experiment station for instance, becomes so engrossed in his specialty that it looms exceptionally large in his own thinking. He tends to divide and subdivide the subject into its highly specialized details. The courses that he offers reflect much of this detail.

Specialization in courses has made it necessary to adopt devices whereby a student may not have his energies scattered as a result of pursuing a large number of detailed, unrelated courses. The preparation of set curricula in which related and supplementary courses are grouped according to the best judgment of a department, the agricultural faculty, and the dean; the arrangement of departmental groups of courses from which a student must select a number; the adoption of a system of majors and minors in which a student must take a certain number of hours of related subject matter in one department or field as a major, and a smaller number of another department or field as a minor; and the arrangement of the curriculum so as to cover a more general field during the first two years and some special field or fields during the junior and senior years, are devices to permit specialization and still keep it within bounds.

In six institutions the organization of set curricula is the practice. In 13 institutions departmental groupings of courses are arranged and the student selects his work on the basis of so many required hours in each grouping.

Arrangement of curricula by majors and minors is the practice in five institutions, and in four others free election of specialized courses is permitted. A combination of any two of these methods such as a set curriculum with a number of free electives, majors and minors with free electives, or departmental groupings with majors or minors are practiced in the others.

Service Courses for Agricultural Students

A large part of the subject matter for students in agricultural curricula is in other subjects than those offered by the agricultural staff. Included here are frequently the basic sciences, chemistry, physics, botany, zoology, and geology and universally English, literature, languages, music, and other humanistic subjects. More than one-half of all work taken by students in the 4-year agricultural curricula is in subjects belonging to these groups.

It is at once evident that if the agricultural curricula in the land-grant colleges are to be satisfactory, a high grade of work in these service courses is essential. Not only is an able and well-trained staff for this work necessary, but its members should understand the relationships of these subjects to the basic and applied courses in agriculture. This work provides the means whereby the agricultural student is assisted to get a vision of the relationships between agriculture and the basic sciences, between agricultural industry and other phases of economic life, and between the rural and other elements of society.

Where service courses are not satisfactory and changes are necessary or when additional service courses are needed this usually becomes the subject of discussion and negotiation between the departments involved.

These discussions are arranged either by the departments themselves, by the deans' offices, or by both. In 19 institutions both these officers and the departments take part in these conferences, in 11 the departments alone, and administrative officers alone in 2. A standing committee handles the matter in 9 institutions, cooperates with the administrative officers in 5 instances, and the agricultural faculty in 2, and the faculty cooperates with the administrative officers in 4.

If these conferences, however handled, are conducted with a view to promoting the best interests of the student and selfish departmental interests are disregarded, they should contribute to better understanding and agreement as to new service courses needed or changes that should be made in existing courses. Nevertheless such consideration in the abstract or upon the basis of existing knowledge will never solve all the problems involved. Continued and thorough-going experimentation in educational values and results under controlled conditions must afford a new basis for dealing with course and curriculum offerings. This process is hardly started in the land-grant institutions.

Service courses in the basic sciences are regarded as generally satisfactory in 22 of the 35 institutions reporting on this point, some satisfactory and some not satisfactory in 4 and unsatisfactory in 9. There is little criticism of the technique acquired by students in these courses. The most common complaints are first, that they fail to bring out the relationship between the basic sciences and their agricultural applications; second, that the courses are limited to specialized aspects not desired by students of agriculture; and third, that the courses do not give adequate preparation in knowledge of facts and principles needed in the courses in agriculture.

The service courses in the humanities are more generally regarded as satisfactory. Only three institutions report that they are not. One says that the custom is to take it for granted that what is presented in such courses is satisfactory, while another says that the elective English courses do not quite fit the need of agricultural students, many of whom have no background of good English usage. Since the English teacher has a duty to all the students of the institution, whether in agriculture, in engineering, in home economics, or in sciences and arts, it is not to be wondered at that there should be some criticism of the services given to students of certain applied curricula.

On the other hand, because of the high specialization in so many of the courses offered, it often is difficult for agricultural students to obtain satisfactory electives in English. The teachers of English quite frequently and very naturally think in terms of the major in English and give work accordingly rather than for the purpose of meeting the needs of students in applied fields. The result is that English and other liberal subjects, excellently taught from the liberal standpoint, fail to function as a liberalizing element in the agricultural major. There is abundant opportunity for teachers of English to exercise ingenuity in the selection of materials for discussions, themes, and papers for the students specializing in the various applied curricula.

One result where service courses are not satisfactory or where there is considerable difficulty in keeping them so, is a tendency in some institutions to duplication of courses between the arts and sciences and the agricultural unit. For instance, if plant physiology is not given satisfactorily to agricultural students by the department of botany, the horticultural department may offer a course in plant nutrition or nutrition of horticultural plants which measurably parallels the regular course in plant physiology. There are similar opportunities for duplication in bacteriology, chemistry, entomology, geology, and physics and perhaps others. Although 35 institutions

report that there is no tendency in this direction, other evidence indicates that this field needs careful consideration and study in every institution.

Within the agricultural division itself there are many places where duplication may occur, as in animal nutrition, plant and animal breeding, crops and soils, and in management courses. Through close cooperation between departments as reported by 36 institutions, supplemented by course syllabi in eight, and working back from curricula to courses rather than from courses to curricula in seven, and by the careful attention given to this matter on the part of department heads and deans of agriculture, it is the judgment of 38 institutions that there is no undue duplication in courses within the agricultural unit. Only three report that such duplication exists. It is probable, however, that if a careful study of this matter were made by individuals or committees in the various institutions, a good many instances of excessive overlapping would be found, with consequent opportunity for correction and improvement.

Certain subjects required in agricultural curricula and where they are taught.—A number of subjects required in the curricula for students in undergraduate agriculture may be offered in one or more than one of two or three major divisions of the institution. These subjects and where they are taught are indicated in Table 9. The emphasis given these subjects, the number of students selecting them, administrative convenience, personnel, and costs, are some of the factors which help to determine in which departments or major divisions they are placed. Their position in the organization often influences the manner in which they are taught and their subject-matter content. When, for instance, agricultural chemistry is given by the college of agriculture, it is entirely likely that the teaching staff is selected partly on the basis of its appreciation and understanding of the relations between so-called pure chemistry and chemistry applied to agriculture and that these relations are made more clear in the classroom and laboratory than if the subject is given in a department of chemistry in which the purpose may be to develop chemists and chemical engineers. On the other hand, when chemistry is taught in the agricultural division it may be that the broader aspects of the subject are not sufficiently emphasized and that the relation of agricultural chemistry to industry is not brought out as clearly as when taught in a division that serves students in a number of allied fields. Careful detailed study should be made upon a comparative basis in order to determine the facts with reference to these matters and the effects of different practices upon the subsequent work of students.

TABLE 9.—*Subjects required in agricultural curricula and major divisions in which they are taught*

Subject	College of agriculture	Arts and sciences, science, applied science, industrial science, and liberal arts	Other
1	2	3	4
Accounting	[1] 18	11	16 in business administration, commerce, or economics.
Agricultural chemistry	19	23	3 in chemistry.
Agricultural economics	35	5	5 in business administration, commerce, or economics.
Agricultural education	26	4	15 in education.
Agricultural engineering	38	----------	6 in engineering or architecture.
Animal breeding	45	----------	
Bacteriology	22	23	2 in veterinary science; 2 in medicine.
Botany	[1] 17	31	
Drawing	[1] 13	9	23 in engineering or architecture.
Entomology	33	14	
Genetics	[1] 35	13	
Home economics	20	4	19 home economics and women's colleges; 3 education.
Landscape art design	36	3	1 education; 3 engineering or architecture.
Plant materials	37	2	1 education.
Marketing	34	6	6 in business administration, commerce, or economics.
Physics [4]	[5] 5	37	6 engineering or architecture.
Plant breeding	44	1	
Plant pathology	28	19	
Plant physiology	19	28	
Zoology	[1] 14	33	

[1] 5 in part only, the remainder in commerce, business or science, and arts.
[2] 3 in part only.
[3] 1 in part only.
[4] In school of physics in 1 institution and physics and chemistry in another.
[5] 2 in part only.

In this connection it is interesting to note that agricultural chemistry is taught as a part of the work of the college of agriculture in 19 institutions, in the arts and sciences division in 23, and in a school of chemistry in 3. The majority of institutions apparently feel that the work given in chemistry when taught in other divisions than agriculture is satisfactory for agricultural students.

Agricultural engineering is a part of the work of the college of agriculture in 38 institutions and of engineering colleges in 6. Where it is taught in the college of agriculture, the phases of engineering which deal with its application to farm structures, to drainage, to farm machinery, to equipment of all kinds, and to use of power on the farm are more likely to be stressed than when it is taught by the staff of the college of engineering where basic principles of design and construction are emphasized.

The work in agricultural education is handled as a part of the work of the college of agriculture in 22 institutions, in the school of education in 15, and in arts and sciences in 4. Where it is in the college of agriculture the teaching personnel is more likely to be selected because of training in agriculture and because of practical agricultural experience than if selected by the school of education.

As a result the student will feel just as much at home in the agricultural education classes as he will, for instance, in a class in agronomy. He is more likely to select vocational educational subjects as a part of his curriculum where they are given in the college of agriculture than in the school of education. Undoubtedly these are some of the reasons why agricultural education is made a part of the work of the college of agriculture in the majority of institutions. On the other hand, such emphasis has sometimes resulted in the employment of teachers poorly trained in education. When the staff in agricultural education is a part of the school of education rather than of agriculture, the professional attitude is encouraged. Membership in both faculties is a device that has been quite generally overlooked. It would seem to have advantages.

The fact that agricultural economics and marketing in 35 and 34 institutions, respectively, are a part of the regular work in the college of agriculture and of other colleges or divisions in 10 and 12 institutions, is significant of the stress placed upon these subjects in agricultural instruction in recent years. As indicated elsewhere in this report, they are rapidly becoming as much a part of the curricula in agriculture as agronomy or animal husbandry.

That botany, zoology, and physics should be handled oftener in the division of arts and sciences than in the college of agriculture is to be expected. These subjects constitute a large and important part of a number of the curricula and may be taken to advantage in that college by the agricultural student. Genetics, which is stressed particularly in plant and animal breeding, fits into the work of the colleges of agriculture and is given there by 35 institutions out of 48. Service courses in this subject for those in other divisions are offered by the agricultural teaching staff.

It should not be overlooked that in some institutions it is not desirable or practicable to segregate entirely all applied courses from the corresponding departments in arts and sciences or in engineering, as the number of students enrolled may be too small to justify the procedure from the standpoint of expense. However, when the student enrollment is sufficient, the expense may be no greater if the applied work is segregated from the basic work. Laboratories and equipment as well as teachers have to be provided in any case. The situation with reference to the place in the organization of most of the subjects discussed is deserving of careful study and review in every institution. The guiding principle at all times should be the best service possible to all students, commensurate with the funds available, whether such students are in agriculture, engineering, home economics, arts and sciences, or in some other major division of the institution.

Farm Practice Requirements

In many institutions there is a considerable enrollment of students in agriculture who have had no farm experience. Since it is felt that all students who receive an agricultural degree should be more familiar with farm practice than is possible through the laboratory work incidental to the courses taken, and since a large amount of practice is not logically a part of a course of college grade, many institutions require practical experience away from the college before the agricultural degree is granted. Twenty-six of 45 institutions require additional experience to that received in college courses. Only in 14 of these, however, is it required of all students in agriculture and only in 6 is the work supposed to be an integral part of the regular courses in the curricula.

Those who major in botany or plant pathology, in agricultural chemistry, in entomology, in forestry, in landscape art, and in floriculture, and in certain cases students from foreign countries generally are exempt from the experience requirement. In five institutions where certain students are not required to have farm experience they must acquire experience in other work appropriate to the specialty which they are studying. Students in forestry are often required to spend one or more summers in practical forestry with the forestry service of the State or Federal Government or with logging and lumber companies. Students in floriculture and landscape gardening may be required to take work in growing of flowers and ornamentals under glass, or in the park service of cities. Only in a few instances is this practical work provided for at the institutions themselves.

Where practical experience is required it is expected that it be completed before the beginning of the junior year in 1 institution, before the beginning of the senior year in 17, and any time before graduation in the others. The practice work requirement is administered by the office of the dean of agriculture in 10 institutions, by the departments involved in 10, and by other arrangements in the remainder. Supervision in the nature of occasional visits by staff members upon students doing practice work is provided by 3 institutions. Detailed reports of practice work done is required from the students in 15 institutions and in 6 of these cases also from the employer. In 4 instances reports from the employer alone are requested. Practice work equivalent to at least 3 months is required in 9 institutions, 6 months in 10, and 1 year in 3. None have a requirement of more than 1 year. The kind of practice work to be done is determined in various ways. In 4 institutions this is the duty of a special officer in charge, of a faculty committee in 4, and of the departments concerned in 11.

For those without experience, practice work in addition to that which may be secured in laboratory exercises has been considered very desirable. It has seemed reasonable to suppose that it should help students to understand and appreciate the work in applied courses or to aid them to discover mistakes in their choice of training at a time when the error can be remedied. When a student has completed his curriculum it is easier for the young man who has had experience to find a suitable position than it is if he is inexperienced. In spite of these advantages, however, it is desirable that case studies be made to determine the facts in regard to the effects of farm practice requirements, both educationally and practically. Such an investigation is justified by the number of institutions that do not have practice requirements.

Chapter VI.—Agricultural Students

There is much interest on the part of the public in higher education, but understanding and appreciation of what an institution has to offer, or what higher education really means, are rare. It is the duty, therefore, of every State-supported institution to make its aims, purposes, offerings, and facilities known to the public and to young men and women. Such informative activity should not be regarded as advertising or propaganda. It should be regarded rather as an explanation due to the people who support the institutions. They have a right to learn of the opportunities offered to young men and women by virtue of public taxation for institutional support. Acquainting prospective students with offerings in undergraduate agriculture is a part of this important duty. How it is done and an estimate of the effectiveness of the methods used is shown in Table 10.

While 45 institutions reported on methods used, only 26 gave an estimate of their effectiveness. It is clear that in the judgment of these institutions cooperation with Smith-Hughes teachers, with alumni, with extension workers, and with high-school principals, and special care in correspondence with prospective students lead in effectiveness. This is to be expected, since such contacts are personal in character. Smith-Hughes teachers of agriculture and county agents almost universally are agricultural alumni, and therefore they and alumni in other occupations are in the best position to enlighten and interest young men and women in college work.

TABLE 10.—*Methods used to acquaint prospective college students with work offered in agriculture and an estimate in the order of their effectiveness as reported by 45 institutions*

Methods used	Number of institutions using method	Order of effectiveness							
		First	Second	Third	Fourth	Fifth	Sixth	Seventh	Eighth
1	2	3	4	5	6	7	8	9	10
Special literature	37	3	2	8	2	3	3	.....	1
College news service to weekly newspapers	31	1	5	3	3	3	2	1	.....
Cooperation of high-school principals	29	4	4	3	2	1	2	.....	.....
Cooperation of Smith-Hughes teachers	40	12	5	3	3	1	2	.....	.....
Cooperation of extension workers	39	4	7	4	1	3	.....	2	1
Cooperation of alumni	38	7	4	5	1	1	1	2	3
Special field man to visit prospective college students	7	1	1	.....	.....	.....	.....	1	1
Meetings of Smith-Hughes students at college	29	3	5	1	3	1	.....	2	1
Meetings of 4-H Club members at college	36	4	2	3	4	2	3	2	1
Special care of correspondence with prospective students	35	7	2	2	1	1	2	1	.....
Other means	9	5	.....	1	1	.....	.....	.....	.....

Entrance requirements for agricultural students.—The general entrance requirements for agricultural students are, as a rule, identical with those of students enrolling in other divisions of the institution and usually specify a certain number of units of high-school work or their equivalent. In some instances a certain grade of work in secondary schools as indicated by the student's record is necessary for enrollment. Special requirements, such as certain courses in mathematics or in foreign languages, may be specified in engineering and in arts and sciences; in agriculture such specifications usually are lacking. The students from secondary school curricula in agriculture (Smith-Hughes) are admitted to the regular 4-year agricultural curricula in all institutions (43 reporting). In Vermont they are so admitted provided they comply with the regular entrance requirements, which permit of five and one-half free elective units. In Massachusetts Agricultural College students of this type are admitted to a course leading to a special degree.

Special students are admitted to the 4-year agricultural curricula in 39 of the 43 institutions reporting. Practically a universal requirement for special students is that they shall be 21 years of age or over. Two specify 20 years of age, and one 23, and four used the word "mature" instead of giving the age. It is understood also, and is specified in several instances, that they must demonstrate ability to carry the courses in which they register.

Special students usually are mature and come for a specific purpose. If after a conference with the department head or the dean of agriculture it is believed that they can handle the work in which they are interested, they usually carry their courses with facility. The experience of many institutions justifies the practice of admitting them to regular courses. Many young men of ability of 21 years of age or over have not had the opportunity to acquire a secondary school education. Such men often are well-read, well-informed, and are capable of handling the college work. State-supported institutions undoubtedly should be in a position to give them this privilege when they want it and as they need it.

Admission of students to short courses in agriculture of less than 4 years but of at least 12 weeks duration is on an entirely different basis in most institutions. These courses usually are of secondary grade and are so planned that those who have a common-school education may enroll with benefit. The usual provision for enrollment in these courses is completion of the equivalent of eighth grade work and the attainment of the age of 16, 17, or 18 years. In a few instances the ability to read and write is the only requirement specified. Completion of two years of high-school work is required in one instance and experience of two years or more in farming in two instances.

Transfers from Other Institutions

Because of the large number of private colleges and because of the growth of junior colleges, applications for admission to the agricultural colleges with advanced standing are frequent. Applicants who have had two years of college work may reasonably expect to be able to receive a bachelor's degree in agriculture in two additional years, whatever subjects may have been covered previously. This is possible when the first two years work has been of a character to fit in with the curricula in agriculture or when there is a large flexibility in the latter, with much opportunity for electives. When this is not the case, it may take more than two years to complete the work in an agricultural curriculum even though a student may have already completed satisfactorily two years of college work. For instance, much of the applied work in agriculture has prerequisites in the general sciences and the necessary work in these sciences and in agriculture usually can not be covered in two years time. Definite plans for coordination and integration of the first years of the curricula in these colleges and the curricula in agriculture in order that transfer of students between them may be facilitated are reported from 13 institutions.

The University of Nebraska reports that junior colleges in Nebraska are organizing their curricula in cooperation with the university examiner so as to correlate the work in sciences and other subjects with similar work of the university, thus making graduation possible in two years. The Utah Agricultural College reports that junior colleges have their courses so arranged as to be similar

to the first two years at the agricultural college. The University of Tennessee reports an arrangement with one college whereby students may take there the equivalent of two years of work consisting of English, first courses in science, agriculture, and mathematics and then complete the work at the University of Tennessee. At the University of Idaho the branch of the university at Pocatello has a 2-year curriculum. This is so outlined that two years in the agricultural curriculum may be taken at that branch and two years at the university at Moscow permitting graduation at the end of four years. Iowa State College reports that three years of work at a private college followed by two years in agriculture at the Iowa State College permits the giving of a degree from both institutions.

In Ohio arrangements have been made by the university and certain of the smaller colleges whereby students attend three years at the cooperating college and two years at the college of agriculture. At the end of the four years the Bachelor of Arts degree is conferred by the cooperating college and at the end of five years the degree of Bachelor of Science in Agriculture is conferred by the Ohio State University.

In every State where there are private colleges or junior colleges whose students in considerable numbers may wish to secure college training in agriculture, it is desirable that these institutions and the land-grant college in the State in which they are located take steps to facilitate the transfer of students from one institution to the other with little or no loss of college credit. Clearly, however, it would be wasteful and otherwise inadvisable for the junior colleges and private institutions to attempt to secure the expensive facilities required to teach agriculture upon the college level in order to accomplish such ease of transfer. It would appear that such adjustments as are advisable should be made by the agricultural college. It is probable that change of objective on the part of the student will always entail some apparent loss of time.

The Smith-Hughes student.—Advanced credit toward degrees in agriculture is nowhere granted for agricultural courses taken in Smith-Hughes schools or in other secondary schools. In a comparatively few instances certain college courses may be omitted by those who have taken Smith-Hughes work and more advanced courses substituted. Connecticut Agricultural College, the universities of Florida, Maine, Minnesota, Tennessee, and Wyoming, and the State College of Washington report from three to six freshman agricultural courses where this practice is permitted. Such courses usually are introductory, similar to or identical with those given in practically all the agricultural institutions of the country to all students, many of whom have had no agricultural work. They are comparable to

beginning courses in chemistry, which, in some institutions, freshmen who have had good high-school courses in chemistry may omit, substituting more advanced work.

The problem of properly caring at the same time for the student who has had no agriculture and one who has had from two to eight units in Smith-Hughes high schools has not yet been solved. It may be necessary in the future to give some introductory courses in agriculture to all students who are not from the farm and who have had no agriculture and to raise the level of the regular required courses given to students who have had much farm experience or agricultural work in secondary schools. In no institution reporting have special sections for Smith-Hughes students been established. Apparently it has been impossible to work out a plan whereby this could be done.

The logical process in evaluation and passing on entrance credentials of all regular and special students as well as those with advanced standing would seem to be for all credentials to go to the central office of the institution for handling whether that be known as the registrar's office, the office of the director of admissions, or by some other name. From the registrar's office they may be referred in certain cases to the office of the dean of agriculture for review and record, and then returned to the registrar for permanent filing and reference. Students with advance standing may properly be referred to a special institutional or college committee for action and returned to the registrar for recording.

Special students usually come for a specific purpose and their cases undoubtedly should be referred to the divisions or colleges in which they wish to major, so that the dean of the division or special college committees may handle these cases with care and to the best satisfaction of the students and of the institution. Recommendation should then be returned to the registrar's office for action and record.

Student Registration and Guidance

The guidance a student receives through the four years contributes much to his success or failure. Many come to enroll with preconceived notions of what they wish to take, which do not fit in at all with the offerings of the institution or the sequence of work necessary to attain certain goals. They need careful guidance so that their work may be well arranged and so that they may not be discouraged. Others who are less individualistic should have equally good guidance throughout their college years.

The institutional advisory system is discussed in Part VI of this report dealing with student relations and welfare. The part of the agricultural college officers in such systems requires that the more experienced members of the faculty and those with a broad point of view be especially charged with student advisement. Normally these are the busiest men on the staff and because of this the advisory work is often given to younger and less experienced persons. Always, under any system, the way should be open for students to consult the dean or the director of resident instruction who presumably is not in-

terested in promoting any particular subject, as is the case occasionally with men who have highly specialized training. The advisory system, in spite of its limitations, gives opportunity for personal contacts of value both to students and to staff.

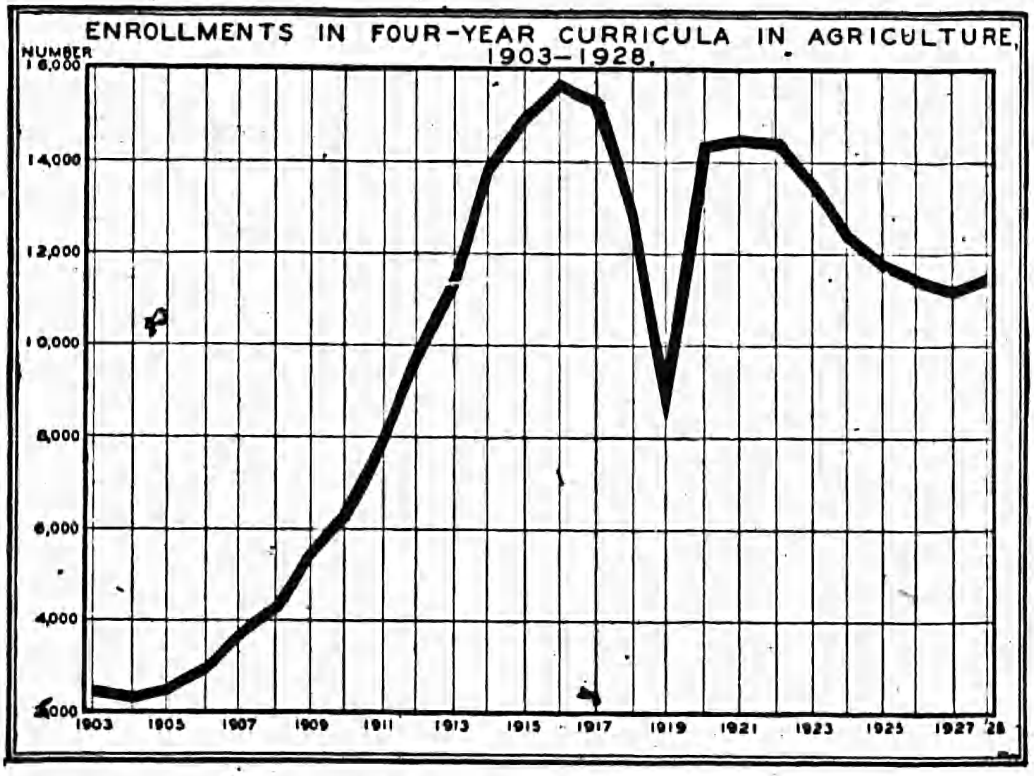
Student Enrollment

Student enrollment in agriculture in land-grant colleges until about 1890 was very small. The colleges had not been established because of any large public demand for instruction in agriculture of college grade. Moreover, following the Civil War there was rapid expansion of the farming area as the western fever took hold of soldiers and others alike and overproduction of agricultural products was the result. Transportation was difficult and very expensive. A mere subsistence from what was produced on the farm and a home were practically all the income that a farmer could obtain. Then came the panic of 1873 and extremely low prices for agricultural products. There did not seem to be any real reason why young men should enroll in courses to prepare for an occupation in which there seemed to be such small promise. Parents and those who took the rôle of farm leaders then, as in the period from 1920 to 1927, advised their sons and young men who were fortunate enough to go to college, not to enroll in agriculture but to study something else. Agricultural enrollment was not at all likely to increase under such conditions.

The depression of 1873 continued over a period of years and the prices of farm products increased very slowly. Some improvement in farm conditions came in the late seventies with a setback again in the early eighties. Not until 1903, according to the records of the Office of Education, was an enrollment of 2,405 students reached in the regular agricultural curricula of land-grant colleges. At about this time new departments were established, new courses introduced in agronomy, horticulture, and dairying, and beginnings were made in animal husbandry.

Demand for farm products improved and a much larger interest among farmers in agricultural methods and practices followed. Farmers' institutes were organized in many States, and college professors were in demand as speakers at these meetings. Here they talked of their experiments and of the results they had obtained and told how these could be applied in practice. Sometimes there were vigorous disagreements and the professors had to exert themselves to prove their point. Often they were right and what they proposed could be applied. Farmers began to have more confidence in the agricultural colleges and in their recommendations.

Coincident with this movement came improvement in the economic conditions on the farms because of better prices. Improved machinery and rapid extension of its use took some of the drudgery out of farm labor. Further agricultural employments in specialized fields other than farming developed with amazing rapidity. A gradual change in sentiment toward agriculture and agricultural education became evident. This was reflected by an increase in agricultural enrollments. By 1910 enrollments in the regular agricultural curricula had reached 6,255. The following chart shows the enrollments in the regular 4-year curricula in agriculture for this period.



With rising prices for agricultural products popular discussions of the high cost of living appeared in the general press, in journals, and in magazines. Experiment stations every year were turning out results that could be used. Good will toward and confidence in the agricultural institutions increased and by 1915, a year after the beginning of the World War, agricultural enrollment had reached a total of 14,886 students, considerably more than twice the number five years before. By 1916 almost 800 more or a total of 15,669 were enrolled.

The agricultural colleges were in prosperous condition when in 1917 this country entered the Great War. The response of the young men of college age was immediate. They enlisted in large numbers. The draft then went into effect. The effect on enrollments in agriculture as well as in other college work was immediate and by 1918–19

only 8,853 agricultural students were enrolled, the smallest number since 1912.

The war closed. In the fall of 1919 there was a great rush to the colleges which continued through the following year. At first it was felt in agriculture as well as in other lines. The slogan "Food will win the war," the demonstration of the dependence of the nations on food, the prices for food products during the war period resulted in a higher regard for agriculture than at any time in its history. The farmer's reaction was that of unbounded faith in his occupation and in its economic outlook. Those not in farming were impressed by the unusually high price level. The result was an immediate increase in college enrollments—14,275 agricultural students in 1919–20 and 14,493 in 1920–21, an increase of more than 60 per cent since 1918–19. In addition, this regular enrollment was augmented by a large group of special students, most of them mature men who did not have the necessary entrance credits but who desired to benefit by the opportunities that colleges offered.

These conditions did not continue. By 1920–21 came deflation and the prices of farm products were soon cut in two. In a few months the great depression in agriculture which was to continue over an indefinite period had arrived. The impossibility of making both ends meet on many farms, the lengthened days of labor, the economies that had to be practiced, and the profound disappointment of farming people during this period will never be fully appreciated by those who did not experience some of the hardships of those days.

Business closely related to agriculture also suffered. Farmers were not able to purchase the farm machinery or make the improvement they desired and needed. They felt compelled to use less fertilizer. Much livestock, especially beef cattle, had to be sold for what it would bring and feed consumption was reduced. Only a minimum could be spent for seeds and plants. All this was reflected in reduced business volume in farm machinery, fertilizers, feeds, and seeds—business enterprises in which many agriculturally trained men are engaged.

The reaction from the situation on the farms and in agricultural business was felt in the colleges. Farm leaders talked about the low estate of agriculture. Others did likewise. Farmers themselves advised and urged their sons not to go into agricultural work. If they went to college let them study business, the professions, anything so that it did not lead back to the farm. After such advice only those cared to enroll in agriculture who had deep personal interest in agricultural science and agriculture as an occupation or who planned to equip themselves for such work as that of county agents and agricultural teachers. The result was that students who en-

rolled in agricultural curricula were very much in earnest but their numbers grew smaller from year to year. By 1924–25 the regular agricultural enrollment had dropped to 11,715, by 1926–27, to 11,179, a point lower than in 1914. Only in 1927–28 did the tide seem to turn and agricultural enrollments slowly begin to increase. This was continued in 1928–29 and in 1929–30.

The changes that took place in agricultural enrollment during the period 1920–21 to 1927–28 are illustrated in Table 11 which shows the enrollments in agriculture during that period in 44 institutions.[11] It is clear from the table that the tide turned in freshman enrollment in 1925–26 and there has been an increase in the number of freshmen each year since that time. In 1927–28 this increase was reflected in the sophomore and junior classes so that the total enrollment in agriculture again appears to be increasing.

TABLE 11.—*Enrollments in agriculture 1920–21 to 1927–28 by classes in 44 institutions reporting*

Class	1920–21		1921–22		1922–23		1923–24	
	Men	Women	Men	Women	Men	Women	Men	Women
1	2	3	4	5	6	7	8	9
Freshmen	4,554	95	4,004	[illegible]	5,188	86	3,831	139
Sophomores	3,504	76	3,151	[illegible]	2,987	69	2,912	85
Juniors	2,334	63	2,747	59	2,489	61	2,360	66
Seniors	2,137	54	2,167	64	2,615	62	2,443	59
Total	12,529	288	12,069	280	13,279	278	11,546	349
Number graduated	1,176	39	1,303	53	1,533	37	1,473	49

Class	1924–25		1925–26		1926–27		1927–28	
	Men	Women	Men	Women	Men	Women	Men	Women
1	10	11	12	13	14	15	16	17
Freshmen	3,784	92	3,957	131	4,183	102	4,299	90
Sophomores	2,797	72	2,611	95	2,729	61	3,052	76
Juniors	2,219	67	2,105	75	2,035	72	2,166	65
Seniors	2,326	63	2,179	76	2,068	69	2,013	69
Total	11,126	294	10,852	377	11,015	304	11,530	300
Number graduated	1,345	52	1,355	48	1,283	83	1,212	63

The land-grant colleges studied the situation during the lean years and made a large number of adjustments in curricula to meet the new conditions. The emphasis since the war has been upon prices, costs, and how these may be reduced; management and the use of labor-saving machinery; and upon marketing. This emphasis in the agri-

[11] These figures do not agree with the official figures from the Office of Education quoted above, since they include only the data sent by institutions in connection with the land-grant college survey, and these include some forestry students.

cultural curricula in the land-grant colleges has provided courses in economics, in agricultural engineering, and in farm management. New curricula in commerce, agricultural administration, and agricultural business have appeared. A more settled condition in agriculture and a more logical and orderly thinking and interpretation of trends in agriculture and in industry also tend to show that the possibilities in agriculture are larger than the conditions of the last few years would seem to indicate.

Enrollments in forestry in the land-grant colleges and universities were first reported with accuracy in 1902–1903. The trend was steadily upward until 1913–14. (See Table 12.) The decline that then set in was especially marked during the first year of the war. With the close of the war forestry enrollment again increased and in 1927–28 there were 1,076 students enrolled in the professional forestry curricula of the land-grant colleges. In addition, many agricultural students were taking such courses as farm forestry, general forestry, and range management as electives.

TABLE 12.—*Enrollment of students in forestry in land-grant institutions*

	Enrollment		Enrollment
1902–3	66	1915–16	374
1903–4	26	1916–17 [2]	347
1904–5	45	1917–18	152
1905–6	61		
1906–7 [1]	114	1918–19 [3]	
		1919–20	452
1907–8	131	1920–21	391
1908–9	198	1921–22	629
1909–10	352	1922–23	588
1910–11	393		
1911–12	487	1923–24	834
1912–13	534	1924–25	1,003
		1925–26	1,074
1913–14	485	1926–27	1,011
1914–15	436	1927–28	1,076

[1] Financial panic.
[2] War and Reserve Officers Training Corps.
[3] Dependable data for this year not available.

The rapid trend upward in forestry enrollment in recent years has become a matter of concern to leaders in forestry education. It is thought that it may lead to an oversupply in this professional group. A national inquiry on forestry education, under the leadership of Dean H. S. Graves of the school of forestry of Yale University, is under way which will give more light on this question.

The high degree of specialization in agricultural curricula combined with a gradual decrease in the number of students enrolled in agriculture from 1920–21 to 1927–28 has had one result that has been the cause of much worry to teachers and administrators, namely, a gradual decrease in the size of classes. Of 6,641 classes in 42 institutions in 1927–28, 3,320, or 50 per cent, had fewer than 10 students,

and 964, or 14.5 per cent, had between 10 and 14 students per class, a total of 64.5 per cent of all classes in 4-year curricula in undergraduate agriculture with fewer than 15 students per class. This condition was not peculiar to any one group of institutions or to institutions with comparatively small enrollments. One of the larger institutions, for instance, with an undergraduate agricultural enrollment in 4-year curricula of between 450 and 500 students had 304 classes of which 167, or about 55 per cent, had an enrollment of fewer than 10 students per class. Another institution with a total enrollment of 350 to 400 had 200 classes of which 114, or approximately 57 per cent, had an enrollment of fewer than 10 per class. On the other hand, in the 42 institutions reporting there were 502 classes with more than 50 students and 142 with more than 100 so that while classes were small in many instances, there also are examples of very large class groups. Table 13 shows the number and size of classes in 4-year curricula in agriculture in 42 land-grant colleges and universities in 1928.

TABLE 13.—*Number and size of classes in 4-year curricula in agriculture in 42 land-grant colleges and universities in 1927–28*

Number of students in classes	Number of classes	Per cent of total	Number of students in classes	Number of classes	Per cent of total
Fewer than 10	3,320	50.0	60 to 69	80	1.2
10 to 14	964	14.5	70 to 79	70	1.0
15 to 19	597	8.9	80 to 89	46	.7
20 to 24	464	7.1	90 to 99	46	.7
25 to 29	311	4.6	100 to 199	111	2.0
30 to 34	218	3.2	200 or more	31	.4
35 to 39	130	1.9			
40 to 49	135	2.0	Total	6,641	100.0
50 to 59	118	1.8			

Small classes often are advantageous because of the close personal relations of students and teachers and because of the opportunity given every member in the class to express himself and to discuss the subject in hand. Such classes adapt themselves to the conference method of teaching where student and faculty member meet on common ground and the latter serves as the informed leader of discussion rather than as a platform lecturer. On the other hand, in many instances the classes have been too small to provide the interest and spirit that come from numbers and the opportunity for friendly rivalry and emulation. Moreover, the cost of instruction per student mounts as the size of the class decreases. Salary costs remain the same whether the class numbers 7 or 25. The same amount of classroom space and the same equipment often is used for a class with a few students as for one, two, or three times as many. The cost feature, therefore, must be considered.

No institution of established reputation willingly lowers its standards by refusing to give certain work that is required in a curriculum or major grouping in order that the teaching staff may be reduced. Nor is it an easy matter for a department head, dean, or president of an institution to say to someone who has been on the teaching staff for many years and who has rendered splendid service that his services are no longer needed. For many institutions it has been fortunate that during the period of decreasing enrollment of agricultural students, funds for research and experimental work have been increasing so that as student numbers have decreased it has been possible to devote more time to research and to retain the staff practically intact. Institutions have done their utmost to keep a competent staff so that work of as high a grade as possible might be given in the classroom and conducted in the research field. In the meanwhile a change in the tide of enrollments has been looked for which again would increase the size of classes and reduce the cost per student. While this has been delayed beyond the anticipation of many, enrollments in agriculture again are on the increase and an increase in the number of students in the various classes is to be expected. Institutions need to be on their guard, however, against overspecialization in undergraduate instruction if the economies to be expected from increased enrollment are to be realized.

Where small classes are inevitable because of limited enrollment and considerable specialization is demanded because of the specialized agricultural industries of the State, certain methods may be used which will help appreciably in avoiding excessive costs of instruction. One of these is to offer certain work in alternative years, making the curriculum sufficiently elastic to permit students who desire such courses to take them, or to excuse certain students from certain courses heretofore required for graduation. This can often be done without lowering the standard of work or measurably reducing the opportunity for any considerable number of students.

Small classes also may be handled frequently through the conference or project study method or a combination of both. Instead of meeting such classes three times a week it is sometimes possible to assign specific work or subject matter to be covered in library study and in the laboratory and to meet such students for help and advice once a week. The same or even better results may thus be obtained without reduction of credit allowed and with less strain upon instructors. Then again it is sometimes possible for one teacher to conduct two small laboratory classes simultaneously. This requires a certain degree of ingenuity and willingness on the part of the teacher to adapt himself to this method of teaching in order both to serve the students and reduce the costs per hour of student instruction. Further studies of overemphasis upon laboratory periods and

experimental trials of more economical means of instruction promise fruitful results.

The matter of large classes also deserves further study. Carefully controlled experiments in teaching certain specific subjects tend to show that large classes are not, in some instances, undesirable. These experiments do not demonstrate that all subjects can be taught equally as well in large as in small groups; they do indicate the probability that for certain subjects on specific levels, the large class is no handicap. Only experimental trial and measurement will provide adequate guidance in determining when small classes are wasteful of money and time. The importance of this matter is so great, however, that the land-grant institutions are urged to carry on careful investigation of the subject in cooperation with each other.

Certain requirements for the bachelor's degree.—Only a comparatively small per cent of agricultural students, except those who may have come to the institution with advanced standing, receive their degrees in less than four years. In only 16 of 38 institutions are such graduates found, the number varying from a fraction of 1 per cent in several to 5 per cent at the University of Wisconsin and the North Dakota Agricultural College, to 6.7 per cent at the Georgia State College of Agriculture, 6.8 per cent at Cornell University, and 10 per cent at the University of Arkansas.

Chapter VII.—Judging Contests

The use of judging contests of various kinds to stimulate interest and keen rivalry within and between institutions has been of long standing in undergraduate agricultural instruction. They have had a particularly prominent place in the animal husbandry and dairy husbandry classes, and contests in judging poultry, grain, apples, and other farm products are not uncommon.

Contests usually are staged after considerable class work in judging has been given. In order that students in classes from which contestants are picked may have the opportunity to see the best stock, poultry, fruit, grain, or vegetables that can be provided, not only is much emphasis placed on having the best possible equipment of this kind at the institution, but trips are made by students and teachers to the better farms in the surrounding communities to see and study the best that they afford. These may be followed by visits to county, State, regional, and national fairs and shows, where the best the country can provide is on view. Here this material is studied, and the climax is reached in intercollegiate judging contests.

All of this is stimulating to students, and there are many in practical agriculture to-day who maintain that they got more from these trips and contests than from their class work or any other student activity. On the other hand, they probably overlook that the trips and contests were the culmination of study and practice and would have meant far less to them had they not had the background of college training and experience.

A number of problems arise in connection with these trips which, to a considerable extent, are still unsolved. First is the matter of class absence and absences from all campus activities during these periods. How often, for instance, can a student stay away from lectures and laboratory in organic chemistry and be able to make up this work to the satisfaction of himself and his teachers? How many class discussions in agricultural economics, in marketing, or in education can a student miss and still get out of the course the same value that it affords those who are present every day? How shall the expenses of these trips, which often are considerable, be handled? Shall the student pay for them, since he is the principal beneficiary; or, because the institution has supervision over and promotes these trips, shall the institution carry the expense? These and similar problems the institutions are trying to solve.

One of the first steps usually taken in that direction is a requirement that all absence from the campus whether on judging trips or contests be approved by certain college authorities, from the head of the department in which the student may take his major work to the dean of the college of agriculture, the dean of men, or even the president of the institution. In one or two institutions the same penalty is imposed for absence from the campus for trips of this character as for absence for personal reasons. In most institutions, however, when permission has been received for such trips, no penalty is incurred, but a student is supposed to make up the work immediately after his return to the campus. The next provision usually is a limitation of the number of days' absence from the institution permitted for the purpose of visits to farms and judging contests. This is practiced in 15 institutions, while in 27 there is no such limitation. In the 15 the absences may vary from 3 days in one institution to 15 days in another and from a loss of 12 per cent of time that should be devoted to class work in 1 institution to 33⅓ per cent of the time in 2 and even 50 per cent in 1. While penalties, such as loss of credits because of absence for this type of work, would seem to be entirely too severe in one direction, permitting absence amounting to 50 per cent of the student's class time is entirely too liberal in the other. On the other hand, when the absences incurred because of judging trips to farms, livestock shows, and other exhibitions are compared with absences of members of athletic teams, the balance is likely to be entirely in favor of the former, both in the amount of time used and in the educational values. This should be taken into consideration when institutional regulations with reference to judging work and contests are considered.

The matter of judging contests has seemed so important that the Association of Land-Grant Colleges and Universities has had a committee at work on this problem for two years. In its second report made at the meeting of the association in November, 1929, the following recommendations were included:

"(*a*) That no member of a contesting team shall be permitted to accumulate more than 18 credit hours class absence due to training for a contest.

"(*b*) That during the contest no member of the team shall incur more than six days' absence from college plus time required for uninterrupted travel to and from each intercollegiate contest. (Teams that can not return home between contests may apply unused credit hours for training specified under the preceding paragraph.)

"(*c*) Additional study in respect to methods and standards of judging and instruction of different commodities is important.

"(*d*) No student having an average scholastic grade below that of the average for the college or who is on probation or under discipline that will be eligible to compete in any intercollegiate judging contests.

"(*e*) Students participating in intercollegiate judging contests shall be enrolled for at least a minimum full schedule as required by the institution."

While students in classes in which judging work is given may go with the class on the trips to surrounding farms and to fairs, participation in the contests is limited to students enrolled in special work leading to them in 32

institutions but is not so limited in 12. In only 10 of the 32 is the amount of preparation for these contests limited to that demanded for regular credit in the course. In the others more time is spent in training for these contests than the credits in the course would require.

The expenses of the trips in connection with these contests are paid in full by the students themselves in 21 institutions and by the students and institutions combined in 17. The expenses of the coaches of the teams are paid universally by the institutions. At Colorado Agricultural College, $400 is appropriated by the State board of agriculture for the senior stock judging team. At Purdue University the board of trustees at times sets aside a small item to handle the expenses of judging teams. At the University of Kentucky a definite sum is budgeted each year for this purpose, any additional amount necessary being furnished by the students. At Cornell University the transportation is cared for occasionally by the institution. At the University of California, Iowa State College, the University of Missouri, and some other institutions, departmental or voluntary student organizations help to defray the expenses of judging teams. Student activity fees are used to handle part of the expenses of judging teams at the University of Florida, Kansas State Agricultural College, and Massachusetts Agricultural College. At the Ohio State University the winnings of college livestock exhibited at the State fair are used toward these expenses. At the University of Minnesota an institutional prize fund is called upon in part and business men in other organizations contribute toward the expenses. Regional shows such as the Pacific International contribute a part of the expenses of students taking part in judging contests. From the assistance given by institutions and numerous other methods used to help defray the expenses of judging teams, it is clear that members of these teams are recognized as representatives in activities that are worth while from the institutional standpoint whether this be one of prestige or educational concern.

Trips for Practice Teaching

Trips other than those by students in judging classes and contests also create a problem in a number of institutions. Included in these are absences from classes due to practice teaching by students enrolled in classes for agricultural teaching. Specialists in education have long realized that such practice is an aid to good teaching. Supervised practice for those who are planning to teach agriculture in Smith-Hughes schools, therefore, has become a requirement. Such practice often may be obtained through arrangement with the local high school and with secondary schools in the neighborhood. Often, however, the necessary practice can be obtained only by taking trips to communities at some distance. These trips, in 22 institutions, create a problem of absence from other classes just as in the case of students who are studying, judging, and taking part in judging contests, while in 22 institutions there does not seem to be a problem of this character. In only 10 institutions has a special organization of the curriculum been arranged to take care of the difficulties incident to class absences. In most of the institutions the arrangements made are informal between the different members of the teaching staff.

Chapter VIII.—Conclusions and Recommendations

(1) Preparing students for general farming is no longer a primary function of the resident undergraduate work of colleges of agriculture in the land-grant institutions. Social, economic, and educational advances require that this fact be recognized frankly by the institutions and by their constituencies.

(2) The objectives of higher education in agriculture are increasingly and properly those of preparing: First, research workers in the scientific and social fields related to agricultural production and distribution and to rural life; second, extension workers for service in the dissemination of knowledge concerning the applications of scientific and economic truth to the problems of rural living; third, workers in all types of business and commercial activities related to agricultural production, distribution, and service; fourth, teachers of vocational agriculture and science in the public high schools; fifth, public servants in the investigating and regulatory departments of the State and National Governments; and sixth, overseers and managers of specialized and large-scale farm enterprises.

(3) The basic problem of organization of agricultural work in the land-grant institutions is one of devising methods for intergrating and coordinating resident teaching, experiment-station research, and extension activities. Tendencies in a number of institutions to develop research and extension in relative isolation from resident teaching require administrative attention.

(4) Minute specialization of departmental organization, with excessive departmental autonomy, tends, in certain institutions, to duplication of work, expensive instruction, and offerings inappropriate to undergraduate work, especially during the first two years of the college course.

(5) In view of the necessity for specialization in serving the diversified needs of modern agricultural research, extension, teaching, and business, and in view of the widespread development of public junior colleges, it is advisable that the land-grant institutions give consideration to reorganization of the agricultural division into junior and senior divisions, with specialization delayed until the end of the second year. Such reorganization is in harmony with current tendencies in higher education and not incompatible with

any of the objectives of college education in agriculture except the vocational one of preparation for general farming.

(6) The standard for training for agricultural staff members is being raised in harmony with the development of instruction that emphasizes scientific and economic objectives. Continued emphasis upon attainment of advanced degrees by the staff and upon study of subjects in education applicable to the problems of college teaching is desirable.

(7) The salaries of agricultural staff members serving for 11 months each year are not commensurate with those who serve 9 months. An adjustment of the salary scales upon the 9 and the 11 months' basis is urgently recommended.

(8) The number of students who enroll in agriculture varies with the condition of agricultural industry. This is true, although emphasis upon the training of research and extension workers, high-school teachers of agriculture and science, for State and Federal employment, and for business more or less closely related to agriculture tend to make this variation less acute than when the objective is primarily a back-to-the-farm one.

(9) Agricultural courses and curricula, and, to a considerable extent, departmental development reflect a decided tendency to increased economic and social emphasis upon the part of the agricultural colleges. This trend has not resulted in weakening of interest in the physical sciences.

(10) Experimental scientific investigations of certain educational problems extending over a period of years and conducted cooperatively and simultaneously by a number of agricultural divisions is recommended. Studies of this kind should be carried on in close cooperation with institutional schools of education or under the direction of educational technicians employed for the purpose. The following fields are suggested: (*a*) The different effects upon subsequent student work of teaching certain sciences in the college of agriculture and in the other basic science divisions; (*b*) method of coordinating the content of specialized courses in agriculture offered during the first two years of college; (*c*) the effects of farm practice requirements upon educational progress and practical success; (*d*) methods of providing practice work for prospective extension workers; (*e*) the validity of prerequisites now prescribed with reference to success in subsequent work; for example, general science prerequisites for applied work in agriculture; (*f*) the effects of different combinations and sequences of subjects upon students of equal ability; (*g*) methods of determining the degree and effects of the previous training of entering students (Smith-Hughes students especially) with reference to ability to carry on specific college sub-

jects in agriculture and means of adapting beginning instruction in college to such individual differences of preparation (not mental ability) as are found; (*h*) the effects of different laboratory methods and means of determining the most effective length of the laboratory period for each phase of a single course; (*i*) effects of class size upon student learning in various subjects and during the different years of college work; (*j*) methods of instruction designed to increase individual student responsibility; and (*k*) requirements that may serve as substitutes for class attendance and their effect upon progress and learning of students in different subjects and at different levels.

PART X.—ENGINEERING

Chapter I.—Introduction

Engineering and Engineering Education

Engineering strives to provide better and easier ways of satisfying human needs. Since the passage of the Morrill Land-Grant Act in 1862 the achievements in engineering and in other branches of applied science have resulted in a greater advance in civilization than had taken place in many centuries before that period. The electric light, electric furnace, electric storage battery, electric welding, X ray, radio, steam turbine, internal-combustion engine, aluminum, acetylene, liquid air, submarine, automobile, airplane, cash register, adding machine, farm tractor, farm machinery, moving picture, phonograph, concrete construction, steel construction, household heating plant, electric street railway, electric locomotive, power elevator, and many other inventions have been perfected during this period which have contributed to human happiness and comfort.

Rapid growth during the same period in the number and in the enrollment of the engineering colleges of the United States parallels this expansion of man's control over the materials and forces of nature. The rapid growth of our industries, public utilities, and public works is dependent upon men who are trained as engineers. In 1862 the people of this country were concerned mainly with the production of raw materials, grains, cotton, lumber, and minerals; the few factories of that time were mainly concerned with the manufacture of the coarser articles of commerce, and their product was valued in 1869 at only $4,000,000,000. To-day the United States is the greatest manufacturing nation in the world, with about 200,000 manufacturing establishments which turn out annually a product valued at more than $60,000,000,000. The telephone industry, which dates only from 1876, has 20,000,000 telephones in this country, or about two-thirds of the total number in the world. The use of electricity since 1882 has grown until on December 31, 1929, twenty-three and one-half million customers contributed to the industry and two-thirds of the entire population lived in homes supplied with electricity. The automobile has 25,000,000 owners. Nearly one-

half of the families in this country use either manufactured or natural gas as fuel for cooking. The engineer is responsible in large part for these developments in American civilization.

The growing importance of the engineering profession is evidenced by the following statistics, which show that the membership in the four national engineering societies, which represent the branches of engineering most generally taught by land-grant colleges, has more than doubled since 1916 and is nearly ten times that of 1900:

TABLE 1.—*Membership in four national engineering societies, 1900, 1916, and 1928*

Name of society	Date founded	Membership in—		
		1900	1916	1928
American Society of Civil Engineers	1852	2,227	7,909	13,577
American Society of Mechanical Engineers	1880	1,951	6,931	18,700
American Institute of Electrical Engineers	1884	1,273	8,212	17,600
American Institute of Mining and Metallurgical Engineers	1871	2,661	5,781	8,528
Total		8,112	28,833	58,405

The market for engineering training is no longer confined to the strictly technical occupations. Executive and administrative posts in complex modern industries and public utilities are being filled increasingly by those who have demonstrated a thorough grasp of the business and social implications of technical processes.

History of engineering education as affected by the land-grant acts.—The land-grant act of 1862 did not originate engineering education in the United States. The United States Military Academy at West Point, organized during 1812–1817, was the first American school of applied science. Until 1827 only 57 of the 500 graduates from West Point were civil engineers. Engineering education, other than military engineering, was started in the United States at the Rensselaer Polytechnic Institute in 1824, with a curriculum that was greatly influenced by the practice of French engineering colleges. In 1840 the first class of civil engineers was graduated from the Rensselaer Polytechnic Institute. During the period from 1824 to 1862 the advent of the railroad created a specific and enlarged need for civil engineers and brought into prominence the need for mechanical and other types of engineers to increase industrial productivity. By 1862 four privately endowed colleges (Harvard, 1847; Dartmouth, 1851; Yale, 1852; Brown, 1854) and the University of Michigan (1852) were added to the institutions giving engineering instruction.

The Morrill Land-Grant Act of 1862 stimulated the rapid extension of engineering education, but did little to determine its distinctive form and character. The development of land-grant institutions made this type of education widely accessible to the industrial

classes, and many of the most notable engineering colleges of the United States were established directly or indirectly as a result of the Morrill Act. From 1862 to 1872 the number of engineering schools in the United States increased from 6 to 70; by 1880 the number was 85, and by 1928 about 150. Only approximately one-third of these engineering colleges are in land-grant colleges receiving Federal aid under the Morrill Act, yet in 1927–28, out of a total engineering enrollment of 65,520 in 148 engineering colleges, the 48 land-grant colleges had an enrollment of 29,528 engineering students. This means that the land-grant institutions are training at present nearly one-half of the engineers of this country.

Previous surveys of engineering education.—Engineering education has had the benefit of more extended and careful study and investigation than almost any other phase of the land-grant-college program. These studies are important for this survey primarily for two reasons: First, the field of the present survey may very properly be limited in large part to the areas not adequately covered by preceding studies; secondly, a summary of the more important results and conclusions of preceding investigations of this kind will form a background upon which to present the specific problems of land-grant-college engineering education in clear perspective with reference to the development of engineering education in general.

The two outstanding surveys of engineering education are the Carnegie Foundation Study of Engineering Education (1914–1917) and the study of engineering education by the Society for the Promotion of Engineering Education (1924–1929).

The first of these investigations was limited to the study of 20 typical engineering colleges, including 8 land-grant institutions. The report, prepared by C. R. Mann, was published by the Carnegie Foundation in 1918.

More than 100 engineering colleges, including all of those that are a part of land-grant institutions, participated in the second study. Engineering societies, several important industries, the National Industrial Conference Board, and the Office of Education of the United States Department of the Interior cooperated with the Society for the Promotion of Engineering Education. In this survey voluntary study by individual engineering colleges was directed and coordinated by a central board and staff of the Society for the Promotion of Engineering Education. The results of this study were published in the Journal of Engineering Education from 1925 to 1929 and have been summarized in 16 special bulletins and 4 reports published by the Society for the Promotion of Engineering Education. Complete detailed reports are now in press.

The main recommendations of these reports follow:

(1) *Engineering curricula.*—Neither report advocates any radical changes in engineering curricula or any modification in the normal length of the undergraduate period. Curricula longer than four years for all students have not received the backing of the engineering profession or of industry.

Both investigations report that American engineering curricula are too congested and recommend a reduction in annual credit hours to 18 as a maximum; both also advocate that a student should carry no more than six subjects at any one time.

Both surveys advise only moderate differentiation in undergraduate curricula. A common core of studies during the earlier part of the curriculum is essential to discover the abilities of individual students. A common freshman year is recommended for all engineering curricula, with major differentiation to be postponed until the third year. The Society for the Promotion of Engineering Education survey recommends that in certain institutions provision should be made for options which recognize the technical and functional subdivisions of engineering curricula. The findings indicated that engineering curricula have unity of structure as well as necessary interdependence of subjects; also, that the subjects follow each other in logical order and that the student is led from broad principles first to the general and then to specific applications.

Both reports stress the importance of the human and economic aspects of engineering. The Carnegie report favors special curricula in industrial or administrative engineering. The Society for the Promotion of Engineering Education survey recommends that the economic and managerial aspects be included in all engineering curricula, but advises that instruction in business and management should not interfere with the scientific and technical character of the curricula. Extended business training does not belong to the engineering curriculum, but can be obtained after graduation as the need arises. A distinct curriculum in business engineering is not needed.

The Carnegie report advocates the teaching of theory and practice simultaneously, stresses the value of engineering laboratory practice, and favors an extension of the cooperative system of engineering education.

The Society for the Promotion of Engineering Education study has revealed that the engineering curricula are not specialized and that the student devotes about half of this time to studies that are acceptable toward a degree in practically any college of arts and sciences. Science, technology, and humanities constitute the basic parts of American engineering curricula. The present trends are to introduce more specifically engineering subjects during the earlier

part of the curriculum and to place greater emphasis on general rather than the technical subjects. It is recommended that a band of nontechnical electives, equivalent to about three semester hours per week, extend through all of the engineering curricula.

The Society for the Promotion of Engineering Education investigation includes a study of the cooperative method of engineering education. This type of instruction, which combines practical experience with scholastic training, is offered by 18 institutions, including 1 land-grant college. About 10 per cent of the total enrollment of engineering students in this country is in these cooperative courses. All but 2 of the institutions offering this type of instruction are located in cities of more than 100,000 population, and only 1 is in a strictly rural community. An analysis of graduates from 2 institutions which are alike in environment, number of students enrolled, size and general quality of staff, and in quantitative scholastic requirements for graduation indicates that there is no marked difference between the actual results secured by the institution offering cooperative curricula and the one confining its work to all-resident curricula. The type of positions occupied by both older and recent graduates exhibit a striking similarity. The two systems, when conducted equally well, produce equally meritorious results. The report states that the greatest fault in the operation of the cooperative plan is that it may be used as a disguise for insufficient facilities, for an inadequate and overworked teaching staff, and for low educational standards. Further, constant emphasis on practical knowledge may lessen the student's respect for abstract thinking and may be detrimental to development of scholarly attitudes.

(2) *The engineering teacher.*—Both reports emphasize the importance of good teaching. The Carnegie report criticizes the autonomy of the departments of our colleges and advocates that the departmental organization should find out by experiment the time needed to cover the subject matter. This report also urges that greater attention be given to the training of the engineer as a professional teacher and to closer cooperation between the engineering staffs and departments of education. The report also criticizes the present method of teaching mathematics and sciences to engineering students and advocates the selection of teachers with engineering background for this type of instruction.

The Society for the Promotion of Engineering Education study finds that, while inbreeding is not general, the present scheme of developing engineering teachers is inadequate. Appointment of engineers from practice is recommended only in special cases and the enlistment of engineering graduates for a teaching career is advocated near their entry into active life. Summer schools for engineering teachers, one of the results of this study, will be described in

another part of this report. Attention is called to the fact that while earning from outside engineering practice is encouraged in nearly all institutions, the salaries of engineering teachers, even when supplemented by outside earnings, are decidedly less than the incomes of the most nearly comparable class of engineering graduates in practice.

(3) *The engineering student.*—The Carnegie report advocates in connection with the admission procedure of engineering students experiments with objective tests and greater attention to records which show youthful interests and achievements.

The findings of the Society for the Promotion of Engineering Education Survey concerning the engineering students indicate that (*a*) the majority of entering students seem to choose engineering without adequate understanding of the work of the engineer and with little adult advice; (*b*) nearly one-fifth of all students admitted are conditioned and one-seventh are conditioned in mathematics; (*c*) less than 30 per cent of the students admitted are graduated in four years, and less than 40 per cent are ever graduated; (*d*) sectioning of basic freshman and sophomore subjects according to ability and preparation is advised; and (*e*) institutions which can not require a high selective system of admission should consider the division of their program into two stages, the first stage to be used as an introductory and try-out period for the advanced studies of the junior and senior years.

(4) *Engineering graduates.*—The Society for the Promotion of Engineering Education studies reveal the following information concerning engineering graduates: The demand for engineering graduates exceeds the supply. The majority of the engineering graduates remain in the same line of work as their college courses or in closely associated branches of engineering.

The engineering graduate advances steadily through positions preponderantly technical in nature to those involving executive and administrative responsibilities.

Conditions for the engineering graduate can be improved by more careful guidance on the part of the colleges in connection with his first position after graduation and assistance in an educational program after leaving college. Twelve per cent of engineering graduates (more than 1,000) pursue graduate study and about 7 per cent receive advanced degrees.

(5) *Supplementary activities of engineering colleges.*—Sixty engineering colleges are carrying on organized engineering research and testing. During the year 1923–24 about one and one-third million dollars was expended for these purposes. Twenty-nine colleges report expenditures of this kind of $5,000 or more per year. The

greater part of engineering research is carried on by 10 institutions and about two-thirds of the engineering colleges maintain no organized research activities.

Only six institutions offer evening classes in engineering which lead to degrees. Twenty-one institutions offer evening instruction which does not lead to degrees. Thirty-one institutions offered in 1924–25 short term and special courses in residence. Sixteen institutions offer correspondence instruction. Twenty engineering colleges maintain radio broadcasting stations.

(6) *Engineering education in Europe.*—Dr. W. E. Wickenden, director of investigations for the Society for the Promotion of Engineering Education, made a very exhaustive study of engineering education in Europe. The main conclusions of the study follow:

A comparison of American engineering colleges with those of the most progressive countries of Europe indicates that engineering education in this country is effective and meets the need of the American student better than the type of engineering college found abroad.

Technical education in the United States, however, suffers by comparison with that of other countries on account of its inflexibility. The most progressive countries of Europe have several well-defined levels of technical education. At the top are the technical universities which are comparable to the best of our engineering colleges. At the middle of the scale are institutions designed to train for the junior technical and supervisory positions of industry. At the bottom of the scale are apprentice schools for skilled workers. The most immediate need for large numbers of young people in the United States is a briefer, more practical, and more intensive training than that of an engineering college, a training broader than a trade school and quite distinct from the academic junior college.

(7) *Survey of engineering education by industry.*—In addition to the above two surveys by the Carnegie Foundation and by the Society for the Promotion of Engineering Education, the National Industrial Conference Board carried on during 1923–1927 a number of studies pertaining to engineering education and American industry. The field for engineering graduates was investigated in 1923 for the paper and pulp, rubber textile, and metal trades industries. Of the executives in these industries engineering colleges have supplied 10 per cent in the textile field, one-half in the rubber industry, 60 per cent in the paper and pulp business, and more than 70 per cent in the metal trades.

Chapter II.—Position of Engineering in Land-Grant Institutions

The preceding summary of the important findings of earlier surveys affords a point of departure for this report upon engineering in the land-grant institutions. This report is concerned with data and conclusions which have been obtained through questionnaires sent to the land-grant institutions by the Office of Education of the United States Department of the Interior, through special visits and by means of the study of published information.

An effort will be made to evaluate the place of engineering education in the land-grant institutions and to find whether it has any distinctive place among the engineering colleges of this country.

The land-grant institutions rest upon the foundation of State and national support. Accordingly, considerable attention will be devoted to facts which bear upon the distinctive services which these colleges are rendering to the public, with particular reference to contributions which relate to social betterment and economy; also information will be given concerning the status of engineering research and engineering extension at these institutions.

Before discussing the facts concerning engineering education secured in connection with the land-grant college survey it will be well to record the interpretations of the land-grant act as applied to engineering, to analyze the attitude toward engineering education at land-grant colleges, and to appraise the objectives of engineering education at these institutions. These topics will be followed by a discussion of the findings from the questionnaires on engineering education at land-grant institutions with special reference to entrance requirements, special problems of the undergraduate student and the engineering graduate, undergraduate engineering curricula, trends in graduate study, the status of cooperative engineering instruction, nondegree curricula in trades and industries, noncredit curricula in trades and industries, noncredit technological courses, industrial education other than engineering, agricultural engineering, engineering research, expenditures for engineering education, status of physical plant and educational equipment, aid to engineering education from industry, staff problems, and trends in internal organization.

Engineering Education and the Land-Grant Act

The term "Mechanic arts" as used when the land-grant act was being considered by Congress was commonly employed synonymously with the terms "useful arts" and "industrial arts." The dictionaries commonly in use at the time make it evident that Senator Morrill was justified in using the term mechanic arts in preference to engineering. Thus, Webster's dictionary of 1855 states that an engineer is one who constructs or manages engines or cannons. The Webster's dictionary of 1860 under engineer refers to: (1) Military engineers; (2) maker of engines; (3) one who manages a steam engine; (4) a civil engineer as one who constructs canals, docks, railroads, etc. Webster's dictionary of 1862, under art, states that the moderns divide the arts into the fine arts and the useful or mechanical arts; those arts in which the hands are more concerned than the mind are called "trades." Apparently Senator Morrill did not use the word "trades" as his act was intended to stress the mental rather than the manual. The Worcester's dictionary of 1855, 1860, and 1866, under "art," refers to the fine arts and useful or mechanic arts. The Encyclopedia Britannica, dated 1857, states that mechanics, applicable or applied, is a term which, strictly speaking, includes all applications of the principles of abstract mechanics to human art. The title of the Franklin Institute Journal (Philadelphia) for 1857 was "Journal of the Franklin Institute of the State of Pennsylvania for the Promotion of the Mechanic Arts, Devoted to Mechanical and Physical Science, Civil Engineering, the Arts of Manufacture and the Recording of American and Other Patent Inventions."

Senator Morrill in his letter to E. W. Stanton, of Ames, Iowa, dated December 23, 1890, makes the following statement: "Civil engineering in the agricultural colleges is perhaps *one of the most useful branches of the mechanic arts* that can be taught and, of course, it was included in the act of 1862."

The American Association of Agricultural Colleges and Experiment Stations (the predecessor to the Association of Land-Grant Colleges and Universities) adopted at its convention held at Portland, Oreg., in 1909, the following resolution:

> That it is the sense of this association that the national laws which constitute the charter of the land-grant colleges distinctly prescribe work of collegiate grade in agriculture and mechanic arts, including engineering in all its branches and the science related to industries, irrespective of whether the colleges are established separately or as parts of universities.

The Secretary of the Interior Department has ruled officially (Federal Laws, Regulations, and Rulings Affecting the Land-Grant Colleges of Agriculture and Mechanic Arts, 1911) that the following

subjects may be included under the head of mechanic arts in the reports of the treasurers of the land-grant colleges: Mechanical engineering, civil engineering, electrical engineering, mining engineering, marine engineering, railway engineering, architecture, textile industry, ceramics, irrigation engineering, and experimental engineering.

The executive committee of the Association of Land-Grant Colleges on November 13, 1914, reported the following definitions for mechanic arts and engineering:

> Mechanic arts is a broad educational term, which includes engineering education as its higher or professional phase, trade-school and short-course instruction as its collateral and extension phase, and experimental and other technical investigation as its research phase.

Soon after the passage of the Morrill Act in 1862, plans were laid for instruction in engineering, under the provisions of this law, at the Massachusetts Institute of Technology and at Cornell University, two of the most famous colleges of engineering. Purdue University, a land-grant institution, has had a reputation mainly as an engineering college since its establishment in 1872. Iowa State College, the University of Illinois, the University of Wisconsin, and the Ohio State University, have all stressed engineering as one of their major fields.

The foregoing evidence indicates that the definitions of Morrill's time and accepted interpretations of the land-grant act place engineering as a required part of the program of land-grant institutions and coordinate with agriculture. The degree of its development in any institution will be controlled naturally by the local needs of the State or region served by the individual land-grant college.

Attitude Toward Engineering at Land-Grant Colleges

The American Association of Agricultural Colleges and Experiment Stations from 1885 to 1919, and its successor, the Association of Land-Grant Colleges and Universities, from 1920 to 1928, for a considerable period gave major attention to the agricultural divisions of land-grant institutions. This was, no doubt, due mainly to the preoccupation of these institutions with the problems of rural people who constituted until recently a majority of our population. State legislative bodies, made up of those whose interests were primarily in agriculture, influenced the attitude of the governing bodies of land-grant institutions.

The proceedings of the Association of Land-Grant Colleges and Universities is of interest in this connection. From the organization meeting of this association in July, 1885, until the seventh convention

in 1893, no mention was made in the proceedings of engineering or mechanic arts. The addresses of the presidents of the association, who were generally land-grant college presidents, included matters pertaining to education, research, and special legislation related only to agriculture. In 1893 a section on mechanic arts was organized and during the period of its existence from 1893 to 1902, it had a very insignificant part in the meetings. Very few of the papers presented were published except by title; and very few institutions were represented at these meetings by engineering teachers or deans. In 1897 an engineering experiment station bill was proposed by the engineering delegates along the lines of the Hatch Agricultural Experiment Station legislation. The executive committee of the association refused to sponsor this bill or to urge its passage. After unsuccessful efforts to receive recognition this "mechanic arts section" was abandoned and the engineering educators had no part in the Association of Land-Grant Colleges until 1916 when the Land-Grant College Engineering Association, organized by the engineering deans of the land-grant institutions, was admitted to the main association as the engineering division of the section on college work. Since 1916 the engineering divisions of land-grant institutions have received greater attention on the programs and in the proceedings of the association. A section on engineering is definitely organized. However, as compared with agriculture, engineering still plays a minor rôle in the management of the association.

Agriculture and mechanic arts were equal in the Morrill Land-Grant Act, but one who is familiar with the internal policies of the land-grant institutions realizes that, except in very few cases, the engineering divisions have received insufficient support. The late Senator F. G. Newlands, of Nevada, at the Twenty-ninth Convention of the American Association of Agricultural Colleges and Experiment Stations held in Berkeley, Calif., in 1915, stated:

> Thus far the legislation regarding our land-grant colleges has been in its practical application more beneficial to agriculture than to the mechanic arts, though they were linked together in the original act.

The boards of control of only 23 land-grant institutions contain either engineers or industrialists. Of a total of 609 members of the land-grant college governing boards, only 49, or about 8 per cent, are engineers.

The attendance at land-grant institutions does not justify this seeming indifference to the interests of engineering as a part of the land-grant college system of education. Even as early as 1900 at the New Haven convention of the Land-Grant College Association, a report was made that the graduates from engineering and from agriculture at the leading land-grant colleges were in the ratio of

5 to 1. During the year 1927–28 the enrollment in engineering and in agriculture at land-grant institutions was in the ratio of 8 to 3. The support for agriculture is none too adequate considering the present status of this most important industry. Nevertheless, governing boards and administrators might in many instances give more attention to the engineering divisions which are responsible for such a large portion of the student enrollment of these institutions.

At the Thirty-ninth Annual Convention of the Association of Land-Grant Colleges in 1925, Dean E. A. Hitchcock, of the Ohio State University, gave the following data of interest with reference to support for engineering and agricultural research: By 1930 as a result of the Hatch, the Adams, and the Purnell Acts of the United States Congress, the land-grant colleges will receive annually from the Federal Government $4,410,000 for agricultural research. At 15 land-grant colleges, which are recognized for their contributions through engineering, teaching, and research, the same paper reports that the amount expended for agricultural research up to 1925 was $37,100,404, as compared with $2,205,115 for engineering research. This means that in these institutions the expenditures for engineering research have been only 5.6 per cent of the total appropriations for agricultural and engineering research. More liberal support for engineering research is needed in order to train creative leaders of industry.

Objectives of Engineering Education at Land-Grant Colleges

When the Morrill Land-Grant Act was passed there was little understanding of the scientific problems underlying industry. For many years after the passage of this act the industries were unprepared to use scientifically trained engineers. The entrance requirements were low in most of the land-grant colleges, and the facilities in staff and equipment were very meager. As a result, the earlier curricula of the land-grant colleges stressed shop practice, drawing, surveying, and similar subjects in order to relate instruction to the opportunities available immediately after graduation. Instruction was mainly vocational and practical training was stressed. These immediately practical objectives have survived under conditions and standards of education unknown to the earlier forms of engineering instruction in the land-grant colleges.

The staff and equipment have also been greatly improved. Entrance requirements have been raised, the number of special students reduced, and the time devoted to the humanities, to science, and to mathematics has been increased and the time given to descriptive and practical subjects reduced.

Yet practical objectives have not given way to academic ones. Placing scholarship as one but not the only aim of education has been accompanied in some cases by a sacrifice of educational standards; availability of opportunity and the efforts to adjust entrance requirements to conditions in each State have often resulted in admitting poorly prepared students; and interest in serving the public has necessitated in some institutions the introduction of special and short courses which are of noncollegiate and vocational character. Nevertheless, these distinctly American colleges are important factors in training large numbers of men for responsible tasks in industry. These colleges have retained ideals of truly democratic education. They are raising the general standards of the industrial classes by supplying leaders who are good citizens as well as efficient technicians.

Chapter III.—Student Problems

Present practice.—The requirements for admission to engineering are uniform in the number and in the kind of high-school units[1] demanded. The average requirement of land-grant engineering colleges increased from 11 high-school units in 1909 (23 institutions reporting), to 14 in 1910 (41 institutions reporting), and to 15 in 1920 (49 institutions reporting).

Prescribed units.—The prescribed units vary from 5 to 13, but 8 units are most generally specified. All of the institutions prescribe the minimum units in mathematics, English, physical or biological science, and social science. The general requirements are 3 units of mathematics, 3 units of English, 1 of physical or biological science, and 1 of social science. Only in 10 cases is foreign language a prescribed subject. However, records of admission indicate that in nearly all cases students offer ancient or modern foreign languages. Industrial arts and commercial subjects are often offered, but only in exceptional cases are more than three units accepted in these subjects. In the selection of the prescribed science units, preference is given to physics and chemistry. Preference for languages are stated as German, French, Latin, and Spanish, in the order given.

Method of admission.—The land-grant institutions, recognizing that they are an integral part of the public-school systems of their States, admit to the freshman class on credentials from accredited high schools. An exception of this rule is the Massachusetts Institute of Technology, which admits only by examination.

Sixteen institutions give either entrance or advanced credit for industrial experience. The amount granted is usually four entrance units or less, and an examination is usually required. Thirteen engineering colleges grant credit for education gained through informal means, but the student must establish such credit by examination.

Intelligence and objective tests.—No institutions require for admission intelligence or special objective tests, although 17 of the colleges are giving selective tests during the early part of the freshman year. Eight are experimenting with psychological tests.

Admission with conditions.—Nearly all engineering colleges admit students with conditions. Nine institutions report that 24.2 per cent of all students admitted in 1927 and 21.8 per cent of those admitted in 1928 had conditions in mathematics. The problem of "conditional students" is the same at nearly all institutions. Many high-school students are unfamiliar with the fixed entrance requirements of colleges and in large numbers of cases seek admission to engineering colleges without adequate mathematical preparation. A large

[1] A high-school unit represents the study of any subject for a school year of at least 32 weeks, with 5 recitation periods per week, each of at least 45 minutes in length, or the equivalent thereof.

percentage of those admitted with conditions have deficiencies in solid geometry or in algebra. In some States, land-grant engineering colleges report that they are forced to accept students who have not had even plane geometry. The large numbers admitted with conditions have necessitated the setting up in many land-grant colleges of special classes in secondary school algebra and solid geometry.

Special Problems of the Undergraduate Student

The replies to questionnaires show the following trends:

Orientation of entering students.—Nineteen institutions have developed orientation courses, engineering problems for freshmen, and other special instruction to aid students in the early part of their engineering curriculum in obtaining a clearer conception of engineering as a career.

Sectioning of entering students.—Thirty-six land-grant colleges section students in basic subjects, such as mathematics and English. This method is helpful in basing instruction upon the student's preparation. In sectioning freshmen, use is made of the student's high-school record as well as of mathematics and English aptitude tests which are given to the entering students in a number of institutions. In 30 institutions students who are poorly prepared are assigned to noncredit courses in mathematics and in 24 colleges such students must pass a noncredit course in English before they are allowed to pursue the regular instruction in this subject.

Lengthening time for completion of curriculum.—Forty-one land-grant engineering colleges advise students who are poorly prepared, who are slow to learn, or who must earn a portion of their college expenses, to pursue a program which will take more than the regular four years to complete the requirements for a degree.

Compulsory stopping places.—Sixteen land-grant institutions favor a compulsory stopping place at the end of the second year for those who lack qualifications for the advanced instruction of the junior and senior years. However, no land-grant institution is enforcing selective admission to the third year. Engineering faculties are not in full accord on this point; furthermore, it is questioned whether a State-supported engineering college could enforce such a requirement.

Special treatment of advanced students.—Only in one institution are students in upper classes placed on their own resources and their instruction differentiated very sharply from that in the lower classes. In this institution successful experiments have been carried on with instruction by the lecture method to large sections of from 90 to 300 junior and senior students. In nearly all cases the methods of instruction during the junior and senior years are not essentially different from those in use for the first two years.

Special recognition of scholarship.—To an increasing extent students of outstanding scholarship are given special treatment. Thus, 8 institutions report special honor courses, 28 award prizes for high grades, 19 place students of superior ability in special sections, 18 allow such students to take extra courses, 16 allow the best students unlimited absences, 35 elect such students to honor societies, and in 1 case honor students are credited with $25 per semester toward their fees and tuition.

Demand for graduates and placement problems.—The demand for those about to graduate from engineering colleges has exceeded the supply. One land-grant engineering college reports that 210 industrial firms recruited employees among the senior engineering students of that institution during the year 1927–28. Eight institutions state that more than 100 distinct organizations actively recruited their senior students during the same year. The number of companies recruiting from different land-grant engineering colleges varies from 4 to 210. Thirty-five and seven-tenths per cent of all of those who graduated from land-grant engineering colleges in 1928 were recruited by such firms or organizations. An average of only 14 per cent of those who graduated in 1928 from all of the 49 institutions were not employed at the time of graduation. The number not placed in the better land-grant engineering colleges is negligible.

An average of 39 per cent of the graduates of land-grant engineering colleges find employment in the State in which the institution is located. This figure varies from only 2 per cent for a small college located in a distinctly agricultural community in a very thickly populated State to 85 per cent for an institution in a large industrial community.[2]

Special guidance of undergraduates.—Forty-six land-grant institutions give definite guidance to their seniors in the selection of the first position after graduation, and 38 engineering colleges encourage their most gifted students to pursue graduate study. In nearly all cases, however, a period of employment in practice is advised before graduate study is undertaken.

The land-grant engineering colleges realize the importance of proper guidance for undergraduates. Nine land-grant engineering colleges have developed personnel systems through which they are endeavoring to aid their students in developing traits of personality which the engineer must possess, such as good address, cooperative ability, and well-balanced initiative. Five of these and eight other engineering colleges are giving much attention to placement of engineering students.

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[2] Occupations and salaries of graduates are presented in Part V of this report, "Alumni and former students."

Chapter IV.—Curricula

The curricula leading to degrees in engineering at land-grant institutions are representative of the general tendencies in engineering education of the United States. Of the 29,528 students enrolled in engineering for the academic year ending June, 1928, at the land-grant institutions, 19 per cent are studying civil, 29 per cent electrical, 17 per cent mechanical, 7 per cent chemical, 3 per cent mining and metallurgical, and the remainder are in other engineering curricula. Thus 65 per cent of all engineering students at land-grant institutions are enrolled in civil, electrical, and mechanical engineering.

Balance between general and technical instruction.—The program of studies is made up of science and mathematics, technology, humanities, and military training and physical education. In Table 2 average statistics (based on replies from the questionnaires) are given in percentages of the time devoted in the major curricula to these subjects. Under humanities are included languages, social and economic sciences, history, psychology, and government. Mechanics, hydraulics, thermodynamics, drawing, designing, shop practice, and the applications of these and of the physical sciences to engineering are given under technology.

TABLE 2.—*Time devoted to various subjects in the engineering curricula*

Curriculum	Number of institutions reporting	Per cent of time devoted to—			
		Humanities	Science and mathematics	Technology	Military training and physical education
1	2	3	4	5	6
Civil engineering	38	17	27	50	6
Mechanical engineering	35	14	27	53	6
Electrical engineering	36	15	27	53	6
Mining and metallurgy	10	14	34	46	6
Chemical engineering	25	14	40	40	6

The data in Table 2 check the conclusions reached by the Society for the Promotion of Engineering Education as a result of the survey of all of the engineering colleges of the United States; that is, that practically 1.8 academic years, or about 45 per cent of the total time in the engineering curricula, are given over to science, mathematics, and humanities, a type of general training which would be entirely acceptable toward a degree in any arts college. Engineering education can not be characterized as specialized or illiberal only in as far as devotion of one-half of the time to technology makes it so. Land-grant engineering colleges are not attempting to turn out a finished product, but to graduate students with capacity to become engineers.

Number of subjects carried at one time.—The number of subjects carried by students in the several engineering curricula, as given by reports from the institutions are summarized in Table 3.

TABLE 3.—*Number of subjects carried at one time*

Curriculum	Number of institutions reporting	Number of subjects carried			
		Freshmen	Sophomores	Juniors	Seniors
1	2	3	4	5	6
Civil engineering	39	7.0	6.5	6.8	6.8
Mechanical engineering	40	7.0	7.0	6.8	6.6
Electrical engineering	38	6.9	6.4	6.5	6.8
Chemical engineering	24	6.6	6.0	6.7	6.7
Mining and metallurgy	14	6.6	6.6	6.7	6.8

Table 3 indicates that the engineering student at the land-grant college carries at one time between six and seven different subjects. This practice was criticized by both the Carnegie and the Society for the Promotion of Engineering Education surveys. More experimental information is needed to demonstrate the number of subjects a student may carry at one time most advantageously. However, it appears probable that the engineering colleges will secure better results by reducing the number of subjects carried at one time to six or even to five.

Quantitative requirements for graduation.—The replies from institutions with reference to the semester hours required for graduation are summarized in Table 4.

TABLE 4.—*Trend in semester hours required for graduation*

Year	Semester hours required for graduation in different curricula					
		Engineering				
	Architecture	Chemical	Civil	Electrical	Mechanical	Mining and metallurgy
1	2	3	4	5	6	7
1890	128	----------	156	145	165	144
1900	144	145	150	158	161	138
1910	161	154	152	155	155	117
1920	149	153	152	152	152	152
1925	147	146	150	149	148	147
1928	149	145	146	146	146	146

Table 4 indicates that 145 to 150 semester hours are required at present for graduation. The trend in civil, electrical, and mechanical engineering seems to have been to reduce the requirements in semester hours. This is due mainly to the reduction in the time devoted to shop practice, surveying, and drawing. A requirement of 146 semester hours is not excessive for an engineering curriculum, and particularly in the case of land-grant institutions where an average of 6 semester hours out of the 146 is devoted to military training and physical education.

Of the semester hours required for graduation, an average of 84 semester hours, or 58 per cent, is common in the three curricula of civil, electrical, and mechanical engineering. The differentiation between these and chemical or mining engineering is greater, but the basic requirements in mathematics, science, and the humanities are practically the same in all engineering curricula.

Practical experience during summers.—Twelve land-grant engineering colleges expect their students to be employed in industry during the summer vacations. This is not a definite requirement for graduation since difficulty is encountered in finding employment which will give large numbers of students industrial experience. Furthermore, the homes of students are often located at great distances from industrial centers and the majority of students attending land-grant colleges must find profitable employment during the summer in order to continue their studies without interruption.

Inspection trips.—To give the undergraduate student some contact with industry, inspection trips are required by practically all land-grant institutions. Four institutions require inspection trips during the sophomore year, 15 during the junior, and 29 during the senior year. An average of five days is devoted to such trips during

the senior year and in all cases attendance is a requirement for graduation. Short informal inspection trips to local industries are arranged throughout the undergraduate years.

Survey camps.—Only eight institutions own camps for instruction and practice for civil engineering students in surveying. The distances of such camps from the colleges vary greatly; 12 to 60 miles is common, but in some cases the distance is in excess of 150 miles. The total acreage covered by these camps in the eight institutions is 4,135 and their value is estimated at $183,650. Instruction is given during the summer, usually between the second and third years. The average length of time for camp practice is six weeks.

Special noncredit technical subjects.—Seven land-grant engineering colleges offer in addition to the regular engineering subjects of the curricula, special courses in elementary mechanics, electricity, power plants, and machine design. These special courses require less mathematical preparation than the corresponding subjects in the standard curricula and can not be used for credit toward a degree in engineering but are designed for special students and for others who are not candidates for engineering degrees. Land-grant engineering colleges will do well to increase such offerings for the benefit of their engineering students who can not graduate on account of the lack of mathematical ability, but who will be more useful to industry if they leave college with some knowledge of elementary mechanics, drawing, electricity, power plants, and other technological subjects which can be taught to those who have had no calculus.

Commercial training.—Only two land-grant institutions offer distinct engineering curricula in which an effort is made to treat both engineering and commerce as major subjects. All institutions are requiring all engineering students to pursue certain courses in economics and a number have available either as required or as elective courses work in accounting, personnel administration, marketing, business law, money and banking, corporation finance, and business administration. To an increasing extent engineering colleges are also offering either as required or electives course work in industrial engineering and management. However, the great majority of land-grant engineering colleges do not favor the teaching of both commerce and engineering as majors in a 4-year undergraduate curriculum.

Cooperative plan of engineering instruction.—Only one land-grant engineering college is now offering engineering instruction on the cooperative plan. Two other institutions are planning to offer such instruction in the future. The cooperative plan, which is now in operation at one land-grant college and which is contemplated by another, is limited to only a small fraction of the total enrollment and leads certain selected students to the master's degree in five years. The students devote all of their time during the first one and three-

fourth years to resident studies. Beginning with the summer of the second year they alternate between industry and college, the length of the period of alternation being a semester or a summer term. The cooperative students spend their entire time in one plant and have also theoretical instruction during the practice periods. About 150 weeks are devoted to resident collegiate instruction and about 60 to practice in industry.

The locations of most land-grant colleges do not lend themselves to the cooperative plan. Furthermore, the results of the survey by the Society for the Promotion of Engineering Education indicate that equally satisfactory results may be accomplished by the all-residence plan.

Undergraduate degrees.—From 1873 to 1928, all the land-grant institutions conferred 47,677 bachelor's degrees in engineering. The number of engineering bachelor's degrees awarded varied as follows: From 1873 to 1886 fewer than 100 were awarded per year. The number rose to 131 in 1886, 294 in 1890, 594 in 1900, and 1,449 in 1909. Then there was little change in tendency until 1918, when the degrees awarded dropped to 940, fell to 879 in 1919, rose to 1,384 in 1920, to 1,828 in 1921, and to 2,467 in 1923. In 1924 the number awarded dropped to 2,132 and has remained nearly stationary since that time.

Nearly all land-grant colleges confer upon those who complete the undergraduate curriculum the degree of bachelor of science to which a specifying phrase may be added; for example, bachelor of science in mechanical engineering. In rare cases the bachelor of engineering is conferred and in one institution the professional degree of civil engineer, electrical engineer, and mechanical engineer is conferred as the first or bachelor's degree.

Trends in Graduate Study

For the period from 1873 to 1928, all the land-grant institutions report only 5,012 engineering master's degrees. For the same period all the land-grant engineering colleges report 47,677 bachelor's degrees in engineering. From 1873 to 1884 the number of engineering master's degrees conferred per year remained below 10; this rose to 14 in 1885, 27 in 1890, 42 in 1900, 97 in 1908, 213 in 1916, 148 in 1917, remained below 150 until 1921, varied from 200 to 300 from 1921 to 1927, and was 331 in 1928.

For the year ending June 30, 1928, all of the land-grant engineering colleges conferred 331 master's degrees in engineering, and during the same year 2,072 undergraduate engineering degrees were conferred. Thus the number of master's degrees conferred in 1928

is 16 per cent of the number of bachelor's degrees in that year, a ratio well above that found by the Society for the Promotion of Engineering Education study of all engineering schools. Of all the master's degrees conferred in 1928, the Massachusetts Institute of Technology is credited with 179, or 54 per cent. Seven doctorates in engineering were conferred in 1924, 9 in 1925, 10 in 1926, 14 in 1927, and 13 in 1928. Outside of the Massachusetts Institute of Technology very few doctorates in engineering have been conferred up to date.

The foregoing data indicate that the land-grant engineering colleges, as well as other engineering colleges, are mainly undergraduate institutions. The great demand for engineers with bachelor's degrees and the inadequate recognition on the part of industry of resident graduate study are the two main factors which are responsible for the small number of engineering students who are pursuing graduate study. Furthermore, the training of the engineer in most cases can not be completed at college. To an increasing extent the young engineering graduate finds that industry has set up special facilities for advanced study, research, and broad experience. In some cases industries have special arrangements with the higher educational institutions of their localities so that the engineering college graduate may pursue courses leading to the master's and doctor's degrees.

Another factor which has limited resident graduate study is the fact that only a very few of the land-grant engineering colleges have proper facilities for graduate study. In nearly all cases the staff members are fully occupied with undergraduate instruction and have inadequate special equipment for advanced courses. In many cases staff members are excellent teachers of undergraduate subjects, but have not extended their own study beyond their undergraduate years. It is true that many of these have had considerable experience, but are not sufficiently grounded in theory to be successful with graduate students.

Graduate instruction in engineering has received a new impetus in connection with the development of engineering experiment stations at land-grant colleges, but the number of students who will pursue resident postgraduate study will remain small until the industries, the utilities, and the public works of the Nation come to appreciate the value of more thorough engineering education that is provided in the undergraduate engineering curricula. However, the stronger land-grant institutions have a responsibility to develop graduate study in engineering in order to train teachers and to give their exceptional students a better scientific knowledge and a better preparation for research as a career.

Industrial Education

Sixteen land-grant institutions are offering curricula leading to degrees in industrial education for the purpose of preparing teachers in accordance with the Smith-Hughes Federal Vocational Education Act. In nine institutions this curriculum is administered by the dean of engineering and in seven it is under the dean of the school of education.

Land-grant institutions should take greater advantage of the Federal vocational education act and should train a larger number of the teachers for trades and industries of the country. The administration of this type of instruction depends upon local conditions, but ordinarily curricula in industrial education should be very closely allied to the training of engineers.

Status of Agricultural Engineers

Administration.—In 22 land-grant institutions the instruction in engineering as related to agriculture is administered as a separate department of the college of agriculture, in 6 this instruction is administered under the college of engineering, and in 12 institutions there is a joint administration by both agriculture and engineering.

Name given to instruction.—Twenty-nine institutions designate the instruction in engineering as related to agriculture by the name "agricultural engineering," 10 use the term "farm mechanics," and 3 use other designations such as "rural engineering."

Degrees in agricultural engineering.—Twenty institutions offer curricula leading to degrees in agricultural engineering. In nine of these, such curricula are administered under the dean of engineering, in four under the dean of agriculture, and in seven under the joint administration of both the deans of engineering and agriculture.

For the year ending June 30, 1927, only 36 degrees were awarded by six institutions.

If the agricultural engineering curriculum is an engineering curriculum its administration by the dean of engineering seems to be the only logical practice. To have such a curriculum administered by the dean of agriculture will no doubt result in two different standards for engineering degrees. Joint administrations may give satisfactory results, but dual responsibility for a curriculum may lead to complications.

Enrollment in agricultural engineering.—In Table 5 are given data for the enrollment in agricultural engineering for a number of years.

TABLE 5.—*Enrollment in agricultural engineering*

Year	Students—				
	Freshmen	Sophomores	Juniors	Seniors	Total
1	2	3	4	5	6
1916	99	52	20	24	195
1920	105	53	24	24	206
1925	84	65	45	59	253
1928	90	59	52	29	220

The data in Table 5 show that only about 225 students are enrolled in agricultural engineering in all of the land-grant colleges. The growth in enrollment in this branch of engineering during the past 10 years was almost negligible. It is true that the 20 land-grant colleges established this curriculum since 1925–26 and that it is therefore too soon to expect much expansion of enrollment. It is doubtful whether 20 land-grant colleges are justified in offering special curricula in this field, although instruction in engineering as related to agriculture should be given in all land-grant institutions.

Noncollegiate Instruction in Engineering

The present facilities in the United States for the noncollegiate type of technical instruction are extremely meager. This country has about 150 institutions which are offering curricula leading to degrees in engineering, but nondegree courses are seldom available for the training of artisans, foremen, and others to occupy the junior technical and supervisory positions of industry. With the passing of the apprenticeship system, facilities are also lacking to train workers for the trades.

Nondegree curricula.—Only four institutions are offering technical curricula of less than three years in length and not leading to degrees. While there is need for people trained in such curricula, the enrollment figures (Table 6) show that such curricula are not popular. The experience of several land-grant colleges leads them to conclude that it is usually undesirable for an engineering college to offer curricula not leading to degrees. In Great Britain both collegiate and noncollegiate technical instruction is being offered in the same institution in industrial centers. In the United States the student enrolled in curricula not leading to degrees has no social status among the other college students. Furthermore, the average American boy, if he is interested in machines, in industrial processes, or in materials, is ambitious to prepare himself for the engineering profession and for nothing lower.

TABLE 6.—*Enrollment in nondegree curricula*

Year	Curricula in trades and industries		
	2-year	1-year	Less than 1 year
1	2	3	4
1923-24	248	163	102
1924-25	204	45	262
1925-26	165	44	236
1926-27	173	44	182
1927-28	127	37	280

Only one land-grant engineering college has had considerable success with curricula in trades and industries not leading to degrees; however, it is reported that this work is to be discontinued because of decreasing demand during recent years. This particular engineering college has offered 2-year noncollegiate curricula in electrical, mechanical, road making, and structural; one 1-year curriculum in auto mechanics; and a special drafting course one quarter in duration. The 2-year curricula had in common such subjects as English, algebra, geometry, trigonometry, shop accounting, industrial economics, drafting, and shop and elementary physics. Those taking the electrical course received special instruction in electric wiring, electrical machinery, steam and gas machinery, electric transmission and distribution, and estimating and planning. Students in the 2-year mechanical course devoted more time to power machinery, mechanics and materials, shop work, and heating and ventilating. Those who elected the road-making course received instruction in surveying, specifications and plans for construction work, and cost keeping and estimating. The structural course devoted considerable time to structures. In the 1-year automobile course the only nontechnical subject was English, and all of the time was devoted to specialized technical instruction.

Intensive short courses for mechanics.—During the World War every land-grant engineering college trained mechanicians for the United States Army. This instruction was given through intensive, practical courses which were 10 weeks in duration. After the war a number of land-grant colleges continued such intensive courses for the purpose of training tractor operators, electricians, contractors, carpenters, blacksmiths, machinists, foundrymen, automobile-garage mechanics, and similar trades. While several land-grant engineering colleges are still offering this type of instruction, the enrollment in most cases is too small to justify the expense.

Short-unit courses and conferences.—To meet the needs of industry for technical instruction other than that leading to degrees, 24 land-grant engineering colleges are offering with great success one or more short-unit courses or special conferences varying in length from three days to one week in such fields as highway construction, the installation and care of electric or gas meters, foundry work, operation of refrigerating plants, laundry work, foremanship, steel treatment, welding, tractor operation, building contracts, plumbing, central heating-plant operation, power-plant operation, telephone-plant engineering, mining, and electric-line foremanship.

Practical experience rather than educational qualifications form the basis for admission to these courses. No academic credit is granted. Ordinarily, such conferences or short-unit courses are held at the land-grant college. In one case district road schools of two days each are held in different parts of the particular State, in addition to the main road school of one week's duration at the institution. Only in exceptional cases are fees charged to those who attend such short-term courses.

About 4,600 people were benefited in the year ending June 30, 1928, by this type of instruction. The possibilities of service to the public through this instruction are great, and all land-grant colleges may advantageously offer short-unit courses for the benefit of the industries of their localities. This type of instruction reacts beneficially to engineering instruction, since the teachers and students are thus brought into contact with mature and practical men who are engaged in industrial pursuits.

Special classes.—In addition to the short-unit courses, six institutions are conducting special classes in industrial centers in factory management, foremen training, steel treating, electricity, power plants, automobiles, metallurgy, concrete construction, elementary mechanics, and other subjects that are of value to the industries and trades of the locality served by the land-grant college. Only two institutions offer any such nonresident courses for college credit. In the other institutions these courses are of a different character and less mathematical than the corresponding subjects in the engineering curricula. For the year ending June 30, 1928, there were enrolled 8,142 in noncredit classes and 1,270 in credit classes. This type of instruction should be enlarged, particularly in the larger cities served by the land-grant colleges.

These classes are usually held in the evening once or twice per week during the academic year and are taught either by teachers from the engineering college or by special teachers employed by the college in the particular locality. In the latter case the instruction is outlined and supervised by the engineering college. In one State the

training of foremen is carried on by the land-grant engineering college with a portion of the expense paid by the State board for vocational education out of the Smith-Hughes funds. In most cases the fees charged pay a considerable portion of the actual expense. No educational test is required for entrance to noncredit classes, but ordinarily those who are engaged in technical occupations are admitted.

The engineering divisions of only eight institutions are of the opinion that courses in general education, such as English or mathematics, should be offered to those who are attending special classes or are benefiting by the short-unit courses. However, other educational leaders are inclined to disagree with the majority of engineering deans in regard to this matter and to approve the opinion of the eight divisions that believe such instruction should be given to these classes.

Qualifications of teachers for noncollegiate instruction.—The land-grant engineering colleges report that 36 teachers are devoting full time to noncredit instruction and 6 to credit instruction. Of those giving noncredit instruction, 30 are college graduates, 2 have had one or more years of college training, and 4 have had no college training. Thirteen have the same qualifications as a professor of engineering and 14 have had more than 5 years of engineering experience. All of those who give instruction for credit are college graduates, but only one-third have had more than five years of practical experience. Fifteen institutions give to those who are responsible for instruction not leading to degrees the same ranks as to members of the resident engineering staff.

Cooperation with other agencies in technical training. In some cases the land-grant engineering colleges are cooperating with other agencies in technical education of noncollegiate grade. Seven are cooperating with the Young Men's Christian Association of their States, 1 with the Knights of Columbus, 6 with the chamber of commerce, 6 with civic clubs, 7 with the training schools of industries, 12 with the public schools, and 8 with other colleges in their States. While it may be impractical for many institutions to offer nondegree technical curricula and undesirable for some engineering colleges to give noncollegiate instruction, all should cooperate with other agencies of their States in developing all types of technical instruction.

Engineering Research

Organized engineering research.—Thirty-five land-grant institutions have engineering experiment stations in which organized research is carried on. Up to June 30, 1928, these engineering experiment stations had published 808 bulletins in which the results of the investigations were reported.

About one and one-third million dollars was spent on engineering research in the land-grant institutions during the year ending June 30, 1928. Of this only about one-half million dollars was supplied by the institution or by State legislatures. Very little was secured from the Federal Government but more than one-half of a million dollars was donated to three land-grant engineering colleges by industries, railroads, and public utilities who cooperated in practical investigations.

The engineering experiment stations at the University of Illinois and Iowa State College were organized in 1903 and 1904, respectively at Pennsylvania State College in 1908, University of Missouri in 1909, Kansas State Agricultural College in 1910, Ohio State University in 1913, State College of Washington, University of Wisconsin and Agricultural and Mechanical College of Texas in 1914, University of Maine in 1915, Colorado Agricultural College and Purdue University in 1917, and 20 since 1920. Only five of these stations receive any special State support and in at least 10 institutions the engineering experiment stations exist only on paper. As a matter of fact, fewer than 10 of the land-grant college engineering experiment stations are receiving support from any source sufficient to develop research in engineering.

Chapter V.—Staff

Engineering Teaching Staff

In the survey of engineering education by the Society for the Promotion of Engineering Education, the figures for 143 engineering colleges are given and these show that about 36.5 per cent of all the teachers hold the bachelor's degree, 9.5 per cent the master's degree, 29.5 per cent professional degrees, 4.5 per cent the doctor's degree, and 14 per cent hold no degrees.

The data upon this matter from 1,425 engineering teachers in the land-grant colleges[3] were not collected upon a basis strictly comparable to those of the Society for the Promotion of Engineering Education study but show that of this group in 1928, eliminating the 119 that did not furnish the information, less than 4 per cent had no degree. Even though it were assumed that all of the 119 who failed to answer this question hold no degrees, the percentage would still fall slightly below that of the Society for the Promotion of Engineering Education study. The land-grant survey returns show that slightly more than 56 per cent of the 1,306 who furnished complete information had a first degree only; approximately 35 per cent the master's degree; and 4.5 per cent the doctor's. Ten had honorary master's and 17 honorary doctor's degrees in addition to those already listed.

The distribution of degrees as shown is supported in general by the record of the number of years training beyond high school received from the same group of staff members. Four hundred and sixty-six did not have more than 4 years; 559 had from 5 to 6; 300 had 7 or more; 100 did not furnish the information.

In connection with the training of the land-grant engineering staffs it is of interest to note that of 495 reporting on the point, 215 had no training in education subjects; 144 had less than 12 semester hours; 64 from 12 to 23; and 72 more than 24 semester hours of credit in professional education subjects.

Professional activities.—One hundred and ninety-three land-grant engineering teachers hold membership in the American

[3] Of this number, 1,270 were employed full time by the institutions—49 from 75 to 99 per cent of their time, 52 from 50 to 74 per cent, 17 less than half time, and no information was available for 37.

Society of Civil Engineers, 214 in the American Society of Mechanical Engineers, 162 in the American Institute of Mining and Metallurgical Engineers, and 17 in the American Institute of Chemical Engineers. Thus, 616 engineering teachers hold membership in the five major national professional engineering societies. This is slightly less than 38 per cent of the staffs in land-grant engineering colleges teaching in these fields. The percentage should be much greater. In additon to these, 111 are members or fellows of the American Association for the Advancement of Science, 62 of the American Society for Testing Materials, 32 of the American Institute of Architects, and a number of many other national bodies.

The interest that land-grant college engineering teachers have in engineering education is evidenced by the fact that 751 are members of the Society for the Promotion of Engineering Education. This, however, is only one-third of the total number of engineering teachers in the land-grant institutions.

Further information concerning the professional interests of land-grant college teachers of engineering is afforded by reports secured by this survey from 1,425 engineering teachers, approximately two-thirds of the entire staff membership. Of this number 1,136 belong to one or more professional or learned societies, 80 per cent of those making returns. Although it is not probable that 80 per cent of the staffs hold such memberships, the number reported by only two-thirds of the staff constitutes more than 50 per cent of all the engineering faculties in the land-grant colleges. Further, in 1927–28, 708 report attendance upon meetings of such organizations.

One hundred and seventy-two land-grant engineering teachers are serving on committees of State and national engineering societies. Of 1,425 members of engineering staffs in land-grant institutions, 241 report during the last five years publications, solely of research character; 161 popular publications; and 153 have written both popular and research material. Thus, more than a third of those reporting have been productive through the agency of publication.

Improvement of teaching.—Forty-three land-grant institutions give special encouragement to their younger teachers to pursue graduate study; nearly all, however, favor graduate study at other institutions than the one from which the teacher has the bachelor's degree.

The distribution of time of the engineering staff as between different activities applicable to their institutional time is indicated by Table 7.

TABLE 7.—*Distribution of institutional time*

Type of work	Number of cases	No time	Per cent of time									
			1-9	10-19	20-29	30-39	40-49	50	60	70	80	90
1	2	3	4	5	6	7	8	9	10	11	12	13
Undergraduate	1,277	138	10	35	49	44	53	105	118	143	144	438
Graduate	1,246	920	123	101	54	18	4	10	6	2	4	4
Research	1,243	841	93	127	74	25	12	18	5	5	2	41
Other creative activity	1,236	959	77	84	51	20	9	14	4	6	1	11
Administrative	1,245	641	253	151	67	49	24	25	18	9	3	5
Extension	1,233	1,052	68	28	17	6	4	8	3	6	4	37
Public contacts	1,239	838	294	84	15	2	1	4	1	0	0	0

Thirty-nine institutions are endeavoring to improve instruction by special conferences, 20 invite special lecturers from the outside, and an equal number arrange for lectures on educational topics by members of their own staff. Twenty-nine offer courses in education for staff members and an equal number of colleges encourage travel.

In only 11 institutions does the school, college, or department of education aid the engineering staff in its efforts to train inexperienced teachers and in studies of their teaching problems. Thirty-one institutions state that their engineering staff receives no aid from the school or department of education.

In only 19 institutions is it customary for the heads of departments and deans to visit classes of engineering teachers. However, 34 institutions encourage the younger and inexperienced teachers to visit classes of older teachers in order to observe teaching methods.

Thirty-nine institutions make a definite effort to aid their younger teachers in improving the mastery of subject matter and also assist them in making contact with industry.

Engineering teaching staffs meet only infrequently to discuss teaching problems and in only seven institutions is there any systematic effort made to help the younger teachers in learning the technique of teaching. In general, heads of departments and deans should take greater responsibility in connection with the training and development of their teaching staffs. Deans of engineering in particular should be educational directors and should have as their main task the improvement of the quality of instruction in their division of the institution. Both heads of departments and deans should be certain that the young and inexperienced teachers are given systematic instruction in the technique of teaching and encouragement to improve the mastery of the subject matter by special courses, by contacts with industry, and by research problems.

Summer schools for engineering teachers.—The Society for the Promotion of Engineering Education, realizing that advances in engineering education can only be made by improving the quality

of instruction given to engineering students, has sponsored five summer schools for engineering teachers, four of which were held at land-grant engineering colleges. About 300 engineering teachers were benefited by these summer schools and their continuation, which is assured by a number of years, should react beneficially to engineering instruction.

In the summer of 1927 summer schools for teachers of engineering mechanics were held at the University of Wisconsin and at Cornell University. Eighty-two teachers attended the sessions and the staff of each school comprised a director, a secretary, three teachers of mechanics, and a group of specialists in various fields. These teachers represented 64 institutions and were distributed as follows: 15 professors, 10 associate professors, 28 assistant professors, 27 instructors, and 2 of other ranks. A professional teacher of education also served continuously on each staff and acted as a general adviser and lecturer. The programs of the two schools included formal lectures, model teaching exercises, demonstration lectures, laboratory exercises, seminars, general group meetings, and committee meetings. Methods of teaching were stressed in all parts of the program. Mechanics was chosen as the first subject, as it is fundamental in all major engineering curricula.

During the summer of 1928 a summer school for teachers of physics was held at the Massachusetts Institute of Technology and one devoted to electrical engineering at the University of Pittsburgh in cooperation with the Westinghouse Electric and Manufacturing Co. As in 1927 the schools were each of three weeks' duration. Forty teachers attended the physics school and 54 the electrical school. The staff of the physics school included 8 teachers of physics, an educational adviser, and 13 special lecturers. The electrical school staff comprised 11 teachers, 2 educational advisers, and 29 special lecturers from industry.

The 1929 session on mechanical engineering was held at Purdue University June 27 to July 18, 1929, and was attended by 88 teachers, who represented 60 institutions located in 36 States of the United States and 2 Provinces of Canada. The staff comprised 23 teachers who came from 18 engineering colleges and 27 lecturers from industry. In addition to these, 13 teachers attended one or more meetings as auditors. A special feature of the program was a 3-day trip to Chicago, where 14 engineers and executives of the Western Electric Co. gave a series of lectures on organization, engineering production, inspection, purchasing, cost control, material handling and storage, personnel practices, and development problems of modern industry. Lectures on general educational practices and principles were given at Purdue University by two educational authorities. To provide a background for engineering instruction

the historical aspects of mechanical engineering were discussed. The purposes and scope of different courses in the curriculum were analyzed through lectures, and these were followed by special talks on the methods of teaching these subjects. A series of lectures on the advanced phases and application of mechanical engineering were delivered by noted authorities.

An important part of all the summer schools is the preparation of committee reports, which are intended to summarize the conclusions reached by those in attendance.

In nearly all cases all of the teachers, including guests and staff members, are housed together. This arrangement affords excellent opportunities for the informal exchange of ideas and the formation of friendship between those in attendance.

The interest of the land-grant institution in improved teaching is evidenced by the fact that 137 teachers were represented as members and on the staff of the four schools as follows:

TABLE 8.—*Teachers represented as members and on the staff of five institutions*

Year	Institution	Number of teachers on staff
1927	Wisconsin University session	27
1927	Cornell University session	15
1928	Massachusetts Institute of Technology session	25
1928	Pittsburgh University session	19
1929	Purdue University session	51

Salaries of engineering teachers.—In Table 9 are given the maximum, minimum, median, and most frequent salaries for land-grant college engineering teachers of different ranks as derived from institutional reports. These figures are very nearly the same as those compiled by the Society for the Promotion of Engineering Education as reported in Bulletin No. 4 of the Investigation of Engineering Education. Considering the earnings of engineers in practice these salaries are extremely low.

TABLE 9.—*Salaries of land-grant college engineering teachers*

Rank	Number reporting	Maximum	Minimum	Median	Most frequent
1	2	3	4	5	6
Dean	43	$9,000	$3,750	$5,500	$5,500
Professor	440	7,500	2,250	4,500	4,000
Research professor	4	6,000	3,250	4,000	4,000
Associate professor	230	5,000	2,000	3,250	3,500
Assistant professor	341	4,500	1,750	2,750	2,500
Instructor	502	3,500	800	1,800	1,800
Total	1,620				

Individual reports from 1,425 engineering staff members, including those employed both full and part time, show the following distributions:

TABLE 10.—*Number of staff members employed and salary range*

Number of cases	Salary	Number of cases	Salary
11	$100- $499	83	$4, 500-$4, 999
41	500- 999	30	5, 000- 5, 499
28	1, 000-1, 499	20	5, 500- 5, 999
149	1, 500-1, 999	23	6, 000- 6, 499
284	2, 000-2, 499	2	6, 500- 6, 999
246	2, 500-2, 999	12	7, 000- 7, 999
196	3, 000-3, 499	5	8, 000- 9, 999
162	3, 500-3, 999	12	No data.
121	4, 000-4, 499		

These regular salaries were supplemented in relatively few instances by perquisites. The reports show 24 teachers receiving perquisites of less than $500 in value and 17 of greater value than $500. Nor are institutional earnings for extra work, such as night classes, extension and summer session, very great. In 79 cases they were less than $299; in 113 from $300 to $599; in 36 from $600 to $899; in 18 from $900 to $1,199; and in 20 more than $1,200.

It is frequently assumed that engineering teachers add considerably to their salaries by outside earnings. Reports on this point are very incomplete but are sufficient to indicate that in many cases the amount of these earnings are sometimes exaggerated. Of the 1,425 individuals reporting 890 did not furnish information, but the following summary shows relatively few large additional incomes from employment outside institutional earnings:

TABLE 11.—*Number of cases and amount of earnings outside of institution*

Number of cases	Amount outside earnings	Number of cases	Amount outside earnings
122	$100- $299	24	$1, 200-$1, 799
219	300- 599	15	1, 800- 2, 399
70	600- 899	21	2, 400- 4, 999
49	900-1, 199	15	More than $5,000

Outside engineering practice by teachers.—Only three land-grant colleges do not permit their engineering teachers to do outside engineering practice during the academic year; all of the other institutions either encourage or do not restrict such outside practice, provided it does not interfere with the institutional duties of the teacher. In practically every institution it is expected that engineering teachers will keep their superior officers fully informed of such practice. In several institutions outside engineering practice may be carried on only upon the approval of the dean of engineering, who

is held responsible by the president of the institution for the type and quantity of such outside practice. No institutions place restrictions upon engineering practice by staff members during vacations.

Only in rare cases are teachers permitted to use institutional laboratory equipment in connection with their private practice. Usually problems which require equipment become projects of the engineering experiment station of the college, and all fees for such services go to the institution. In only three colleges are engineering teachers given extra compensation for tests of materials or machinery sent to the laboratories for such tests. All of the institutions charge fees for such tests, but in nearly all cases these fees are either appropriated to the department carrying on the tests or to the engineering college.

In nearly all cases teachers are forbidden to use the name of the institution in reports in connection with their private practice. The use of institutional stationery is also discouraged for other than official correspondence.

Tenure and factors influencing promotion of teachers.—Thirty-one institutions reported indefinite tenure for deans, professors, and associate professors. Assistant professors and instructors are usually employed for terms of one to three years. Assistants and fellows are appointed for one year.

In considering promotions, 38 institutions state that they place first the teacher's ability to arouse and to interest his students, 44 institutions place teaching ability first; 36 knowledge of the subject; 28 loyalty; 23 ability to cooperate and mental balance; 25 attitude toward the student. Nineteen institutions place promise of growth in the first place and 24 in the second place; 14 place fairness in grading in the first place and 29 in the second place. Personal traits are considered of major importance by 14, of secondary importance by 31, and of minor consequence by 2. Research ability is given first place by only 2 institutions, second place by 28, and 15 consider this of little or no importance. Personal leadership is given first place by 9, second place by 33, and 4 regard this as a minor qualification. Length of tenure is not given by any institution as of major importance, 25 consider this important, and 20 feel that it is of litttle or no importance. Authorship is given second place by 23 and an equal number consider this factor of no importance. Executive ability is placed first by 3 institutions, second by 23, and of no importance by 19.

From the foregoing it is evident that ability to interest students, teaching ability, knowledge of subject matter, and loyalty are the major factors which are considered in connection with the advancement of teachers.

Chapter VI.—Support and Organizations

Budgets of expenditures.—The annual budgets of the expenditures of land-grant engineering colleges for a 5-year period are given in Table 12. These figures show that about $11,000,000 were expended for engineering education at land-grant institutions during the year 1927–28.

TABLE 12.—*Annual budget of expenditures for engineering in land-grant institutions, 1924–1928*

Budget for—	1923–24	1924–25	1925–26	1926–27	1927–28
1	2	3	4	5	6
Salaries and wages	$6,112,701	$6,216,710	$6,854,017	$7,274,571	$7,261,652
Materials and supplies	578,003	619,172	670,398	650,908	633,616
Equipment, replacements	212,454	473,610	221,403	108,714	884,137
Equipment, new	208,769	339,098	197,325	432,780	275,814
Land, buildings, and permanent improvements	682,947	1,187,238	1,083,039	849,546	1,785,073
Total	7,794,874	8,835,828	9,026,182	9,316,519	10,840,292

This expenditure has increased $3,045,414 during the 5-year period, or 39 per cent. The budget allowance for salaries and wages has increased during the same period $1,148,951, or 19 per cent. It should also be noted that the total expenditures of the land-grant institutions for salaries and wages were $70,709,216 for the year ending June 30, 1927. The expenditures for engineering salaries and wages for the same year were $7,274,571, or slightly more than 10 per cent. For materials and supplies in the year 1927–28 the engineering colleges received $650,908 out of a total of $34,937,742, or less than 2 per cent. The capital outlay for engineering for the same year including replacements and new equipment was $541,494 out of a total of $4,990,478, or nearly 11 per cent. Land, buildings, and other permanent improvements represented $849,546 out of a total of $14,076,455, or about 6 per cent. During the same year the engineering enrollment of these institutions was 29,528, plus 1,216 in architecture, out of a total of 149,606 students, or nearly 21 per cent. Since slightly more than half of the teaching load of engineering students falls upon the colleges of engineering, the budget allowance for engineering is low. The engineering student enrollment in the land-grant colleges during the period from 1923 to 1928 has increased from 24,792 to 29,528, or 19 per cent, and the budget allowance was increased by about the same amount.

Gifts for engineering.—During the 5-year period 1923–1928 the land-grant institutions received from industry a total of only $1,410,305. Of this amount only $140,880 was contributed for resident teaching, $28,682 for engineering extension activities, and about one and one-third million dollars for engineering research. Actually, the gifts from industry for resident teaching are somewhat in excess of the $140,880 already indicated, as considerable equipment is being

presented by industry to the engineering colleges, the exact value of which can not be accurately estimated. Despite a popular impression that industry is contributing considerable sums to engineering education, it is clear that it is contributing directly only a fraction of 1 per cent of the actual cost of this type of education. The responsibility for this type of education as for others lies, and should continue to lie, with the public.

Budgets for engineering research.—For the year ending June 30, 1928, the total expenditures for engineering research at 48 land-grant institutions were $498,646 of State funds as compared with $8,492,639 for agricultural research at the same institutions. In 1925 the ratio of expenditures for agricultural and for engineering research was 21 to 1, in 1920 it was 30 to 1, and in 1910 the ratio was 50 to 1. These data show that support for engineering research at land-grant institutions is increasing, but that the total amount is small considering the great numbers of industrial problems that are dependent upon engineering research for solution.

Budget for engineering extension.—The amount expended for non-collegiate technical instruction and for other types of engineering extension in all land-grant colleges was $311,451 for the year ending June 30, 1929. During the same year the Federal, State, and county funds for agricultural extension totaled $12,758,067 for only 36 States. Better support should be provided for this type of instruction which, as is indicated in another part of this report, is greatly needed by the industrial population of this country.

The Physical Plant for Engineering

Replies to questionnaires indicate that only in exceptional cases are the facilities in buildings and equipment adequate for the large number of students. The following information is presented as a summary of the present conditions.

Buildings.—Twenty-five institutions report that their laboratories are inadequate only eight state that they are ample.

Twenty-nine institutions have insufficient facilities for the assembly of large classes and only seven are well provided for in this respect.

Twenty-three institutions lack classrooms, 17 have inadequate space for shops, and 14 have too little drafting-room space.

The offices are ample only in 11 institutions, sufficient in 19, and inadequate in 18.

The engineering equipment of 14 land-grant institutions is housed, at least in part, in temporary quarters and 11½ per cent of the engineering instruction in these institutions must be housed in these temporary quarters.

The illumination, heating, and ventilation of the engineering buildings are usually reported either as excellent or as satisfactory. Only 11 institutions report the foregoing services as unsatisfactory.

The condition and upkeep of the engineering buildings is reported by 14 institutions as excellent, by 28 as satisfactory, and 7 claim unsatisfactory conditions.

Equipment.—In Table 13 are given statistics concerning the value and condition of engineering equipment, also, of the needs for new equipment. Thus, the value of all engineering equipment on July 1, 1928, was $8,764,913 and equipment valued at $3,243,010 is urgently needed. The table also indicates that only about two-thirds of the equipment is modern, 13 per cent is antiquated or useless, and about 24 per cent is old but usable. When it is recognized that 17.7 per cent of the value of all equipment came through gifts by industry it is evident that the investment in equipment is only about $7,000,000.

TABLE 13.—*Value of engineering equipment*

School or department	Value of equipment on July 1, 1928	Average percentage of equipment			New equipment needed
		Modern	Old but usable	Antiquated or useless	
1	2	3	4	5	6
Civil engineering	$2,943,051	60.0	31.2	8.8	$759,000
Mechanical engineering	2,729,174	49.4	37.9	13.7	729,535
Electrical engineering	1,233,792	46.4	31.1	17.5	864,000
Chemical engineering	450,614	79.0	11.6	9.4	191,000
Mining and metallurgy	271,346	74.0	4.5	21.5	55,000
Other departments	1,433,936	66.4	19.5	14.1	644,475
Total	8,764,913				3,243,010

Criticism of the name "agricultural college."—The engineering graduates[4] of the separate land-grant colleges of Colorado, Kansas, North Dakota, Oregon, and South Carolina quite generally were of the opinion that the name "agricultural college" is detrimental to the engineering alumni of such institutions. No objections were offered to the name "State college of agriculture and mechanic arts" or to "agricultural and mechanical college," although the designation "State college" seems to be preferred to the other names.

Statements have been made that engineering graduates of "agricultural colleges" are not thought of as graduates of engineering colleges. Experience with the employers of engineering graduates leads to the conclusion that the complaints of engineering alumni of "agricultural colleges" have considerable justification. Engineer-

[4] Part V of this report, "Alumni and former students," presents survey results with reference to occupations, further training, and salaries of graduates and ex-students of engineering in land-grant colleges.

ing staff members of "agricultural colleges" also feel that they are at a disadvantage and have to give excuses to their professional friends for teaching engineering at "agricultural colleges."

Internal Organization Problems

In this section will be recorded present practices with reference to the organization and administration of the engineering activities of land-grant institutions. In 28 institutions the governing boards consider that the most important function of the engineering organization is to give the individual student suitable preparation for a profitable life career. Special services to meet State industrial needs are considered of secondary importance. The organization of the engineering staffs of land-grant institutions has, accordingly, been developed to give major attention to undergraduate engineering education. In the agricultural divisions of these institutions research and extension activities have been given consideration at least coordinate with resident teaching, but engineering has always been dominated by resident teaching, while research and extension have been largely incidental activities.

All States interpret the Morrill Acts and supplementary legislation as carrying a clear obligation to maintain a college of engineering. However, neither the constitution nor the organic laws of the States, except two, determine or prescribe the organization and activities of engineering instruction; also, in only two cases has the State legislation prescribed the engineering research activities of institutions. State legislatures or the governors of States have in eight cases instigated special surveys of land-grant institutions which included the engineering divisions of such institutions. It is customary for special committees of State legislatures to visit and inspect the work of institutions; also, in some cases the governors of States have appointed special visiting committees. However, as far as can be determined, neither the State legislatures nor the governors of States interfere with the internal organization of the engineering divisions of land-grant institutions.

Organization of the major division devoted to engineering.—In the 26 institutions which are combined land-grant colleges and universities the term "college" is usually applied to the major division devoted to engineering. In about half of the 20 separate land-grant colleges the term "division" is used. Six separate land-grant colleges use the term "school." One designates its work in chemical, civil, electrical, and mechanical engineering as "schools." In the 5 States where State universities are not maintained but land-grant colleges are provided, 2 use the term department, 1 has a college of engineering, 1 a school of engineering, and the Massachusetts Insti-

tute of Technology, which is mainly an engineering college, has no separate division for engineering.

The major engineering division has as its chief executive officer a dean who is responsible to the president of the institution for the administration of the engineering curricula, the quality of instruction, and the proper expenditure of the funds allowed in the engineering budget. In many institutions, although there are notable exceptions, the dean of engineering is also the director of the engineering experiment station and is responsible for the quality of research and for the funds allowed by the institution or by cooperating agencies for this purpose.

The dean of engineering formulates and executes policies with reference to the engineering college; recommends to the president the appointment of engineering staff members upon institutional committees; unifies the activities of the engineering departments and builds up the solidarity of his college or division; presents to the president the needs of the departments of his college; represents the engineering college officially before the public; serves as a medium of communication of all official business of the engineering college with other institutional authorities, students, and constituents; assists in coordinating the activities of the engineering division with other major divisions of the institution; makes recommendations to the president concerning engineering budgets; certifies the pay roll of the division; approves requisitions for purchase of supplies and equipment; makes annual and other reports on the work of the engineering college; directs publicity for engineering; selects, subject to the approval of the president and trustees, engineering staff members; approves and supervises the publications of research and other reports on engineering; supervises department heads; is educational director, and as such conducts activities for the improvement of teaching; oversees relations between engineering faculty and students; directs personnel, placement, and vocational counseling of engineering students; and advises the president concerning the physical plant of the institution.

The main division devoted to engineering is usually made up of the following departments: (*a*) Departments the heads of which are responsible to the dean of engineering for the administration of the engineering curricula and the technological instruction in civil, electrical, mechanical, chemical, mining, architectural, and other branches of engineering. Architecture, when taught at a land-grant institution, is also usually administered under the dean of engineering. (*b*) General technical departments which are service departments to the engineering curricula. Such departments usually include instruction in general engineering drawing and descriptive geometry, shop practice, mechanics, and other branches which are common for all engineering students. The heads of such departments also report to the dean of engineering. In some institutions shop practice is taught in the mechanical engineering departments and mechanics in the civil or in the mechanical engineering department. The tendency at present, however, is to teach subjects which are common to all engineering curricula in separate technical service departments. (*c*) Departments in science and mathematics. In one land-grant university all of the instruction in mathematics, chemistry, and physics

is administered in departments the heads of which report to the dean of engineering. In one institution physics is under the college of engineering, and in another case chemistry is a department of the engineering division. However, the aforementioned cases are exceptions to the general practice where instruction in science and mathematics is administered by the dean of the college of arts and sciences. (*d*) Connection of the engineering experiment station with the engineering division or college is a plan of organization that should benefit the teaching staff and students by reason of the engineering research with which they thus come in contact. (*e*) The engineering extension department enables the engineering staff to come into direct contact with the industries of the State and to be of assistance to those who can not be benefited by resident engineering instruction.

It is only by placing engineering teaching, research, and extension under the direction of one responsible head that full cooperation at a minimum cost may be secured.

The major duties of a head of an engineering department are to act as adviser to the dean; to formulate and execute departmental policies; to unify the department and build up departmental solidarity; to improve the standards and quality of teaching; to make budget recommendations for consideration by the dean of engineering; to certify the pay roll of the department; to prepare requisitions for departmental supplies and equipment; to oversee the expenditures of the department; to make annual and other reports to the dean concerning the activities of the department; to adjust the teaching load of the department staff; to assign teachers to classes; to interview delinquent students; to initiate selection of departmental staff members subject to the approval of the dean; to cooperate with the dean and other officers of the college in personnel, placement, and vocational guidance of students; to sponsor honor and professional departmental societies; to make recommendations to the dean concerning changes in curricula; to oversee registration of students; and to approve students' programs of studies. In some institutions the last two are carried on by the dean.

Curricula offered.—Civil, electrical, and mechanical engineering are offered in 47 land-grant colleges, chemical engineering in 32, mining in 19, and architectural in 14.

Engineering faculty.—In the 26 institutions which are combined land-grant colleges and universities, there are separate engineering faculties empowered to deal with most of the problems pertaining to engineering curricula and students. At Cornell University the college of engineering is made up of the three schools of civil, electrical, and mechanical engineering. Each of these schools has a separate faculty.

Twelve separate land-grant colleges reported that they have separate faculty organization. Usually the separate land-grant college engineering faculty has no separate organization or power, and all legislation pertaining to curricula and students is carried on by the general faculty of the institution. While this plan is satisfactory in a very small institution, the self-contained engineering college with its separate faculty should be the plan of organization for institu-

tions which have more than 500 engineering students. It is only by this method that unity of purpose and close cooperation of the different branches of engineering may be secured.

Financial relations.—The engineering colleges, like other major divisions of land-grant institutions, usually benefit from funds that come to the institution from the Federal Government, State government, student tuition and fees, interest on endowment, and other sources of income. Exceptions to these are Cornell University, which receives State funds only for agriculture, home economics, and veterinary science, and the Massachusetts Institute of Technology, which receives no State funds for any purpose.

Nearly all institutions have definite budgets of expenditures for each of the major divisions. The engineering budget is prepared by the dean of engineering in cooperation with the heads of departments. This budget is then submitted by the dean to the president. In some cases the dean consults the comptroller or other institutional business officer before the final budget is submitted to the president for consideration. After the budget is approved by the president, orders for supplies or capital expenditures are made on requisitions prepared by the head of the department and approved by the dean of engineering. Expensive items of equipment usually require the special approval of the president, as do also traveling expenses outside of the State.

Engineering laboratory, shop, drafting room, field, and other student fees are credited to the engineering college budget in 19 institutions. In the majority of cases, however, all such fees go to the institution to be distributed in connection with other receipts. Earnings for commercial and service tests nearly always go to the engineering college or are added to the budget of the engineering experiment station.

Staff appointments and promotions.—Except for a few special cases in small institutions, where the president handles all of the details, staff appointments are handled as follows: When a vacancy occurs the head of the department concerned initiates the selection of candidates. He then presents his findings to the dean of engineering, who recommends to the president concerning the appointment to be made. The president in all institutions has the authority to appoint subject to the approval of the governing board. In larger institutions the president seldom questions the recommendations of deans concerning staff appointments. It is customary, however, for the dean in the case of important positions, such as full professors, to arrange that the president not only has a complete record of the candidates recommended but also interviews the most promising individuals.

Dismissal of staff members is made only upon the recommendation of the dean and head of the department concerned. Dismissal of staff members occurs only in extreme cases, such as distinct incompetence, low morals, or disregard of national laws.

Recommendations concerning increase in salaries or promotions in rank are made by the head of the department to the dean who transmits such recommendations to the president. Usually such matters are considered only in the spring of the year when the annual budgets are prepared. In one institution promotion to be a voting member of the institutional faculty must have the approval of two-thirds of the heads of departments of the institution who act as a committee in all such cases.

Alumni contacts.—Only in the largest institutions do the engineering colleges maintain relationship with engineering alumni distinct from those carried on by the general alumni association of the institution. These are usually very informal in character and in only one case was a distinct engineering alumni association reported. Contact with engineering alumni is carried on by every engineering college through news letters, addresses before alumni associations, aid to alumni in connection with employment problems, and through social contacts of individual staff members.

Contact with the public.—Four institutions report that special officers are employed to make contacts with industry who devote from one-fifth to one-third time to the engineering college. In nearly every engineering college the dean of engineering and the more experienced staff members are constantly in contact with the industries of their specialties. Institutions which maintain engineering experiment stations and engineering extension departments have additional opportunities for contact with the public. The placement problems in connection with the large numbers of graduates again places the engineering staff members in direct contact with a great variety of industries. The fact that 175 members of land-grant engineering college staffs are members of committees of national engineering societies indicates rather close contact with industry. While a large per cent of these members of committees are selected from the most prominent and most centrally located land-grant institutions, the promising and most active engineering teachers of smaller colleges are to an increasing extent appointed on such committees. In general, institutions which have a liberal policy with regard to the payment of traveling expenses of staff members to national meetings and conferences pertaining to engineering maintain the best contacts with industry.

Nearly every institution has an officer who gives full or part time to institutional publicity. Replies from institutions indicate that

only in exceptional cases is 10 per cent of the time of the publicity officer devoted to engineering. One cause for this is the fact that engineering staff members in general are very reluctant about giving out technical information in a popular style.

Technical bulletins, papers before engineering societies, and articles in the engineering press are considered by all engineering staff members as types of proper publicity. Short newspaper items about special accomplishments of students, special achievements of alumni, installation of distinctive equipment, or outstanding investigations by staff members are favored by more than half of the institutions. Radio for engineering publicity is favored by a considerable number of institutions. Only in rare instances have exhibits at fairs and conventions been practical; in most cases such exhibits have led to wrong ideas about the activities of the engineering college or the work of engineers. News items in alumni and student publications concerning activities of engineering colleges are always favored.

In one institution special publicity committees are set up in each engineering department and a special publicity representative from each department cooperates with the publicity officer of the institution. This institution receives considerable engineering publicity in the Associated Press.

The deans of nearly all land-grant engineering colleges state that more general publicity for engineering is needed and the majority feel that an experienced publicity agent could devote advantageously considerable time to engineering.

Responsibility for the physical plant.—In 12 cases, including most of the small institutions, the dean of engineering or one of the engineering professors is responsible for the physical plant of the institution, including buildings, heating plant, power generation and distribution, water supply, sanitation, roads, and walks. As the institution grows in size this practice is undesirable as it becomes detrimental to the educational program. In one large, separate land-grant college a superintendent of the physical plant is responsible for the aforementioned services, but he reports to the dean of the division of engineering. Even this plan places an undue burden upon the dean of engineering and interferes with his main duties pertaining to teaching, research, and extension in engineering.

Thirty-two institutions, including most of the larger engineering colleges, report that the dean of engineering acts as the chief advisor to the president in connection with all of the engineering problems of the institution but neither he nor his staff members have responsibility for the physical plant. In such cases the superintendent of the physical plant reports to the controller or business officer of the institution. This plan which is favored by engineering faculties as

an advisory relationship in connection with the engineering problems of the institution enables them to prevent the installation of obsolete equipment or wrong service systems. Only in one case is the engineering staff absolutely ignored in connection with the engineering problems of the institutional plant. In one land-grant institution operating under the advisory plan the dean of engineering has designated one of his staff members as the advisor to the superintendent of the physical plant.

In a number of cases members of the engineering staff have designed institutional power and heating plants, water works, and sanitation systems, but act only in a consulting capacity in connection with their operation. Such a contact with the physical plant of the institution is most desirable. In installing new power and heating plant equipment the educational as well as the service features should be considered. Contact of the engineering staff members in connection with new installations also enables the institutions to secure special price discounts on account of the standing and acquaintance of engineering teachers with industry.

General notes on organization.—Well-organized engineering colleges with the duties and responsibilities of deans and heads of departments carefully defined are very exceptional. In the majority of land-grant institutions there is either no organization scheme or the plan is only a paper one. For best results the dean of engineering, as the chief executive officer of the main division pertaining to engineering, should be given definite authority and should be held responsible for results. In a similar manner the dean should outline the duties of heads of departments and should hold them responsible for the effective administration of their departments. The dean of engineering should be in responsible charge of all teaching, research, and extension activities in engineering. In a similar manner the heads of the engineering departments should be in charge of the teaching, research, and extension activities in their fields.

Separate engineering faculties with power to handle questions pertaining to curricula, discipline of students, and other internal problems should be set up for every engineering college. Only matters of general institutional concern should be taken up with the general faculty of the institution. The engineering faculty should meet at least once per month and when not occupied with routine matters should consider educational problems in engineering. It is only by this plan that the fullest cooperation between engineering staff members may be secured and interest in educational problems increased.

Chapter VII.—Services of Land-Grant Engineering Colleges

The previous surveys of engineering education, while dealing very fully with the educational problems of the engineering colleges, have given little or no attention to the direct contributions of these institutions to the social and economic problems of the Nation. They have not considered the major services which engineering colleges are rendering to their communities, the States in which they are located or the Nation as a whole. The land-grant engineering colleges, which owe their existence to national and State beneficence and which receive their major support from State funds, should be particularly interested in services which are of direct benefit to the public.

Replies to questionnaires indicate that all land-grant engineering colleges consider that they serve the public best if they prepare the engineering students enrolled in their institutions for most effective performance as members of the engineering profession. Accordingly, an effort was made to find out through questionnaires the direct contributions which these land-grant engineering colleges have made through their graduates.

Since a higher educational institution is a place where scholars teach and create new knowledge, an endeavor was also made to discover what the engineering staffs of land-grant colleges have contributed not only through teaching, but also as the result of their investigations, discoveries, and practice as engineering experts. A summary of the results of the most outstanding researches by the land-grant engineering colleges will also be given in this part of the report.

These statements will be followed by data secured through questionnaires of the special services rendered by the land-grant engineering colleges to the United States Government, State agencies, municipalities, industry, and the engineering profession.

Major Accomplishments of Land-Grant Engineering College Graduates

In the 55 years from 1873 to 1928 the land-grant institutions have awarded 47,677 bachelor's degrees in engineering and more than 5,000 master's degrees. During the same period at least 50,000 students who did not receive degrees received one or more years of instruction in engineering at these institutions. Since this country

has about one engineer for each 12,500 of population, or about 100,000 altogether, it is evident that a considerable portion of the engineering talent of the United States has been derived from land-grant institutions.

An effort was made by those in charge of the land-grant college survey to secure through questionnaires accurate data about the engineering graduates of each land-grant college and their contributions through discovery, invention, research, engineering practice, or other means that have resulted in the improvement of standards of living and human happiness. Unfortunately, even the best and largest institutions have only incomplete records of the accomplishments of their graduates. In the following paragraphs is included an incomplete summary of the contributions of land-grant college engineering graduates as reported by the institutions.

Pioneer experiments by engineers trained at land-grant institutions did much to place the design of concrete structures upon a rational basis. Their contributions in steel structures include the design and construction of steel bridges, tall buildings, industrial structures, and railway terminals. A considerable number of the leading architects and architectural engineers of the United States are graduates of land-grant engineering colleges. These have added greatly to American architecture in general and have improved industrial buildings in particular. Land-grant college trained engineers have been active in the design, construction, and operation of steam-electric and hydroelectric power plants. They have also contributed to pioneer work on electric power development and have headed firms that are concerned with financing, designing, construction, operation, and consulting services in connection with power generation. They are largely responsible for pioneer investigations which have been carried on with high voltage electric transmission by two industries and three universities The directors of the largest and most important laboratories in the world devoted to researches on telephone and radio hold degrees from land-grant engineering colleges. Graduates are largely responsible for pioneer work in the development of electric street railway and electric interurban systems. The first locomotive-testing plant in the world was designed by a land-grant engineering college graduate. His experiments on this plant and on air brakes, brake shoes, draft gears, and other equipment have contributed greatly to the standardization and improvement of American railway mechanical equipment. Land-grant college engineering graduates have had a leading part in highway research and in the development of the science and practice of highway design, construction, and maintenance. The ceramic industry of Ohio was developed by an alumnus of a land-

grant engineering college who also had an active part in placing the entire ceramic industry of America on a scientific basis. Land-grant college graduates have been pioneers in the application of sicence to mining and have been leaders in the introduction of electricity in coal mining.

They have been active in the solution of difficult problems in industries. They have contributed to agriculture by designing power-farming machinery, reclaiming arid lands, draining swamps, and placing within the reach of many farmers the household conveniences of city dwellers. They have contributed to flood prevention and to the solution of difficult harbor and river problems. Both in heavier and lighter than air flying, pioneer work is being done by engineering graduates of land-grant institutions. A complete account of the contributions of land-grant college engineering graduates during the World War would fill a large manuscript. At least 25,000 engineering graduates of these institutions served either in the Army or Navy or contributed their technical and business knowledge as civilian engineers. Fifty-eight deans of engineering are graduates of land-grant engineering colleges. In addition to these, hundreds of the leading engineering professors were trained at these institutions. These graduates have done much in shaping engineering education all over this country.

The directors of the research laboratories of the General Electric Co., the Westinghouse Electric & Manufacturing Co., the General Motors organization, and the American Telephone & Telegraph Co. hold degrees from land-grant engineering colleges, as do large numbers of the research staffs of these and other industrial laboratories. The directors of the United States Bureau of Standards, Reclamation Service, Public Roads, and of other important United States Government technical bureaus have been largely engineers trained at land-grant colleges. In addition to these, large numbers are serving the United States Patent Office and other technical bureaus in non-administrative capacities.

Engineering graduates of land-grant institutions are credited with many inventions and discoveries of value to the public. Among these are meters for measuring steam, air, electricity, and gas; instruments for the study of deformation of materials under stress and for industrial uses; special alloys; new processes of value to the chemical and civil industries; new building materials; steering gears, spark plugs, and carburetors for automobiles; new methods of welding metal; the tungsten lamp; the Coolidge tube; and many special machines.

The presidents of the General Electric Co., the General Motors Corporation, and of several of its companies, the Goodyear Rubber

Co., the SKF Industries, the American Bridge Co., the Arthur D. Little Chemical Co., the Mathieson Alkali Co., the Du Pont interests, the Union Gas & Electric Co., the New York Edison Co., Stone & Webster Co., and many others of the leading manufacturing and public-utility industries are graduates of land-grant engineering colleges. Graduates from these colleges are found in the presidencies of railroads such as the Illinois Central and the Great Northern; vice presidents of railroads such as the Missouri Pacific and the Pennsylvania, chief engineers and superintendents of motive power of a large number of railroads; and other important railway executive and technical positions. Even in finance the graduates are prominent. The head of the Babson statistical organization and the president of one of the largest banks in the world are land-grant college engineering graduates.

The foregoing summary of the accomplishments of engineering alumni should prove a source of great satisfaction not only to the land-grant institutions but also to the public at large which has so largely contributed to the support of these institutions.

Contributions of Engineering Teachers

The greatest contribution which any teacher can make is to train his students to think clearly, to act honorably, and to lead useful lives. The accomplishments of the engineering alumni of land-grant institutions, as enumerated in the last section of this report, indicate that their teachers have served society in a most remarkable manner. It is gratifying also to find from the replies to the questionnaires that in additon to training engineers the engineering staffs of land-grant institutions are responsible for many inventions, discoveries, and other special contributions. A summary of the most outstanding of these follows:

Through research and invention.—(*a*) Perfection of special processes for the manufacture of aluminum, soap, artificial building stone, and ceramic products; (*b*) invention of coal, gas, and steam calorimeters; (*c*) perfection of steam and gas engineering indicators; (*d*) perfection of special machines for testing materials of construction; (*e*) improvement in coal carbonization processes; (*f*) improvement of farm power machinery; (*g*) development of permanent farm structures; (*h*) development of new industries; (*i*) pioneer studies on coal mining and classification; (*j*) pioneer investigations of domestic and central station heating; (*k*) pioneer research on reinforced concrete, steel, and other structural materials; (*l*) pioneer experiments with locomotives and other railway mechanical equipment; (*m*) pioneer development work on carburetors and other automobile accessories; (*n*) pioneer studies which have resulted in data for the rational design of culverts; (*o*) fundamental studies of the action of soils and earths; (*p*) investigations in electric traction, high-voltage power transmission, nitrogen fixation, and electric communication (the inventor of the telephone, Dr. Alexander Graham Bell, received much assistance through studies by a professor of a land-grant institution); (*q*) experiments which have improved methods used for water

softening, sewage disposal, wood preservation, and the use of local clays for the manufacture of china and terra cotta; and (r) special investigations in connection with flood protection, drainage, and irrigation.

Publications

(a) *Textbooks.*—The two largest publishers of engineering reference and textbooks out of 371 titles by engineering teachers credit land-grant college engineering teachers with 243 books, or nearly two-thirds of the total. Thus engineering teachers of these institutions are responsible for a large portion of the textbooks and reference books used in colleges and by the engineering profession.

(b) *Bulletins.*—Land-grant engineering college staff members are authors of more than 1,200 bulletins which give the results of investigations.

(c) *Papers and articles.*—Besides about 150 papers annually before national engineering societies, land-grant engineering staff members are constantly contributing articles to the engineering press. It is difficult to secure an accurate list of such articles, but two teachers of one land-grant institution have contributed nearly 500 papers and articles to the engineering press during the past 25 years.

Special Researches by Institutions

The University of Illinois and the Iowa State College were the first land-grant colleges to demonstrate the value of organized research. At present there are 38 engineering experiment stations at land-grant institutions which report the following typical engineering contributions through research:

(1) Millions of dollars have been saved through the development of standard methods of testing all rigid types of sewer pipe, drainage tile, and culvert pipe. (2) Sanitary disposal of industrial wastes has contributed immeasurably to public health. (3) Economic and scientific studies of the design of highways have contributed to the proper use of the large funds which are being expended by the States and the United States Government for road construction. (4) Great savings have been produced due to studies which resulted in the utilization of industrial and agricultural wastes. (5) In several States the land-grant institutions designed and constructed the first sewage-disposal plant, which formed the basis for improved sanitation in an entire State. (6) Research on electrolytic iron, permalloy, and other new alloys have meant much to economic industial production. (7) Investigations of impact on railway bridges has resulted in improving specifications for bridge design in the United States, Canada, India, and Japan. (8) Researches on concrete, plain and reinforced, have developed a rational practice in their use and have improved its value as a building material. (9) Discovery of the causes of discoloration and efflorescence of limestone has meant much to the quarry industry. (10) Tests on locomotives, air brakes, brake shoes, draft gears, and other railway equipment have resulted in greater safety and lower costs to the public. (11) High-voltage research has made long-distance electric-power transmission practical and has given as by-products new methods for nitrogen fixation and for ozone manufacture. (12) Tests by the land-grant college engineering experiment stations have extended the market for low-grade coals, have resulted in more accurate grading of coals by mines, have reduced the smoke nuisance in many communities, have indicated the value of cleaning certain coals, and have reduced losses of fuels through spontaneous combustion by developing proper methods for storing. (13) Researches have developed new data by means of which the properties of steam and other vapors at great ranges of temperature and pressures may be calculated. (14) The science of heating homes has been developed through investigations in the laboratories of a land-grant engineering college. (15) Properties of building materials for different localities have been fixed by scientific tests. (16) The fatigue of metals and of concrete can be predicted as the result of investigations completed. (17) The modern carburetor is the result of researches in a laboratory of a land-grant engineering college. (18) Much of the present data on heat transfer is due to studies in land-grant college laboratories. (19) The science of foundations was aided through special investigations. (20) The ceramic industry of America was developed through studies at a land-grant engineering college. (21) Aid has

been given to the solution of water-supply and water-power problems in several States, and much new knowledge of water measurement was developed. (22) Data were secured as a basis for rational farm electrification in different States. (23) Timber testing has resulted in great benefits to the public. (24) Experiments have resulted in improved farm machinery and farm power. The modern farm tractor was standardized in the laboratories of a land-grant college; in fact, engineering staffs and former engineering students of land-grant colleges are mainly responsible for the development of the farm tractor of to-day. (25) Special machines and instruments have been perfected. Examples of these are the farm-gas tractor which was first conceived in the engineering laboratories of a land-grant institution, machines for material testing meters for the measurement of fluids, an electric oscillograph of large frequency range, high speed gas engine indicator, and other devices of value to the public.

Special Services to the United States Government, State Agencies, Municipalities, and Institutions

The land-grant institutions being supported mainly by funds appropriated by the States and by the United States Government, it is to be expected that these public institutions of higher learning render special service to the bureaus and departments. Questionnaires filled out by the institutions indicate that the land-grant engineering colleges are cooperating with the above agencies in the following ways:

United States Government bureaus.—The Bureau of Public Roads of the United States Department of Agriculture is cooperating with 19 institutions. Seven land-grant engineering colleges furnish laboratories to this bureau for special investigations and five report definite contributions by the United States Bureau of Public Roads for highway research.

Three institutions furnished laboratory facilities for the United States War Department. Two give special engineering instruction to officers of the United States Army. Through the Reserve Officers' Training Corps, the War Department is very helpful to the engineering colleges of all land-grant institutions as the military instruction supplements very effectively the technical engineering instruction.

One institution gives special advanced instruction to the graduates of the United States Naval Academy, while four report that they have been benefited from special equipment furnished by the United States Navy.

The Bureau of Standards of the United States Department of Commerce is very helpful to all engineering colleges through its publications, standardization of instruments, and advice; three institutions report researches in cooperation with this bureau.

The Bureau of Mines of the United States Department of Commerce is cooperating with nine land-grant engineering colleges in research of value to industry and mining.

The Office of Education of the United States Department of the Interior has received assistance from five land-grant engineering colleges in connection with surveys and has aided all engineering colleges of the country through special surveys and studies, statistical information, and general educational publications.

Only in rare cases has there been any cooperation with other bureaus of the United States Government. It seems that there should be greater cooperation between all of the land-grant engineering colleges and all the technical Federal bureaus. Unfortunately, neither the land-grant colleges nor the United States departments and bureaus seem to realize the opportunities for service to the public through greater cooperation of Government with the land-grant engineering colleges of the country.

National Research Council.—Twenty-three institutions report that they are cooperating with the National Research Council. In two cases definite research projects are supported by the council. In the other cases individual professors serve the council as representatives of engineering societies.

State departments.—Thirty land-grant institutions are performing valuable service to their State highway departments. In several colleges special road schools and conferences are held for the benefit of those who are responsible for the construction and maintenance of roads and streets. General advice by engineering staff members to engineers and officials of State highway departments is general. In a number of colleges the materials testing laboratories of the land-grant college are available for special investigations for the benefit of the State highway department. In a few cases the materials testing laboratory of the land-grant college is the official laboratory of the State highway commission. Thirty-two institutions report that aid is received from the highway departments of their respective States. In practically all cases, however, this aid was only nominal, such as assistance with programs for road schools which benefited mainly the State highway departments. Only in rare cases have the State highway departments contributed any funds directly to the land-grant college for research or for extension instruction. Employment of undergraduates during summer vacations has also been carried on to a very small extent. With the large sums of public funds which are being expended in each of the States for road building the cooperation between the State engineering college and the State highway departments should be more effective and general.

Twelve land-grant colleges are directly cooperating in a very general manner with the public utility regulating departments of their respective States. Again in the case of public service commissions the engineering staffs can be of great assistance. Public-service

commissions will also find it to their advantage to utilize engineering students and staff members during summers in connection with valuation problems. However, only in extreme cases should an egineering staff member be requested by a commission to give expert testimony.

Eight land-grant engineering colleges have definite cooperation with their State conservation departments, including the State geological survey; in one of these the professor of civil engineering is chief engineer of the State conservation department. Cooperation with the health, labor, or other State departments is found only in two States.

Several engineering colleges report that they have aided in connection with State legislation pertaining to safe boiler codes, water resources, highway laws, sanitation, building codes, engineers' license laws, architects' license laws, smoke prevention, and city-manager plans.

As is the case of the United States Government bureaus, insufficient cooperation exists between the State technical bureaus and the State-supported engineering colleges. The land-grant engineering colleges and the State departments should establish closer cooperative relations. Even the smallest land-grant engineering college can render effective service to State departments. The State technical departments, on the other hand, have a great opportunity to assist in the improvement of engineering education, particularly in the smaller land-grant colleges which are not located in industrial districts.

Aid to municipalities.—The communities in which land-grant institutions are located seldom make use of the talents of engineering staff members in connection with problems pertaining to city planning, water supply, sewage disposal, and street improvement. In rare cases engineering staff members are retained as consultants and as city engineers. Ordinarily such services are advisory in character and are rendered without compensation. Local communities should make greater use of engineering staff members. However, such services should not be given gratis as this practice is detrimental to consulting engineers.

Engineering staff members are quite generally used in advisory and consulting capacities in connection with the engineering problems of municipalities outside of the local community. These services are in connection with road building, bridge design, water supply, sanitation, smoke elmination, irrigation, drainage, and heating problems for schoolhouses and public buildings. One institution reports that the watershed for a town of 14,000 was protected by the proper location of filter beds. Several institutions report test of materials

at cost for municipalities. Other institutions report definite assistance to municipalities in connection with their water supplies, streets, buildings, and other technical problems.

Aid to State institutions.—The engineering colleges are contributing greatly in connection with the solution of the engineering problems of their institutions as indicated in a previous section of the report. In 32 cases members of the engineering staff act in an advisory capacity in connection with the design and operation of the institutional heating and power plant. In many instances the members of the engineering staff are also consulted with reference to buildings, grounds, athletic stadiums, sanitation, and æsthetic surroundings of the land-grant institution. In 12 smaller institutions it is customary for a member of the engineering staff to be responsible not only for the design and construction but also for the operation of the heating and power plant, and in some cases a professor or the dean of engineering is responsible for the entire physical plant of the institution.

In one case the land-grant engineering college made a survey of the physical plants of 20 State institutions at the request of the governor. In several the engineering staff members are consulted with reference to the physical plants of State institutions.

The practice of utilizing the talents of engineering staff members for consulting service to State institutions other than the land-grant colleges is favored only in exceptional cases, on account of objections offered by consulting engineers. Furthermore, this practice is detrimental to the main teaching and research duties of staff members.

Special services to industry and to the engineering profession.—Twelve land-grant engineering colleges report definite service to commercial organizations, 25 to manufacturing, 24 to building, 7 to ceramics, 16 to chemical, 14 to transportation, 26 to electric-power utilities, 19 to electric communication, 17 to gas utilities, 21 to water utilities, 11 to mines, 4 to petroleum interests, 6 to quarries, 4 to textile, and 2 to financial houses. These services were mainly through special instruction or research of value to industry.

In several States new industries were built up mainly through the assistance of the engineering staff members of land-grant colleges. The ceramics industry of Ohio is a definite example. The coal industries of two Middle West States were greatly aided through researches by the land-grant colleges of their States.

Nine engineering colleges indicate definite aid from commercial organizations, 33 from manufacturing, 13 from building, 10 from ceramic, 13 from chemical, 20 from transportation, 31 from electric-power companies, 26 from telephone and telegraph companies, 9 from gas utilities, 10 from water utilities, 9 from mines, 10 from

petroleum, 2 from quarries, 4 from textile, and 5 from financial houses. In the majority of cases gifts of equipment, special lectures, and supplementary teaching material were furnished by industry. Only in a very few institutions did industry cooperate with the engineering colleges by supplying funds for research.

Fifteen out of the twenty-five presidents of the Society for the Promotion of Engineering Education were teachers of land-grant colleges. A large proportion of the educators who were presidents of the engineering societies were also land-grant college teachers.

Chapter VIII.—Conclusions and Recommendations

(1) The definition of "Mechanic arts" during the time of the passage of the Morrill Land-Grant College Act and the custom of interpreting it place engineering as a required part of the program of land-grant institutions and coordinate with agriculture.

(2) The results secured through the land-grant college survey do not indicate that the land-grant institutions have developed a distinctive form of engineering education. At present the problems pertaining to undergraduate curricula, graduate study, teaching staff, and graduates are the same in all types of engineering colleges whether they are endowed polytechnic institutes, endowed universities, State universities, or separate land-grant colleges.

(3) The land-grant engineering college curricula are representative of the general tendencies in engineering education in America. Two-thirds of all the engineering students are enrolled in civil, electrical, and mechanical engineering. The engineering student devotes only about one-half of his time to technology and an equal amount to science, mathematics, and humanities. The quantitative requirement for graduation is 145 to 150 semester hours and the student carries about seven subjects at one time.

(4) Those in the land-grant college group, like all engineering colleges, are mainly undergraduate institutions. Inadequate recognition by industry of graduate degrees and lack of facilities in most institutions for advanced instruction are the two reasons for the small number of graduate students enrolled. The demand for graduates with the bachelor's degree in engineering exceeds the supply, but the stronger land-grant colleges should provide facilities for graduate study in engineering in order to train teachers and research engineers. Land-grant institutions located near large industries will also do well to consider the development of credit graduate courses for the benefit of techincally trained engineers employed in industry.

(5) Three-fourths of the land-grant engineering colleges section their freshman students in mathematics and English in accordance with their preparation. These institutions have also been the first in this country to develop orientation courses and special engineering problems for freshmen.

(6) While selective admission to the freshman year seems impractical for State-supported institutions, about one-third of the land-

grant engineering colleges favor a compulsory stopping place at the end of the sophomore year for those who lack qualifications to benefit by the advanced instruction of the upper two years.

(7) Only in one land-grant institution are students in the upper classes placed on their own resources and their instruction differentiated from that of the first and second years. This practice should become more general and greater recognition should also be given to superior scholarship.

(8) The junior colleges have thus far had little effect upon engineering colleges. However, land-grant institutions will ultimately be called upon to deal with such students and probably in larger numbers than is the case at present with those who hold degrees of bachelor of arts or bachelor of science from liberal arts colleges.

(9) A considerable number of land-grant engineering colleges have tried in the past to develop nondegree as well as degree curricula, but without success. Nearly all land-grant college engineering deans and the more prominent members of their staffs state that it is undesirable for an engineering college to offer both collegiate and noncollegiate resident instruction. Information now at hand indicates that it is usually undesirable for an engineering college to undertake 1-year or 2-year technical courses not leading to degrees upon the same campus with the degree curricula.

(10) Land-grant engineering colleges should cooperate to a greater extent with secondary schools and other agencies in their States which offer noncollegiate technical and trade instruction.

(11) Some land-grant engineering colleges may well offer in residence elementary courses in mechanics, electricity, power plants, machine design, surveying, metallurgy, and other technical subjects for the benefit of special students and for others who lack time or mathematical ability to benefit by the instruction of the regular engineering curricula.

(12) Short-term courses, conferences, special instruction in industrial centers, and elementary resident technical instruction are some of the methods of offering noncollegiate aid to industry which should be considered by all land-grant engineering colleges.

(13) Only about 225 students are enrolled in the curricula leading to degrees in agricultural engineering, and the small change in enrollment for a number of years raises the question as to whether it is necessary to have 20 land-grant institutions offer curricula in this field.

(14) While considerable encouragement is being given to younger teachers to continue their preparation, little systematic effort is being made to assist the younger teacher in mastering the technique of teaching. To raise the general standard of land-grant college en-

gineering teaching deans and heads of departments should assume greater responsibility in this matter.

(15) Better results may be obtained if the lines of authority and responsibility of engineering staff members are carefully defined. Separate engineering facilities with definite powers and responsibilities seem desirable in all except the very small land-grant institutions.

(16) The name "agricultural college" as used to designate certain land-grant institutions seems to be detrimental to the interest of engineering alumni and staff members of such institutions. It is recommended that the name of such land-grant institutions be changed to "State college."

(17) It has been estimated that $30,000,000 per year are being expended in the United States for engineering education. The land-grant institutions in which are enrolled one-half of the total engineering students of this country are spending only slightly more than $10,000,000 per year, or only about one-third of the total. The governing boards of land-grant institutions must realize that inadequate support for engineering education will necessarily affect unfavorably the quality of instruction and the other services of these colleges.

(18) Except in a very few institutions no encouragement is given to the engineering staff to build up research or extension. Both these types of work should be emphasized to a much greater extent than they are at present.

(19) Cooperation between the land-grant engineering colleges and the State and United States Government departments should be improved. The land-grant engineering colleges have been most helpful in nearly all cases in connection with the highway programs of their States, but the State highway departments have rarely reciprocated. Effective cooperation exists between a considerable number of land-grant engineering colleges and the United States Bureau of Public Roads, the United States Bureau of Standards, the United States Office of Education, and the United States Bureau of Mines. There is much room, however, for closer contacts between the land-grant engineering colleges and all of the technical bureaus of the United States Government.

(20) The land-grant engineering colleges are cooperating to an increasing extent with the industries and utilities of their localities. Eight of these institutions are solving industrial problems which are national in scope, are receiving considerable sums for cooperative research, are attracting large numbers of students from States other than their own, and are recognized as research and training centers in certain engineering fields. With proper support and encouragement this number can be increased.

PART XI.—HOME ECONOMICS

Chapter I.—Objectives

There is good reason to believe that home economics will make more rapid progress in defining its objectives and in creating the means for their attainment than was the case of some of the other more recent special fields of higher education. The basis of this belief may be discovered in tendencies that are apparent in the statements of land-grant college home economics objectives and in the discussions that constitute a part of the Proceedings of the Association of Land-Grant Colleges and Universities. From these sources it seems that a definition of objectives is being evolved in terms of a type of college education rather than in terms of specific skills and subject-matter information.

Home economics personnel recognize more fully perhaps than does the remainder of the academic world the apparently disorderly conditions that have existed in their field. They have attempted most seriously and intelligently to regularize and standardize their objectives and the means used to attain these objectives without abandoning faith that home economics provides a new and creative instrument to higher education. Their task involves the definition and segregation of an area of educational endeavor.

As compared with the traditional fields established in the higher educational world, they have had a very short period in which to work out their problems. By 1900 only nine land-grant institutions, Iowa State College, Kansas State Agricultural College, South Dakota State College, Oregon Agricultural College, Agricultural College of Utah, Colorado Agricultural College, Michigan State College, Ohio State University, and Montana State College, had courses in "domestic economy." Work in home economics in 33 of the institutions has been started since that date. This is a very brief time in which to isolate and to create subject matter, to devise organizations, train staffs, and formulate purposes in terms of a college standard that has itself been revolutionized during the past 15 years.

The day has long passed when any single and specific area of learning can maintain a monopolistic claim to provide the only knowledge and medium through which higher education may be

acquired. The ancient languages and mathematics had to make room for scientific education and, in turn, pure science has, during the past two generations tended to break down into a series of specialties that gain life and vigor by reason of appeal to interest in the application of the scientific method to various life activities. Thus colleges of engineering, agriculture, education, and of commerce and business have developed as respected faculties of the colleges and universities.

Home economics objectives described for the purposes of this survey indicate quite clearly that in the minds of many leaders in this field, home economics is conceived in terms of utilization of another area of human interest and activity to develop the attitudes and abilities that are supposed to result from college education. This viewpoint makes home handicraft skills incidental to and mere instruments of a wider purpose. The accomplishment of the home-economics mission can not, therefore, be measured by comparison of the cooking and sewing of its graduates with the facility in similar accomplishments acquired by other persons in household practice. Important as is ability to manage the material and social affairs and relationships of the home, the conception of home economics as a medium and incentive for college education merely takes advantage of the interests and family ideals of women to induce them to acquire the social and scientific attitudes that characterize any well-educated person. Even the gainful occupations for which preparation is offered are regarded to a considerable degree not as ends in themselves, but as means through which the individual becomes a member of the intellectual classes. When home activities and relationships are thus regarded as a medium that may be utilized to provide a college education, selection of subject matter, development of skills, and methods of teaching are controlled by quite different principles than would be the case in trade training or education to a station in family life.

However, a national survey of home economics in the land-grant colleges and universities of the United States will not present a true picture of the status of home economics in these institutions by recording the interpretations of the most advanced home economic leaders and the embodiment of these interpretations in the methods and curricula of a few land-grant colleges. The judgments of the entire group of college home economics staffs in regard to the objectives of their work must be examined critically and an attempt made to relate these judgments to inferences that may be drawn from the organizations set up in the colleges for the administration of home-economics instruction, from the character of the staff, from the courses and curricula offered, and from the student product.

Aims and Objectives

The responsible heads of home economics work in 43 land-grant colleges described their conceptions of the objectives and aims of college home economics for use in connection with this survey. It is impossible to arrange this group of statements in systematic and logical form and to report consensus of opinion upon the basis of clearly defined expressions of objectives. Nevertheless it is possible to derive from the statements four main tendencies or conceptions in interpretation of purposes. Somewhat roughly these objectives may be designated as (1) the development of handicraft skill in the operation of home keeping; (2) the development of home managers capable of handling the labor, the financing, and the social relationships that arise in the family unit; (3) preparation for specific gainful employment; and (4) utilization of interest in home and family activities and relationships as a medium through which scientific and social education may be provided in combination upon the college level.

Upon the basis of the statements of objectives reported for the purposes of this survey, it seems that two or more of these purposes may, and do quite frequently, exist side by side in a single institution in more or less contradictory and illogical relationship.

The handicraft objective.—No institution admits to-day that the major objective of its home economics work is that of developing handicraft skill in the operations of home-keeping. Long after creation of good cooks, home dressmakers, and housekeepers by teaching skill in household operations and by imparting rule of thumb information is recognized as an inadequate objective for college home economics the practices derived from this conception may survive and the objective itself persist in an obscured form. Most frequently this obscurity arises from the addition of well-recognized and respectable academic requirements that bear an attenuated relationship to subject matter prescribed to attain the old objective. Thus, since cooking involves chemical changes, since pattern making requires knowledge of measurements, curves, and irregular volumes, and since a house must be provided for housekeeping, it would easily be possible to attain academic standing for home economics by insisting that science be taken through organic chemistry, that mathematics be pursued through solid trigonometry, and that the elements of architecture should precede the course in house furnishing. Yet the cooking, sewing, and household work might be modified in only the slightest degree by all these additions and the essentially home economics instruction might remain upon the same old handicraft level. Home economics leaders fully recognize this fact and are mak-

ing considerable progress toward integrating abstract science and home economics application. The fact that the contributing sciences are highly departmentalized for purposes other than those of use to the divisions of application such as education, agriculture, engineering, and home economics, frequently makes such adaptation difficult. The extent to which integration of the science and the application of home economics has proceeded must be sought in the methods used and courses offered rather than in statements of objectives by college home economics teachers.

The family unit objective.—Examination of the statements of objectives by home economics departments shows that more than two-thirds of the statements are determined by desire to provide education that will serve the purposes revealed by more or less conscious and thorough-going analysis of the family. It is significant to note the emphasis given to development of attitudes within and toward the family and home as contrasted with the emphasis upon isolated, specialized bits of information and skills that characterized the handicraft objective. Assuming that the activities of the home provide a worth-while area of educational effort the handicraft objective was derived by analysis of the very limited and somewhat obvious manipulative processes that go on in the normal household. The family unit objective, on the other hand, is based upon recognition of wider and more varied home activities, but still depends for validity upon the adequacy of the activity analysis process as a means for determining the objectives of home economics instruction. Thus, the handicraft objective is subordinated to objectives derived from analysis of the home in its economic aspects, of the family as a social unit, and of the family as an element in larger social groupings.

The home economics objectives in land-grant colleges that center about home and family concepts are for the most part statements of the purposes of instruction based upon analysis of a variety of family activities and relationships. Thus we have "better understanding of child training and more intelligent use of family finance," "application of sciences and arts to problems of the household," "the place of the home in good citizenship building." The family unit objective in home economics instruction is undoubtedly a fruitful and rich concept and affords opportunity for wide and serious intellectual effort. Whether the statement of this objective is merely a theoretical and pious hope or whether it is a real and practical purpose can be determined only by examination of courses and curricula offered as means of attaining this objective.

This discussion of the family unit objective would be inadequate if attention were not called to some of the dangers and deficiencies that arise from too exclusive dependence for determination of pur-

poses upon the basis of analysis of family activities and relationships. The family is an extremely complex organization that involves a great number of interests, forces, and relationships within its own circle. When the contacts of this circle with other social groupings are also considered the complexity and instability of data are tremendously increased. Objectives of instruction based upon analysis of the elements and factors that concern the family unit can have only such validity as is derived from the soundness and completeness of the analysis itself.

The statements of home economics objectives submitted by the land-grant colleges quite frequently show an overemphasis upon one or another element of the family or home that distorts the value of the family unit objective for undergraduate home economics instruction. Since the activity and relationship analysis of the family is never completed, new and outstanding results of investigation in one phase very naturally tend to be reflected in at least temporary overemphasis in home economics instruction and purposes. One example of such overemphasis is apparent in a large number of the statements of objectives. During recent years remarkable progress has been made in the scientific study of the physiology and psychology of young children. This fact, coupled with an almost universal interest in and love of babies, has apparently led to frequent definitions of college home economics objectives in terms that seem to make child care, child psychology, and child growth the chief concern of family life. The child-centered family like the child-centered school is as much a distortion of social and economic conceptions appropriate to modern life as would be an ancestor-centered family. The importance and value of child study as one element of the undergraduate home economics program is fully recognized. Considerable judgment is necessary, however, if this element is kept in proper relationship to other phases of family relationships. Similar excessive preoccupation with special phases derived from analysis of family and home interests and activities might be cited, but this serves to indicate an important weakness when objectives and curricula to accomplish objectives are based upon incomplete analysis and stop short of synthesis of various elements derived from such analysis.

No one questions the importance of the family and home in the social organization. No one probably would deny that a corresponding obligation is laid upon home economics education to provide educational service based upon analysis of the activities that center in the family. At the same time it may be doubted whether such analysis can provide a definition of objectives adequate for home

economics instruction under modern social conditions. Most men live very rich and active lives outside their family relationships; women are increasingly seeking and finding similar interests that are much more closely related to other institutional and social groupings than to the homes that they maintain. This does not mean less interest in and love of home, but is simply realization of the wider and richer individual living that has come to women largely through better and higher educational opportunities. To some members of both sexes the home and the family provide full and satisfying realization of personal living. When this is not the case there would seem to be no more reason why the other individual interests and abilities of woman should be submerged in the family unit than that the wide economic and human interests of men should be subordinated or smothered under a single important social relationship. Under phrasing that is frequently obscure and uncertain the statements of objectives submitted by home economics departments in land-grant colleges show clearly that this conception is playing an increasingly important part in the development of college home economics education.

Remunerative employment objectives.—All of the 43 institutions that describe their home economics objectives include in one form or another statements of objectives in terms of gainful employment. Twelve list preparation for one or more types of such employment among the primary objectives of their home economics instruction. The more important employments mentioned for which preparation is offered are in descending order of frequency, teaching, dietetics, extension service, institutional management and research, and, among the employments mentioned only occasionally, social service, public-health service, nursing, journalism, and business concerned with the buying, selling, or servicing of products used in homes.

It should be fairly obvious that these employment objectives are not fully determined and can not be determined by analysis of family and home activity and relationships. All are more or less closely related to family and home interests but the specific employment in each case involves and is related more closely to other social and economic groupings. Attainment of gainful employment objectives must be determined in each of these cases by adopting and relating specific phases of strictly home economics instruction to other bodies of fact and activity centered about social agencies that are not formed upon the basis of the family unit. Examination of curricula reported in another section of this survey of home economics in the land-grant colleges will consider the vocational curricula from this standpoint.

The objective of combined scientific and social education.—Real values and legitimate purposes are involved in the definitions of the

objectives of college home economics in terms of handicraft, home life, and vocation. Yet definitions upon all these bases as in other "applied sciences" are subject to criticism and give rise to confusion, misunderstanding, apparent conflict, and obvious inconsistency of practice.

The most frequent complaint and criticism in regard to the areas of specialized education that have scientific or vocational objectives is that the liberal and social elements of education are neglected or do not function. This criticism is very seriously directed against teacher training, engineering, agricultural and business education, and is deplored by the leaders in each of these fields. In the same way the college of liberal arts is freely criticized because it is claimed that it leads nowhere but to academic and impractical interest. In view of the criticisms of these types of education it is extremely significant that the statements of objectives by home economics leaders in the land-grant colleges reveal an unmistakable determination that home economics shall combine practical, scientific, social, and cultural elements in such fashion that they shall be integrated in the consciousness and attitudes of the individual student.

To define the objective of college home economics that is directed to this end demands a degree of predictive hazard, but upon the basis of survey reports this objective may be described as one that attempts to combine scientific and social education by utilizing as a medium and incentive the activities and relationships that arise from home and family life.

This statement is not so clearly and so definitely stated by any of the reports from the home economics departments in land-grant colleges, but represents an attempt to embody in brief form a variety of partial statements of ideals and purposes that clearly tend toward some such conception of objectives. It will be noted that the definition consists of three elements: First, the combination of social and scientific education; second, dependence upon the activities and relationships of the family as a source of subject matter; and third, utilization of this subject matter as a medium and incentive for college education.

In so far as this is a just statement of a definite home economics objective it requires solution of practical problems and experimental procedures that may well be of greater significance in higher education than the mere segregation of another area of educational endeavor.

The processes that will be required if this problem is to be solved in the field of home economics will result in the creation of new subject matter, in new treatment of old subjects and in daring experimental combinations of methods and courses. These things can not

be done in a day. Criticism of home economics upon the score of failure to accomplish this task in the immediate future will be justified only if the problems are not earnestly attacked, if attainment of academic respectability is substituted for constructive accomplishment or if the rank and file fail to follow progressive leadership in adherence to purposes of this character.

Statements of home economics objectives tend to adhere to dependence upon home activities and family relationships for subject matter even in those cases in which objectives are directly those of gainful employment. Without entering into the question of whether home economics teacher preparation, training of dieticians, business women, and institutional managers are primarily home economics functions or belong to merely related areas, insistence by home economics staffs that these fields be centered in home interest emphasized the fact that in their opinion the home does provide an extremely rich field of subject-matter content. It must be admitted, however, that much work remains to be done if this material is to be segregated and utilized. In spite of the biological, social, and economic importance of the family, there has been relatively little thorough study devoted to it under modern conditions. In other words, the field has not been thoroughly explored although the work that has been done makes it evident that the family is an inexhaustible mine of indefinite extent. The demands of home economics leaders for funds to carry on exploratory investigation in this field make it perfectly evident that they are fully aware of the need for thorough study.

Subsequent discussion of home economics organization, staff, and curricula will attempt to relate them, in so far as possible, to the conception of college home economics as a form of combined social and scientific education through the medium of home activities and relationships.

Chapter II.—Organization

This survey holds no brief for any specific form or type of college home economics organization. Nevertheless the organization of home economics in the institutions tends to reflect and to determine to a considerable degree the conceptions of home economics objectives that are dominant in the land-grant colleges as a group. This relationship between organization and conception of home economics is especially valid as a measure of institutional and administrative attitudes; it does not so accurately indicate the objectives of the home economics staffs that are compelled to adapt their work to organizations over which they have little control. In an institution the organization of home economics may be a survival which is inappropriate to the present, more highly developed purposes of the home economics personnel. Or it may be borrowed ready-made from another institution which has made great progress in definition and attainment of home economics objectives and may, therefore, conceal very vague and limited purposes. Nevertheless, a rather high degree of correlation may be expected between types of institutional objectives and forms of organization when the entire group of home economics units in land-grant colleges is considered.

This is true both with respect to the place of home economics in the institutional organization and with respect to the nature of the internal organization of the home economics unit itself. For convenience of presentation discussion will follow this classification and deal first with the place of the home economics unit in the institution; second, with the internal organization of the home economics unit; and third, with the relationships that arise from the position of home economics in the institutions and from the nature of the internal organization of home economics units.

Institutional Organization

Examination of the formal position occupied by home economics in the land-grant colleges shows four types of assignment that reflect the following four institutional conceptions of home economics objectives: (1) Assignment of home economics to the college of arts and sciences; (2) assignment to the college of education;

(3) assignment to the college of agriculture; and (4) assignment to a position coordinate with the traditional major divisions in university organization. Each of these allocations will be considered in turn.

When home economics in college is thought of merely or primarily as a means whereby special subjects may be offered that will attract girls and appeal to housekeeping mothers the work may be appropriately assigned to almost any college or major division of the institution whose own objectives are not so specific as to render a home economics addition entirely irrelevant. Because of the general purposes of the college of arts and sciences this major division is frequently the one called upon to provide a berth for the new subject. Home economics is assigned to arts and sciences in 5 of the 41 land-grant institutions that report on this phase of the home economics inquiry. As has been indicated, retention of home economics in the college of arts and sciences does not necessarily mean that the work in a specific institution retains the vague objectives that probably led to its original allocation to this major division. The initial scattered work may develop into a curriculum. It may be organized into a department in the college comparable to the departments of history, English, and botany. Such assignment tends to restrict the development of new and wider home economics objectives since administrative control is centered in an educational position that is unlikely to devote a large degree of vigor and initiative to the special development of this field.

When it is regarded as the function of home economics to provide training for gainful employment, it is a logical procedure to assign the work to the major institutional division that is most closely related to the vocation in which the largest number of women find employment. Hence we find home economics curricula or departments administered by schools of education in 11 institutions. However, as women in increasing numbers enter occupations other than teaching it becomes necessary for the school of education to administer home economics preparation for employments quite inappropriate to its own educational objectives or for new home economics units to be established in other more suitable major divisions of the institution. Thus preparation for employment as nutrition or dietetics specialists may be assigned to the college of agriculture as a unit that is concerned with problems that underlie both human and animal feeding. As the variety of unemployments increases, however, this method of assignment becomes awkward to apply, and development of work appropriate to vocational purposes tends to be restricted until such time as an important division of home economics is developed to which major responsibility may be given.

The allotment of home economics to the school of education requires some further discussion. If all home economics work is conducted by this major division, the practice is not in harmony with the relations that exist between other subject-matter fields and the school of education. In other fields the school of education depends upon the subject-matter departments—botany, English, history, etc.—for training in subject matter; its function is that of providing professional knowledge and attitudes to be applied in actual teaching of a variety of subjects. It would seem, therefore, that if this common form of organization is sound, the same principle of organization should apply in the case of home economics. In other words, assignment of the entire home economics unit to the school of education is justified only if the sole home economics objective of the institution is that of teacher preparation. On the other hand it is just as much out of harmony with accepted principles of institutional organization to assign home economics teacher training exclusively to a major division other than the school of education when a well-developed school of education exists in the institution.

In 21 of the 41 institutions reporting, home economics education or teacher training is shown to be organized either entirely in or jointly with divisions of education. In 12 the home economics teacher-training course or curriculum is located in a division of education: University of Arkansas, University of California (at Berkeley and Los Angeles), Connecticut Agricultural College, University of Illinois, Purdue University, University of Kentucky, University of Maryland, University of Missouri, University of Nevada, University of New Hampshire, Pennsylvania State College, and the University of Wyoming. In six it is organized jointly in the divisions of home economics and education. These are Colorado Agricultural College, University of Minnesota, Oregon Agricultural College, Rhode Island State College, Agricultural College of Utah, and State College of Washington. In three it is organized jointly in divisions of agriculture and education: Ohio State University, West Virginia University, and the University of Wisconsin. In eight it is in the division of agriculture: University of Arizona, Georgia State College of Agriculture, University of Maine, University of Nebraska, Cornell University, University of Tennessee, University of Vermont, and Virginia Agricultural and Mechanical College. In eight others it is in the division of home economics: Alabama Polytechnic Institute, University of Delaware, Iowa State College, Michigan State College, North Dakota Agricultural College, Oklahoma Agricultural and Mechanical College, Louisiana State University, and Rutgers University. In three it is in the division of letters and science, or general science. They are University of Hawaii, University of Idaho, and Kansas State Agricultural College. In one, Montana State College, it is in the division of household and industrial arts.

Practice in the land-grant colleges with reference to the relationships that the home economics units bear to home economics teacher training shows considerable variety and indicates frequent departure from sound principles of organization. Present conditions give rise to unfortunate situations such as that reported by 34 institutions in which members of the resident home economics staff are responsible to the titular head of the home economics unit. In 11 of these institutions this situation is due to the fact that home economics subject-matter teachers are responsible to the head of the department or

school of education rather than to the head of their own subject-matter field.

Of the 34 institutions 17 report members of the home economics staff responsible for home economics instruction to some one other than the head of the home economics unit; 19 report such responsibility with reference to housing and feeding of students; and report that budgetary responsibility is involved and that research is concerned. In only one of 19 institutions reporting on the point is the State home demonstration leader responsible jointly to the director of Smith-Lever extension and to the resident home economics department; in the other instances the home economics department is not concerned. Further, 13 institutions report Smith-Lever extension specialists as having no responsibility and apparently no relationship to the head of resident home economics work. In two institutions the State supervisor of home economics education is a member of the home economics staff, but in neither case is she in any way responsible to the head of the home economics unit.

Failure to articulate all home economics residence instruction, extension, and research through the head of home economics resident instruction is likely to result in undesirable duplication and a variety of standards within the institution. Further resident work should derive material benefits from connection with Smith-Lever extension and experiment station research and the resident home economics staff should be able to contribute to extension and research programs. If for any reason leadership of all aspects of institutional home economics activities can not be exercised by the head of the home economics unit and if the home economics staff is not able and prepared to participate effectively it would seem probable that the character of home economics personnel is not all that it should be or that defective organization is imposing an undesirable handicap upon the home economics staff.

When home economics is regarded as a means of developing home managers prepared to deal with the various tasks of housekeeping and homemaking these matters are likely to be interpreted by the institutional authorities that determine creation and allocation of new units pretty largely in terms of food and clothing. Hence it seems entirely reasonable to them to assign home economics work to the major division of the institution that is concerned with foods and with the production of wool and cotton, that is to the division of agriculture. This reasoning was probably in many instances supported by the fact that when home economics units were established the majority of homes were rural; in some States they still are and in all they constitute a large proportion of the homes. Further, because the college of agriculture contains the Smith-Lever extension service and the experiment station, both of which carry on home economics work, this division of the institution seemed adapted to resident instruction in home economics. When home economics is assigned to the college of agriculture the close relationship that home economics extension under Smith-Lever services and the agricultural experiment station under the provisions of the Purnell Act,

should have with resident instruction may be facilitated. We find, therefore, that home economics curricula are set up in the college of agriculture in 3 institutions and in departments in 15.

When home economics instruction is conceived in terms of utilizing subject matter derived from home and family relationships as a medium for a combined humanistic and scientific college education it is entirely logical to set up an independent major division of home economics coordinate with the other schools and colleges of the institution. In 19 instances such organizations are reported by the home economics units of the land-grant institutions. In this connection it is interesting to note that the home economics work of eight of these institutions was originally assigned to the college of agriculture; more than one-third of the home economics units originally placed in the college of agriculture have become major divisions of home economics. To this number should probably be added another division of home economics that is connected with the college of agriculture for administrative purposes only. It appears that the affiliation of home economics work with the college of agriculture has provided opportunity in many instances for rather free development. Further evidence also points in this direction, since many of the home economics units still in colleges of agriculture are well developed and exercise a degree of autonomy far in excess of the self-control permitted to other subject-matter departments.

The tendency to desire organization as independent divisions is shown by the fact that 12 of the home economics units that are not organized as major divisions desire to become independent schools or colleges within their institutions. Eight of the home economics units that express this desire state, however, that they do not regard their present organization affiliation as especially unsatisfactory. It may be, therefore, that the wish to make the home economics unit an independent one is in some instances a conventional notion of what is needed rather than an indication that home economics objectives are such as to require separate control. It should be fairly obvious that "freedom" and "independence" might be unsatisfactory both for home economics and for the institutions when the actual local situation and home economics preparation to exercise the full responsibilities of independent major division are not sufficiently weighed. In what ways and under what circumstances an independent administrative unit for home economics can excel in the accomplishment of the objectives of home economics must be defined and demonstrated in terms of institutional situations and home economics resources before it can be accepted and adopted as a standard by any individual land-grant organization.

The four assignments of the home economics units described are typical. It frequently happens, however, that in a single institution the home economics work directed to the attainment of different purposes may be assigned to a number of more or less appropriate major divisions. Thus home economics work may be conducted in a single institution by as many as three different schools or colleges—arts and sciences, education, and agriculture—although the dual situation, agriculture and education, is more common.

One test of the actual position of home economics in institutional organization is the line of administrative responsibility that connects the home economics unit with the chief administrative officer of the institution. If the home economics unit deals directly with the president, a considerable degree of administrative autonomy is implied.

On the other hand when home economics matters must pass through a number of subordinate administrative heads before reaching the president it is relatively safe to assume that the immediate heads of home economics work may frequently be compelled to modify their objectives and activities in accordance with policies and attitudes determined primarily upon grounds other than those of development of home economics purposes. However, the validity of such reasoning is considerably modified for the land-grant institutions because approximately half of these institutions are State universities and the remainder separate land-grant colleges. Of the 17 institutions in which the home economics unit reports directly to the president only 3 are State universities and of the 20 institutions in which the home economics unit is administratively responsible through the dean of a major division, usually the college of agriculture, only 3 are separate land-grant colleges and in 1 of these cases (Pennsylvania State College) the institution is in effect the State university. In view of the fact that the dean of the college of agriculture in a State university occupies a position in many ways, although not exactly, comparable to that of the president of an agricultural college, it would seem that a considerable number of the home economics units have immediate access to administrative officers of extensive authority.

It is probable that the interposition of a dean between the home economics unit and final administrative authority works quite as frequently to the advantage of the home economics unit as to its disadvantage. This is especially likely to be the case when the intermediate officer is the dean of the college of agriculture who is responsible for the Smith-Lever extension service and the agricul-

tural experiment station which both carry on home economics work. In a properly administered organization the home economics unit will gain strength from the relationships with extension and research that should be facilitated through the dean of agriculture. Detailed examination by subsequent pages of this report of the responsibility and powers of the home economics unit in selection of staff, management of the budget, and determination of offerings should reveal whether in these important functions home economics is unduly restricted by the existing lines of administrative responsibility.

The official relationships of home economics to the registrar's office might well be indicative of the place of the unit in the institutional organization. However, the facts as shown by institutional reports reveal little that is of special significance. Although the home economics unit and the registrar's office are in the great majority of cases jointly concerned with evaluation and transfer of credits and with the recommendation and approval of substitution of courses these relationships are normally those that exist between a subject-matter department and the institutional office of record.

Quite apart from formal organization the institutional estimate of the home economics unit is revealed to a considerable degree by the extent to which the unit is represented upon ruling bodies and institutional committees.

The facts concerning these relationships are, therefore, presented. In 34 of the 39 institutions reporting on this point, home economics has representation upon the faculty bodies of the institutions. In four of the cases, however, the head of the home economics unit apparently has no power to vote in such bodies. Membership is quite frequently rather strictly limited by institutional rank. In only one institution are all ranks admitted and in one other all ranks are admitted with the condition that instructors must first serve for a definite term in the institution. Four report that all members of the home economics staff with the rank of assistant professor or above sit upon the faculty ruling body. Apparently in the remainder of the institutions admission is limited to the higher academic ranks.

Forty-two institutions submitted reports concerning the representation of home economics staff members upon general faculty committees. These statements are summarized in Table 1.

TABLE 1.—*Membership of home economics staff on general faculty committees, 42 institutions reporting*

Committee	Number institutions reporting	Head chairman	Head member	Other than head	Other staff member chairman
1	2	3	4	5	6
Catalogue	19	1	16	2	0
Curriculum	21	1	18	2	0
Health	8	0	4	4	0
Housing and feeding of students	14	2	8	4	0
Publications	10	1	5	4	0
Research	14	1	11	2	0
Social life	19	2	10	6	1

Membership in the governing faculty bodies of the institutions gives little indication that in the land-grant colleges the staffs of home economics units have attained a parity with the older, better-developed units of the institutions. Representation is so limited that a query may well be raised concerning the reasons for this situation. The facts that may serve as a basis of judgment in regard to this matter will be presented in the section of this report that deals with the home economics staff.

Representation of college home economics teachers upon institutional standing committees is significant and deserves some comment. In view of a quite common academic conception of home economics and because of the nature of home economics subject matter it would be natural to expect that the largest number of institutions would place home economics staff members on committees concerned with housing and feeding, social life, and health. More than a third of the institutions do, in accord with this expectation, enlist home economics representation upon the committees dealing with housing, feeding, and social life. But the table indicates a much more significant practice than assignment to these committees. More institutions include home economics members upon the curriculum committee than upon any other committee. Faculty work upon the curriculum is one of the most difficult and important matters dealt with by means of committee consideration. That home economics should be represented so frequently in this work is at least testimony by a large number of institutions that the home economics staff is recognized as having a contribution to make. Members of the survey staff who have attended meetings of the home economics section of the Association of Land-Grant Colleges and Universities believe that the earnest and informed discussion of curriculum matters and the proportion of the time given to consideration of curricular problems at these meetings indicate ability to make contributions of great

value to the institutional curriculum committees upon which home economics staffs are represented.

While the catalogue and publication committees are less important than the curriculum committee, the means used to inform the public of the work of the institutions are of primary concern. More catalogues committees include home economics representatives than is the case with any committee other than the curriculum and social life committees.

It is significant, too, in view of the quite frequent judgment that home economics staffs have not yet developed a considerable degree of research ability, that in one-third of the institutions reporting home economics staff members are represented upon research committees. In one case the head of home economics is chairman of the research committee. There is no reason to believe that membership on this committee has been conceded upon any grounds other than ability to contribute to the development and maintenance of high standards of research in the institutions concerned.

Criticism may be directed against the basis that sometimes determines home economics connection with institutional social activities. Too often the part of home economics in social life is conceived in terms of furnishing refreshments for committees, dignitaries, and parties. Its standings and offerings are judged by the palatability of the refreshments. This notion is a survival of the institutional conception that the main objective of home economics is the attainment of skill in cooking.

In so far as home economics representation upon general faculty committees is a valid basis for judgment of the position of home economics in the institutions serious questions may be raised with reference to the situation in four institutions which report no home economics representation upon such committees. Is this due to administrative prejudice? Is home economics in these institutions so undeveloped as to have no organization position which justified faculty committee membership? Or is the fact accounted for by the lack of home economics leadership and by the character of the training and abilities of the home economics staff? These questions can be answered only upon the basis of critical judgment of individual institutions, which is outside the province of a national survey.

Internal Organization

The facilities and the restrictions that are due to the formal position of home economics in the institutional organization serve to promote or to limit definition and attainment of objectives. Nevertheless the internal organization of the home economics unit itself may to a considerable degree counteract apparent favorable or un-

favorable institutional allocation. Thus, while it may be expected that the suitability of the internal organization to the accomplishment of specific objectives will to some extent run parallel to institutional assignment for the promotion of similar objectives, the actual development of home economics may proceed or be retarded under any of the positions to which it may be assigned in the institution. Internal organization is, of course, dependent to a large degree upon the same authorities that determine the general place that home economics occupies in the higher educational program, but aggressive and competent home economics leadership or sympathetic administrative impetus may secure for home economics an organization of such size and of such character as to attain very advanced objectives even though its apparent position in the organization as a whole indicates restricted purposes. Examination of the internal organization of the home economics unit for undergraduate instruction should provide, therefore, some further light upon the questions of institutional objectives in home economics work and upon the effectiveness of the means provided to home economics for meeting these objectives.

Study of the groupings of staff and of subject matter that constitute the departments of the home economics organization involves many difficulties of interpretation.

The survey requested from each institution two entirely distinct records of the list of departments and of the number of staff members in each department. In accordance with the listing furnished by one of these records it appears that in 33 institutions, five of the home economics units have more departments than they have staff members. This is a curious situation difficult to explain under any ordinary interpretation of the meaning of a department. A department implies a definite and distinct organization for conduct of instruction with a responsible head in each case. Multiplication of departments until the number is so great as to require one person to serve as the head of two or more departments is obviously an unwarranted and somewhat deceptive practice. The same record reveals that in six institutions there was but one staff member for each of the departments listed. This also implies an excessive departmentalization since it is fairly obvious that a well-developed program will require at least two persons in the two or three basic departments before the institution is justified in adding other highly specialized departments. However, it is by no means certain that this apparent condition is not due to confusion between curricula and departments by the home economics staffs that furnished this record.

Examination of the second set of records of departments and staffs shows that of 45 institutions reporting, only 15 list home economics as a major division. Of the 15, five institutions either do not pro-

vide definite subdivisions in the home economics unit or failed to record the fact if departments are actually organized. Of the remaining 10 institutions 4 show 3 departments; 3 show 4 departments; 2 show 6; and 1 shows 7. In none of these cases is the number of staff less than the number of departments, but of the 43 departments 30 have heads with the appropriate rank of professor; and others have one or more persons of the rank of professor; and others have one or more persons of the rank of associate professor who may act as heads of the departments; 5 have no members of rank suitable to department leadership. It would appear from both records, therefore, that in a number of the land-grant colleges multiplication of departments has proceeded at a rate not justified by the size of staff and by the academic ranking given to staff members. The significance of this condition with reference to advanced home economics objectives lies in the doubt aroused as to whether the actual organization is in many instances as suitable to the attainment of theoretical purposes as the paper organization would indicate.

Turning from the rather unsatisfactory evidence furnished by numbers of departments and by numbers and ranks of staff assigned thereto, we find somewhat more reliable data in regard to the lines along which departmentalization is determined. Whether these reports do or do not represent actual attainment the statements indicate the trend. Of 33 institutions considered 31 report departments of textiles and clothing; 30 departments of food and nutrition; 12 departments of extension methods; 1 each of physical education and hotel management. These departments indicate by their titles with considerable precision the subject-matter fields with which they deal. It will be noted that the departments that occur with greatest frequency, textiles and clothing and foods and nutrition, are concerned with home activities that may be treated merely upon the level of handicraft skills or that may be presented with objectives more appropriate to higher education.

The remaining departments that occur with greatest frequency are general home economics (twenty-three times), home management (twenty-one times), applied arts and institutional management (each nineteen times), family life (fifteen times). In no one of these instances does the title of the department indicate with any degree of precision the specific subject matter that is appropriate to such a department. Examination of the content of courses and offerings in each of these departments shows the widest diversity of practice and little evidence that similarity of content has been obtained through conventionalized understanding or definition of the field that home-economics personnel assign to these departments.

This apparent failure to standardize the meaning of departmental terminology indicates the need for further study and development of the areas of knowledge that are intended to be included under the titles now used in order that clarity may be attained and common purposes served by analysis and realignment of subject-matter material. As presented in the reports received from the institutions, the internal organization of home economics units throws very little light upon the suitability of the existing organization to the attainment of any specific type of objective. Internal organization needs readjustment for the definite purpose of adapting organization machinery to the accomplishment of very well-defined purposes.

Relationships of Home Economics

The relationships of the home economics unit to other divisions and departments of the land-grant colleges are such that the subject is perhaps more closely allied to home economics courses and curricula than to organization. Yet the interchange of services that exists is of considerable importance in estimating the position that home economics occupies in these institutions. Thirty institutions furnished information concerning courses and services given by home economics for other divisions, and to home economics by other departments. It is interesting that home economics conducts service courses for the medical and nursing divisions in 14 institutions; for the extension service in 11; for agriculture in 7; and for units of arts and sciences in 19. In four institutions home economics conducts service work for the college of engineering. This is excellent evidence that home economics is establishing its subject-matter field in the esteem of other areas of college instruction, although such service by home economics is considerably less than it receives. Perhaps the fact that home economics is thus indebted to other divisions for service work is in part due to its combined social and scientific objectives as largely as to its relatively undeveloped status.

That this interest is not content with or compelled to mere acceptance of courses conducted by other divisions without reference to home economics purposes is evident from the number of instances in which the home economics unit is consulted by other divisions concerning the content of courses that they are giving. Thirty of the arts and science divisions thus seek the advice of home economics in regard to the adaptation of their material to home economics service. The same practice prevails in 17 colleges of agriculture and in 11 schools of education. It will be especially surprising to many to find that in 16 institutions the colleges of engineering have a similar connection with home economics through the service given with reference to home equipment and housing.

The service thus rendered to home economics runs all the way from meat-cutting demonstrations by the animal-husbandry department to lectures on prehistoric weaving by the department of archæology. In one institution the pharmacy department aids with lectures on household remedies. The more extended course work covers a wide range as is evident from the fact that 34 institutions list 167 courses other than those required for the first home economics degree as being offered by other departments to home economics students. All of these courses are closely related to scientific or social phases of the better established aspects of home economics instruction with the possible exception of 24 in music, art, and literature. Further adaptation of the work offered by other departments to home economics students will doubtless be required as the functions of home economics are clarified and as curriculum construction is determined more largely by objectives than by the necessity of utilizing existing materials. On the other hand, expansion of the service that home economics can render to other divisions of the institution depends upon the degree of success attained in efforts to establish new and more thoroughgoing analyses of relationships and combinations of home economics subjects.

Chapter III.—Staff

Considerable confusion in definition of home economics objectives and corresponding variety and unequal development of organization for the accomplishment of objectives are perfectly natural phases in the creation of a new medium of scientific and social education upon the college level. Neither organization nor objectives can be developed, however, except as appropriately trained staffs are employed. The character of the personnel engaged in home economics teaching must of necessity limit and in large part determine the standards and the purposes of home economics work in the colleges. Study of the home economics staff and its management should provide, therefore, an important measure of the progress made and should indicate whether home economics staff viewpoints, training, and management are comparable to the standards in other fields of higher education.

Such study has two phases—first, that which deals with the more or less personal attainments of staff members, and, second, that which deals with the management of personnel. Each of these aspects of staff consideration will be presented in some detail by this section of the survey report.

Personnel Information

A whole series of questions that pertain to the personal experience and training of any group arises when an attempt is made to estimate the competence of the personnel to perform the duties involved in any situation. The survey, therefore, attempted in two ways to secure information that would answer some of these questions. First, the institutions were asked to make summaries and statements with reference to the staffs of each major division. Secondly, a questionnaire was filled out by individual members of the staff. More than 12,000 members of the staffs of land-grant institutions returned this questionnaire. This portion of the home economics survey report is based upon both institutional and the individual reports.

The questions most frequently raised concerning the personal qualifications of the home economics staff that this section will attempt to answer include the following: Is instruction in home

economics being given by young, middle-aged, or older persons? Have they had experience of marriage and in the actual conduct of a home under normal conditions? What education have they had and what teaching, administrative, or business experience? Do home economics personnel in land-grant colleges carry on research or other creative work? Are they interested in and do they associate themselves with the professional and scientific organizations in their fields? In other words, are the home economics staffs of the land-grant colleges live, competent, and energetic, or are they mediocre in ability, vigor, and interest in their work? Each of these questions will be discussed in the order given.

Age.—In any individual case the mere number of years that a person has lived is relatively insignificant as a basis for judging suitability for the job in hand. But youth or decrepitude is significant when either characterizes an entire group.

Approximately four-fifths of the 500 members of the home economics staff included in the institutional returns reported ages. The distribution shows 6 per cent under 25 years of age, 24 per cent 25 to 30 years of age, 46 per cent 31 to 40 years of age, 20 per cent 41 to 50 years of age, and 4 per cent 51 to 60 years of age. In other words 70 per cent of the home economics staff belong to the vigorous years from 25 to 40 and if to these be added the 20 per cent that are from 41 to 50 years of age, 90 per cent of the home economics staff clearly belong to the years that can with no degree of justice be described as either callow or decrepit. In so far as age is an indication the home economics staffs of land-grant colleges should show vigor and ability to adjust to new viewpoints and should be characterized by constructive interest rather than by the iconoclasm of youth or the standpattism of old age.

Experience.—It does not seem necessary to attempt to account for this age distribution. The fact itself is of primary consideration and among the many factors that may determine it only one is of special interest or importance. Has any selective process associated with marriage and family life left in the home economics staffs an undue proportion of women who have passed the age of probable marriage and establishment of their own homes? If this is a corollary of the present age distribution the matter is extremely important for a field of education that centers about home and family relationships. Actual experience of these responsibilities should contribute a desirable element of training to home economics college teachers.

Data on this matter are relatively incomplete. But only 25 of 43 institutions report any married persons upon their staffs. Among 697 members of home economics staffs that reported individually 72 are married and 39 widowed or divorced. Thus 111, or 16 per cent,

have had the experience of matrimony. Of the married members of the staff 39 per cent have children. It is significant that among a group of more than 600 persons engaged in the direction of education that depends upon homemaking for its incentive, so small a number have had experience in the fundamental relationship of marriage. Living in a home as a daughter or sister involves such different relationships from those of wife and mother that the one can not be substituted for the other. It is desirable that institutional and State restrictions upon the employment of married women be removed wherever they exist and that an adjustment of home economics instruction especially be made in order that women actually responsible for their own homes may more easily be employed upon a part-time basis.

Training.—Although the effect of training is in many individual instances inadequately represented by the academic degrees obtained by members of a college staff, the fact remains that for a relatively large group in educational work the degrees held are, in many respects, the most valid basis for estimating the degree of scholarship represented. The home economics staff in the land-grant colleges is no exception. It is, therefore, of special interest that of 697 [1] individual records of the training of home economics staff members, only 30, or 4.7 per cent, have doctor's degrees. Inasmuch as the Ph. D. is the most commonly recognized badge of scholarship and of academic superiority, home economics and institutional administrations may well take measures to employ new members with the doctor's degree or to encourage study while in service which will enable present members of the home economics staff to obtain the Ph. D.

Experience of responsibility for a home, including both married women and those who have had such experience in some other relationship, is also very limited. Only about 35 per cent of the total report any such homemaking experience. Such experience should be valuable for understanding of the problems involved and as a balance to too theoretical teaching of subject-matter to undergraduate students.

A very much larger proportion of the home economics staff has obtained the master's degree, 254 out of 697 cases reported, slightly over 39 per cent. This is encouraging although it is not special cause for pride on the part of a college subject-matter division in view of the rapidity with which the master's degree is being required as a

[1] Of 697 reports received from individual staff members, 553 were employed by their institutions full time; 4 from 75 to 99 per cent; 30 from 50 to 75 per cent; 6 less than 50 per cent of full time; and 104 did not furnish information concerning the per cent of time employed.

preliminary qualification for employment in the better secondary schools.

But a really serious deficiency in the academic training of home economics staffs becomes evident when it is realized that 314, or 48 per cent of the persons employed in this division of the colleges hold no degree higher than the bachelor's degree. When the product of only a 4-year undergraduate course is brought into a division of the college teaching staff in such large numbers, it becomes fairly obvious that no very high standard of scholarship can be maintained. This is true even though the persons selected for such service represent the highest type of undergraduate ability and ambition.

The situation apparently becomes even more distressing when 49, or 7.5 per cent, of the home economics staff is shown by the individual reports not to have attained even the bachelor's degree. But when the additional fact is determined that of these, 41 are distributed among only 12 institutions, criticism for such low standards of employment must be confined to this group of land-grant colleges rather than applied to home economics standards as a whole. Even though all of the persons without degrees may hold teachers' certificates the criticism is but slightly ameliorated since in higher educational opinion teaching certificates are not as yet regarded as acceptable substitutes for college degrees.

The amount of training evidenced by degrees attained may be supplemented by the data concerning the years of training beyond high school possessed by 670 members of the home economics staffs. Two hundred and fifty-four report not more than four years, 280 from 5 to 6 years, and 136 seven years or more.

The proportion of the home economics staff whose highest degree is the bachelor's should be greatly reduced and employment of persons without any academic degree whatsoever should be confined to a few specialized fields in which degree training is seldom afforded.

In spite of the condition revealed by the facts just presented, the situation is not without encouragement. Many home economics staff members have, during the past five years, continued their academic study. During this period 18 heads of home economics departments have received advanced degrees, 3 of them their doctorates. During the same period 4 professors, 2 associate professors, and 5 assistant professors have earned their doctor's degrees, while 118 of these ranks have obtained master's degrees. It is apparent that home economics leaders realize the importance of further and better training for the technical members of the land-grant college staffs. The problem of securing persons of the desired academic training is, however, one of staff management and will be discussed in a subsequent section of this report.

In one aspect of the training of college teachers that is now exciting much interest and discussion, courses in education subjects, home

economics college teachers show a record that can probably be equaled by no other element of the land-grant institutions unless it is by the staffs of schools of education. Of 697 individuals reporting, 7 indicated that they had received no credit in undergraduate or graduate courses in education and 198 failed to give the data. But 78 had received from 1 to 11 semester hours of such credit; 209 from 12 to 23 hours; and 205 twenty-four hours or more. Certainly if courses in education as now given have the values for college teachers that are claimed for them, home economics teachers as a whole have a decided advantage over their fellow teachers in other divisions.

Experience.—Probably teaching experience is the most satisfactory supplement to, and perhaps even a good substitute for study experience on the part of educational folk. No attempt has been made, however, to determine by actual count whether the members of the home economics staff who have had teaching experience prior to their present employment are to any large extent the same as those who are somewhat deficient in academic training. Cursory examination of returns gives the contrary impression that the members of the staff with advanced degrees are those who have had also the advantage of teaching experience in elementary and secondary schools and in colleges.

The extent to which home economics staffs have enjoyed the advantages of such experience is evident from compilations made upon the basis of reports received from the institutions. These show that approximately 30 per cent of the members of the home economics staffs have had elementary school and 61 per cent high-school experience as teachers. The institutional reports are supported by reports from individuals that show 429 out of 647 or 66 per cent have high-school teaching experience. Of these, 372, or over 57 per cent, of the total have high-school experience in teaching home economics. It is interesting to note that 84, or 13 per cent, have had experience as principals or superintendents of schools.

The first-hand knowledge of secondary school work thus indicated should be of special value in the preparation of students for home economics teaching in the high schools and to a certain degree in adjusting college work to the capacities and previous training of entering students.

But probably of even more significance as a supplement for academic training is the experience that the members of the home economics staff have had in higher institutions other than the ones in which they are now employed. According to institutional reports almost 39 per cent have had such prior experience. Of these, 12 per cent had 1 year of experience elsewhere; 40 per cent from 2 to 4 years; 40 per cent from 5 to 9 years; and 8 per cent from 10

to 20 years. Thus selection of staff from other institutions to fill vacancies has been in 80 per cent of the cases from the group with from 2 to 10 years' experience.

But in addition to the value of experience in other institutions is the period of service in the institutions in which members of the staff are now employed. Data were obtained on this matter concerning 355 persons, of whom 91, or 25 per cent, had served 1 year; 124, or 35 per cent had served from 2 to 4 years; 96, or 27 per cent, had served from 5 to 9 years; 42, or 12 per cent, had served 10 to 20 years; and 2, or 1 per cent, had served more than 20 years.

It is interesting to note that more than half of the persons now upon the land-grant college home economics staffs reported have served in their present institutions less than five years. Whether this is an undesirable or a desirable condition is difficult of determination. It may indicate either a relatively rapid rate of turnover or considerable expansion in the size of home economics staffs during the 5-year period.

Although it is impossible to ascribe any specific influence upon the competence of the home economics staff to business experience it is of interest to learn that 67, or over 13 per cent, of those reported upon by the institutions have had such experience. The fact may be of some importance as indicating that a certain proportion have had wider contacts than those of the academic world but this is by no means certain since no means are available for determining the nature of such experience or of discovering whether these members of the staff were selected because of the success of such experience or sought themselves academic employment because it was more congenial than employment in the business world.

Creative activities.—Creative work by the staffs of the higher institutions is not confined to research, although the tendency to emphasize research activity in forming estimates of a college or university faculty sometimes gives this impression. Constructive effort of a creative character may be expressed in a variety of ways. Magazine articles, popular bulletins, and similar forms of interpretation to the public may and do quite frequently constitute a constructive element in educational service. Invention or the practical application of research results is a service that indicates intellectual activity of a high type. Examination of the creative work of the home economics staff is, therefore, not confined to research but is also presented with reference to publications of all types.

A study of the creative work of the home economics staff members in 39 institutions as reported by the institutions for the five years previous to 1928, viewed from the standpoint of writings, shows a total of 31 books produced, 23 research bulletins, 74 bulletins of

popular nature, 109 technical articles, and 116 miscellaneous articles. Seven of the thirty-nine institutions report no publications of any kind during the 5-year period. The maximum number of research bulletins produced by the home economics staff in a single institution during the five years was 4; of technical articles, 34; of books, 8; of popular bulletins, 11; and of miscellaneous articles, 20. Many institutions had only one item of each kind to credit to the home economics staff.

Of the 697 individual reports, 457 do not indicate publications of any character; 52 report publication of research material only; 149 the publication of popular articles only; and 39 have published both popular and research material.

Interest in such work should be stimulated. Home economics needs scholarly material both in the scientific and social aspects of its work. An increase in the amount of interpretative material of more or less popular type is also desirable. It should be one function of college home economics staffs to take the leadership in providing publications of both types and administrators should check to ascertain the possibilities for such development in their institutions.

Further study of the material produced by 24 institutions during the years 1926–27 and 1927–28 shows that among those who have written something are 61 professors, 27 associate professors, 22 assistant professors, and 17 instructors. This is perhaps a fairly typical distribution of such activity among academic ranks. It is interesting, however, to note that instructors of home economics are more active in producing books than is any of the other ranks.

As indicative of the relative development of the various subject-matter departments with the home economics unit, it is significant that of 121 publications produced by this division in 25 institutions, 55 are ascribed to members of the staff in foods and nutrition, 26 came from textiles and clothing; 15 from teacher training; 14 from household management; 6 from applied art; 3 from departments of family life; 1 from a department of health; 1 from related science, and none from a department of institutional management. In 14 cases the departmental source was not indicated.

Affiliations.—Probably study of the membership of any division of a college staff in the scientific or scholarly societies is more significant because of the conclusions that may be drawn from failure to make such affiliations than from the positive and specific benefits that accrue from these associations. Membership is easy to obtain in most instances, requiring little more qualification than ability to pay dues. Yet lack of interest on the part of a large proportion of staff members in association with persons of similar professional employment and in the publications issued by such groups betokens a provincialism and a degree of contentment that are extremely undesirable.

It is significant, therefore, that according to institutional reports, more than 68 per cent of the home economics staff personnel in 43 institutions are members of the American Home Economics Association, the most inclusive of the national professional organizations

devoted to home economics. The impression produced by membership in State teachers associations is also favorable. Thirty-nine institutions report 185 persons on the home economics staff as belonging to such associations. Inasmuch as teacher training is but one aspect of home economics interest this seems to denote a lively association with the local professional groups that represent the teaching interest.

Five hundred and two individuals, or 72 per cent of the total number of such reports received, belong to scholarly and professional organizations. To record membership in associations of less general appeal would merely multiply wearisome details. But it does seem worth while even at the risk of excessive dryness to present the facts in regard to the number of home economics staff members that hold office in organizations of professional character. Holding an office in an organization indicates quite a different degree of active participation and influence than mere membership.

National organizations in which home economics staff members hold office are: The American Home Economics Association with 13 institutions reporting 21 members in office in 1927–28; the American Association for Vocational Education with 4 institutions reporting 4 persons in office; Better Homes in America, in which 3 persons from 3 institutions are holding office. Three institutions report 4 offices on the Board of Vocational Education; 9 report 11 persons serving as officers in the State teachers association; 29 report 57 staff members holding office in State home economics associations; 2 report activity in this direction in the State federation of women's clubs; 6 in State parent-teachers associations; and 1 in the Camp Fire Girls. One institution reports some member of the staff holding office in all of these organizations mentioned as well as in the Girl Scouts. In local organizations the largest interest is shown again in the federated women's clubs in which 11 institutions report members of the staff holding office. Three institutions only, mention such relationship with professional and business women's clubs.

Affiliations of home economics staff members are varied and fairly broad. The fact that the largest number of contacts of this sort is shown with organizations closely related to and associated with home economics work indicates that the staff is devoted to its own profession and that it is participating to a considerable degree in organizations that command the interest and support of women outside the field of higher education.

Of somewhat different character are home economics memberships in honorary scholastic societies. The fact that 54.3 per cent of the total home economics staff are members of Phi Beta Kappa, Sigma Xi, Omicron Nu, and similar organizations indicates a relatively high degree of academic achievement upon the under-graduate level. In other words it seems that a considerable proportion of the home economics staff have shown a high degree of intellectual ability. Selection for these societies is a fairly reliable measure of scholastic ability.

Staff management.—Many elements of home economics staff quality are dependent to a considerable degree upon institutional policies and procedures. Personal attainment on the part of individuals is limited by such management. The possibility of such attain-

ment is to a considerable degree determined by such management. Utilization to the best advantage of the existing abilities and capacities of the staff is a function of management. It is with these aspects of the home economics staff that the following pages will deal. Home economics staff selection, promotion, salaries, rank, duties, improvement, and turnover will be discussed in turn from this standpoint.

Selection.—Because of the variety of places to which home economics units are assigned in land-grant college organization, the channels that must be followed in selection of new members of the home economics staffs are of special importance. The normal procedure in the institutions is that of recommendation by the head of the department to the dean, by the dean to the president, and by the president to the governing board. The position of home economics in the institutions is so varied that it might be expected that the influence of the head of home economics in the important matter of staff selection would show considerable variation and in some cases be so reduced as to become of negligible importance. However, the reports from the institutions do not seem to confirm this reasoning. In the 40 institutions reporting, the head of home economics is directly responsible for recommending new appointments. Even when the home economics unit occupies a relatively subordinate position in the institution, the practice is apparently to depend upon the judgment and knowledge of the head of the unit in choosing new home economics staff members.

The implications of this estimate of the statements made by the institutions are clear. The training, experience, and character of the home economics staff in so far as these are determined by the selection of new personnel during the terms of the present heads of the work are due directly to these heads and not to imposition of undesirable persons upon the home economics staff by deans or other superior authorities. If the character of these selections is inferior or superior to the standards prevailing in the institution as a whole, the responsibility rests largely with the home economics unit itself, except as the unit may be restricted or aided by salary scales that compare unfavorably or favorably with those of other divisions.

Promotion.—Very similar conditions exist with reference to promotions. In 40 institutions the head of the home economics unit is directly responsible for the recommendation. However, promotions can not be made within a single unit or division without reference to other elements in the institution. Final decision with reference to promotion is, therefore, much less likely to coincide with recommendation than is the case in the selection of new members of the staff. Superior authority is compelled by financial limitations and institutional unity to exercise a much larger degree of control.

In other words, the regulation of promotion is an institutional rather than a divisional function.

The principles or policies that have actually operated with reference to the promotion of home economics staff members in the land-grant institutions should be those that operate for the institutions as a whole. According to the home economics reports the factors that determine are securing advanced degrees, length of service, and quality of work in the order named. One institution reports "no definite standards," another that it has "no information" and 10 fail to make any statement whatsoever.

It is interesting in this connection to note that the weight given to securing advanced degrees varies somewhat between those obtained in the institution in which the staff member is serving and those obtained from other institutions. Nine institutions report procurement of advanced degrees obtained within the institution as a factor in promotion, while 19 report such training as a factor when received from outside the institution. Apparently and rather reasonably there is some tendency to regard the new viewpoints, new contacts, and new experiences implied by graduate work at another institution as of more value than the work done with colleagues under familiar conditions.

How home economics staff members have actually fared under the conditions of promotion during the five years prior to 1928 is of interest. Reports from 34 institutions with total staffs of approximately 697 show that 88 have received promotions during the period. Of these promotions 27 were made in 1927–28: 6 to the rank of professor; 9 to associate professor; and 12 to assistant professor. Although so small a proportion of the home economics staff received promotion during the five years the fact is not as important as it seems. A large number of the institutions have very small home economics staffs. With departmentalization carried to the point that it is within these staffs and with appropriate academic ranks assigned to each department the opportunity for promotion is very limited. In larger staffs changes in personnel provide vacancies that may be filled by promotion of lower ranking staff members.

Salaries.—Several theories seem to be applied in the land-grant colleges with reference to the basis of payment of women members of the staffs of which home economics personnel constitutes so large a part. First, there is the principle that equal work and rank demand equal pay for men and women. Second, there is the practice that attempts to adjust pay to the financial needs of staff members which results in a lower range for women who are unmarried (since it is said "they have no families to support") and has the same effect upon the pay of married women (since "they have husbands to aid in maintaining the family"). In the third place, pay may be determined upon the basis of training and creative activity. This principle also tends to lower the average level of home economics compensation in somewhat the same ratio to the remuneration of other staff members that the standards of home economics staff training and creative work bear to standards in other divisions. Whatever theoret-

ical approval may be given to the first of these principles and whatever the arguments that may be advanced against the second, it is difficult to disapprove that institutional management upon the basis of the third method has not resulted in the lower present actual standard.

The facts in regard to the pay of 407 members of home economics staffs in 40 institutions are presented in Table 2. The figures in this table are interesting in the extreme. Three assistant professors and 15 instructors receive less than the pay of a third-grade clerk in the Federal Government service. No one of 35 home economics heads receives more than $6,000, and only 1 receives more than $5,000. More than 80 per cent of the entire group of 407 receive less than $3,000 per year.

Comparison of Table 2 with the salary range derived from reports by 693 individual staff members, is illuminating.[2]

TABLE 2.—*Salary scale—home economics undergraduate staff in land-grant institutions, 1927–28*

Rank	Number receiving—								
	Less than $500	$501–$750	$751–$1,000	$1,251–$1,500	$1,501–$1,750	$1,751–$2,000	$2,001–$2,250	$2,251–$2,750	$2,751–$3,000
1	2	3	4	5	6	7	8	9	10
Dean or director									2
Professor								2	8
Associate professor							2	16	12
Assistant professor				2		9	10	64	24
Associate							1	12	1
Instructor	2		5	1	7	52	32	32	1
Assistant	3	14	6	5	2	2			
Lecturer		1		1		1			
Total [a]	5	15	11	9	9	64	45	126	46

Rank	Number receiving—							
	$3,001–$3,250	$3,251–$3,500	$3,501–$3,750	$3,751–$4,000	$4,001–$4,500	$4,501–$5,000	$5,001–$5,500 [b]	Total
	11	12	13	14	15	16	17	18
Dean or director	1	6	6	8	5	6	0	35
Professor	8	10	5	5	1	0	2	41
Associate professor	10	7	2	1	1			51
Assistant professor	5	14	6					134
Associate								14
Instructor								132
Assistant								32
Lecturer								3
Total	23	31	13	6	2	0	2	407

[a] Dean or director not included in total.
[b] None receives more than $5,500.

[2] Compare also with compensation of graduates of land-grant colleges who have become college teachers, Part V, p. 345.

TABLE 3.—*Salary range of 693 individual home economics staff members*

Range	Number of cases	Range	Number of cases
$100-$499	2	$3,500-$3,999	44
$500-$999	16	$4,000-$4,499	9
$1,000-$1,499	16	$4,500-$4,999	5
$1,500-$1,999	61	$5,000-$5,499	4
$2,000-$2,499	233	$5,500-$5,999	1
$2,500-$2,999	181	$6,000-$6,499	3
$3,000-$3,499	118		

Nor is this situation relieved to an appreciable extent by perquisites received in addition to salaries or by additional institutional earnings for evening classes, extension, or summer school. Of five heads of departments who receive perquisites ranging in value from $60 to $500, only one is in a salary grouping of less than $3,000. Four professors in two institutions are reported with perquisites ranging in value from $135 to $550. Two associate professors in one institution have perquisites with a valuation of $437.50 which adds to their salaries of between $3,251 and $3,500. Ten assistant professors in eight institutions have perquisites ranging in value from $50 to $500. Seventeen instructors in nine institutions receive perquisites ranging in value from $150 to $600. Four assistant instructors in three institutions are listed with perquisites from $200 to a little more than $400. Individual reports show that of 697 cases 38 receive perquisites valued at less than $299; 58 perquisites worth from $300 to $599; 14 from $600 to $899; and 6 of value greater than $900. Additional institutional earnings according to the same reports amount to less than $299 in 26 instances; to from $350 to $599 in 88 cases; to from $600 to $899 in 13; and to $1,200 or more in 2.

Although the idea that college teachers are able to supplement their institutional salaries to a considerable extent by outside earnings is much exaggerated for all major divisions, home economics teachers in college show less general and less remunerative outside activity than their colleagues in other divisions. Of 697 individuals who submitted reports only 19 recorded such outside earnings. Ten of these added in this way less than $299 per year to their institutional salaries; five from $300 to $899; four earned $1,200 or more per year.

Rank.—The practice of substituting the honor of high academic ranking for the material compensation of the pay roll is not unknown in the educational world. This is perhaps a justifiable practice when the method produces the contentment that contributes to the efficiency of staff work. That the ranking of the home economics staff show little evidence of this practice is evident in the distribution shown in the last column of Table 4.

The distribution of rank between professors, associate professors, and instructors shows 11 per cent in the highest of these ranks; 15 per cent associate professors; 36 per cent assistant professors, and 38 per cent instructors. The home economics staff shows a decided weight in the lower ranks. This may be due to relatively low academic training, short periods of service, or rapid turnover. It is not of necessity due to institutional management of the home economics staff in the interest of maintaining a large proportion of the staff in the lower grades.

TABLE 4.—*Present age of staff members of various ranks*

Rank	Number aged						
	Under 25	25–30	31–40	41–50	51–60	Over 60	Total
1	2	3	4	5	6	7	8
Head of department	0	1	6	22	4	1	34
Professor	0	0	16	17	5	0	38
Associate [illegible]sor	0	4	23	21	4	0	52
Assistant [illegible]	3	21	76	24	1	0	125
Associate [illegible]	0	0	6	3	3	0	12
Instructor	11	56	53	8	3	0	131
Assistant	11	13	5	1	0	0	30
Lecturer	0	2	2	1	0	0	5
Total[1]	25	96	181	75	16	0	393

[1] Heads of departments not included in total.

Table 4 also reveals some interesting situations with respect to age distribution among the different academic ranks. The percentage of professors, of associate professors, and of instructors in the age group 31–40 is almost the same, 42 per cent, 44 per cent, 40 per cent, respectively. This may mean either that members of the staff have begun their home economics careers later in life than is usual or that they have not advanced in rank. If the latter is the case, there may be some correlation between this fact and the training secured since their positions were obtained.

The institutional reports concerning the present age of staff members with reference to their academic rank may be supplemented by the record derived from individual staff returns showing distribution of ages at which certain ranks were attained.

TABLE 5.—*Age at which different ranks were attained*

Rank	Age and number of cases							
	19	20–24	25–29	30–34	35–39	40–44	45–49	50
1	2	3	4	5	6	7	8	9
Instructor	3	81	131	64	25	9	4	------
Assistant professor	0	6	42	69	34	19	3	1
Associate professor	0	1	10	22	21	15	5	2
Professor	0	8	11	23	23	11	6	1

Duties and Schedules

At no point has the management of the staff more direct influence upon standards and effectiveness of instruction than in the assignment of duties. Colleges and universities are teaching and research institutions. It is a matter of primary concern, therefore, that as large a proportion of the human energies of the staff as is possible be devoted to these functions. Administration in an educational institution exists for and should be directed to facilitating the activity of the nonadministrative staff upon teaching and research. Assignment of duties and the way the members of the faculty spend their time provide a means whereby the effectiveness of divisional and institutional administrative officers may be measured. Individual teachers have little responsibility in this matter except as their training and abilities make them available for assignment to work that needs to be done.

It is the purpose of succeeding paragraphs to examine the duties performed by the administrative heads of home-economics units, to discuss the nonteaching and nonresearch responsibilities laid upon the home economics unit and to present the facts in regard to the loads borne by faculty members and the activities to which their time is devoted.

Of the 67 different types of duties and functions sometimes performed by the home economics staff and listed in the replies from 42 institutions, there is scarcely one that is not credited to the head of home economics. Only 17 institutions report that any of these duties are performed by clerical assistants, although many of the activities listed are purely clerical in character. Even though more than 60 per cent of the institutions have home economics units composed of 10 or fewer persons, it is very wasteful of the time of a relatively highly paid administrator and teacher to require of her performance of manual and routine duties. It is, of course, not certain in many of these instances of apparent mismanagement of the time of home economics heads that the fault is due to institutional oversight. It has been suggested by various home economics leaders that this condition is in part due to a variety of causes such as the tendency of women to economize wastefully in small things, a mistaken pride in keeping all details in hand which results in failure to delegate work and to organize it effectively, and lack of experience which will enable the director of home economics to classify activities in order of relative importance. However this may be it is evident that a study should be made in each institution of the actual duties performed in order that a reorganization and a reassignment of administrative detail may be made which will not only

prevent waste but which will release the time of trained administrative personnel for the more important phases of staff management.

The duties of the head of the home economics unit thus far discussed relate largely to normal processes that must be carried on in connection with administration of the home economics unit. Of quite different character are certain other nonteaching, nonresearch duties placed upon the unit.

In 10 institutions among 28 reporting home economics is responsible for advising with institutional dormitories.

In seven of these it is the head of home economics (Colorado Agricultural College, Massachusetts Agricultural College, Michigan State College, Montana State College, North Dakota Agricultural College, University of Tennessee, State College of Washington). In three others assistants on the home economics staff perform these functions (these are University of California, Kansas Agricultural College, Oregon Agricultural College). One institution, Montana State College, reports two sorority houses supervised by the home economics head; two institutions, the University of California and Oregon Agricultural College, report that assistants supervise fraternity or sorority houses; one institution, the University of California, reports that home economics assistants also supervise cooperative houses. In Virginia Agricultural and Mechanical College the head of home economics has this responsibility.

In 18 institutions home economics is responsible for the supervising of college cafeterias or dining halls.

In 10 responsibility lies with the head of home economics. (These are, University of Kentucky, University of Maryland, Michigan State College, Montana State College, University of Nebraska, Rutgers University, Oklahoma Agricultural and Mechanical College, University of Tennessee, Washington State College, and University of Wyoming.) In eight others, members of the staff supervise (University of California, University of Illinois, Iowa State College, Kansas State Agricultural College, University of Minnesota, University of New Hampshire, Ohio State University, and Oregon Agricultural College).

It is clear from these reports that home economics is taking a larger part in the actual housing of the student body than was indicated by its membership on committees whose work it is to direct housing and feeding policies.

The connection of home economics with institutional housing and feeding committees is, of course, entirely appropriate. It should be assumed that home economics has something to contribute to these activities and responsibilities in every institution. However, to accompany such connection with direct home economics responsibility for operation of these auxiliary services is quite a different matter. The two functions are in very different categories. If members of home economics are in charge of actual operation of dormitories and dining halls special personnel should be furnished for the purpose or adequate time allowance from teaching duties provided. Distinct instructional values may be obtained for home economics by such connection, but too frequently these duties are

imposed upon a staff already heavily loaded by classroom teaching. The wisdom of comparable assignment of actual responsibility for the business operation of the institution to the school of business, of building construction to the school of engineering, and of the institutional laundry to the home economics department is not assumed. It may be questioned whether the assumption is justified in the case of the operation of dining halls and dormitories.

The distribution of teaching, research, and administrative duties among the staff members gives a picture of the activities of the faculty for which the divisional and institutional authorities are largely responsible. Table 6 shows that this distribution in general is based upon the returns received from 39 institutions.

TABLE 6.—*Distribution of duties of undergraduate home economics staff in 39 land-grant institutions, 1927–28*

Rank	Undergraduate work	Number engaged in—						
		Graduate	General research	Purnell research	Extension	Institutional management	Graduate study	Administration work
1	2	3	4	5	6	7	8	9
Head of department	20	17	10	10	7	5	8	25
Professor	28	25	12	3	0	3	6	12
Associate professor	33	30	11	5	5	5	2	13
Assistant professor	68	38	7	8	8	9	9	22
Associate	22	3	2	0	0	2	3	0
Instructor	86	16	6	5	3	8	14	10
Assistant	10	1	0	1	0	7	4	0
Lecturer	4	2	0	1	0	3	0	1
Total [1]	251	115	38	23	16	37	38	58

[1] Heads of departments not included in total.

Approximately 450 members of the home economics staffs are represented in the distribution of duties shown in Table 6. Almost 57 per cent, therefore, devote full time to resident undergraduate work carrying on no administrative duties, no direction of graduate work, no research, no extension, and are themselves doing no graduate study while in service. It is also interesting to note that about one-fourth of the entire staff represented is directing graduate work. Only 11 institutions report no undergraduate staff member who is not also engaged in graduate teaching. In view of the paucity of Ph. D.'s among the members of home economics staffs it would appear probable that the graduate work in home economics, as in other fields, is upon the master's degree level in most of the land-grant colleges. This inference is confirmed by evidence contained in the part of this survey dealing with graduate work in the land-grant institutions.

Another approach to the distribution of the time of faculty members is that obtained by determining for each of the activities the number of the staff that spend certain proportions of their time upon each. Although Table 7 shows that these facts are based upon the same set of staff members as Table 6 the classification is somewhat different.

TABLE 7.—*Study of division of time of home economics staff members in undergraduate work in land-grant institutions, 1927–28*

Rank	Resident teaching—number giving					Research—number giving					Administrative and committee—number giving				
	1–25 per cent	26–50 per cent	51–75 per cent	76–100 per cent	Total	1–25 per cent	26–50 per cent	51–75 per cent	76–100 per cent	Total	1–25 per cent	26–50 per cent	51–75 per cent	76–100 per cent	Total
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Head of department	17	10	3	2	32	14	5	0	0	19	9	9	11	5	34
Professor	2	6	15	14	37	15	3	0	0	18	19	10	1	2	32
Associate professor	0	12	14	25	51	14	3	1	1	19	26	8	1	0	35
Assistant professor	7	15	17	68	107	17	5	2	3	27	56	5	3	0	64
Associate	0	1	5	6	12	2	0	0	0	2	3	1	0	0	4
Instructor	9	15	10	83	117	15	4	1	1	21	27	4	0	4	35
Assistant	2	6	6	4	18	1	1	0	0	2	6	0	0	2	8
Lecturer	0	1	0	0	1	0	0	0	1	1	0	0	0	3	3
Total[1]	20	56	67	200	343	64	16	4	6	90	137	28	5	11	181

Rank	Extension—number giving					Outside activities and contracts—number giving				
	1–25 per cent	26–50 per cent	51–75 per cent	76–100 per cent	Total	1–25 per cent	26–50 per cent	51–75 per cent	76–100 per cent	Total
	17	18	19	20	21	22	23	24	25	26
Head of department	12	1	2	0	15	29	0	0	0	29
Professor	12	0	1	2	15	29	0	0	0	29
Associate professor	10	0	0	0	10	33	0	0	0	33
Assistant professor	13	4	1	0	18	61	4	0	1	66
Associate	1	0	0	0	1	8	0	0	0	8
Instructor	9	0	0	4	13	36	2	0	1	39
Assistant	0	0	0	2	2	6	0	0	0	6
Lecturer	0	0	0	3	3	0	0	0	0	0
Total[1]	44	5	2	11	62	173	6	0	2	181

[1] Heads of departments not included in total.

These reports from 39 institutions show 59 per cent of the staff of all ranks giving most of their time to resident teaching. The ranks carrying the heaviest teaching loads are the assistant professors and instructors; of the former 64 per cent and of the latter 71 per cent

are giving 75 to 100 per cent of their time to teaching graduate and undergraduate work. Of the total number 71 per cent give 25 per cent or less of their time to research. Very few of the staff give any time to extension, although 80 per cent of the heads of departments devote 25 per cent or less of their time to this activity. The separation of home economics resident and extension staffs that prevails in the land-grant institutions accounts in large part for the unimportant place that extension work occupies among the duties of the resident home economics staffs.

All ranks share in administrative and committee work, but it is indicative of the relatively undeveloped condition of home economics divisions that the heads of only 5 of the 84 home economics units represented devote more than 75 per cent of their time to administrative work. Slightly more than 50 per cent give less than half their time to administration.

If the facts upon which Table 8 is based were compared with the actual hours of class work reported for these members of the home economics staff, it would be possible to translate percentages of time spent upon duties other than teaching into terms of the hour load per week spent by these faculty members upon institutional duties. Unfortunately, it is impossible for the survey staff to make this detailed study, but inspection suggests that some curious situations exist that would repay further investigation.

Distribution of institutional time as derived from the reports of 697 individual members of home economics staffs is shown in Table 8.

TABLE 8.—*Distribution of time of the 697 home economics staff members in land-grant institutions*

Division of work[1]	Percentage of time						
	No reply	No time	19 per cent or less	20 to 39 per cent	40 to 59 per cent	60 to 79 per cent	80 to 100 per cent
1	2	3	4	5	6	7	8
Undergraduates	157	231	22	37	50	41	159
Graduates	179	920	224	72	14	8	8
Research	179	454	26	11	16	2	9
Other creative work	179	459	39	5	3	2	10
Administrative work	172	307	117	48	28	6	19
Extension	178	255	58	7	10	3	186
Public contacts	171	329	190	5	1	0	1

[1] The total number of home economics staff members reporting is considered with reference to each division of work, i. e., undergraduates, graduates, research, etc.

The teaching loads of heads of home economics units and of the different ranks are presented in Table 9.

TABLE 9.—*Range of teaching loads of home economics staff members of 38 institutions reporting, 1927–28*

Rank	Class hours—number having									Student clock hours—number having					
	5 or less	6–10	11–15	16–20	21–25	26–30	31–40	41–50	Total	Less than 100	101–200	201–300	301–400	401–500	Total
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Head of department	8	12	5	2	2	1	1	0	31	12	5	7	3	0	27
Professor	4	5	7	3	2	1	0	1	23	4	9	3	4	2	22
Associate professor	2	9	14	13	2	1	1	0	42	9	11	11	5	3	39
Assistant professor	4	17	23	33	5	4	1	7	94	17	22	26	16	10	91
Associate	0	3	7	2	0	0	0	0	12	1	10	1	1	1	14
Instructor	8	20	30	26	9	5	0	3	101	11	24	22	25	12	94
Assistant	4	8	2	0	2	0	0	0	16	5	2	1	0	2	10
Lecturer	1	2	0	0	0	0	0	0	3	2	0	0	0	0	2
Total [1]	23	64	83	77	20	11	2	11	291	49	78	64	51	30	272

[1] Heads of departments not included in total.

A study of Table 9 shows a third of the 31 heads of home economics units carrying 6 to 10 class-hours per week. Another fourth carry less than five hours. Almost half of those reporting show less than 100 student clock-hours per week. It is apparent that home economics heads are keeping in touch with the student body through some teaching. This is made possible and indeed necessary by the fact that the size of home economics staffs in such a large proportion of the land-grant institutions is small.

Of the staff of all ranks 8 per cent have a class-hour load of less than 5 hours; 23 per cent from 6 to 10 hours; 29 per cent from 11 to 15 hours; 27 per cent from 16 to 20 hours; 6 per cent from 21 to 25 hours; 3 per cent from 26 to 30 hours; less than 1 per cent from 31 to 40, and 3 per cent from 41 to 50 hours.

Among the most important features of institutional management of the staff is the provision made for maintenance and improvement of faculty quality by means of attendance at professional meetings, study while in service, and leaves of absence for graduate work elsewhere. These matters are of special significance for the home economics unit in view of the need for research experience and development of higher standards of staff training.

Reports from 39 institutions show a total of 206 home economics staff members in attendance at professional meetings of one sort or another during 1928. These institutional reports are confirmed by individual statements which show 317 staff members of 697 in attendance upon such meetings. This is a very good representation indeed, approximately half of the home economics staffs. It is evident that such meetings must be attended more generally by the lower academic ranks than is usual with many of the institutional divisions. How-

ever, further examination of the reports shows that this participation in professional discussion was more largely due to the individual initiative of staff members than to substantial institutional encouragement. Two-thirds of the reports show that the head of the home economics unit paid her own expenses to such meetings and that more than half of the professors and instructors were also unassisted by the institutions. Although differences in local conditions and in the accessibility of institutions to the usual centers for professional meetings make uniformity of practice in regard to travel of staff members impractical, many State and institutional regulations that now restrict out-of-State travel should be removed and more serious efforts should be made to secure funds to assist staff members to retain their professional associations by attendance at important educational gatherings. The more remote the institution is from the usual meeting places, the greater the need for such institutional assistance. Perhaps keener administrative appreciation of the importance of such contacts might result in the development of regional conferences that might be attended at less expense or at any rate might result in more urgent efforts to secure important meetings at places more convenient to their institutions.

Provision for graduate study within the institution in which staff members are employed is reported by 27 institutions. However, three institutions definitely state that the practice is not allowed. That there is relatively little liberality in adjusting staff duties in order to provide time for such study is evident from the fact that only 6 of the 27 that permit it encourage the practice. Undoubtedly attendance at institutions other than those in which the staff are employed has decided advantages. However, study within the institution itself is preferable to conditions of institutional management which discourage attempts at self-improvement.

This matter is of special importance in view of the fact that so few of the land-grant colleges have institutional provision for leave for study. Only 12 of 30 institutions reporting indicate that home economics staff members have been entitled to such leave during the past five years. During this period in 11 of these institutions 26 members of the staff actually received such leave with pay or part pay. Five of these were heads of home economics units, 8 professors, 3 associate professors, and 10 assistant professors. In addition 14 institutions report that 26 home economics staff members took leave equal to sabbatic leave during these years but without pay. Six were heads of departments, 1 a professor, 3 associate professors, 10 assistant professors, 1 associate, and 5 instructors.

It is apparent that the tendency to stay on the job is not seriously affected by institutional staff management. The extent to which

home economics staff members obtain fresh surroundings, and new experiences by shifting about between institutions is, of course, an important factor in the expenses incident to rapid turnover. Perhaps more generous provision of leave for study would prove less expensive than the continuous process of hiring and training new home economics teachers.

Turnover.—During the same 5-year period for which leaves were reported, a total of 124 home economics staff members, exclusive of heads of department, left to take teaching positions elsewhere; 41 to go into business; 64 have married and left their institutions. A total of 229 changes. The largest turnover is among instructors. This is serious since these are the young and vigorous element in the staff and should provide the stimulating influence of new blood.

No home economics staff members have been retired with pension during this period, according to reports from 27 institutions. Five have been retired without pension. Only five of the total staff in all institutions reporting have died during this period. Only two institutions report no change in staff in the 5-year period. Both of these, however, have very small staffs.

Table 10 shows the distribution of turnover among different ranks for the 5-year period 1923–1928.

TABLE 10.—*Distribution of turnover of home economics staff members for the 5-year period 1923–1928 in 27 land-grant institutions*

Rank	Staff members	Number					
		Leaving past 5 years			Resigning in past 5 years with salary under $1,800	Retired in past 5 years without pension	Deaths in past 5 years
		To take teaching positions	To take business positions	To marry			
1	2	3	4	5	6	7	8
Head of department	7	5	1	1	.....	.....	.....
Professor	10	4	3	3	.....	.....	.....
Associate professor	6	4	1	.....	.....	1	.....
Assistant professor	56	26	13	14	.....	1	2
Associate	7	3	1	1	.....	.....	2
Instructor	113	56	10	32	11	3	1
Assistant	65	17	8	9	31	.....	.....
Lecturer	3	.....	2	1	.....	.....	.....
Total [1]	260	110	38	60	42	5	5

[1] Heads of departments not included in the total.

The home economics staff in land-grant institutions during the past five years has had a very large turnover. Factors operative are the low salaries paid and slow promotion, the increased interest of commercial firms in the home economics trained woman, offering larger salaries to successful people; marriage, which must always make fairly large inroads where the staff is composed to any considerable extent of young women; and the competition among colleges for

persons who have proved their worth. Constructive staff management might easily reduce the effect of some of these factors.

The emphasis of the present administrative viewpoint in regard to staff management is probably indicated with considerable accuracy by the aspects of such management that are apparent in the plans presented by 30 institutions for the development of their staffs during the next 5-year period. The points listed in descending order of frequency follow:

1. Increase in size of staff	17
2. Increase of the number of departments	9
3. Advanced study and travel	8
4. Better training of the staff	7
5. Provision of time for creative work	6
6. Addition of research workers to staff	5
7. Staff promotion	5
8. Increases of salaries	5
9. Require master's degree	4
10. Arrange for sabbatic leave	3
11. Require attendance at State and national meetings	2
12. More clerical assistance	1
13. Reorganization with head for each department	1
14. Require successful experience	1
15. Relief from heavy teaching loads	1

Ambitions for numbers and size are mentioned twenty-six times by these plans for development and six times with direct implication of better balancing of all aspects of home economics work. Phases of staff improvement that throw the burden of meeting higher requirements upon the individual staff members are mentioned by these plans for the future twenty-two times. Adjustments and arrangements by means of exercise of administrative action looking to better conditions and opportunities for the staff receive attention in 21 instances. It may be that the nature of these aspirations affords no legitimate basis for criticism. Certainly practically all the points suggested by the facts presented by preceding portions of this report as desirable steps are mentioned one or more times by this group of institutions. Criticism of desire for growth or of determination to require individuals to fit themselves properly for their duties would not be justified. Nevertheless, the fact that improvement through better exercise of divisional and institutional management is mentioned but twenty-one times raises the question as to whether the possibilities and the responsibilities of such means are fully realized or accepted.

Chapter IV.—Physical Facilities

Under modern conditions the impractical character of the popular saying about Mark Hopkins and the log becomes apparent in every element of the combination. Knowledge is so varied and so highly specialized that the accomplishments and interests of a small staff will bring to students an entirely inadequate measure of knowledge and wisdom. Seekers after learning are so numerous that the log must be developed into large and expensive buildings. The teaching process as a pouring out on the part of the teacher and absorption on the part of the student has given way to student learning through personal experimental experience with the materials of knowledge; laboratories and libraries are an essential factor that must be added to Mark and the log.

The fact that home economics objectives are in process of development is reflected in the character of its housing in the land-grant colleges. Although 18 of the institutions report their departments housed in 22 buildings used exclusively for this purpose, relatively few of these buildings were constructed with the specific requirements of modern home economics service in mind. Sixteen home economics units share buildings with other divisions, and in these instances expedients have in most cases been used to adapt the housing to home economics use.

Among the 22 buildings which are clearly shown by reports to be used exclusively for home economics instruction, 2 were erected before 1890; 5 between 1900 and 1910; 10 between 1911 and 1920; and 5 between 1920–1928. One institution, the State College of Washington, reports a new 5-story home economics building under construction. The space provided is to be ten times that in the present building. Among buildings used exclusively for home economics instruction, considerable range in valuation is noted. At the University of California, a 3-story building erected in 1908 is reported to be valued at $17,000. A 2-story building at Colorado Agricultural College erected in 1910 is valued at $46,000. At the University of Nebraska, a 3-story building erected in 1908 is valued at $55,000. At Kansas State Agricultural College, three buildings, one built in 1885, one in 1908, and the other in 1921, are valued at $79,000, $70,000, and $125,000, respectively. At Cornell University, the 4-story building in use since 1911 originally cost $154,000. At the present writing the central unit of a new building is under construction, the cost to be $475,000. At Oregon Agricultural College, two 3-story buildings erected in 1913 and 1920 are valued at $61,300 and $143,769. At the University of Minnesota, the department of home economics is housed in a 4-story building constructed in 1916 and valued at $9,000. The home economics building at Oklahoma Agricultural and Mechanical College erected in 1920 is valued at $200,000. The University of Tennessee reports a 4-story

building for home economics erected in the year 1926, costing $200,000. Michigan State College has a comparatively new 4-story building erected in 1923-24 valued at $350,000.

The number of rooms used for home economics undergraduate instruction varies greatly among institutions. In 11, or about 32 per cent, of the 36 institutions reporting, fewer than 10 rooms are available for home economics work; in 3, or 8 per cent, between 10 and 15; in 6, or 16 per cent, between 15 and 20; in 7, or 20 per cent, between 20 and 30; and in 10, or about 30 per cent, more than 30 rooms are in use. Five of the 10 institutions have more than 50 rooms used for home economics undergraduate instruction.

Adequate office space is essential in order that staff members may have opportunity for uninterrupted work and conference. In one institution, no office space is available for home economics staff members; in two, one office is provided for seven persons; in another, one office is used by six staff members. In but 4 institutions among the 37 reporting is there an office for each staff member. Office facilities are inadequate.

More important than number, age, and value of buildings in which home economics is housed are the provisions made for student experimental experience of individual effort in the fields with which home economics instruction is concerned. Such facilities in home economics are libraries, laboratories, nursery schools, home management houses, and those provided for practice work in medical schools and hospitals. Each of these will be discussed in turn.

Because of the relatively small size of most home economics units in the land-grant institutions and also probably because in so many instances the work is largely dependent upon the literature of other well-established fields, few of the home economics units have their own departmental libraries. Only 12 of 33 institutions reporting have library facilities of this type. The central library provides service and since the head of home economics is in 40 institutions responsible for recommending the purchase of new books in her field the opportunity is given to build up and to maintain an adequate collection wherever funds are sufficient. It should be noted in this connection that unless full advantage of this opportunity is taken by the head of the home economics unit, responsibility for inadequate collection rests to a large degree upon her shoulders.

Laboratories

In a field of study so much concerned with sciences as is home economics, laboratories must make up a considerable part of the teaching facilities. Among 38 institutions there are 402 laboratories in addition to home management houses and nursery schools, used in the direct teaching of home economics subjects.

One hundred and sixty-eight, or 42 per cent, of all laboratories are used for demonstration and experimental work in food preparation and service, food selection, dietetics, and other nutritional studies. One hundred and nineteen, or

29 per cent, are equipped for practice work in clothing and textiles. Fifty-one, or 12 per cent, for design and other practice work in connection with applied arts; 24, or 6 per cent, in institutional management laboratories, among which are cafeterias, and dining rooms for institutional service. Another 6 per cent were designated by the institutions as research laboratories equipped especially for research work. Twelve, or 3 per cent, are home management laboratories equipped and used for studies in selection and use of household equipment. Five institutions report laboratories fitted especially for practice work in house furnishing; four report home nursing laboratories.

Two hundred and eighty-five, or two-thirds of all the laboratories, are equipped for group work; 159 for individual work. This indicates a tendency to equip many laboratories as far as possible like home kitchens and home situations. It is not many years ago that all food laboratories in home economics schools were equipped with individual stoves and utensils but to-day there is a decided tendency to abandon the individual unit in favor of equipment that emphasizes less the difference between the laboratory and the home situation. Research laboratories are equipped for individual work but since this is on a different plane than undergraduate work, similarity to home situations would be a disadvantage.

The largest number of laboratories reported by any one institution is 33 (at Iowa State College) 9 of which are used for foods work; 9 for textiles and clothing; 10 for applied arts; 3, home management; 1, institutional management; and 1, vocational education. Oregon Agricultural College reports 32 laboratories: Ten for foods; 8, clothing and textiles; 3, applied arts; 3, home management; 3, institutional management; 1, research, and 1, housing. One institution, Ohio State University, reports 22 laboratories; Michigan State College, 21; University of Nebraska, 18; University of Minnesota, 17; University of Wisconsin, 15; South Dakota Agricultural College, 14; 2 institutions, University of California, and Oklahoma Agricultural and Mechanical College, 13; 2, Cornell University and University of Missouri, 12; 3, Montana State College, Colorado Agricultural College, and State College of Washington, 11; 2, North Dakota Agricultural College, and one other, 10; Rutgers University, 9; University of California at Los Angeles, 8; 2, University of Kentucky and West Virginia University, 6; 3, Rhode Island State College, Virginia Agricultural and Mechanical College; and University of Nevada, 4; 7 institutions, or 20 per cent of those reporting, are equipped with 3 laboratories each; and 1 institution shows but 2 laboratories, 1 for foods and 1 for clothing.

The number of laboratories that are used for graduate work as well as undergraduate instruction is significant. One hundred and fifty-one, or 37 per cent of all laboratories reported, are used for graduate as well as for undergraduate work. If the graduate work done is to any great extent upon the research level, it would seem that the appropriate techniques and equipment should depart considerably from those required for undergraduate work in which similarity to home situations is at present a determining factor.

Nursery Schools

The establishment of nursery schools in connection with home economics departments has a threefold purpose, namely: To give preparental training to students majoring in home economics; to give opportunity for parents to observe scientific methods of guid-

ing young children; and to provide for research in child development and behavior. Thirteen institutions report nursery schools in operation during the year 1927–28.

They are Alabama Polytechnic Institute, University of California, Iowa State College, Kansas State Agricultural College, Michigan State College, Purdue University, University of Nebraska, Cornell University, Ohio State University, Oklahoma Agricultural and Mechanical College, Oregon State Agricultural College, University of Tennessee, and University of Wisconsin. The Colorado Agricultural College maintains a nursery school during the summer session. Home economics departments in two other institutions report nursery schools established in the fall of 1928.

In seven institutions the nursery school laboratory is situated in the home economics building; in two, in home management houses. Four institutions report separate houses rented or owned for the purpose of a nursery school laboratory set-up.

Children who attend the nursery school are selected from a number of sources. Twelve of the 13 institutions report selection from the families of faculty members; 12, that children are selected from among those of well-to-do parents; and 5, that children in the nursery school are from among the poorer homes in the community. Most institutions choose from at least two of the three groups mentioned. Since the nursery school is a laboratory for the study of child behavior, a more accurate picture can be obtained from a mixed group of children than from the study of those who have been too highly selected from among one group.

The importance of the preschool period demonstrated by recent studies has been one of the newer discoveries in the field of psychology. For this reason the children enrolled in the nursery school are between 1½ and 5 years of age; most of them under 4 years of age. They come to the nursery schools in the morning and remain for varying lengths of time.

One institution reports that the children remain in the nursery school only two and one-half hours (University of Nebraska); two institutions report three hours (Oregon Agricultural College, Purdue University) a day for five days of the week. At Oklahoma Agricultural and Mechanical College and Alabama Polytechnic Institute, the children remain four hours; at Cornell University, University of Tennessee, Michigan State College, Kansas State Agricultural College, and Iowa State College, six hours; at Ohio State University, and the University of California, they are in attendance seven hours each day for five days of the week.

During this time they are guided in play and in various tasks to stimulate certain types of development and to establish desirable physiological habits.

Among the 13 institutions 49 staff members with special training in child development, child psychology, and child care have charge of the nursery school. Among their duties, in addition to the guidance of children and training of students, are conferences with parents. In the majority of nursery schools weekly conferences are held between parents and specialists in the various fields of child guid-

ance. Three institutions report that both parents are urged to attend the nursery school at least once every quarter for conference with instructors and for observation of the nursery school techniques. Study groups of mothers are generally organized and maintained in order to relate the work of the nursery school to that of the home. These study groups are valuable in bringing to the teachers in the departments a fuller knowledge of the child's home environment, habits of behavior, and an understanding of the emotional life of the child. The majority of institutions report that cooperation between parents and staff is maintained by specialists in foods and clothing, who confer with mothers in regard to diets and proper clothing for children.

In this work the nursery school staff is aided by the department of education in eight institutions; the department of physical education in five; and the department of psychology in eight; the department of sociology in four; medical school in two; dental school in one. In two institutions the English department cooperates by giving stories and readings suitable for preschool children; in one the music department, by studies in rhythm; in four, the department of physiology cooperates; and in one, the department of bacteriology. Here is evidenced a fine type of cooperation for the purpose of bringing scientific information in the various fields to bear upon the problems of child guidance and child behavior.

Financing of Nursery Schools

Nursery schools in 5 of the 13 institutions are financed by receipts from fees paid into the department on the basis of the children attending. These are the University of California, Michigan State College, Oregon Agricultural College, and the University of Wisconsin. The University of Wisconsin reports that gifts of small apparatus are received from mothers and that the larger types of apparatus are purchased with the interest money from a memorial fund. The food which is prepared and served to the nursery-school children by the students in nutrition and dietetics, is paid for by the mothers. At Oregon Agricultural College the blanket laboratory fee of $4.50 per student per term covers all courses for home economics majors. The Michigan State College reports that the food for the children in the nursery school is purchased already prepared at wholesale price from the Women's Commons. In the University of California a fee of $10 per month is charged each child attending the nursery school. Among the remaining eight institutions where nursery schools are a part of the laboratory equipment for teaching courses in child care and development the receipts are from fees charged on a "per child" basis, laboratory fees for students taking the course in child development, and the home economics budget.

The student fees range from $1.50 to $20 a quarter; the fees for children from $5 to $10 a month. In seven institutions the fee per child is $5 or less per month. In six the fee is between $6 and $10 per month per child; in one, Oregon Agricultural College, $10 per child is charged for a six weeks' period of instruction in the nursery school. One institution, the University of Minnesota, reports the home economics department closely associated with the Institute of Child Welfare. The home economics department provides the part time of two people on the staff of the institute.

Expenditures for nursery school work in 1927–28 among the 13 institutions maintaining these laboratories for the study of child development were on the whole very small, according to reports from 11 of the 13 institutions. One shows a total expenditure of less than $100; one, between $250 and $300; one, between $400 and $500; two, between $575 and $625; four, between $1,300 and $1,800; one, between $2,500 and $3,000; and one, between $6,500 and $7,000.

Nursery School Staff

The number of members on the staffs of nursery schools varies from 1 to 11. Two institutions report but 1 member; four report 2; three, 4; two, 5; one, 6; and one has 11 resident staff members. In every instance persons serving on the nursery school staff have had special training for their work, either graduate work in child psychology or nursery school education, or special training in child development. Many of the staff are reported to have had home economics training in addition to the other specializations. This is indicative of careful choice of those who are, not only to guide the children under their care, but to instruct parents in regard to child care and development. It appears also that actual home situations are perhaps more closely related to laboratory practice and instruction in child training and development than is the case with any other phase of home economics instruction. It is probable that the same cooperative methods and techniques might be employed profitably in the study of clothing for the family, food for the family, family finance, and family relationships. Less artificial situations in the schoolroom and laboratory should be developed thereby.

The interest that home economics departments in land-grant colleges are taking in child study is shown by the fact that only eight institutions report that no provision is made in the course of four years' work in home economics for any child study. The nursery school occupies the center of interest in this type of education.

Seventeen institutions that do not have nursery schools have various arrangements whereby home economics students may study child development and care. Five give no opportunity for laboratory work or observation, but confine the instruction in this field to discussions and reading on the subject. Several report that visits to local kindergartens and primary grades offer opportunity for stu-

dents to observe child behavior. Others, that the child in the home management house offers the laboratory opportunity to students for practice in child care. Still others report that parents cooperate by permitting students to study their children.

Home Management Houses and Apartments

To give opportunity for students to correlate methods and principles taught in their various home economics courses, home management houses and apartments have been established by divisions of home economics in 32 land-grant colleges. Although a few such laboratories were in existence before 1920, most of them have been set up since this date. The objectives given by all the 32 institutions are well expressed in a report from one where the three chief aims of the work in the home management house are, "first, to provide a home setting for characteristic administrative and technical problems; secondly, to provide a demonstration unit, in which are provided desirable equipment; and in the third place to provide a unit that shall function as a social unit in community relationship."

Two institutions, Iowa State College and Oregon Agricultural College, own more than one home management house. Iowa State College reports three and Oregon Agricultural College two. Most of the home management houses (21) are owned by the institutions and are on the college campus. The valuations of grounds and buildings range from $4,000 to $35,000.

Students occupy the home management house in groups varying in size from 3 to 15. The length of time one group of students remains in the home management house for practice work varies greatly among the 32 institutions. In Montana State College, where five students occupy the house at one time, taking full charge of all the management of the home, the practice period is from three to four weeks. At the University of Minnesota, it is three months. At Utah Agricultural College and the University of Tennessee, the practice period is 12 weeks. In three others, almost this length of time is spent in the practice house. Each home management house or appartment has at least one instructor in residence who lives in the house with the students and supervises the practice activities of the girls. The University of Maine, Louisiana State University, and State College of Washington, each report two supervisors.

Most of the home management houses and apartments are open for the whole of the school year; two institutions, however, report them in use only three months during 1927–28. Three report the houses in use for only five months during that year.

It is the practice of about one-half the institutions maintaining practice houses, to give to the students upon entering, printed or typed outlines giving full details of conditions and requirements of the work which they will undertake. Several institutions submitted copies of these printed forms. Some contain much detail and seem not only to acquaint the student with the main divisions of work in the house, but work out many problems for her. While the use of an outline is valuable in the saving of time and preventing confusion, the detailed directions including menus in certain groupings and classifications according to costs reminds one of the arithmetic book which has the problems worked out for the student. Prob-

ably an outline containing the essential details of position of rooms, equipment, and responsibility, and order of procedure for the work under main or general headings, is all that is necessary. The students themselves, should have a part in planning the division of work, the menus, in fact much that pertains to the life of the girls when in the house. One institution, State College of Washington, begins its detailed plan which is presented to the students before they begin their practice work, by statement of aims of the course, which are: "To apply principles and training in home economics courses to solving the problems of home management for a small group; to develop standards of efficiency that are practical for the homemaker who does her own work; to give opportunity for appreciation of home problems; to give opportunity for getting reliable records and data."

In most of the practice houses, the girls carry on all the housekeeping activities of the average home. Heavy work, such as cleaning, snow removal, and furnace work is done by extra help. Fifteen of the 32 institutions report that the home management houses are used for other purposes than instructional work. Twelve report using it as a demonstration house during better homes week. Most of the institutions report that the home management house is open to visitors at any time and is useful as a demonstration throughout the school year. It would be interesting and significant to know how many visitors there are during the year and how much is being done by the several home economics departments to acquaint homemakers of the community with the work being done in the home management practice laboratories.

The cost of practice work in home management houses is met largely by laboratory fees or fees for board and room which the supervisor and students living in the house pay. But 13 of the 32 report funds to cover costs taken from the home economics budget. Among these, all but one report small sums; this one reports a larger item for the rental of the house. Ten institutions report reimbursements from State and Federal Smith-Hughes funds varying in amounts from $250 to $773. The amounts most often reported are between $350 and $400. Four of the 10 institutions received Smith-Hughes money in 1920; 8 in 1925–26; and 10 in 1927–28.

The total expenditures for home management houses in 11 institutions for which complete figures are available for the years 1920–1928, are shown in Table 11.

TABLE 11.—*Total expenditures for home management houses in 11 land-grant institutions, 1920–21 to 1927–28*

Year	Total	Maximum	Minimum	Average
1	2	3	4	5
1920–21	$24,668	$8,405	$513	$2,243
1925–26	22,313	7,980	225	2,028
1927–28	24,120	6,667	200	2,193

In order that students living in the home management house during the practice period may not be overburdened with the schedule of studies it is lightened and credit given for the home management practice work.

In just how far experience in entertaining, in management of household finance, and housekeeping duties attendant upon everyday life, is valuable to the young woman living with a group of other young women of about the same age, and under the direction of a supervisor, may be estimated in some measure by the reports of its value from all institutions mentioned. In every case, except one, the supervisor or person reporting is most enthusiastic over this method. It is at best an artificial situation, but one which is the best substitute for the home situation that has thus far been worked out. So much human behavior is determined by emotional responses occasioned by situations in which the relationships are so entirely different from this experience among a group of young girls that some of the greatest problems in family life are not even touched in home management houses. Practice in home management houses is valuable, however, in helping the student to find out for herself (and she must find out for herself if the experience is to be valuable), the physical problems and duties attendant upon everyday management of a home. In addition its gives opportunity for her to build attitudes toward home management and capacity for responsibility in these duties under the direction of a trained supervisor.

In order more clearly to approximate the actual home situation and give young women an opportunity to have practice work in child care and feeding, 13 institutions have a small child in the home management house. The Oregon State Agricultural College, University of Minnesota, and Iowa State College report more than one child cared for each year by the students. The children range in age from 3 months to 15 months; the majority are 1 year of age. They are, in most cases, loaned to the departments of home economics by children's homes, and are adopted or returned at the end of the school year. Opinions of members of the home economics staff differ decidedly in regard to the advisability of students caring for little children during their work in the practice house. Some are very enthusiastic and believe such practice gives a much-needed opportunity for students to observe the development of babies of this age, to have experience in caring for, feeding, clothing, and guiding a young child. Those who oppose the practice do so on the grounds that with nursery school facilities available it is not necessary and expensive; that the child is too often regarded as a plaything; and that his development is hampered by too many changes among the persons who care for him. Opponents also con-

tend that fallacious deductions are made under the supposition that such an arrangement simulates home conditions. On the other hand it is maintained that the practice is worth while from the standpoint of the child's physical welfare and as a demonstration of results of proper physical care without consideration of the value in giving young women experience in the care of a little child. From the standpoint of the emotional development of so young a child, the opinion of psychologists is not entirely favorable to the practice. Some studies are now being made to find out, if possible, comparative changes which take place in the child living in a normal home where father and mother, and perhaps brother and sister, are present and those which occur when the child develops in a situation other than that of the normal family group.

In addition to laboratories and special units such as the nursery schools and home-management houses devoted exclusively to home economics instruction, certain phases of home economics require experimental and practice work in association with other elements of the institutions. This is notably the case of advanced work in dietetics. Hospitals and medical schools either directly connected with the institution or affiliated more or less informally most frequently serve home economics needs.

Cooperation of Home Economics with Hospitals and Medical Schools

A study of the reports from 42 institutions shows that 7 have made provision for student dietitian practice in local hospitals. They are Washington State College, University of Minnesota, University of Maryland, Iowa State College, Connecticut Agricultural College, University of Hawaii, and the University of California. The State College of Washington reports that hospitals take students at the end of the junior year for summer work to offer insight into hospital dietetics, but that student dietitians go to the East and Middle West for training. The University of Hawaii has a similar arrangement.

Only one institution reports its relationship with a local hospital unsatisfactory. The reason given is the faulty organization of the hospital diet course. Two of the seven report hospital practice work engaged in after graduation; three during undergraduate years; three do not specify time. In only one case is the practice period less than three months; four report it six months in length; one, the University of Maryland, has an arrangement with Johns Hopkins whereby students are at the hospital for a 9-months' practice period.

Eight institutions report arrangements for student dietitian practice with hospitals some distance away. They are Connecticut

Agricultural College, Montana State College, Kansas State Agricultural College, University of New Hampshire, Cornell University, University of Wisconsin, University of Hawaii and the State College of Washington already mentioned. Colorado Agricultural College and the University of Kentucky report students accepted at hospitals in nearby cities, but that no formal affiliation exists.

Of the 42 institutions reporting, 24 have no arrangement for hospital practice. Fourteen of these give the training of hospital dietitians as a secondary aim of home economics education; five as a primary aim.

Though much of the fundamental theory of dietetics can be gained from textbooks and in school laboratories this theory can in no wise take the place of experience in the hospital situation. Sooner or later, all institutions expecting to train effectively professional hospital dietitians must make provision for hospital practice.

Chapter V.—Financing

Objectives maintained as ideals may be ever so carefully worked out and enthusiastically championed but practical realization will depend upon the adequacy of resources devoted to provision of a competent staff and suitable physical facilities. On the other hand, financial resources that should be adequate in amount may fail to serve the needs of the home economics units if poor management results in expenditures that are poorly directed to accomplishment of definite objectives. When objectives themselves are vague, confused, and contradictory no consistent basis or principle of economical financial expenditure is possible and the tendency is to confuse economy with parsimony. Financing the home economics work of an institution has, therefore, two rather distinct aspects, the phase that concerns institutional fiscal policies as they relate to home economics, and the phase that relates to the responsibility of the home economics unit itself for expenditures that are within the control of the head of this unit. Presentation of the facts about fiscal matters can not be separated upon this basis, but the interpretation of any factual situation must usually consider the implication that may be drawn both from the standpoint of institutional policy and from the standpoint of internal administration of the home economics unit. It is the purpose of this examination of home economics financing to present facts concerning budget making, the size of home economics budgets, sources of income, cost accounting, and expenditures that may be significant from the standpoints indicated. A budget plan for expenditures is used by the majority of home economics departments in land-grant colleges. Forty-two institutions give detailed information concerning budget initiation and approval, adjustments within the budget, the checking of bills, and keeping of cost records. In 40 of the 42 institutions reporting, the director of home economics is directly responsible for the initiation of the budget for home economics undergraduate instruction. Three institutions, the University of Missouri, the University of Delaware, and the University of Maryland, report budget committees, composed of members of the home economics staff, cooperating

with the director in budget planning. Sixteen institutions among the 40, report that the heads of various subject-matter divisions within the home economics unit assist by presenting statements of the needs of their departments to the director.

In 21 of the 40, the dean of the college in which the department or division of home economics is situated cooperates in the initiation of the home economics budget. In 22 the president of the institution is also a cooperator. In 11 institutions four different administrative heads are reported to have a part in the initiation of a plan for home economics expenditures. In but two institutions are first plans for a home economics budget made without consulting the department.

The home economics budget is considered by a committee in 29 institutions. In 12 home economics has representation on the committee; in 17 no member of its staff is a member of the committee.

The foregoing data present a picture of complex relationships and responsibilities. The director of home economics and members of her staff serving as department heads within the home economics unit know well the needs of the department. She is or should be in close touch with the financial situation, not only in her department and college, but in the institution as a whole, and should have an important share in shaping the home economics budget with regard to the general development of education within the institution and with regard to development of a unit best qualified to accomplish accepted home economics objectives.

Fifteen of the thirty-nine institutions reporting show the following progression in the approval of the home economics budget. Members of the home economics staff heading subject-matter departments, as clothing and textiles, foods and nutrition, home management, and others, present the financial needs of their several departments to the director, who in turn presents a combined budgetary plan to the dean of the college in which the department or division of home economics is situated. The dean then presents it to the president of the institution. In nine other institutions the director of home economics submits her budget directly to the president. Reports from 15 other institutions present varied steps in budget procedure. In 5 of the 15 the business manager is concerned; in 1 the director of home economics and the dean of the college where the department is situated jointly submit the home economics budget to the dean of the faculty, who then presents it to the president.

One institution reports a conference of deans or directors of all the divisions, previous to the planning of the budget. This would make for understanding of the general financial situation as well as plans of development in different departments. Such a plan lends itself well to small institutions, but might be unwieldy in larger colleges.

Twenty-three institutions report the home economics budget planned for one year only; 20, for two years; 2 for a longer period. A budget planned for more than one year in advance has many

advantages. A budget should do more than present a picture of money needs of the immediate future. To be of larger use, it should show a clear and well-developed plan of educational service. Developed in this way, it will not only act as a guide in the wise use of money by the department, avoiding wasteful expenditures, but will show to the public supporting the institution, the purposes of the various units. In other words, a budget should be a means of avoiding a hand-to-mouth existence. The director of home economics and her staff, because of their close acquaintance with the details of home economics, should be able to interpret its needs in budgetary form more practically than any other agency in the institution.

Amount of Budget

The total budget for home economics work in 22 land-grant institutions in 1915–16 was $343,125. The maximum budget at that time in any one institution was $45,000; the minimum $184. This shows a very great range in amounts of money available for home economics instruction. The same sort of situation is shown in the reports for 1927–28, for which year the total home economics budget for 37 institutions is shown to be $1,625,183. The maximum budget for an institution is $324,695; the minimum, $1,249.

In 1915–16, six, or more than one-fourth of the institutions reporting, were working on budgets of less than $5,000; four, or about one-fifth of these reporting, had budgets ranging from $5,000 to $10,000. But two report between $25,000 and $35,000; and but three show budgets of between $35,000 and $50,000; three institutions report between $10,000 to $15,000.

Among the 35 institutions giving figures on budgets 10 years later, or in 1925–26, only one reports a budget of less than $5,000. Three, or 12 per cent of those reporting, as against 20 per cent 10 years before, show budgets of more than $5,000 but less than $10,000. However, 19 institutions, or approximately 50 per cent, show annual budgets of less than $25,000. Nine institutions report budgets ranging between $25,000 and $50,000; four between $50,000 and $75,000; one between $75,000 and $100,000; and two have budgets of more than $100,000. The maximum home economics budget among institutions in 1925–26 is reported to be $202,883.

In 1927–28, two years later, the maximum home economics budget is shown to be $324,695. One institution, however, is shown still to be working on a budget of less than $5,000. Two, or 8 per cent of the 37 institutions, show for 1927–28 budgets between $5,000 and $10,000; eighteen, or about one-half, show budgets of less than $25,000. The number having larger budgets shows an increase. Eleven now report budgets of more than $50,000, while only seven were in this class for 1925–26. Six of the eleven show budgets ranging from $50,000 to $75,000; two from $75,000 to $100,000; and three, above this figure.

Sources of Income

Because of insufficient data, the facts concerning sources of income could not be studied for the entire group of home economics units. However, 16 institutions were able to furnish information that appears to be fairly reliable. (See Table 12.)

TABLE 12.—*Receipts for home economics undergraduate instruction in 16 land-grant institutions*

Year	Total income	Total from—						
		Federal appropriation	State appropriation	Private funds	Fellowships	Sales and service	Student fees	Other
1	2	3	4	5	6	7	8	9
1915–16	$255,136	$14,951	$221,524	$250	0	$5,513	$11,661	$1,237
1920–21	519,176	36,480	462,251	0	0	13,778	27,160	9,257
1925–26	824,695	52,062	581,522	[1] 23,250	$1,100	99,887	48,975	17,899
1927–28	1,033,009	50,936	755,606	[2] 30,250	600	122,708	54,164	18,745

[1] $23,000 to Cornell from Laura Spellman Memorial Fund of Rockefeller Foundation.
[2] $30,000 to Cornell from Laura Spellman Memorial Fund of Rockefeller Foundation.

Slightly more than 92 per cent of the income for home economics instruction in these institutions was received from State and Federal appropriations in 1915–16; 91 per cent from the same sources in 1920–21; 77 per cent in 1925–26; and 78 per cent in 1927–28. Home economics undergraduate instruction is financed to a greater extent by public funds than is instruction in the land-grant colleges generally. The financial report for 1927–28 covering 52 land-grant colleges shows 59.5 per cent of the cost of undergraduate instruction in these institutions met by income from State and Federal appropriations. Seventy-eight per cent of the cost of undergraduate instruction in home economics in 16 land-grant institutions was provided for by income from these sources. The per cent cost of undergraduate instruction met by both Federal and State appropriations is decreasing.

Among the 22 institutions reporting for 1915–16, but one shows any income from private sources, a sum of $250. Four of the 35 reporting show a total of $24,792; the maximum $23,000, the minimum $250. In 1927–28 among 37 institutions reporting, three show receipts from private funds totaling $41,558. Twenty-three thousand dollars in 1925–26 and $30,000 in 1927–28 represent grants from the Laura Spellman Memorial Fund of the Rockefeller Foundation to the College of Home Economics at Cornell University for research in child development.

The income from sales and services presented by Table 12 for 16 institutions shows considerable increase of income from this item doubtless due to establishment of cafeteria and similar dining service by home economics departments in connection with instruction in institutional management. Incomplete reports of other groups of institutions confirm the fact of increase of this item of income and are accounted for upon the same grounds.

Student fees constitute a very small percentage of the total income for home economics undergraduate instruction. Among 16 land-grant colleges in the year 1915–16, but 4.5 per cent was from this source; in 1920–21, 4.9 per cent; in 1925–26, 6 per cent; in 1927–28, 5.2 per cent. Although low cost to the student is to be expected and is desirable in public higher institutions it is desirable that considerable uniformity of such expense be maintained as between the different units within a single institution. When institutional cost accounting has reached the point where it is able to determine with considerable accuracy the relationships between the actual expense involved in providing education for a single student in each of the specific curricula offered, it may be possible to adjust student fees in different curricula upon some basis proportioned to such cost. This refinement of accounting has not yet been attained with reference to undergraduate work and uniformity of fees within a rather restricted range seems desirable even though the percentage of total cost contributed by the student may thus vary considerably between the different curricula and units.

To carry on an education business as well as other businesses, cost accounts are necessary. In the handling of both bills and cost accounts striking evidence is shown of lack of clerical assistance for home economics or poor organization within the department.

Reports from 41 institutions show that in 31 the heads of home economics units are directly responsible for checking bills. In 4 of these, no assistance is given; in 3 others, the directors are assisted by secretaries and in 18 by other members of the staff. Keeping of cost records for the home economics unit is a much more important matter, one in which the head of home economics should be vitally interested. It is important, therefore, that 24 institutions report that she is responsible for this work. In only three institutions, however, she is assisted by a secretary. In eight institutions, the University of Illinois, Iowa State College, Kansas State Agricultural College, University of Nebraska, Michigan State College, Ohio State University, Oregon Agricultural College, and the University of Wisconsin, a secretary is in charge of this work which permits the head of home economics to devote her attention to interpretation and use of the information thus obtained.

Expenditures for undergraduate instruction in home economics were under two headings: (1) Operation and maintenance showing (*a*) salaries and wages, (*b*) materials and supplies; and (2) capital outlay showing (*a*) equipment and apparatus, and (*b*) replacement of equipment.

Table 13 shows expenditures for these items in 17 land-grant institutions for which complete records are available for the period between 1915–16 and 1927–28.

TABLE 13.—*Expenditures for undergraduate home economics in 17 land-grant institutions*

Year	Operation and maintenance				Capital outlay [1]				Total
	Salaries and wages	Per cent	Materials and supplies	Per cent	Equipment and apparatus	Per cent	Replacement of equipment	Per cent	
1	2	3	4	5	6	7	8	9	10
1915–16	$197,913	84.0	$30,783	13.0	$6,892	2.9	$119	0.1	$235,707
1920–21	412,033	82.5	58,935	11.8	23,684	4.7	4,905	1.0	499,557
1925–26	554,018	85.2	70,004	10.8	18,214	2.8	7,792	1.0	650,028
1927–28	611,675	82.7	66,843	9.0	55,634	7.5	5,856	.8	739,909

[1] Does not include cost of building.

The 17 land-grant institutions represented in Table 13 are not the same as those shown in Table 12. Therefore, no attempt should be made to balance the figures presented by the two tables. It was not possible on account of incompleteness and inaccuracy to assemble enough of the same institutions to show trends in income and expenditures with any degree of accuracy.

More than 75 per cent of the total expenditures for home economics in 17 institutions was for salaries throughout the period 1915–16 to 1927–28. This is considerably above the proportion spent for this item by land-grant institutions as a whole, but it should be remembered that the home economics budget is not charged with many elements of institutional expenditures that must be included in getting similar percentages for the entire institution. For 1927–28, home economics expenditures for materials and supplies was 9 per cent of total expenditures. The capital outlay for equipment and apparatus for home economics in 1927–28 was 7.5 per cent of all expenditures. In these cases, as in the case of salaries, no comparison can be made properly with the figures for institutional expenditures as a whole.

More important than amounts and proportionate distribution of expenditures are the methods used in making allotments of available income to the different subject-matter fields. It is at this point especially that the correlation between financing and objectives should be especially evident.

Among 42 institutions reporting on the methods used for allotting funds to various home economics subject-matter departments, clothing and textiles, home management, foods and nutrition, and others, 25 indicate funds divided according to the requests of the heads of these departments. The majority of the 25 indicate that in so far as possible the allotments for the various departments are equalized. All indicate conferences in staff meetings where the needs of the

departments are discussed and adjustments made when necessary. One institution reports funds allotted following the conferences between deans of other divisions, the president, and comptroller of the institution. Another reports that each department spends first, according to its earned income, and secondly, that any excess is allotted as needs are presented by each department. Another institution, where the earned income basis for the allotment of funds is reported, the amount of laboratory fees paid into the general college fund is used as a gauge of expenditures to be incurred. One institution reports that since no increase in department funds except for research has occurred in the 5-year period previous to 1928 the problem of the director of home economics has been one of following existing allotments.

The occurrence in a number of reports of the expressions, "minimum needs," "most urgent needs," and similar phrases, indicates not only the care with which funds are allotted and used but suggests retarded development and, therefore, curtailment of service.

Expenditures by Subject-Matter Departments

In reports from 41 institutions showing expenditures by subject-matter departments, that is, applied art, foods and nutrition, textiles and clothing, and others, 24 report funds so divided for the year 1927–28; 16 that funds are not subdivided on this basis; 1 that no systematic record is kept. But 3 institutions among the 41 show expenditures by subject-matter departments for 1910–11; 4 for 1915–16; 12 for 1920–21; 22 for 1925–26; and 24 for 1927–28. The practice of keeping records of expenditures by departments seems to be coming into general use, although analysis of the reports shows that figures given under many of the headings do not show the emphasis that the institution is putting upon the subject. For instance, in one institution the equipment and supplies for family life and child development are listed with those purchased for home management. In a number of instances expenditures for applied art and textiles and clothing are grouped. Comparisons have little value, therefore, because of the large number of variable factors and combinations presented.

Table 14 shows the amounts spent, both for permanent equipment and consumable supplies by 10 institutions during 1920–21, 1925–26, and 1927–28, for certain subject-matter departments. Too much weight, however, should not be given to the figures and facts presented by the table. They are indicative rather than conclusive.

TABLE 14.—*Home economics expenditures by subject-matter departments in 10 land-grant colleges*

Item	Household art	Cafeteria and lunch room	Family life and child care	Food and nutrition	Home management	Textiles and clothing	Institutional management	Total
1	2	3	4	5	6	7	8	9
1920–21								
Permanent equipment	$19,051	$87,445	.....	$31,958	$14,942	$43,044	.....	.....
Number of institutions reporting in above figures	6	4	.....	8	4	8	6	.....
Consumable supplies	$6,692	$21,407	$1,256	$26,364	$4,929	$19,243	$3,047	.....
Number of institutions reporting in above figures	6	4	1	8	3	7	5	.....
Total for 1920–21	$25,743	$108,852	$1,256	$58,322	$19,871	$62,287	$3,047	$269,378
Per cent of total	10	40	1	21	8	19	1	.....
1925–26								
Permanent equipment	$23,398	$73,620	$19,500	$66,504	$25,629	$41,117	$15	.....
Number of institutions reporting in above figures	6	4	3	10	5	9	1	.....
Consumable supplies	$8,907	$26,873	$5,478	$32,395	$4,743	$22,982	$1,116	.....
Number of institutions reporting in above figures	6	4	4	10	6	9	2	.....
Total for 1925–26	$32,305	$100,493	$24,970	$98,899	$30,372	$64,099	$1,131	$352,269
Per cent of total	9	29	6	28	9	18	1	.....
1927–28								
Permanent equipment	$16,401	$107,236	$22,670	$65,521	$20,558	$34,011	.....	.....
Number of institutions reporting in above figures	5	.....	4	10	6	8	6	.....
Consumable supplies	$11,608	$75,521	$6,813	$32,868	$6,164	$22,932	$2,629	.....
Number of institutions reporting in above figures	5	.....	5	10	6	7	3	.....
Total for 1927–28	$28,009	$182,757	$29,483	$98,389	$26,722	$56,943	$2,629	$424,932
Per cent of total	7	43	7	23	6	13	1	.....

Included in expenditures for subject-matter departments shown in Table 14, are those for permanent equipment, office furniture, consumable supplies, and salaries. Light, heat, and room are not included. Some institutions included salaries under permanent equipment; others under consumable supplies. Percentages were worked out on the basis of total expenditures for permanent equipment and consumable supplies. In the department of household art, total expenditures decreased from 10 per cent of all subject-matter department expenditures in 1920–21 to 9 per cent in 1925–26 and to 7 per cent in 1927–28. Expenditures for cafeteria and lunch room decreased from 40 per cent of the total expenditures for all departments in 1920–21 to 29 per cent in 1925–26; an increase to 43 per cent is shown for the year 1927–28. The large proportion of expenditures shown for the year 1920–21 undoubtedly may be accounted for by the installation of equipment which was expensive, but which, once installed could be used over a period of years. It

is interesting and significant that the sales from cafeteria and lunchroom service have increased so perceptibly during these years, although the expenses, judging from a study of these 10 institutions, have not increased to any great extent.

Expenditures for equipment and consumable supplies in the department of family life and child development have increased notably since 1920–21, when they were but 1 per cent of the total expenditures. In 1925–26, they constituted 6 per cent of the total; and in 1927–28, 7 per cent. Expenditures for foods and nutrition work remain practically the same, increasing from 21 per cent of the total in 1920–21 to 28 per cent in 1925–26, and decreasing to 23 per cent in 1927–28. Home management department expenditures likewise have remained in about the same proportion. Eight per cent of the total subject-matter department expenditures went into the home-management department in 1920–21; 9 per cent in 1925–26; and 6 per cent in 1927–28. This drop may indicate the change in viewpoint regarding the teaching of home management from one in which the study of household equipment absorbed practically all the time of students to one which considers the economic and management problems to a much larger extent than formerly. Expenditures for the department of textiles and clothing have decreased from 19 per cent of the total in 1920–21, to 18 per cent in 1925–26; to 13 per cent in 1927–28. This may indicate not only that the expensive equipment bought in the earlier year is still in use, but that such equipment is less needed because less attention is given to construction and more to appreciation and selection of textiles and clothing. The figures for institutional management are very small.

Chapter VI.—Courses

When this survey was planned many of the home economics heads and staffs in the land-grant institutions were requested to suggest phases of study that would be of special interest or value to their work. Of the suggestions made those that dealt with courses and curricula were more numerous and more insistent than those that concerned any other aspect of home economics work. Home economics displayed more concern about its offerings than did any other division of the institutions. Since home economics is in process of development this interest is, of course, natural, but the searching nature of the requests for study and the evidence afforded that the home economics staffs are conscious of the intimate relationship between offerings and definition of objectives seem to justify somewhat more detailed presentation of these matters than has been attempted with reference to other divisions of land-grant college activity.

The institutions cooperated so heartily in furnishing information about courses and curricula that a larger amount of detail has been assembled than can be presented in the space and time available. Much of the data must be treated by this report in a rather general and summary fashion. It is hoped, however, that the specific detail collected may be further studied and supplemented by graduate students and others interested in home economics matters. This report will consider in turn methods and means used by the institutions in determining what shall be offered, the number and types of courses listed, the organization of courses into curricula, and finally methods of instruction.

Determination of Offerings

Five points related to determination of what subject matter shall be offered by home economics deserve separate treatment: First, the administrative processes and considerations that determine offerings; second, relationships to previous preparation of entering students; third, prevention of undesirable duplication between college home economics courses; fourth, means used to determine actual content of courses; and fifth, methods adopted to improve the quality of courses.

The development of home economics objectives and the changes in social conditions and subject-matter fields to which home economics instruction must be adapted make especially important the function of determining what shall be offered. This responsibility, subject to institutional confirmation through agencies of control applicable to all divisions, rests upon the head of the home economics unit in the 43 institutions that report upon the subject. In 39 of these institutions she also finally selects and approves the texts that are used. In practice other members of the staff commonly participate actively in curricular reorganization (28 institutions) and in selection of texts (37 institutions).

An important aspect of changes in and extension of offerings is the initiation of new courses. Thirty of the institutions report that responsibility for initiating a new course is shared by other members of the staff with the director of home economics.

It is, of course, common practice for staff members in all the divisions of colleges and universities to suggest new course offerings and in many instances the desire and ability of a staff member to offer a new course are in effect the determining factors in spite of machinery of control set up to pass upon and unify offerings. This sometimes results in curious specializations of courses and multiplication of minute subdivisions in harmony with the personal interests of teachers rather than in response to definite student needs or institutional objectives. It is interesting, therefore, to list the factors involved in the initiation of new courses according to the reports of home economics heads although these considerations may not in fact always be the determining causes to the extent that the record would seem to indicate.

Among the primary factors that lead to the initiation of new courses first place is given by 28 of 39 institutions to State demand for home economics training, especially for the training of Smith-Hughes teachers. Second, is the amount of money available listed by 21 institutions; third, undergraduate student demand cited by 17; and fourth, requests by graduates indicated by 16. Twelve institutions give primary consideration to demands made by the public schools. Twelve also make decisions upon the basis of staff conviction that new courses are needed to create or maintain the prestige of the unit among higher educational institutions; and closely related to this point is the statement of 11 institutions that new instruction is begun in order to conform to the practice in the majority of land-grant colleges. Of somewhat the same order is the reason given by 10 which regard the opinion of the American Home Economics Association as of first importance in determining what new courses shall be offered.

It is perhaps permissible to suspect that institutions that determine the development and growth of their home economics work upon the basis of "authority" rather than upon the basis of their own situations and objectives exercise little leadership in the creation of college home economics standards and service. In this connection it is probably significant that secondary factors mentioned by the home economics reports as determining new offerings include in order of frequency—opinion of the American Home Economics Association, conformity to departments in the majority of land-grant institutions, and prestige of institution. The value of changing courses or curricula at the instigation of organizations or to conform to opinions and standards set up by organized groups is in direct proportion to the soundness of the principles and practices represented by such opinions. It would be unfortunate for home economics development if practice should become conventionalized prior to the best adaptation of means to the accomplishment of well-defined objectives. Inconsistency and change are much less objectionable than consistency and permanence of practices upon a mediocre level.

It is somewhat surprising that a group as keenly interested in the development of its work as is the home economics group should determine its new offerings to so slight an extent upon the basis of scientific analysis of the activities and interests of women. Several institutions report that this is done. Three institutions reported that the staff is continually at work analyzing the needs of girls as a basis for curriculum development and adjustment, but no evidence was submitted to show whether these studies were merely observations or were carefully controlled and systematic investigations. A few institutions report that students make suggestions, but there is little indication of any thoroughgoing attempts to secure student judgment. Certainly such student reaction as is secured does not lead to the fallacious practice of substituting immature and inexperienced opinion for the trained judgment and wider knowledge of the responsible staff.

Ways of Avoiding Duplication of High-School Work

Duplication of high-school work is not only wasteful in the sense that it takes time in college which might be used in other ways, but it acts in a much more destructive way in discouraging the student. Therefore, ways of avoiding such duplication are important. Among 39 of the institutions reporting on the methods used to insure students against duplication of high-school work, 37 show that they are paying considerable attention to the solution of this difficulty. Only one institution reports nothing done to avoid duplication; another that no satisfactory method has yet been evolved. The majority

of institutions use tests or examinations of one sort or another, together with the examination of high-school notebooks, textbooks, visits to high schools, reports from the State department of education relative to approved high schools in the State, and a valuation of high-school courses by a teacher trainer in home economics to avoid repetition of subject matter given in high schools. Five institutions report using a trial and error method, putting all students into the same courses at the beginning of the year, then regrouping them later on according to demonstrated abilities. Four institutions have separate courses for those who have had home economics work in high school. One reports that students presenting home economics credits from accredited high schools are registered in courses carrying less credit.

From the varied ways in which so large a number of departments of home economics in land-grant colleges are working to avoid duplication of high-school work, it is clear that further systematic study of this problem is desirable. In part, solution probably lies in development of research in home economics that will provide subject matter sufficiently advanced to be distinctly separate in type from that offered in secondary schools. Problems of articulating college and secondary offerings in home economics will nevertheless demand adjustment by the colleges upon the basis of present offerings in both units. In this process the obligation rests most heavily upon the college.

Duplication of Subject Matter in College Home Economics Courses

Of somewhat the same character as duplication between high-school and college home economics courses in duplication between courses offered in the college itself. The former is most serious because it indicates that some home economics instruction in college is of secondary grade, but the latter is just as wasteful and especially reprehensible since it testifies that courses under the control of the home economics unit itself are not designed for the accomplishment of definite home economics objectives.

As specialization develops within home economics, with attendant grouping of courses into subject-matter units or departments, with curricula for each, the problem of avoiding duplication of subject matter in various courses becomes increasingly great. The home economics staffs are attacking this matter with considerable energy by means of frequent revision of courses, observation of classes, conferences, and use of course outlines. Probably in part because of the tentative nature of home economics development, the home economics unit displays more interest in and use of these methods than is the case of the older and better established subject-matter fields. In

more than half the institutions reporting the head of the department of home economics personally observes classes as a means of keeping in touch with the content of courses. Thirty-seven institutions report conferences with department heads other than home economics used as a means of avoiding serious duplication. One institution reports using, in the textiles and clothing courses, a list of objectives as a means of avoiding duplication, and adds further that this is the beginning of a plan to be worked out for all subject-matter departments. Another institution reports a similar system in which the course content is arrived at in the first place through conferences of all divisional teachers.

In the majority of institutions reporting, the course outline method is used to keep in touch with current developments in use of subject matter by the different courses.

Among 42 institutions reporting, 39 report that course outlines are required as a means of checking duplication. In 32 institutions the head of the home economics department reviews the outlines for purposes of revision. In 16 of these, the author of the outline also goes over it with the entire home economics staff. Seven institutions report the course outlines reviewed by members of the staff without the assistance of the director; in 13, the director alone does this work.

One institution reports a group of instructors working on general curricula reconstruction, the membership in which is voluntary, and represents about one-half the staff. It is this group which reviews course outlines presented by their authors. Another institution reports conferences of faculty members in each department of the school, where outlines of courses are discussed and duplication thus avoided. Another reports that plans for courses must be accepted by a curriculum committee before the courses are given. In this way, every course outline comes before a committee which has the opportunity and responsibility for comparison and elimination.

The activity and determination thus displayed in the field of course and curriculum control is highly commendable. But it would probably be more effectively and intelligently carried on if it were placed upon the basis of experimental procedure conducted cooperatively by a number of institutions rather than upon the present basis. In this respect is must be acknowledged that home economics differs very slightly from other subject-matter fields and units in higher education institutions.

Determination of Content

A considerable proportion of the institutions that report concerning methods of determining course content indicate that studies of the work of teachers, dietitians, home demonstration agents, dress designers, tearoom managers, homemakers, research workers, and others, form the basis for the special curricula offered to students pre-

paring to enter these occupations. As might be expected, the majority of the 35 institutions offering special courses to train teachers in home economics assert that an analysis of the current situations in teaching home economics is the method for determining what shall be included in these courses. Thirteen of the 14 institutions offering extension curricula state that they use this method of procedure. Twelve institutions give an analysis of the homemaking occupation as the method used in determining the content of various home economics curricula, while 2 mention an examination of department store openings as a way of learning what is needed and, therefore, what should be included in the courses for persons wishing to specialize in commercial work connected with department store activities. In all the reports, the emphasis in the determination of specialization in home economics offerings is placed upon examination of gainful occupations.

But few institutions report that groupings of home economics courses for specialization are made because of common practice in other land-grant colleges, or requirements set up by outside agencies. Eleven is the largest number of institutions that admit that they follow the practice of determining curricular content according to standards set up by organizations and in these cases it is said that this method is followed only with reference to the general home economics curriculum. There is one exception to the latter statement, however, made in the reports from 20 institutions, specifying that the home economics teacher-training curriculum is made up largely in accordance with requirements set up by Federal and other outside agencies.

Conferences of staff members among themselves, and with those of other departments engaged in teaching service courses for home economics are not frequently given as a basis for determining what courses shall be included in the various curricula. This is a practice which will increase as interest in curricular development grows. That standards set up by groups of professional people should determine in some measure the content of home economics offerings, there is no doubt, but needs in the occupations for which the institution is preparing its students must always be considered if curricula are to show life and a high degree of service. It is, therefore, significant that so many institutions assert their allegiance to occupational analysis as a method of determining content; it is perhaps just as significant that no written accounts of studies of this kind made for institutional purposes were submitted in support of protestations of adherence to the principle although a second request for such studies was made. The seriousness and thorough character of the studies reported may be regarded with some skepticism.

Strengthening Offerings

Various methods are used by departments of home economics to strengthen courses which have a tendency to become dilute as regards subject matter. Those named by the institutions are increase in library facilities, more adequate equipment, a greater degree of correlation between basic subjects, adjustment of prerequisites, combination of two or more courses, staff adjustments, and better trained staffs. Forty institutions report using most of the methods named. This indicates that home economics divisions are not only alive to a need for strengthening courses, but aspire to the use of every means at their command to bring their offerings to a high standard.

Three institutions mention dropping weak courses as means of strengthening offerings. Two mention improvement of staff by giving opportunity for graduate study. Two institutions report conferences of home economics staff members among themselves as well as with those of other departments who are giving service courses to home economics students. One institution reports an examination at the beginning of the course, the setting up of objectives for courses by the students and advanced work being done by the present staff.

The dropping of weak courses or combining of two or more courses already weak does not necessarily constitute a strengthening process, but may emphasize the weaknesses and substitute nothing better. Stimulating and constructive courses may best be developed by a determination and delimitation of objectives, by group review of course outlines, by the employment of carefully worked out bibliographies and other guides for reading, and by the use of carefully selected equipment. It is the relationships between library facilities, adequate equipment, and the extent to which these relationships are discovered and employed in service of objectives that will determine in large measure the strength or weakness of courses. There is something clearly wrong with courses which can not be shown to have well-defined and forceful relationships with objectives.

Classification of Home Economics Courses

More than eleven hundred courses in home economics are reported by 40 of the land-grant institutions. In order to deal with this great number of course units and because something of the nature of the work thus becomes evident it is desirable to group them in accordance with several systems of classification. Unfortunately the limitations of this study make it impossible to classify these courses in accordance with some of the categories that would be most enlightening. The data secured do not permit arrangement of the courses according to their purposes in developing skills, knowledge, or atti-

tudes on the part of students. It is also inadvisable to attempt to group them with reference to whether they serve immediately practical vocational functions or are primarily intended to provide means of personal and social growth. Two types of classification may be considered, however, upon the basis of data available; the practice with reference to definition of courses as elementary, advanced, or graduate; and a classification into subject-matter fields corresponding somewhat closely to the departmental divisions ordinarily adopted by home economics units.

Lower and Upper Divisions and Graduate Courses

Higher education in general is confronted by several situations and conditions that are especially important to an area of instruction so clearly in process of development as is home economics: First, the junior college as a separate unit or as an extension of the public high school is developing rapidly. Graduates of these institutions in increasing numbers will demand admission to the home economics unit of the land-grant colleges with the expectation that they may secure their home economics degrees without special inconvenience or material loss of time. In other words, the land-grant college home economics units will be asked with ever-growing insistence that they adjust their specializations to permit graduates of junior colleges to enter them without handicap and to complete their work in two years.

Second, the level of general education in the United States tends to rise more and more commonly beyond the training afforded by the high school. The affiliation of junior colleges with secondary education is indicative. Should home economics not contemplate reconstruction of its curricula in such fashion as to provide for two years of upper division work to which admission may be obtained simply and easily by general junior college preparation? Should its first two years or lower division instruction in home economics not be intended for those who are not able or who do not plan to obtain degrees but who wish to prepare for the intermediate types of life occupations for which training can be given in two years upon the basis of graduation?

Third, although there is a tendency to start serious specialization at the beginning of the third year in college, graduate work is rapidly becoming something still more highly specialized and requiring content and method distinct from those of senior college courses. Is home economics prepared or tending to direct its further development in harmony with these tendencies?

All these situations are of serious import to those who would determine the future trends of home economics growth. This growth must

take place during a period of general educational transition. Shall home economics attempt a long-time program of development looking to the traditional 4-year college superimposed upon the twelfth grade or shall it venture to anticipate general changes in educational conditions that will take place during the next two decades?

Some indication of the degree to which home economics is aware of these problems is afforded by present practice in division of courses offered into lower division courses and upper division courses, and as providing either undergraduate or graduate credit, in accordance with the formal classification of the student who takes them.

Eighteen of the colleges report that home economics courses are not classified by separation into lower or upper divisions or designated as elementary or advanced work. Twenty-three, however, make this distinction. One of these, Iowa State College, reports junior and senior colleges with elementary courses grouped in the junior college; advanced in the senior college. Eleven of the institutions showing a graduation in courses and classification according to upper or lower division make the distinction by college years, the elementary courses being those offered during the first and second undergraduate years; the advanced courses those offered during the third and fourth years. One institution, Oregon Agricultural College, reports that elementary home economics courses have no college prerequisites, while those of advanced standing have. The University of Wisconsin reports that home economics courses classified as elementary are begun by a general survey course; those of advanced standing, are built upon this foundation.

Whether this classification is really significant or only a formal and perfunctory one is hard to determine. An indication is afforded, however, by apparent failure on the part of the greater number of institutions to insist upon completion by students of lower division work prior to admission to upper divisional classification, and by failure to impose any penalty in the case of students who neglect lower division work until after such time as they obtain upper division ranking. However, five institutions report that upper classmen who take courses in the elementary or lower division group do so with with less credit than is permitted to lower division students taking the same work. On the other hand, 27 institutions make no such reduction and it seems doubtful in these cases whether the course classification into elementary and advanced groups has any very real significance. Incidentally failure to distinguish between upper and lower levels of courses raises the question concerning the validity of such course prerequisites as may be prescribed within the curricula pursued.

Further evidence that home economics courses are not specifically designed to serve the purposes of instruction upon the different

levels of junior college, senior college, and graduate credit is afforded by the fact that of the 1,162 courses offered for undergraduate credit 743 may be taken also for graduate credit. Only slightly more than one-third are given for undergraduate credit alone. Not only is this the general situation when the total number of courses is considered as a single group, but analysis indicates that in only a few of the specialties does the proportion that the number of courses for undergraduate credit only bears to the total number of courses show more conscious differentiation between graduate and undergraduate work. In only two fields are fewer than half of the courses offered available for both undergraduate and graduate credit, in general home economics courses and in health. In the case of the former group of courses only 35.7 per cent are available for graduate credit. This fact, however, can not be interpreted without reservation as representing more careful definition and development of courses in this area.

General home economics deals on the face of it with the general rather than the specialized aspects of home economics instruction. It would seem doubtful whether courses obviously intended for general and survey purposes should ever carry credit upon a level as specialized as graduate work should be. The second phase of home economics instruction that seems to show a more sound realization of distinction between graduate and undergraduate courses is that of health. Only 25.7 per cent of the health courses offered for undergraduate credit may be used for graduate purposes. This proportion is probably more nearly the one that should prevail, yet in this instance the fact has little bearing upon home economics practice, since the health courses offered in home economics constitute but 3 per cent of the total number of home economics courses.

From such evidence as is afforded by facts of the kind just recorded it seems that graduate work in home economics as is the case in other fields in land-grant colleges that have not highly developed graduate schools, is too largely merely a continuation for a longer period of time of the same sort of work that is offered in the undergraduate years. In other words, there is too little distinction between the nature of undergraduate and graduate work. In this respect home economics does not differ from the practice that has commonly been followed during the developmental period of other subject-matter fields and during the early stages of other new colleges and major divisions. Nevertheless, the matter is one that should receive the careful consideration of home economics leaders. Here, as in other phases of retarded home economics development, the solution lies in greater emphasis upon and provision for research work both in the subject-matter field and in the educational aspects of home economics work.

Further classification of home economics courses upon the basis of the customary departmental subject-matter fields serves to indicate the relative emphasis given to the different subjects by land-grant college home economics units. Table 15 summarizes the facts with reference to this classification and also gives data concerning the undergraduate courses that may carry graduate credit.

TABLE 15.—*Emphasis upon various home economics subject-matter units and development of work in the same shown by relative number of courses and semester hours offered by 39 land-grant institutions*

Subject matter	Number of institutions reporting	Courses		Undergraduate courses			Graduate courses		
		Number	Per cent	Number	Per cent	Semester hours credit allowed	Number	Per cent	Semester hours credit allowed
1	2	3	4	5	6	7	8	9	10
Applied or related art	36	188	16.2	70	37.2	442	118	62.8	123
Extension	9	12	1.0	9	66.7	27	3	33.3	5
Family life and child care	31	53	4.6	19	35.8	118	34	64.2	66
Foods and nutrition	39	341	29.3	87	25.5	983	254	74.5	343
General home economics (survey courses)	19	28	2.4	18	64.3	46	10	35.7	8
Home economics education	22	76	6.6	27	35.5	200	49	64.5	90
Home management	37	102	8.8	46	45.1	276	56	54.9	107
Institutional management	20	68	5.9	32	47.1	169	36	52.9	76
Textiles and clothing	39	259	22.3	85	32.8	684	174	67.2	190
Health	27	35	3.0	26	74.3	69	9	25.7	18
Total	.....	1,162	.....	419	.....	3,014	743	.....	1,026

Examination of the table shows, in so far as number of courses offered is an indication, that the emphasis is upon two fields, foods and nutrition and textiles and clothing. Six hundred, or 51.6 per cent, of the 1,162 courses offered deal with these subjects, of which 341, or 29.3 per cent, are in foods and nutrition and 259, or 22.3 per cent, in textiles and clothing. Next in order of number of courses offered is applied or related art with 188 courses, or 16.2 per cent of the total.

In spite of the fact that Smith-Lever extension work provides employment in the field of home economics to a large number of women only 12 courses in home economics extension, slightly more than 1 per cent of the total number of courses, are offered by the 39 land-grant colleges reporting. Inasmuch as the work of home demonstration agents should require rather intensive technical home economics training in a variety of subject-matter fields it is sometimes thought sufficient to emphasize these aspects of preparation. However, the portion of this survey that deals with the land-grant college extension services shows two things clearly, first, that the demand for home demonstration agents will increase greatly during

the next 10 years, and second, that the training of the present home economics extension field force is inadequate. If to these considerations be added the increasing emphasis upon all forms of adult education and consequent development of methods and techniques appropriate to such instruction, it becomes fairly obvious that home economics may well give greater attention to courses designed for the special training of home economics extension workers.

In the past such courses as have been offered have not been popular, but even cursory examination of the situation reveals many reasons for their failure to appeal to students. In many instances they have been makeshifts, only slightly related to actual work in the field by practice opportunities, and even more commonly the tone of extension leaders in the institutions has been one of minimizing the practical benefits and advantages that may result from formal training for the field. So much reliance has been placed upon common sense, tact, and energy requirements for extension service that the actual possibilities of psychological and personnel management instruction have been seriously neglected. If home economics extension is to be developed to the extent and upon a plane that is desirable, training must be given comparable to that of high-school teachers although of quite a different kind and emphasis.

It is also somewhat disconcerting to discover that the courses that are directly related to health constitute but 3 per cent of the total number of home economics courses offered. While it is true that health and sanitation are treated in other groups of courses from both their public and domestic aspects, it is extremely probable that the small number of courses offered directly upon the subject reflect an actual deficiency of emphasis in home economics work. At no point does home economics have a better opportunity to provide upon a nonmedical plane a very extensive and extremely technical body of scientific, legal, and social training that should create attitudes and interests upon the part of students which will operate throughout their lives to the advantage of personal living and community welfare. It is earnestly recommended that home economics leaders consider the possibility of utilizing subject matter in the fields of health and sanitation to a much greater extent than at present as a means of accomplishing the objectives of home economics defined by preceding paragraphs of this report.

Although not a matter that concerns the classification of home economics courses by subject-matter fields, one further noticeable and perhaps significant characteristic or tendency became very evident in the examination of the courses listed by home economics departments for the purposes of this survey. This was the frequency with which the word "selection" was included in the course

titles. Food selection, clothing selection, selection of household textiles and furnishings, and similar titles show the interest being taken in presenting a larger number of courses on this basis. Specialization in industry has taken over in such large part the construction of the materials necessary to clothe, house, and feed the family, that the problem of the homemaker is, and will increasingly be, one of selection. It is becoming more and more the case that choice of commodities and activities must be based upon highly technical knowledge if it is to be intelligent and not simply in response to attractively illustrated advertising.

Chapter VII.—Curricula

A curriculum is merely the bringing together of various elements of instruction so related to each other and to the accomplishment of a common purpose that a definite educational objective may be attained. A curriculum is in effect a planned rather than a chance means to reach a specific desirable educational outcome. Merely to group together a series of courses haphazard and without reference to a purposeful result is not making a curriculum. The whole significance and purpose of curriculum making lies in the assembly and use of materials purposefully. Like a road a curriculum leads from one place to another; its terminal must be definitely selected. A single curriculum can not serve a half dozen major objectives.

It becomes important, therefore, to discover how home economics sets about constructing its curricula, what objectives are set up by each, and how well the specific selection and groupings of elements are adapted to the accomplishment of these objectives.

In discussion of methods of determining offerings some of the administrative processes adopted for the construction of home economics curricula have been presented. The arrangement of these offerings into distinct curricula is usually not rigidly prescribed throughout. Part may be required, part freely elective, or part may be elective within a limited range of choice. Many kinds of combinations and special adjustments are in practice. Thus a basic or core group of courses extending over a 4-year period (sometimes mistakenly referred to as a curriculum) may be prescribed to which various free or group electives may be attached for the purpose of attaining specialized objectives of various kinds. Or the basic courses may be grouped in the first two years and upon these various specialized curricula of two years may be constructed. Under either of these types of course grouping, what the student gets is a curriculum only in so far as the grouping and the succession represent a planned and purposeful means to the accomplishment of a definite educational end.

How many curricula do the various home economics units set up and which ones are most generally offered? Without attempting to determine at this point whether what the institutions call curricula

satisfy the definition given or are in fact something else, we find the following situation. Five institutions report but one curriculum, that in general home economics. Eleven report 2 curricula, 1 of which in 10 instances is the general home economics curriculum and in 9 cases is the curriculum in teacher training. Three curricula are offered by each of 10 institutions; 4 by 7; 5 by 4; 6 by 1; 7 by 3; 8 by 2; and 10 by 1. Three-fourths of all the institutions reporting offer four or fewer curricula.

It would appear, therefore, upon the face of these returns that the land-grant colleges are in most instances attempting to arrange their work into articulated groups and programs for the accomplishment of a limited number of major objectives. However, this apparent conclusion must be considerably modified in view of the variety of major objectives reported in other portions of the survey returns. It appears rather that in many instances so-called curricula are in fact not groups of courses coordinated for the accomplishment of definite objectives. It seems that assemblies of practically all courses available are frequently designated by the term "curricula" merely upon the basis of the predominance of courses in a specific field. Further examination of detail with reference to certain curricula for which data were furnished will afford additional evidence upon this question.

The following list of curricula given by the institutions will serve to indicate those most generally offered and will also provide a convenient order for successive discussions of each. The curriculum in general home economics is listed by 36 institutions; that in teacher training by 35; foods and nutrition by 20; textiles and clothing by 10; institutional management by 15; extension by 14; and applied or related art by 6.

Various others mentioned by from one to three institutions are curricula in physical education, family life, bacteriology, hospital dietetics, research in textiles and clothing and in clothing and art, hotel management, and home management. But these are so infrequently offered that they are of little significance in a study of general practice in home economics curriculum differentiation.

General Home Economics

General home economics is the curriculum named by more institutions than any other. It will be examined, therefore, in considerable detail in order to determine: First, whether general agreement has been reached as to its objectives; second, whether general agreement has been reached concerning the proportion of the total time that should be allowed to required and elected work; and third, whether general agreement has been reached as to its content.

Of the 36 institutions that list the objectives of their general home economics curricula, 33 name home making, thus indicating that in three institutions at least other objectives control this curriculum apparently to the exclusion of home making. Twenty-seven report that general culture is an objective. Although this is a somewhat different objective than the home-making one, the two are not inconsistent. It is of little significance, therefore, that many of the same institutions list these two objectives for a single curriculum. But additional items listed, such as teaching by 12 institutions, hospital-dietetics work by 8, extension by 5, social service and business each by 3, and research by 2, indicate clearly a somewhat amazing confusion of objectives assigned to a single curriculum. It is fairly obvious that several of these objectives are so directly vocational and specialized that a curriculum designed to prepare for home making or even for general culture must of necessity be inappropriate to the attainment of such different purposes. The conclusions that may be drawn are: First, that many home economics units have no clear conception of the functions of a curriculum. Second, that objectives are not clearly defined by many home economics units. Third, that home economics has not reached the degree of common agreement concerning the major objectives of general home economics as would seem to be indicated by the frequency with which home making and general culture are stated as objectives.

Division of time between requirements and electives in the general home economics curriculum.—Quite apart from unity of objectives in the general home economics curriculum it might be expected that a certain degree of agreement would have been reached with reference to the proportionate distribution of the time given in this curriculum between prescriptions in home economics and the sciences and humanities and electives permitted. It was possible from the returns made by the home economics units to compile this information for the general home economics curriculum in only 15 institutions. The results of this compilation are given in Table 16. The ranges shown by the table are significant. The University of Wisconsin requires that 15 per cent of the total requirements for graduation be taken in home economics subjects, while the University of Missouri requires 39.3 per cent, more than twice as large a proportion. However, 9 of the 15 institutions show a range within very narrow limits from 23 per cent to 28 per cent of the total. To the sciences and humanities one institution demands that students give 33 per cent of their credit hours while another requires 65 per cent. The intermediate steps between these extremes are fairly regular. The proportion of the total time allowed for electives shows a still wider range. One institution allows only 10.8 per cent while another per-

mits 51.7 per cent of the total number of semester-hours required for graduation to be elected. However, 10 of the 15 institutions allow their students to elect from approximately 20 to 30 per cent of the total required hours.

TABLE 16.—*General home economics curricula in 15 land-grant institutions*

Instutition	Number of semester hours						
	Required for first degree	In strictly home economics subjects	Per cent	In science and humanities subjects	Per cent	In elective	Per cent
1	2	3	4	5	6	7	8
Alabama Polytechnic Institute	144	47	32.6	63	43.7	34	23.7
Colorado Agricultural College	160	42	26.2	88	55	30	18.8
Connecticut Agricultural College	120	30	25	60	50	30	25
Georgia State College of Agriculture	140	36	25.7	86	61.4	18	12.9
University of Illinois	130	31	23.8	62	47.6	37	28.6
Kansas State Agricultural College	128	37	28.9	65	50.7	26	20.4
University of Maine	140	52	37.8	58	41.4	30	20.8
Michigan State College	132	41½	31.8	59⅓	44.6	31⅙	23.6
University of Minnesota	126	44⅓	34.9	57⅓	45.2	24	19.9
University of Missouri	122	48	39.3	46	37.7	28	23
University of Nebraska [1]	125	32	25.6	54	43.2	39	31.2
University of Nevada	128	34	26.5	76	59.3	18	14.1
Ohio State University	126⅔	32	25.3	70⅔	55.5	24	19.2
University of Vermont	140	33	23.5	92	65.7	15	10.8
University of Wisconsin	120	18	15	40	33.3	62	51.7

[1] General homemaker's curriculum.

In this connection it is also interesting to examine the period in the general home economics curriculum when elections are permitted. The following table was compiled from statements made for the purposes of the land-grant college survey.

TABLE 17.—*Free electives in general home economics*

Year	Number of institutions reporting	Number of semester hours allowed							
		0	1 to 5	5 to 10	10 to 15	15 to 20	20 to 25	25 to 30	Maximum by any one institution
1	2	3	4	5	6	7	8	9	10
First	25	14	5	5	1	0	0	0	[1] 10
Second	29	8	9	6	4	0	2	0	[2] 21
Third	28	1	3	7	8	7	1	1	[3] 26
Fourth	30	0	0	4	6	12	8	0	[4] 20–32 [4] 24⅓

[1] University of Nebraska.
[2] University of Wisconsin.
[3] Connecticut Agricultural College.
[4] North Dakota Agricultural College.

Fourteen out of 25 allow no free electives during the first year, 8 extend the restriction through the second year, and 1 permits none in the third year. Aside from the tendency to restrict electives during the first year the figures show little uniformity of trend.

It is apparent that the general home economics curricula in the land-grant colleges show very little agreement as to what part of the total should be in home economics subjects, what part in the sciences and humanities, and what proportion left for free electives. In so far as uniformity of such distribution is a feature that might be expected in a curriculum with common standards throughout the United States it is evident that the general home economics curriculum does not satisfy this measure of judgment.

Content of General Home Economics Curricula

Statements of objectives may be confused and formal regulations in regard to distribution of time between requirements and electives may vary, but the courses that constitute the general home economics curriculum might be so uniform as to result in a considerable degree of similarity between these curricula in the different institutions. It is desirable, therefore, to apply this test to the actual offerings of the general home economics curriculum in order to determine whether from the standpoint of content this curriculum has a common meaning in the land-grant colleges.

The general reader will find the detail of such a study extremely uninteresting reading, but concrete presentation is so essential to understanding of the actual situation that it is believed home economics staffs will desire even more data than can be given by this report.

The information provided by 35 institutions was sufficiently consistent and exact to justify use in the tabulation of the hours required in the various subjects presented in Table 18 and other portions of this report. These variations have been carefully considered and are due to factors that do not affect the validity of the conclusions drawn or the trends indicated.

TABLE 18.—*Number of semester hours required in general home economics curricula in land-grant institutions*

Institution	Chemistry					Biological sciences					Other natural science				
	1 year	2 years	3 years	4 years	Total semester hours	1 year	2 years	3 years	4 years	Total semester hours	1 year	2 years	3 years	4 years	Total semester hours
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
University of Arizona	8	6	0	0	14			8		8			4		4
University of Arkansas	8	6	0	0	14		6	4		10					
Colorado Agricultural College [1]	10	10	0	0	20	9		9		18		5			5
Connecticut Agricultural College	3	7	0	0	10			4		4			4		4
University of Delaware	6	6	0	0	12		6	6		12		3			3
Georgia State College of Agriculture	8	0	6	0	14	3		3		6		8			8
University of Idaho [1]	0	8													
University of Illinois	10	5	0	0	15		5			5					
Iowa State College	5⅓	6⅔	4	0	16		2	7⅓		9⅓	2				2
Kansas State Agricultural College	5	10			15		13	3		16	4				4
University of Kentucky	10	4			14		8		3	11					
University of Maine	8	8	3		19		8	5		13			5		5
University of Maryland [1]	8	4			12			7		7			4		4
Massachusetts Agricultural College [1]	5.3	2			7.3	2.7	6			8.7			2		2
Michigan State College	8	2⅔			10⅔		5⅓			5⅓		2⅔			2⅔
University of Minnesota	8	4	10⅔		22⅔	6	6⅔			12⅔	3⅓				3⅓
University of Missouri	5	3			8	10	8			18					
Montana State College	9	8⅔			17⅔	6	6			12			3⅓		3⅓
University of Nebraska	8				8										
University of Nevada		6	4		10	3		6		9		4			4
Cornell University	6	4	3		13	18	3			21		6			6
North Dakota Agricultural College	8														
Ohio State University	6⅔	6⅔			13⅓	6⅔	6⅔	3⅓		16⅔		3⅓			3⅓
Oklahoma Agricultural and Mechanical College	6	3			9		4			4					
Oregon Agricultural College [1]	6				6		2			2					
Pennsylvania State College	6	5			11	2	2	4		8		3			3
Rhode Island State College [1]		6			6	3	7	3		13					
University of Tennessee	8				8		8⅓			8⅓					
University of Vermont [1]	10	6	3		19	2	8	7	2	19					
Virginia Agricultural and Mechanical College	8⅔	1⅓	5⅓		15⅓	2	2	4		8		4			4
State College of Washington	6			3	9			4		4					
University of Wisconsin	10				10										
University of Wyoming [1]	8	3⅓			11⅓		12			12					

Institution	Psychology					Sociology					Political science				
	1 year	2 years	3 years	4 years	Total semester hours	1 year	2 years	3 years	4 years	Total semester hours	1 year	2 years	3 years	4 years	Total semester hours
1	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
University of Arizona	0	0	3	0	3			3		3	8	6			14
University of Arkansas		3			3			3		3		3			3
Colorado Agricultural College [1]			5		5									3	[2] 9
Connecticut Agricultural College									3	3	6		6	6	18
University of Delaware									3	3	6			6	12

[1] No teacher-training curricula.
[2] Includes hours "not set" in any particular year—but required.

TABLE 18.—*Number of semester hours required in general home economics curricula in land-grant institutions*—Continued

Institution	Psychology					Sociology					Political science				
	1 year	2 years	3 years	4 years	Total semester hours	1 year	2 years	3 years	4 years	Total semester hours	1 year	2 years	3 years	4 years	Total semester hours
1	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
Georgia State College of Agriculture	----	6	----	----	6	----	----	4	----	4	2	6	----	----	8
University of Idaho [1]	----	----	----	----	----	----	----	3	----	[2] 9	----	----	----	----	----
University of Illinois	----	----	----	----	----	----	----	----	----	3	----	----	----	----	3
Iowa State College	----	2	2	----	4	----	----	2	----	2	----	6	----	----	6
Kansas State Agricultural College	----	3	----	----	3	----	----	----	----	----	1	----	3	6	10
University of Kentucky	----	----	6	----	6	----	----	----	3	3	----	----	6	----	6
University of Maine	----	----	----	----	----	----	----	----	----	3	----	----	----	----	6
University of Maryland [1]	----	----	----	----	----	----	----	----	----	----	6	----	----	----	6
Massachusetts Agricultural College [1]	----	----	----	----	----	----	----	----	2	2	----	6	2	3	11
Michigan State College	----	----	----	----	2⅔	----	----	----	----	2⅔	----	----	----	----	8
University of Minnesota	----	4	2	----	6	----	2	----	----	2	----	----	3½	2	5½
University of Missouri	----	----	3	----	3	----	----	5	----	5	----	----	5	----	5
Montana State College	----	2	----	----	2	----	----	----	2	2	----	----	----	4	4
University of Nevada	----	3	----	----	3	----	----	----	----	----	6	----	6	----	12
Cornell University	----	----	----	----	----	----	----	----	----	----	----	----	5	----	5
North Dakota Agricultural College	2⅔	2	----	----	4⅔	⅔	----	2	----	2⅔	----	4	2⅔	2⅔	9⅓
Ohio State University	3⅓	----	----	----	3⅓	----	----	3⅓	2	5⅓	----	----	3⅓	----	3⅓
Oregon Agricultural College [1]	----	----	2	----	2	----	2	6⅔	----	8⅔	----	6	----	----	6
Pennsylvania State College	----	----	6	----	6	----	----	----	3	3	----	----	6	----	6
Rhode Island State College [1]	----	----	3	----	3	----	----	----	----	----	----	3	3	----	6
South Dakota State College	----	----	4⅔	----	4⅔	----	----	----	3⅓	3⅓	----	2	3⅓	----	5⅓
University of Tennessee	----	4	----	----	4	----	2	----	----	2	6	----	4	4	14
University of Vermont [1]	----	----	6	----	6	----	----	----	----	----	----	----	----	6	6
Virginia Agricultural and Mechanical College	----	2	1⅓	----	3⅓	----	1⅓	----	3⅓	4⅔	----	4	4	4	12
State College of Washington	----	----	----	----	4	----	----	----	----	----	----	----	----	----	10
West Virginia University	----	----	5	----	5	----	----	3	3	[2] 8	6	----	3	----	12
University of Wyoming [1]	----	----	2	----	2	----	----	----	6	6	----	----	4	----	6

Institution	Education					English					Other languages				
	1 year	2 years	3 years	4 years	Total semester hours	1 year	2 years	3 years	4 years	Total semester hours	1 year	2 years	3 years	4 years	Total semester hours
1	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46
University of Arizona	6	6	----	----	12	6	6	----	----	12	----	----	----	----	----
University of Arkansas	----	----	----	----	----	6	6	----	----	12	----	----	----	----	----
Colorado Agricultural College [1]	----	----	----	----	----	10	4	----	----	14	----	10	----	----	10
Connecticut Agricultural College	----	----	3	----	3	6	6	----	----	12	----	----	----	----	----
University of Delaware	----	----	----	----	----	6	6	----	----	12	----	----	----	----	----
Georgia State College of Agriculture	----	6	----	----	6	6	6	----	----	12	----	----	----	----	----
University of Idaho [1]	----	8	8	7	15	6	4	----	----	10	----	----	----	----	----
University of Illinois	----	----	----	----	----	6	----	----	----	8	----	----	----	----	----
Iowa State College	----	----	----	----	----	6	2	2	----	10	----	----	----	----	----
Kansas State Agricultural College	----	----	----	----	----	6	6	----	----	12	----	----	6	3	9

[1] No teacher-training curricula.
[2] Includes hours "not set" in any particular year—but required.

TABLE 18.—*Number of semester hours required by general home economics curricula in land-grant institutions*—Continued

Institution	Education					English					Other languages				
	1 year	2 years	3 years	4 years	Total semester hours	1 year	2 years	3 years	4 years	Total semester hours	1 year	2 years	3 years	4 years	Total semester hours
1	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46
University of Kentucky						6	5			11					
University of Maine						6	6			12					
University of Maryland [1]						6				6	6				6
Massachusetts Agricultural College [1]			3.3	6	9.3	6	6			12	6				6
Michigan State College						8				[2] 10⅔					8
University of Minnesota			4	7⅓	11⅓	6	2	2		10					
University of Missouri						10				10					
Montana State College						6	10			16					
University of Nebraska						4				[2] 10					
University of Nevada			2			6	4			10	6				6
Cornell University						6				6					
North Dakota Agricultural College			2⅔	2	4⅔	6				6	8	8			16
Ohio State University						3⅓	3⅓		3⅓	10					
Oregon Agricultural College [1]	⅔				⅔	8	6			14					
Pennsylvania State College						12				12					
Rhode Island State College [1]			2		2	6		5	5	16	6	6			12
University of Tennessee				4	4	6	6			12	6	6			12
University of Vermont [1]			3	6	9	6	6			12	6	6			12
Virginia Agricultural and Mechanical College	3⅓				3⅓	6	6	1⅓	3⅓	16⅔					4
State College of Washington						4				[2] 8					
West Virginia University						6	4			10					
University of Wisconsin						6	2			8	8				8
University of Wyoming [1]						6				[2] 12	6	6			12

Institution	Mathematics		Applied art and design					Physical education				
	1 year	Total semester hours	1 year	2 years	3 years	4 years	Total semester hours	1 year	2 years	3 years	4 years	Total semester hours
1	47	48	49	50	51	52	53	54	55	56	57	58
University of Arizona			4		3		7	6	2	3		11
University of Arkansas			6	3		2	11	4	2			6
Colorado Agricultural College [1]	5	5	2	3			5	2	2	4		8
Connecticut Agricultural College			3	5			8	2	2			4
University of Delaware			6				6	7	6			13
Georgia State College of Agriculture			4	4	2		[2] 29	3	3		4	10
University of Idaho [1]			4	2	4	2	12	2	2			4
University of Illinois			4				4	3	2			5
Iowa State College			4	4		2	[2] 14	1⅓	2⅓			3⅓
Kansas State Agricultural College			5		1		6	3	1		3	7
University of Kentucky			4	3			7	1.4	1.4			2.8
University of Maine			5½		2⅔	2½	10⅔			3		3
University of Maryland [1]				6		3	9	2	4			6
Massachusetts Agricultural College [1]	6	6		2			2	3.3	5.3			8.6
Michigan State College			2⅔	1⅓			4	2⅔	2			4⅔

[1] No teacher-training curricula.
[2] Includes hours "not set" in any particular year—but required.

TABLE 18.—*Number of semester hours required by general home economics curricula in land-grant institutions*—Continued

Institution	Mathematics		Applied art and design					Physical education				
	1 year	Total semester hours	1 year	2 years	3 years	4 years	Total semester hours	1 year	2 years	3 years	4 years	Total semester hours
1	47	48	49	50	51	52	53	54	55	56	57	58
University of Minnesota			4	2		5½	11½					
University of Missouri			4		5		9	1	1			2
Montana State College			4⅔		6⅔		11⅓	6⅔	2	6⅔		15⅓
University of Nebraska								2	2			4
University of Nevada			4				4	3	1			4
Cornell University			3				3	2	2			4
North Dakota Agricultural College			4				4	1⅓	1⅓			2⅔
Ohio State University			3⅓		5⅓		8⅔	2⅔	2			4⅔
Oklahoma Agricultural and Mechanical College			4			3	7	2	2			4
Oregon Agricultural College [1]			6⅔			2	[2] 10⅔	3⅓	2	1	1	7⅓
Pennsylvania State College			4	2	1		7	3	2	1		6
Rhode Island State College [1]			3	3	3		[2] 12	2	2	2	2	8
South Dakota State College				8⅔			8⅔	⅔	⅔		2	3⅓
University of Tennessee			2	2	2		6	5½				5½
University of Vermont [1]			5				5	3	2			5
Virginia Agricultural and Mechanical College		4	3½	4⅔	2		[2] 11	⅚		1½		2⅓
State College of Washington				2			[2] 4	1	1	1		3
West Virginia University			4		6		10	2	2			4
University of Wisconsin			3		4		7					
University of Wyoming [1]			8		2		10	4⅔	4			8⅔

Institution	Agriculture		Foods and nutrition					Clothing				
	1 year	Total semester hours	1 year	2 years	3 years	4 years	Total semester hours	1 year	2 years	3 years	4 years	Total semester hours
1	59	60	61	62	63	64	65	66	67	68	69	70
University of Arizona				6		3	9	3	3	2		8
University of Arkansas			3	3		6	[2] 12	3	3			6
Colorado Agricultural College [1]	5	5		5	11		16	2			3	5
Connecticut Agricultural College			4	6	4				8			8
University of Delaware			3	3	6		12	3	3			6
Georgia State College of Agriculture				6	3		9	4				4
University of Idaho [1]				3	6	6	15	4			4	8
University of Illinois				8			[2] 12				4	4
Iowa State College			4		2⅔	2	8⅔		2	2	2⅔	6⅔
Kansas State Agricultural College			3	5	3	5	16	2	3			5
University of Kentucky			5	8	4		17	3	2			5
University of Maine				7	5		12	5¼		4		9¼
University of Maryland [1]				6	3		9		3	4		7
Massachusetts Agricultural College [1]	2	[2] 6		2	6.6		8.6		4	1.3	3.3	8.6
Michigan State College				8			8	5⅓	1⅓			6⅔
University of Minnesota				6⅔	10⅓	4	21⅓	2	6	2		10
University of Missouri				6	9		15		6		6	12
Montana State College				6⅔	6⅔		13⅓	4	2	2⅔		8⅔
University of Nevada				7	4	5	16		4	3		7
Cornell University			3	5	5	1	14	3				[2] 5
North Dakota Agricultural College			2	2	2		6		4	2		6
Ohio State University				6⅔	3⅓		10	4⅔		3⅓		8
Oklahoma Agricultural and Mechanical College			5	2	12	3	22	5	2	4	6	17
Oregon Agricultural College [1]				6			6		4			4
Pennsylvania State College			3	6	2		11	5	3			[2] 14

[1] No teacher-training curricula.
[2] Includes hours "not set" in any particular year—but required.

TABLE 18.—*Number of semester hours required by general home economics curricula in land-grant institutions*—Continued

Institution	Agriculture		Foods and nutrition					Clothing				
	1 year	Total semester hours	1 year	2 years	3 years	4 years	Total semester hours	1 year	2 years	3 years	4 years	Total semester hours
1	59	60	61	62	63	64	65	66	67	68	69	70
Rhode Island State College [1]				6	5		11	6		6		12
South Dakota State College			5⅓	3⅓	11⅔	2⅔	23	4⅔	4⅔	2		11⅓
University of Tennessee			4	4		4	12	4	2	4		10
University of Vermont [1]				6	6		12	3		3		6
Virginia Agricultural and Mechanical College	4	[2]8	3⅓	3⅓	2		8⅔	3⅓	3⅓	4		10⅔
State College of Washington					24							
West Virginia University				8	4		[2]18	4	3	3		[2]13
University of Wisconsin		3					3		3			3
University of Wyoming [1]				2⅔	8		10⅔	2		6		8

Institution	Textiles					Housing					Home management				
	1 year	2 years	3 years	4 years	Total semester hours	1 year	2 years	3 years	4 years	Total semester hours	1 year	2 years	3 years	4 years	Total semester hours
1	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85
University of Arizona			3		3			3		3				6	6
University of Arkansas	2				2			2	2	4			2	4	6
Colorado Agricultural College [1]			2		2				5	5				2	2
Connecticut Agricultural College	3				3			3		3					
University of Delaware	3				3								6		6
Georgia State College of Agriculture	2				2		2			2				6	6
University of Idaho [1]	2				2										
University of Illinois					[2]3					[2]3				3	3
Iowa State College	2				2		6			6		1½		4	5½
Kansas State Agricultural College			3		3								3		3
University of Kentucky	2				2		3			3				5	5
University of Maine	2			½	2½				5	5	¼	1	⅛	4½	6⅛
University of Maryland [1]													2	5	7
Massachusetts Agricultural College [1]			5.3		5⅓			1.3		1.3				3.3	3.3
Michigan State College	2				2			2⅔	2⅔	5⅓			5⅓	4	9⅓
University of Minnesota	3⅓				3⅓				3⅓	3⅓				4	[2]6
University of Missouri										[2]2				4	4
Montana State College	2				2	1⅓		5⅓		6⅔				4	4
University of Nevada		2			2				5	5				2	2
Cornell University					[2]1					[2]2				9	9
North Dakota Agricultural College	1⅓				1⅓								2	[2]1⅓	3⅓
Ohio State University	2				2			3⅓		3⅓				3⅓	3⅓
Oklahoma Agricultural and Mechanical College		2			2		3	4		7			3	8	11
Oregon Agricultural College [1]		2			2									3⅓	[2]5⅓
Pennsylvania State College									3	3				3	3
Rhode Island State College [1]									4	4				3	[2]6
South Dakota State College	2⅔				2⅔				4⅓	4⅓			6		6
University of Tennessee	2				2			4		4				4	4
University of Vermont [1]			3		3		2			2			4		4
Virginia Agricultural and Mechanical College								5⅓		5⅓					
West Virginia University								6	3	9					
University of Wisconsin								4		4				4	4
University of Wyoming [1]	2⅔				2⅔	2			2	4	1⅓			4	5⅓

[1] No teacher-training curricula.
[2] Includes hours "not set" in any particular year—but required.

TABLE 18.—*Number of semester hours required by general home economics curricula in land-grant institutions*—Continued

Institution	Institutional management					Family life					Total semester hours for first degree
	1 year	2 years	3 years	4 years	Total semester hours	1 year	2 years	3 years	4 years	Total semester hours	
1	86	87	88	89	90	91	92	93	94	95	96
University of Arizona									2	2	124
University of Arkansas								2		2	132
Colorado Agricultural College [1]								2	3	5	160
Connecticut Agricultural College									3	3	140
University of Delaware								3		3	120
Georgia State College of Agriculture									2	2	140
University of Idaho [1]											128
University of Illinois											130
Iowa State College									4	4	136
Kansas State Agricultural College											128
University of Kentucky											133. 4
University of Maine								3	½	3½	140
University of Maryland [1]									5	5	132
Massachusetts Agricultural College [1]						1. 3			2	3. 3	93. 3
Michigan State College								4	5⅓	9⅓	132
University of Minnesota								2		2	120
University of Missouri									3	3	122
Montana State College								2		2	144
University of Nebraska											125
University of Nevada									2	2	128
Cornell University											71–77
North Dakota Agricultural College								1⅓		1⅓	136
Ohio State University								3⅓	3⅓	6⅔	126⅔
Oklahoma Agricultural and Mechanical College		2	3		5	4	4	3	8	19	130
Oregon Agricultural College [1]									2	2	128
Pennsylvania State College									3	3	128
Rhode Island State College [1]							1			1	136
South Dakota State College									2	2	136
University of Tennessee								2	2	4	132
University of Vermont [1]						2			4	6	140
Virginia Agricultural and Mechanical College							2⅔			2⅔	144
State College of Washington											128
West Virginia University											128
University of Wisconsin						1			4	5	120
University of Wyoming [1]		2⅔			2⅔				2	2	126

[1] No teacher-training curricula.

For the sake of avoiding exceptional terminology and relatively insignificant variations the plan was adopted of indicating requirements in certain especially significant specific subjects and in certain groupings of related subjects. The classifications thus chosen were: Chemistry; the biological sciences, including bacteriology, biology, botany, entomology, histology, genetics, physiology, and zoology; other natural sciences, including physics; psychology; sociology; other social sciences, including economics and history; education; English; other language both modern and ancient; mathematics; applied art and design; physical education; agriculture, including all those technical applications included in the college of agriculture

that are not specifically and clearly covered by other classifications; foods and nutrition; clothing; textiles; housing; home management; institutional management; family life; and extension. It is fully recognized that it may be very significant whether some one or another subject included in several of these group classifications is given. For instance, in the biological science group whether the work consists of elementary general biology or genetics. The facts are therefore summarized but detailed consideration would not materially strengthen the demonstration of subject-matter trends in the general home economics curriculum and might serve to still further confuse the presentation of what at best is a very complex body of facts. The requirements in the more important of the subject-matter fields presented by the table will be considered in turn.

Chemistry.—With the exception of two institutions, general chemistry is required by all institutions in the first year. The hours vary from 3 to 10. One-half the institutions require eight or more hours of general chemistry in this year. Organic chemistry is generally required in the second year. The number of hours varies from 2 to 10 among 24 institutions. One-half the institutions requiring this advanced chemistry include more than six hours. The usual combination of chemistry requirements, however, in this curriculum is general, organic, and physiological. This grouping occurs among 11 institutions. Seven institutions require household chemistry. The hours vary from two-thirds to six. In the case of the institution requiring six hours, this phase of chemistry is the only course required in addition to the six hours of general chemistry in the first year. Eight institutions require courses in quantitative or qualitative chemistry.

The total number of semester hours of chemistry required shows a wide range, from 6 at one institution where only general chemistry is required in this curriculum to 20.

General chemistry is taught in the college of arts and science in 24 of the institutions reporting, and in all but one by the department of chemistry. Organic chemistry is likewise taught by the department of chemistry in most institutions reporting this requirement. Household chemistry is taught by the department of chemistry in the college of arts and science at three institutions. The other institutions requiring household chemistry for this curriculum do not specify the department or college teaching the courses. Physiological chemistry in three instances is taught by the department of home economics. At one institution the college of medicine gives this course for the home economics students. Data do not reveal how well adapted these

courses are to the needs of the home economics student who is not preparing for professional or technical work. Study of this problem should be undertaken under competent technical guidance.

Biological sciences.—Genetics is required by but two institutions. Of the 12 institutions that require zoology, 5 include from 2 to 6 hours among the requirements of the first year; 5, among second-year requirements, the hours ranging from 2 to 8; and 2 institutions list it among the third-year requirements and require 4 hours.

General bacteriology is required by 19 institutions, or more than one-half of all those offering this curriculum. Nine others require household bacteriology. The hours of general bacteriology range from 2 to 6. The usual number is between 2 and 4 hours. The requirement is made in the second year. Requirements in household bacteriology come in the third year, the hours ranging from 2⅔ to 4.

The study of biology for students in general home economics may be considered of importance. Seven institutions report requirements in this field varying from 2 to 6 hours. Among four of the six the requirement is made for the first or freshman year. Two require 6 hours in this year.

Twenty-eight institutions require either general or human physiology. It is a little surprising that a subject so important should not receive the consideration of all institutions in the making up of this curriculum, although it may be that courses in hygiene offered under physical education make up for this seeming lack of attention to advanced study in so basic a science.

Eighteen of the 28 institutions reporting require human physiology. In nine, or one-half of the institutions, the department of zoology in the college of arts and sciences or agriculture, gives the course. The variation in hours required is as great as in the other sciences—from two to six. The second year of the student's work seems to be the favored one for this requirement.

Other natural sciences.—General physics is required by but five of the institutions offering the general home economics curriculum. The hours range from two to six. There is a tendency to include household physics rather than general physics for home economics majors. Fourteen institutions require courses in this field. In 11 they are given by the physics department, but in two cases the department of agricultural engineering teaches the course in household physics, while at one it is taught in the department of science in the agricultural college.

Psychology.—General psychology is listed among requirements in 20 institutions; child psychology in 10. This general recognition of the place that a general knowledge of psychological laws

has in the education of persons who are to be leaders in family groups is significant. However, six institutions require no psychology. In five of the six, no requirements in education are prescribed which might offset this weakness to some extent. The number of hours required show clearly that psychology is not given the place of emphasis in the general home economics curricula that is accorded to the biological sciences or chemistry.

Sociology.—Sociology is quite generally included among the requirements in the general home economics curriculum but seven institutions omit it. The required hours vary from two to nine. Eight, or 33 per cent, of the 24 institutions reporting require three hours. There is no agreement as to the year in which its study is judged to be most advantageous.

Other social sciences.—The importance of economics study is reflected in courses in the general home economics curricula. Twenty-nine of 35 institutions include the subject among the requirements in this curriculum. The number of hours shows a variation from 2 to 12. In general, from three to six hours are required. "Principles of economics" is the study most often included. In most cases courses in economics are given by the department of economics in the colleges of arts and sciences.

Twenty-four among the 35 institutions require history, the hours varying from 1 to 14. Nine institutions list the history requirements among those of the first year. In 10 institutions, including 3 of the foregoing, history is a second-year requirement; in 2 institutions in the third year; and in 5, it is a fourth-year requirement. In five institutions the year is not set.

A trend toward emphasizing the social and political sciences is shown in the fact that in five institutions the number of hours required in these subjects is greater than the total number of hours of natural science required; in eight others, the ratio of the total hours of social and political sciences to the total hours of natural science is as two to three. Table 19 shows the relative emphasis put upon natural sciences and social and political sciences in general home economics curricula among the several institutions.

TABLE 19.—*Showing hours of natural science and social and political science required by institutions in general home economics curricula*

Institution	Number of hours required in	
	Natural sciences	Social and political science
1	2	3
University of Arizona	26	20
University of Arkansas	24	9
Colorado Agricultural College	43	14
Connecticut Agricultural College	18	21
University of Delaware	27	15
Georgia State College of Agriculture	28	18
University of Illinois	20	6
Iowa State College	27⅓	12
Kansas State Agricultural College	35	13
University of Kentucky	25	15
University of Maine	37	9
University of Maryland	23	12
Massachusetts Agricultural College	18	13
Michigan State College	18⅔	13⅓
University of Minnesota	38⅔	13⅓
University of Missouri	26	13
Montana State College	33	8
University of Nebraska	18	15
University of Nevada	23	15
Cornell University	40	5
North Dakota Agricultural College	8	16⅔
Ohio State University	33⅓	12
Oklahoma Agricultural and Mechanical College	13	0
Oregon Agricultural College	8	16⅔
Pennsylvania State College	22	15
Rhode Island State College	19	9
University of Tennessee	16⅔	20
University of Vermont	38	12
Virginia Agricultural and Mechanical College	27⅓	20
State College of Washington	12	14
University of Wyoming	23⅓	14

The lack of agreement in regard to the relative emphasis upon these two fields is evident from the table.

Education.—Courses in education are very naturally not so generally included in the general home economics curriculum as are courses in social and natural sciences. Students enrolled in general home economics curricula are not as a whole preparing to teach home economics, for most of the institutions offering the general home economics curriculum also offer one in teacher training. Nevertheless, 12 institutions require courses in education in the general home economics curricula, the number of hours ranging from two-thirds to 15.

English.—It is, of course, the accepted convention in the general home economics curriculum, as well as in almost all other curricula offered by the higher institutions, to place considerable emphasis upon English. Among 35 institutions, 27 require 10 or more hours, most of which fall in the first or second year of college work.

Other languages.—Less than one-half of the institutions offering a curriculum in general home economics make any language requirement other than English, but the number of hours required by 12 institutions is rather large. Among them, 5 require 12 or more hours.

Mathematics.—A study of college mathematics is not regarded as essential in the training of young women in this field. But four institutions require courses in this subject.

Applied art and design.—All of the 35 institutions list courses in applied art and design among the requirements in the general home economics curricula. The number of hours shows a very great variation, from 2 to 29. The requirements are not limited to any one year, but are distributed rather evenly throughout the first three years in most of the institutions. Ten institutions include art appreciation among the required courses. The theory of color is listed among requirements in 11 institutions; principles of design in 30; costume design in 22; furniture design in 3; home decoration in 21; landscape design is included among the requirements at one institution and pageantry and play design at one. Two include courses in textile design among requirements in this curriculum. In 10 institutions, courses in principles of design are taught in the department or division of home economics, while in 17 they are given by the department of art. One institution lists a required course in principles of design given by the department of landscape gardening.

Physical education.—Physical education is required of all students enrolled in the general home economics curricula except in one case. Most institutions have a physical education requirement in both the first and second years. Eight of these carry this requirement into the third year.

Agriculture.—Three institutions among the 35 require courses in agriculture of students in general home economics. The requirement of two hours in one of these institutions is divided between courses in poultry, dairying, and horticulture. Eight and two-thirds hours of agriculture required by another are divided as follows: Three and one-third hours of poultry, one and one-third hours of horticulture, and two hours of dairying. The courses required by the third institution are limited to courses in horticulture.

Foods and nutrition.—Emphasis upon foods and nutrition is indicated by the large number of hours required in this subject by all institutions. Sixteen institutions list courses in this field among the requirements of the first year. In most instances the courses deal with food selection, which do not demand of the student a fundamental knowledge of chemistry. Fourteen institutions postpone food study until the second year, when the study of food preparation and service in addition to food selection enters into the curriculum. The

absence of experimental cookery as such among the requirements of home economics is significant, since it shows either a tendency to include it as an aspect of all foods work, or to disregard it entirely in the training of students who do not expect to become laboratory technicians. Nutrition and dietetics for the normal rather than the abnormal person is emphasized by the inclusion of courses in this field among the requirements of most institutions. The range of required hours is very great, from 3 to 23 hours with several group tendencies evident that are also widely different. Further, eight institutions make no nutrition or dietetics requirement for general home economics. One institution requires no foods work. One institution requires a study of dietetics for the abnormal person but requires no nutrition or dietetics for the normal person.

Clothing and textiles.—The emphasis placed upon construction and care of clothing is shown in the somewhat larger number of hours required by most institutions in courses of this type than in courses where the training in selection of clothing is the main interest. Twenty-seven institutions list clothing construction and care among requirements, while 25 list clothing selection courses. The total hours of clothing construction range from 2 to 10. Since many institutions include the study of clothing selection in courses with construction and care, this picture of emphasis is somewhat distorted. Considerable attention is being given to selection, since 25 of the 35 institutions offering curricula in general home economics require courses in textiles for use in clothing. Seven of these require additional courses in textiles for home furnishings, including instruction in selection of household linens, blankets, and other furnishings.

Housing.—Eighteen of all institutions reporting require courses in house planning which are usually given by the department of home economics; while 11 require courses in sanitation, and 7 in home equipment and home furnishings. Although it is important in the training of a young woman whose occupation will be that of homemaker to understand some of the principles of house construction and planning in order to know what to look for in choosing a place to live as well as in building her own home, the emphasis that is put upon this phase of work in the requirements of many institutions is interesting. There is more agreement between institutions regarding the total number of semester hours of housing required than in any other field of subject matter in specific home economics subjects.

Home management.—A study of the economics of food as well as economics of clothing as a separate branch of work is not generally listed among the requirements in a general home economics curriculum. The subject of costs and values in relation to both foods

and clothing is such a vast one, so far-reaching, and involves so many factors, so little work has been done in this field, so few people trained, that it is not surprising to find less than one-half of the institutions offering specific courses. Data reveal, however, a considerable interest in acquainting students who will spend most of the family income, with information which should help them to choose both clothing and foods wisely. The management of family finance has always engaged the attention of home economists and its study has been included in home economics curricula from the first. Home economics has emerged, however, from the static budget plan of presentation of the problems of family finance to a more real and vital consideration of the use of real incomes. One-half of the 35 institutions offering curricula in general home economics require courses in family finance of their students. Among the nine institutions reporting a definite number of hours required in this subject, the range is from one and one-third to three hours.

Practice work in the home management house is required by but 17 institutions. Considering that the training offered by a general home economics course should be less specialized and should train young women particularly for homemaking, it is a little surprising that practice in a situation so nearly like that of the real home is not listed among the requirements.

Family life.—Twenty-seven institutions list courses in child care and development and family life among the requirements in the training of young women in general home economics. The institutions omitting these subjects from their requirements are not limited to the smaller colleges. The hours of this subject required are not long and vary as do those in other fields. The requirement is generally made for the third and the fourth year work, indicating that a knowledge of psychology and social sciences as well as orientation in other subject matter and the greater maturity of the student may all be brought to bear in the consideration of the problems of child care and development and of family relationships.

Summary of general home economics curriculum.—The very confusing picture presented by this record of practice is relieved at very few points. To be sure, the English requirement is universal, but represents general institutional policy rather than home economics determination. In the same way the general requirement that chemistry shall be taken is an institutional prescription to at least as great a degree as it represents home economics reflection upon its needs for the general home economics curriculum. This becomes evident in the wide variations in both number of hours and course content prescribed in addition to normal institutional demands. Home economics is apparently in little agreement either as to the amount or kind of chemistry needed in the general home economics curriculum.

Similar discrepancies in practice are evident in all the other subject-matter fields. Institutions do not agree as to how much or what phases of a single subject shall be included in the curriculum and in practically every instance some institutions neglect entirely subjects that to other institutions seem essential to general home economics training. Even in the older and better established subjects indubitably elements of technical home economics, one institution requires many more hours than another. Thus in foods and nutrition one institution requires more than seven times as many credits as the institution that requires the smallest number. Nor is this situation true of only the extremes. In foods and nutrition the eight institutions requiring the greatest number of hours all demand twice as many credits as the highest among the seven lowest institutions.

Even cursory examination makes it evident that so far as similarity of course requirements and content are indicative there is not among the 35 land-grant institutions reporting a general home economics curriculum that can be understood as meaning even approximately the same thing in all the institutions. The confusion of objectives already noted, the lack of agreement in regard to relative division between requirements and electives, and the failure to reach common understanding in regard to content of the general home economics curriculum are, of course, interdependent factors.

The public expects and, in view of the fact that the great majority of women become homemakers, demands that home economics reach some degree of agreement in regard to what should constitute the college education of women through the medium and by virtue of the interest that women have in the distinctly home economics subjects.

The undergraduate student who does not expect to enter a professional or technical field is the primary concern of those who would construct a general home economics curriculum on the college level. This curriculum should be definitely directed to this end. The purpose is large and its attainment will constitute an outstanding contribution to American higher education. Other purposes may well be set aside or delayed; certainly compromise with the objective here indicated in order to provide training in specialized fields and employments will mean mediocre accomplishment in all areas.

Home Economics Teacher-Training Curricula

Consideration of the education courses in the home economics teacher-training curriculum belongs properly with the section of the land-grant college survey that deals with professional education of teachers. The detailed treatment will be found in that section. But it is desirable to include brief consideration of this important curricu-

lum in its entirety at this point in order that its objectives as defined by the home economics units, its division into required and elective elements, and the content of subject matter assigned to it may be examined in relation to these three factors in other curricular programs.

Objectives of home economics teacher-training curricula.—The occupational objective of a teacher-training curriculum appears so obvious that it may fairly be expected that the 35 institutions that list specific teacher-training curricula would assign but one major objective, preparation of teachers, to this curriculum. Thirty-four do assign this objective but 12 also assign to this professional and occupational curriculum the function of preparing homemakers, 7 add that it is intended to provide general culture and 4 indicate extension work as an objective. This is almost as confused as the assignment of objectives to general home economics. Of course, teachers require general culture, and many of them ultimately become homemakers, and extension work is a teaching employment that has as yet not developed adequate training in its techniques and objectives as differentiated from those of high-school teaching. Nevertheless it arouses considerable question concerning the degree of design for the specific purpose of teacher preparation when a grouping of material is expected to accomplish such varied objectives.

Required and elected hours.—Division of time among home economics required subjects, the sciences and humanities, and electives is shown by Table 20 as reported by 13 institutions.

Much the same variation between the proportions of requirements and electives is shown in this curriculum as in that of general home economics, although the list of institutions is not the same throughout.

TABLE 20.—*Home economics education curricula in 13 land-grant institutions*

Institution	Number of semester hours—						
	Required for first degree	Strictly home economics subjects	Per cent	Sciences and humanities	Per cent	Electives	Per cent
1	2	3	4	5	6	7	8
Alabama Polytechnic Institute	144	47	32	66	46	31	22
University of Arizona	124	35	28	61	49	28	23
University of Hawaii	132	29	23	20	14	83	63
University of Illinois	130	43	33	69	53	17	14
Kansas State Agricultural College	128	37	29	65	50	26	21
University of Maine	140	58	42	75	53	7	5
Michigan State College	132	42⅔	32	71⅓	54	18	14
University of Minnesota	126	44⅔	35	70	48	11⅓	17
University of Missouri	122	48	39	46	38	28	23
University of Nevada	128	34	26	76	59	18	15
Ohio State University	126⅔	23⅓	18	78⅓	62	24⅓	20
University of Vermont	140	33	23	92	65	15	12
University of Wisconsin	124	36	29	44	35.5	[1] 44	35.5

[1] Includes 10 credits in general home economics subjects which are required.

Among the institutions reporting on this particular phase in teacher-training curricula, four institutions allow no free electives during the first two years; two institutions allow none during the first three years. Table 21 shows the number of institutions allowing certain semester hours of free elective years.

Among 23 institutions reporting on group electives allowed in teacher-training curricula, 17 show a larger number of hours in groupings of non-home economics subjects. Among these, six institutions report all electives in non-home economics subjects. Among the six other institutions, two report a larger number of hours of home economics subjects in groupings of electives. One divides the hours equally between home economics and non-home economics; 3 give total number of hours, but do not specify from which group they may be chosen.

TABLE 21.—*Free electives in teacher-training curriculum in land-grant institutions*

Year	Number of institutions	Number semester hours allowed—						
		0	1 to 5	5 to 10	10 to 15	15 to 20	20 to 25	Maximum number by any one institution
1	2	3	4	5	6	7	8	9
First	19	9	6	3	1	0	0	[1] 10
Second	22	4	11	7	0	0	0	[2] 8
Third	22	3	6	7	5	1	0	[3] 15
Fourth	24	3	3	6	6	5	1	[3] 20

[1] Ohio State University.
[2] Michigan State College.
[3] South Dakota Agricultural College.

Content of teacher-training curricula.—Curricula designed to prepare students to be teachers of home economics show a material difference from those in general home economics in only one significant respect—the number of hours of education required when the two curricula are compared institution by institution. In other particulars they are similar in respect to the fields of subject matter in which requirements are made, the number of hours required, and their arrangement or sequence in years.

Among the 27 institutions offering both general home economics and teacher-training curricula, four institutions include more chemistry for teachers than for students in general home economics. The additional courses required are usually physiological chemistry. Three institutions increase slightly the requirements in physiology; five increase to some extent the number of hours of applied art for teachers; one increases the economics requirement; three require

slightly more English for teachers than is required in the general home economics curriculum. Requirements in psychology are very similar; although one institution increases the hours required from six in general home economics to eight in teacher training; and another that has no psychology requirement in the general home economics curriculum requires six hours in teacher training, four in general psychology, and two in child psychology. Requirements in economics are practically identical as are those in English and other languages.

It was noted that certain of the institutions set up education requirements in their general home economics curricula. In 18 institutions making no such requirements in the general home economics curricula the frequency and range of requirements in the teacher-training curriculum are shown by the following: One institution requires 10; one, 12; one, 13; five, 15; one, 16; three, 18; one, 18⅔; one, from 18 to 20; two, 20; one, 21; and one, 22. Close correlation exists between the number of hours of education required in these curricula and the State minimum requirements for teacher certification.

Two institutions that require education in the general home economics curriculum raise this requirement in the teacher-training curriculum, one from 12 to 29 hours and the other from 3 to 18.

Among 33 institutions that reported in detail concerning their teacher-training curricula, 24 require courses in principles of education, usually coming in the third year of work, the hours ranging from two to five, most institutions requiring three. Thirty-two require observation and student teaching as well as studies of special methods in home economics. In most cases these requirements are made in the fourth year. One requires eight hours of observation and student teaching in the junior year with two and two-thirds hours of special methods in the same year, while another, with a student-teaching requirement also in the junior year, requires but two hours then and an additional four hours in the senior year. One other institution requires student teaching (3 hours) in the junior year. But 25 institutions among the 33 require educational psychology, the hours ranging from two to five and occurring most often in the third year. Fifteen institutions require courses in secondary education methods. Nine institutions require courses in vocational education. Among those reporting the number of hours required, the range is between one and one-third and five.

Seven institutions offer teacher-training curricula, but no "general home economics." The significant difference between the teacher-training curricula developed by these institutions and other curricula offered is again in the matter of number of hours of edu-

cation required. These are for the most part similar both in course content and in number of hours to the curricula offered by the 27 institutions having both general home economics and teacher-training curricula. Slight differences between the hours of specific home economics subjects required by these institutions and others are noted in the field of foods and nutrition and housing in which less nutrition and more housing are required for teachers than for students preparing for other lines of work. Eight institutions offer no specific curricula for teacher training.

It is apparent that few institutions make material difference in subject matter between their general home economics and teacher-training curricula except in the education requirements. In some instances the time for this specialization is secured rather more largely at the expense of the specific home economics subjects, but normally the amount is taken somewhat equally from home economics and scientific and humanistic subjects and from electives.

Foods and Nutrition Curricula

Twenty institutions state that they offer curricula in foods and nutrition. Inasmuch as this subject plays so large a part in general home economics curricula and the courses appropriate to the foods and nutrition classification range from general cooking work to highly specialized dietetics courses, the objectives of these curricula can not be inferred from their title. The statements of the objectives assigned to this curriculum by the institutions serve to clarify understanding in only the slightest degree.

Preparation for teaching is listed as an objective ten times; home making, eight; research, seven; general culture, five; business, five; social science, three; extension, three; and preparation of hospital dietitians is given as the objective in one instance. This does not seem reasonable. Inasmuch as all the institutions that offer this curriculum in foods and nutrition also offer curricula in general home economics, which obviously should be designed for home making and therefore for general culture also, and since practically all also offer teacher-training curricula, it is puzzling to discover teacher training, home making, and general culture described as the objectives of a parallel curriculum. Does a foods and nutrition curriculum exist in fact in these cases? Have these institutions a foods and nutrition curriculum with its own objectives? Are curricula and subject-matter majors or their equivalent confused? These questions can not be answered exactly, but the lack of meaning of the curricular label in this instance is apparent. Business, extension, and research are conceivable objectives to certain types of foods and nutrition work, but the

statements are vague since business is of so many kinds, research specialized in so many directions, and extension usually not differentiated along lines of food and feeding.

Examination of the content of these so-called foods and nutrition curricula aids in distinguishing distinctive purposes in the case of only a few institutions. The facts summarized by Table 22 merely serve to emphasize the lack of correlation between specific functions and multiplication of claims to curricular development.

If these curricula had as objectives the specific preparation of research workers in food and nutritional areas, of consulting nutritionists, or hospital dietitians or of public-health workers, the fact should be indicated clearly by emphasis upon chemistry requirements since all these employments obviously demand concentrated training in this subject. This is not the situation, however. While all require general chemistry, only 15 require organic, 6 quantitative, and 4 qualitative. On the other hand, four require household chemistry which was clearly developed to adapt pure chemistry to the less precise and systematic needs of students of home economics without professional or technical purposes. Only 12 of the 20 require physiological chemistry.

TABLE 22.—*Foods and nutrition curricula in 20 land-grant institutions*

Institution	Number of semester hours required in—													
	Natural science	Applied art	Physical education	Psychology, economics and social science	English	Other languages	Education	Foods and nutrition	Clothing and textiles	Housing	Home management	Institutional management	Family life	Total for first degree [1]
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
University of California	18	0	2	6	6		0	21			4			124
Connecticut Agricultural College	22	0	4		12	0	6	14	11	3	0	0	3	140
University of Hawaii	17	4	8	6	12	0	0	15	13	3	0	0	0	132
University of Idaho	38	10	4	9	10	0	13	15	13	0	0	0	0	128
University of Illinois	40	0	5	12	14	0	0	24	0	0	0	0	0	130
Purdue University	51	6	2⅔	0	12	0	0	24	6	0	0	0	0	149
Iowa State College	33⅓	12	2	12	10	0	0	14	8⅔	6	5⅓	0	4	136
University of Maryland	27	9	6	6	6	6	2	12	3	0	7	0	5	132
Michigan State College	21⅓	4	4⅔	13⅓	12	0-8	0	18⅔	8⅔	2⅔	6⅔	2⅔	1⅓	132
University of Minnesota	47⅓	11⅓	0	11⅓	10-11⅓	0	0	20⅓	11⅓	3⅓	6	0	2	126
University of Missouri [2]	43	4	2	13	10	0	10	18	6	0	4	3	5	122
Rutgers University	30	3	10	6	12	6	0	24	7	0	0	3	0	135
Cornell University (for teaching)	46	6	4	11	6	0	18	18	6	5	9	0	3	107–108
Oklahoma Agricultural and Mechanical College	16	6	4	9	15		11	26	19	7	7	0	19	130
Pennsylvania State College	26	7	6	9	12	0	18	18	8	4	3	0	3	126
South Dakota State College	25⅓	5⅓	3⅓	10⅔	10	0	2	22	12	0	6	0	0	136
University of Tennessee	22⅔	6	5½	16	12	12	4	14	12	4	4	0	4	132
Agricultural College of Utah	24	0	8	12	16	10	0	20	0	6	0	0	0	120
West Virginia University [3]	19	10	4	25	10	0	0	20	10	9	5	0	5	128
University of Wisconsin	38	7			6	8	0	10	5	4	7	3	5	120

[1] Because of incomplete information the hours assigned to specific fields do not equal the total number of hours required.
[2] Curriculum called "Research in food and nutrition."
[3] Agriculture, 9 semester hours required.

It is apparent that these curricula are not generally designed for the accomplishment of the highly technical occupations that depend upon chemical training although it is evident that upon the basis of this test several of the institutions have thoroughly adequate chemical requirements in this curriculum. The advisability, however, in these cases of calling it a foods and nutrition curriculum may well be questioned.

It would be expected, whatever the objectives or the reasonable grounds for setting up a foods and nutrition curriculum, that such curricula would contain a larger proportion of courses so classified than is the case in other curricula. However, there are 7 of the 20 curricula that require 15 or fewer hours in this field which certainly does not differentiate this curriculum from the general home economics one. Less than 15 hours does not represent a very high degree of specialization. However, certain of the institutions that in other respects have constructed this curriculum for the accomplishment of highly technical occupational objectives show decided emphasis upon foods and nutrition and related natural science. Thus one institution requires 29⅓ hours of foods and nutrition work and 47⅓ hours of science, making a total equal to three-fifths of the graduation requirements. With a few exceptions of this kind these curricula do not stress natural science beyond the general requirements in any course leading to a B. S. degree.

Such examination of the facts as those indicated lead inevitably to the conclusions, first, that when definite technical objectives are ascribed to foods and nutrition curricula, other names would be more appropriate; and second, that the term foods and nutrition curriculum has no common meaning or significance among the institutions that list such a curriculum.

Textiles and Clothing Curriculum

The 17 institutions that offer a curriculum in textiles and clothing show the same confusion and vag[redacted] definition of objectives that was apparent in the foods and [redacted]ition curriculum and probably for much the same fundamental cause, confusion of subject matter with purposes. The objective is stated as that of teaching nine times, home making eight times, business extension, general culture, and research nine times each. One institution states that social service is the objective.

In this field as in that of foods and nutrition some institutions have developed curricula with very well-defined objectives that might well be given more exact descriptive names, as is done in the case of one institution's curriculum in research in textiles and clothing, which has for its objective the training for research in this field.

Examination of the content of this curriculum as shown by course requirements with the hours listed by Table 23 makes clear that in only a relatively few instances have institutions adapted offerings to objectives that are distinct from those of general home economics or from the foods and nutrition curricula.

Of special significance is the notable reduction in the number of hours of natural science as compared with foods and nutrition, although in three instances the chemistry requirement is heavier than the requirement in strictly clothing and textiles subjects. Lack of common understanding of the purposes of this curriculum is revealed also by the wide range of hours in applied art, extending from 8 to 22. The higher ranges in these subjects are entirely appropriate to curricula which have for their objectives preparation for research in textile chemistry or costume designing. If these are the objectives of the curricula, it would probably be advisable to indicate the fact in the title of the curriculum. On the other hand, these higher requirements in both chemistry and textile subjects are entirely inappropriate to the objectives of home making and general culture which are each named nine times as objectives of the work by institutions offering this curriculum.

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TABLE 23.—*Textiles and clothing curricula in 17 land-grant institutions*

Institution	Number of semester hours required in—												
	Natural science	Applied art	Physical education	Social science	English	Other languages	Education	Foods and nutrition	Clothing and textiles	Housing	Home management	Family life	Total for first degree
1	2	3	4	5	6	7	8	9	10	11	12	13	14
University of California	12	20	2	6	6	15			28	6	0		124
University of Hawaii	8	16	8	6	12	0	0	9	25	3	0		132
Purdue University	29	16	2⅔	30	18	0	0	8	16	0	40	6	154
Iowa State College	27⅓	16	2	12	10	0	0	10⅔	[2]22⅔	6	5⅓	4	136
University of Maryland	27	9	6	6	6	6	2	9	10	0	7	5	132
Michigan State College: [1]													
Clothing	18⅔	6⅔	4⅔	2⅔	12	0–8	0	8	11⅔	5⅓	9⅓	1⅓	132
Textiles	34⅔	5⅓	4⅔	2⅔	12	0–8	0	8	10⅔	5⅓	9⅓	1⅓	132
University of Minnesota	31⅓	15⅓	15⅓	13⅓	10 or 11⅓	0	0	6⅔	16	3⅓	6	2	126
University of Missouri	26	11	2	0	10	0	0	6	[3]15	2	4	3	122
Do	38	9	2	13	10	0	0	6	[3]17	2	4	3	122
Rutgers University	24	22	10	6	12	6	0	7	17	0	0	0	125
Cornell University	36	11	4	11	6	0	18	5	23	5	9	3	103–106
Oklahoma Agricultural and Mechanical College [4]	16	11	4	6	15	0	11	22	22	7	7	19	130
Pennsylvania State College	18	6	6	12	12	0	18	11	17	3	3	3	126
South Dakota State College	25⅓	8⅔	3⅓	13⅓	10	0	2	8⅔	14	0	6	0	136
University of Tennessee	16⅓	8	5⅓	16	12	12	4	8	18	4	4	4	132
Agricultural College of Utah	24	10	8	12	16	10	0	0	16	0	0	0	120
West Virginia University	19	10	4	25	10	0	0	20	13	9	5	5	128
University of Wisconsin	30	11	([5])	([5])	6	8	0	3	10	8	7	7	120

[1] Michigan State College has two separate curricula.
[2] Clothing and arts.
[3] Preparation for research in textiles and clothing.
[4] Institutional management, 3 semester hours required.
[5] No credit given.
[6] Elective.

The lower ranges of requirements in these curricula in textiles and clothing are appropriate to a general home economics curriculum and it would seem advisable for institutions that have not the facilities for highly specialized and technical work in the field of textiles and clothing to confine their offerings frankly to the general home economics curriculum. The institutions that have best developed specialized curricula indicate the fact by omitting or minimizing work that is clearly more appropriate to the general home economics curriculum. Thus five make no requirements in family life or child development although three of the same institutions prescribe work in home management, apparently as serving more general basic purposes appropriate to the specialization chosen.

Extension Teaching

Eleven institutions provided data with reference to extension teaching curricula. All very properly give the definite vocational objective of extension teaching as the purpose of the curriculum. But homemaking is also named as an objective five times, general culture twice, social science and business once each.

Examination of the content of this curriculum as shown in Table 24 for the 11 institutions make it evident that the objectives stated in addition to the basic one of extension teaching might be served just as well as extension preparation by the selection and arrangement of subjects given by a number of the institutions. For instance, only five of these curricula show any required courses in extension methods. This in spite of the facts that the physical situation in which extension teaching takes place is very different from that of the formal schoolroom, the extension teacher has problems of administration which the classroom teacher does not have, and the approach or "set" required for teaching in the informal situations wherein adult learning takes place are so different as to demand some orientation either in the form of courses, or better, in the combination of required courses in extension methods and field work.

TABLE 24.—*Home economics extension curricula giving the total semester hours credit in 11 land-grant institutions*

Institution	Number semester hours in—															
	Natural science	Mathematics	Agriculture	Applied art	Physical education	Social science	English	Other languages	Education	Foods	Clothing and textiles	Housing	Home management	Family life	Extension methods	For first degree
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
Alabama Polytechnic Institute	30	0	9	13	8	11	16	0	16	12	9	3	8	8		144
University of Arkansas	24	0	8	11	6	9	12	0	3	12	8	4	6	2	4	132
Iowa State College	27⅓	0	0	12	2	10	10	0	10	8⅔	8⅔	6	5⅓	4		136
Louisiana State University	14	0	1	0	0	14	6	0	8	13	10	2	4	2		72
University of Maryland	23	0	0	9	6	6	6	6	14	9	3	0	7	5		132
University of Minnesota	38⅔	0	0	11⅓	0	15⅓	10	0	11⅓	21⅓	13⅓	3⅓	6	2	2	126
University of Missouri	26	0	0	9	2	19	10	0	5	15	12	2	4	3		122
University of Nebraska	27	0	0	8	4	12	10	0	3	11	11	4	3	1	2	125
Cornell University	43	0	0	11	4	11	11	0	10	15	23	5	9	3	3	124–130
University of Tennessee	16⅓	0	14	6	9⅓	20	14	12	28	12	12	4	0	4	2	132
Virginia Agricultural and Mechanical College	27⅓	4	8⅔	10	2⅔	19⅚	16⅔	0	30⅔	8⅔	10⅔	5⅓	0	2⅔	0	144

The extension teacher of home economics is primarily engaged in acquainting the homemakers of the State with information which will assist them in the adoption of approved practices in all the lines of work connected with family and home relationships. She must be acquainted, therefore, with the fundamental knowledges in foods, clothing, housing, home management, and family life, and moreover, she must be skilled in methods, both administrative and teaching, which will make these knowledges available and useful in the extension teaching situation.

Foods and nutrition, here, as in the other home economics curricula receive the major attention in most institutions. But family relationships and home management are just as important for the extension worker. They are given relatively little attention by several of the extension curricula. Indeed the range in number of semester hours in all fields of home economics subject matter is sufficient demonstration that there is little agreement upon what is necessary to provide the technical home economics material demanded by an extension curriculum and that some institutions are offering so-called extension curricula that are well devised to excite the prevalent doubtful attitude that extension leaders take in regard to their effectiveness as actual preparation for extension work.

The extension teacher to be successful must be equipped not only with subject matter in the field of home economics, but with considerable knowledge of psychology, sociology, and economics. The number of hours of these subjects required of those preparing for extension teaching varies from 6 to 20. Six of the 11 institutions offering extension curricula require between 11 and 15 hours in these subjects. Two require less and 3 a greater number.

Since writing and public speaking are two methods of teaching very largely used by persons in the extension field, preparation for them should be emphasized considerably in the extension curricula. A wide range in emphasis in English requirements is shown among the institutions. Two institutions require but 6 hours; six of the eleven require between 10 and 12 hours; one, 14; and two, 16.

The range in the total number of semester hours of natural science from 14 to 43 is significant. Likewise, the range in the total number of semester hours of agricultural courses required. Many extension teachers need considerable knowledge of dairying, horticulture, and poultry. Therefore, this difference of emphasis in this field is one seriously to be considered.

Curricula in Institutional Management

Data concerning the institutional management curricula of 14 land-grant colleges and universities were furnished. Clearly, whatever

the variety of institutions for which managers may be prepared, ranging from tea rooms and cafeterias to college housing and insane asylums, the objective here intended must be vocational. The statement of objectives made by 12 institutions which indicates this fact is usually expressed as preparation for business and thus makes the situation even more vague than the title, since business covers a wider area of occupations than institutional management. But in addition objectives are again stated in terms of homemaking, teaching, general culture, extension, and social service from one to five times. Further, seven state that the objective is hospital dietetic work, a purpose that seems somewhat more highly scientific than those associated with institutional management and business.

The courses included in curricula called institutional management curricula are indicated by Table 25.

TABLE 25.—*Institutional management curricula in 14 land-grant institutions*

Institution	Number of semester hours in—														
	Natural science	Applied art	Physical education	Psychology, economics, and social science	English	Language	Education	Foods and nutrition	Clothing and textiles	Home housing	Institutional housing	Home management	Institutional management	Family life	First degree [1]
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Georgia State College of Agriculture [2]	31	29	10	18	12	.....	.....	18	0	0	3	.....	.....	21	140
Purdue University	29	6	2⅓	26	15	0	0	24	6	.....	3	11	.....	.....	150
Iowa State College	27⅓	12	2	12	10	0	0	10⅔	8⅔	6	2	5⅓	6	4	136
University of Maryland	23	9	6	6	6	6	2	12	3	0	0	7	0	5	132
Michigan State College	24	4	4⅔	17⅓	10⅔	0–8	0	16	8⅔	5⅓	0	6⅔	4	1⅓	132
University of Minnesota	38⅔	11⅓	.....	11⅓	10 or 11⅓	0	0	30⅔	11⅓	3⅓	0	6	0	2	126
University of Nebraska	27	6	4	15	10	0	0	11	2	4	0	3	8	1	125
Rutgers University	0	3	10	6	12	6	0	24	7	0	0	0	3	0	135
Cornell University	43	3	4	5	6	0	0	25	6	2	2	9	0	0	93
Oklahoma Agricultural and Mechanical College	13	6	4	6	12	0	0	22	21	7	4	7	14	19	100
Pennsylvania State College	26	7	6	15	12	0	0	18	8	3	6	3	0	3	126
University of Tennessee [3]	22⅓	6	5⅓	16	12	12	4	12	12	4	7⅓	4	0	4	132
State College of Washington	23	7	3	11	8	0	0	18	9	7	2	0	7	0	128
University of Wisconsin [4]	30	9	(4)	.....	6	8	0	9	5	4	4	7	3	5	124

[1] Because of incomplete information the hours assigned to specific fields do not equal the total number of hours required.
[2] Requires 2 semester hours in agriculture.
[3] Requires 4 semester hours in mathematics.
[4] In University of Wisconsin each student is required to take physical education but no credit is given toward a degree.

Extended comment upon the facts given by the table seems unnecessary, it would be in effect little different from comment on curricula already discussed. However, attention must be called to certain especially significant facts. There is a notable absence of courses in mathematics or business administration which would acquaint those preparing to follow the occupation of managing any institution with business methods, accounting, and similar fundamentals. The fact that four include courses in the economics of food and clothing seems an inadequate provision for curricula designed to prepare persons for the complicated business duties and relationships involved even in the management of a roadside tea room. It is, on the other hand, worthy of note that nine of these curricula require special courses in institutional housing carrying credit of from two to seven and one-third semester hours.

Miscellaneous Curricula

Three curricula offered by a limited number of institutions may for the purposes of this survey be grouped together, the applied art curriculum, the home management curriculum, and the curriculum in family life, child care, and development. Careful studies of objectives stated and of the content of these curricula make it evident that they represent no significant or specific contribution to the problem of adaptation of subject-matter material to attainment of specific and important objectives. They appear to represent still further the tendency evident from the examination of curricula already discussed to multiply the number and names of curricula without corresponding differentiation of content or purpose.

In addition to the curricula already treated several are being offered that display a better and more exact understanding of the functions of curriculum making and the relationships of curricula to objectives of the occupational type.

The hotel management curriculum offered by Cornell University displays careful attention to planning content for the attainment of a specific objective. As an example of the results of the process which is one that should be followed whenever a special curriculum in any vocation is set up some of the facts in regard to this hotel management curriculum are given.

Of those preparing to become hotel managers, 25 hours of natural science are required. Among these, 2 hours of general bacteriology; 6 of biology; 6 of general physics; 3 of general physiology; and 3 hours of animal husbandry are required. In addition to the hours in natural science are 10 hours of principles of economics; 9 hours of agricultural economics; and 4 hours of psychology. The hotel manager must in addition to these pursue studies of mechanical draw-

ing and interior decoration, as preparation to select furnishing and textiles in harmony with the architecture peculiar to hotels. Twelve hours of foods and nutrition are required including courses in marketing and large quantity cooking; counter supply for institutional management; food selection and 77 hours in preparation and service of foods. Thirteen hours of institution management including study of institutional equipment and construction problems arising in connection with institutions; 14 hours of accounting and financing are required.

As an example of a vocational curriculum of the scientific rather than the business type, which has developed relatively close adaptation of content to the attainment of a specific desired outcome is the hospital dietetics curriculum offered by the universities of Missouri and Minnesota and Cornell University. Table 26 summarizes briefly some of the major distributions of content material in this curriculum in terms of semester hours.

Additional examples might be given of isolated cases in which curriculum construction has been determined by formulation of attainable objectives and content material selected for such definite purposes. Such examples might be discovered in individual instances among several of the curricular groups already discussed and also among other specialized curricula that the limitations of space make it inadvisable to mention.

TABLE 26.—*Hospital dietetics curricula in three land-grant institutions*

Subject	Number of semester hours required by—		
	Cornell University	University of Minnesota	University of Missouri
1	2	3	4
Natural science	40	41½	36
Applied art	3	11½	(1)
Physical education	4	0	0
Social and political science	5	2	13
English	6	10	10
Education	0	4	10
Foods and nutrition	17	30	25
Clothing and textiles	6	7½	6
Housing	2	3½	2
Home management	0	6	4
Family life	0	2	3

[1] Six hours applied art under home economics.

It is not the purpose of this survey to submit models or lay down standards in the case of specific curricula. The purpose is to examine and report on the general situation with respect to home economics curricula in the United States with reference to the educational principles and policies that prevail in the higher educational

world and to suggest procedures and policies looking to the further development of the functions of college home economics in harmony with the future evolution of educational life in the United States. These purposes are no doubt obscured for the general reader and perhaps to a degree for the home economics specialists also, by the details that have been presented. It is advisable, therefore, to summarize certain tendencies and conditions revealed by the preceding discussion and to relate these conditions and tendencies to other aspects of home economics education and to trends in general higher educational development.

The Curricular Situation

This most obvious superficial situation revealed by study of home economics courses and curricula is confusion of objectives, confusion of means adapted to the attainment of objectives, and confusion of lines of demarcation between subject-matter fields. Nevertheless, judgment of home economics solely upon the basis of these contradictions and obscurities would miss entirely the elements in home economics that give it such unmistakable vitality. These elements are essentially those that have always caused the great advances and the great disturbances in the world, unwavering faith in what has not been demonstrated and stubborn conviction that this faith can and ultimately will be justified by its works. Historically and currently the distinctive faith and function of home economics must be defined in terms of sex. Home economics is the educational expression of a changing social world in which women seek to define in new terms their relationships to all the factors of living. It is not concerned especially with what has come to be connoted by "women's rights." Although removal of artificial disabilities that stand in the way of women receives whole-hearted support it is noteworthy that home economics has never been characterized by "militant" feminism. It is above all concerned with discovering and utilizing the means by which the capacities of women may be fully developed and through which their abilities may find free expression. Home economics shares the common confidence that this like all other important problems is one of education.

Only by such an interpretation as this is it possible to explain the vigorous and aggressive position of home economics in education in the United States. The offerings of home economics in the land-grant colleges and universities afford evidence of the substantial validity of such an interpretation and are in turn clarified by it. These abstract generalizations may be made concrete and specific; they are derived from a thousand facts and provide the pattern that gives the facts meaning.

Three threads run through the entire mass of data concerning the courses and curricula that constitute home economics offerings. They appear again and again in the statements of objectives. First is the constant concern with the education of women as members of the family social unit, second is interest in women as earners, and third is the pursuit of new and more exact knowledge that will contribute to both these aspects of women's functions. These things are clear; upon them there is agreement. It is only when practical expression of these purposes is attempted that the impression is created that home economics is bewildered by the wealth of possibilities, by the necessity of selecting from the multitudinous materials available those best suited for its purposes, by the variety of demands, and by the chasms of ignorance that must be bridged. Shall the interests through which it is believed that impetus may be given to women's development be defined and presented in terms of science, of economics, of the material, of the level and sociological, or in some other terms?

Women's interests provide a starting point for all these forms of educational attacks, all provide a wealth of material that has been developed and organized for other purposes but that may be adapted to the uses of home economics. This confusion is reflected in the striking lack of agreement in regard to emphasis upon the various subjects that compose any one of the curricula that is offered in a number of institutions and is especially evident in the curriculum designed for general home economics education.

If home economics continued to define its objectives in terms of skills or knowledge this condition would be more serious than it is, for in that case the best choice of content and method would be relatively limited to vocational purposes that can be rather easily analyzed. But despite the fact that there is doubtless much surviving adherence to these interpretations of educational purpose, home economics leaders are expressing with increasing clarity the more fundamental objective of creating what may be called educated attitudes, educated viewpoints, and educated methods of dealing with all problems by which the individual may be confronted. The educated attitude is interpreted as one of intellectual rather than emotional reaction. The educated viewpoint is one of tolerance and of wide interest in all the activities of the world. The educated method is that of reasoned and logical treatment of facts. These purposes are the basic ones of general home economics. To attain them requires a synthesis of the viewpoints represented by the scientist, the economist, the sociologist, and the humanist—a synthesis that utilizes subject matter derived from the special interests and functions of women as members of the family unit. The purpose is

not that of a profession—the profession of homemaking, motherhood, or being a woman—for it contemplates the activities, duties, and functions of women in quite another realm of values than that of professional occupation.

The objectives of general home economics may be stated in much the same terms as those of the college of arts and sciences but its field and its subject matter are much more exactly and clearly limited. The college of arts and sciences has assumed that there is a body of knowledge that may be so treated as to create in anyone the initial interest and experience, the attitudes and habits of action that characterize the educated or intellectual classes. General home economics retains the basic purposes of liberal education but takes its departure from interests already strongly developed among women and seeks to select and relate subject matter from these fields in such fashion as to release and to develop the abilities of women in directions that will lead them to educated viewpoints and methods of dealing with life as women find it.

With this objective the confusion of subject matter now found in general home economics curricula may be explained and, in so far as confusion represents experimentation, directed to the discovery of the best selection of subject matter for this purpose. However, the present condition does not in fact arise simply from causes of this kind. In part it is due to acceptance of the educational emphasis developed by special subject-matter fields in the legitimate pursuit of their own proper places in the sun, in part to traditions of the 4-year college course, and in part to failure to distinguish clearly between the general home economics objective and objectives of vocational or research character.

The emphasis upon chemistry without corresponding integration with the initial interests of women or with other elements of the general home economics curriculum which developed with the increasing importance of chemistry in industry is now giving way somewhat to emphasis upon economic and social subjects that developed effectively, so far as the land-grant colleges are concerned, with discussion of agricultural marketing, farm relief, and other elements of rural welfare not immediately phases of agricultural production. General home economics may very properly, of course, utilize these aspects of learning, but it should be with conscious and specific reference to its own objectives rather than as a reflection of tendencies in industrial or agricultural education.

The tradition of the 4-year college course represents the background and environments in which the college curriculum in general home economics has developed. The hold of this tradition is now becoming weaker but will persist and perhaps should persist in

many college organizations and curricular plans. The problem of the general home economics curriculum becomes one, therefore, of determining which of four general policies it shall follow. Shall it adhere to the principle of the 4-year arts and science course in which interest is aroused by inserting courses of specific home economics character throughout the entire period? Shall it attempt to develop what may be called an isolated college of general home economics in which the basic core about and through which the abstract sciences and humanities are made to function upon the consciousness of its students in home interest? Or shall it accept the principle that home economics shall during the first two years complete the general education of its students by utilizing home economics subject matter to vitalize the elements of education that in their abstract form appeal less to women and to follow this general training by other specialized 2-year curricula looking to occupational or research preparation? Or shall it abandon any special emphasis upon home economics during the first two years, and depending upon a type of general education designed to prepare during this period for almost any kind of specialization, undertake to set up distinct 2-year general, vocational, and research curricula in home economics upon the basis of these two years of general education. All these tendencies are evident in current educational development. Probably all will persist and be embodied more or less permanently in different types of institutions in spite of the present strength of the tendency to emphasize the advantages of two years of general junior college education upon which specialization may be based. The survey does not recommend any single one of these plans to general home economics for adoption by all institutions. It does earnestly recommend that in harmony with the policy of the institution of which it is a part each home economics unit definitely select one of these four choices and reexamine its curricula, especially its general home economics curriculum, in accordance with the general theory and policy adopted. At present this has not been done. Much of the confusion in the present construction of home economics curricula arises from attempts by single home economics units to adhere simultaneously to two or more very different and divergent plans.

Confusion of general home economics objectives with vocational and research purposes that is evident in the statement of objectives and content of home economics curricula arises in part from attempted adherence to two or more of the theories of educational organization just presented. In part this confusion is due to the inadequate educational training and experience of home economics personnel which results apparently in inability to relate specific

demands for home economics education to appropriate subject-matter combinations.

However the situation is not due entirely to either of these causes, an important factor has been institutional and social insistence that diverse objectives be served without providing personnel and facilities which would make possible articulation of subject matter consistent with the purposes intended. Home economics like other elements of higher education has had to meet pressures of this kind by expedients that the personnel could not sanction upon professional or educational grounds. This is a problem for institutional as well as for home economics administrators. Both should attempt to limit offerings to areas that the institution is prepared to handle effectively rather than to comply with all the diverse demands that may be made or to attain by means of paper arrangements the variety and scope of curricula of larger and better financed institutions. The general home economics curriculum that contemplated a general college education specifically designed for woman is the basic function and service of home economics education. This implies, however, no belittling of more specific vocational functions which should be served through their own curricula. The need for vocational specialization in the fields in which women find employment is highly desirable. Demands for cafeteria managers, teachers, dietitians, editors, saleswomen, and buyers in specialized lines and so through the whole series of modern remunerative employments have to be considered from the standpoint of college home economics functions.

From the strictly vocational standpoint many of these occupations do not require four years of college training in the specialty that is applicable. Many of the women who look forward to life employment in certain vocations may not profitably devote two years of junior college to general education as foundation for specialization. In these cases which can be determined only by careful personnel judgment of the student and by careful analysis of the contemplated occupation, the vocational preparation may well be given upon the lower division or junior college level. Curricula should be devised for this purpose. The student who spends two years in general preparation as a basis for more exacting specialized vocational preparation should, in the event that she changes her mind or fails to display the requisite ability for such specialization, be permitted and encouraged to attempt one of the junior college vocational curricula. On the other hand several of the vocational curricula now dispersed through four years may well be concentrated into two years of senior college or upper division work based upon two years of general junior college training. General junior college training may or may not be through a 2-year

general home economics curriculum. It seems advisable, however, wherever institutional organization and policy permit that this be the plan adopted.

With the present high standards of high-school education it is probable that two years of general home economics instruction upon the junior college level will provide as high a standard of general education as is advisable and should be followed by specialized upper-division curricula. However, it is not improbable that the social judgment of the desirability of "going to college" will and should preserve indefinitely in some institutions the 4-year home economics curriculum with objectives that are strictly those of general education.

General home economics curricula and curricula designed to prepare for home economics vocations should be distinguished from those that contemplate preparation for research. The research function is one of scholarly preoccupation distinctly different from the general purposes of liberal education and although research may lead to remunerative employment the main characteristic is learning, not earning. Because of the influence of developments in other fields as well as because of a very real connection with areas of primary concern to home economics the tendency in home economics discussion has been to emphasize scientific research. However, research in the sociological and economic aspects of women's interests and especially in the problems of women's education should have as much earnest attention as research in the physical sciences. Perhaps more emphasis should be given, since the conventional investigations in the field of the social sciences is less directly applicable to home economics problems than is the case of research in physical sciences.

The need for research to clarify and supply material for the home economics education of women is clearly recognized in the statements of objectives assigned to all the home economics curricula. The adaptation of subject matter to meet this need is, however, often insufficiently distinguished from the assemblies of courses for the purpose of attaining quite different objectives. This is evident from an examination of the home economics curricula described for the the purposes of the survey.

Part of this confusion arises from the persistence of belief in, but vague definition of, the desirability of providing those who are to follow scholarly pursuits with a basic general home economics training. Perhaps some of the perplexity engendered by the wish for this alliance would disappear if the problem were attacked by utilizing a 2-year period of general home economics education as a means for providing this training and as a means of selecting the students who should be guided to an upper-division curriculum looking definitely to preparation for research in physical or social sciences. Thus stated

it should be distinctly different from the preparation designed for the more highly skilled or technical vocations. The courses chosen for this curriculum would naturally be those which give training in the methods of investigation and research procedures appropriate to groups of the social or physical sciences. The purpose of this specialization is clearly not that of undergraduate attainment of expertness or productiveness in a specific field of scholarship but is rather that of preparation for graduate apprenticeship for scholarly production.

To recapitulate briefly, home economics curricula should be carefully distinguished as to objectives and their length adapted to the specific purposes they are intended to serve. The general home economics curriculum of two years' duration may provide a basis both for a variety of upper level vocational curricula and for curricula looking to development of research careers in the physical or social sciences. Lower division vocational curricula are needed both for those who do not contemplate more highly technical employments and for those who prove unable to pursue such advanced training. Nevertheless, it is probable that some institutions should continue to provide more discursive and leisurely 4-year curricula both in general and in vocational home economics.

Chapter VIII.—Home Economics Teaching

A national survey of the status of home economics in the land-grant colleges can contribute little to the solution of problems of actual classroom teaching. The survey data do, however, furnish some information in regard to emphasis upon the laboratory method and in regard to the extent to which individual instruction is undertaken.

It is perfectly evident that home economics has somewhat enthusiastically accepted the laboratory method as a means of instruction. In 12 institutions the number of laboratory and lecture or recitation hours are about equal. In 24 other institutions the proportion of laboratory to lecture or discussion hours varies from 3 to 1 and 4 to 1. In one institution among 20 home economics courses taught in 1927–28 two hours of lecture, none of discussion, and 73 hours of laboratory work per week are shown. In another among 60 courses are 40 hours of lectures, 17 of discussion, and 226 laboratory hours per week. In still another, no lectures, 18 discussion hours, and 100 laboratory hours occur.

These facts raise two questions. Are the so-called laboratory hours in such subjects as foods and clothing devoted to practice in becoming good cooks or expert seamstresses? Are they devoted to work compatible with the real functions of laboratory work, making the students familiar with the techniques and methods of attack through which truth is discovered or applied? If the former is the case, the laboratory hours are a weakness in home economics instruction and not an element of strength as is usually assumed. If the latter is the case, it would seem that the proportion of time devoted to the purpose is entirely too great for the range and level of undergraduate instruction. The undoubted values of the laboratory method have in other fields as well as in home economics led to overemphasis upon and substitution of routines and insignificant procedures for basic instructional values that may be acquired by this method. The entire matter of laboratory method and its place in teaching needs thorough reexamination in home economics as in other fields. Probably educational experimentation designed to determine comparatively the results of laboratory work of various kinds and in various amounts

should be applied to the different subjects in which this method is used. Perhaps also some further investigation of the comparative results of laboratory work and demonstration and the limitations of both should be undertaken in the home economics fields. Such studies will require careful definition, control, and interpretation. It is recommended that the home economics services unite for studies of this character.

The individual conference method of instruction under which the student is largely thrown upon his own resources and in which it is the function of the instructor to provide the student with guidance in methods of attack and procedure rather than with subject matter, is used to a very limited extent in home economics instruction by the land-grant colleges. This has in the past been the method supposedly appropriate to graduate work but is increasingly finding its way in undergraduate instruction. Although as has been shown by previous pages of this report more than 50 per cent of the undergraduate courses offered in home economics may also be taken for graduate credit, less than 7 per cent of 1,188 courses offered are taught either wholly or in part by the individual conference method. The method is used at all in the home economics instruction of only 19 of the land-grant colleges reporting. It is not advocated that any large proportion of the work of undergraduate home economics teaching be carried on in this manner, but for students of special ability or unusual interests and for the accomplishment of purposes that can not be realized through class instruction, the individual conference method is commended to the consideration of home economics teachers and administrators.

Practical Experience and Home Economics Training

Practical experience is not generally regarded as essential to the success of professions or occupations in which students of home economics are specializing, according to reports received from 27 institutions. Among six institutions offering special training in applied or related art, but one requires practical experience of one summer's duration. But 8 of the 14 institutions offering special training for extension workers require practical experience. Among these, six give one month as the length of time required. But 10, or one-half of the 20 institutions offering special curricula in foods and nutrition, include practical experience as a requirement. Twenty of the 35 institutions offering special training for teachers of home economics require practical experience in the teaching situation as part of the preparation for this work. Six of the 16 offering special training in institutional management make such a requirement and 8 of the 16 offering special training in the field of textiles and clothing.

The three institutions offering special curricula in dietetics require some practical experience. There is obvious misunderstanding of the meaning of "practical experience." Many included what must be practice teaching and hospital dietetics practice under this head.

It does not seem to be considered necessary that this practice be done under supervision. Particularly is this true in the fields of applied art, foods and nutrition, teacher training, and general home economics. Under teacher training, but nine institutions report the practice work done under supervision; eight that it is not supervised; three do not report. Two institutions report practice work in foods and nutrition done under supervision; three report no supervision. The practice in institutional management and clothing and textiles, though it is not widely required, is generally done under supervision.

The student who is specializing with a view to preparing herself to go at once into highly specialized society, immediately upon leaving college, needs not only tools useful in her future practice, but practice and guidance in using these tools in particular situations. Methods can be better practiced in the actual situation where the student will employ them, than in the artificial setting of a classroom or a school laboratory. The establishment of home management houses has been a step in this direction for home management and general home economics. At best, it is somewhat artificial. It is highly desirable that home economics departments establish relationships with homemakers, commercial concerns, and other persons and agencies in order to work out a cooperative program which will include a broader opportunity for student practice under the guidance or supervision of persons capable of giving wise direction. This recommendation is not to be regarded from the standpoint of apprenticeship, but rather from the one of a mutual interchange of tools and methods. By practice in the real situation, the student gains much more than mechanical skills. By cooperation and association with outstandingly successful persons the student may not only learn techniques of management, but, more than that, he has an opportunity to observe a philosophy.

Chapter IX.—Students

Home economics organizations in the institutions, home economics staffs, buildings, and offerings have no virtue of their own. Their purpose and value consist solely in their use in the education of students. It is possible, or has been attempted in preceding pages of this report, to discuss the suitability and standards of these instruments of instruction in a fashion more or less detached from the students themselves, but the ultimate measure of their usefulness is the human product. To attempt to determine the effect upon a national scale of home economics in terms of student measurement is impossible but some indication of the values of home economics instruction is afforded by the degree to which it attracts students (enrollments) by the character of the student body, by the number of degrees earned, and by the life occupations that graduates find. This section upon home economics students is devoted to these matters and to corollary considerations that arise from them.

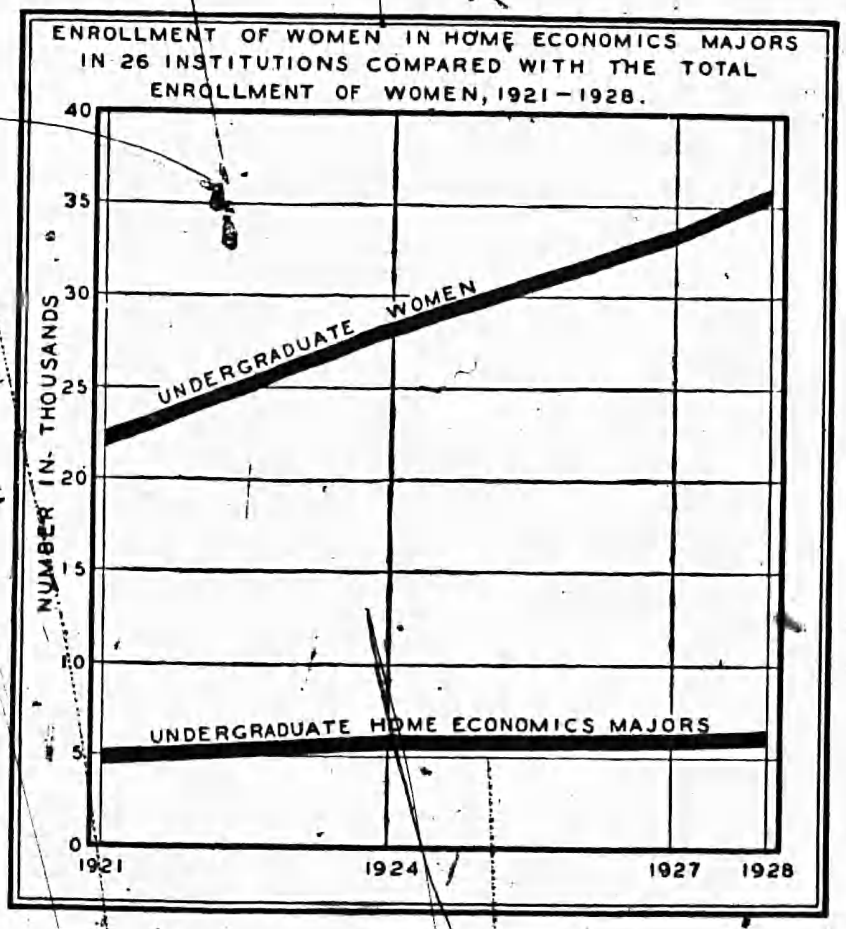
Enrollments

It is a common assumption that the enrollment of women in land-grant institutions is largely enrollment of women majoring in home economics. That this is not the case in the 26 institutions for which comparable figures were available over a period of years, is shown by the graph on the opposite page.

It will be noted that in this group of 26 institutions the percentage of home economics majors to the total enrollment of women has declined from 22 per cent in 1920–21 to 17 per cent in 1927–28. It will also be noted that while the percentage rate of increase of the total number of undergraduate women has tended to decline during the years 1920–21 to 1927–28, the rate of growth in the number of home economics majors has declined even more rapidly.

It is perhaps significant that certain institutions show a very much higher percentage of home economics majors to the total enrollment of women in these institutions than is the case for the 26 institutions included in the graph. In Connecticut Agricultural College 89 per cent of the women enrolled are majoring in home economics; in Georgia State College, 85 per cent; in Iowa State College, 82 per

cent; in Rhode Island State College, 75 per cent; Colorado Agricultural College, 70 per cent; Purdue University, 67 per cent; Virginia Agricultural and Mechanical College, 49 per cent; South Dakota State College and the Agricultural College of Utah, each 40 per cent; and in Oregon Agricultural College 39 per cent. All of the institutions showing very high percentages of women students enrolled in home economics majors are separate land-grant colleges, that is predominately technical institutions.



This fact may be interpreted in two ways: Either the programs of these institutions are so limited to technical purposes that home economics is practically the only curriculum offered that appeals to women, or the home economics offerings are so constructed that they afford opportunities that in State universities would be met by distinct non-home economics curricula. Other evidence furnished by survey data makes it apparent that the institutions showing larger percentages of women majoring in home economics may be divided into two groups upon the basis of the application of these two tendencies.

The relationship of the number of home economics majors to the total enrollment of women in the land-grant colleges is intimately

connected with curricular development and definition of home economics objectives.

The distribution of enrollments in various home economics curricula in 1927–28 presented by Table 27 for 43 institutions is of special interest in this connection.

TABLE 27.—*Enrollments in home economics by curricula in 43 land-grant institutions, 1927–28*

Curricula	Number of institutions reporting	Number of students enrolled	Per cent
1	2	3	4
Applied art	2	13	0.3
Extension	9	48	1.3
Foods and nutrition	8	131	3.5
General home economics	19	1,733	46.6
Teacher training	21	926	25.0
Home management	1	7	.2
Institutional management	11	126	3.4
Textiles and clothing	6	47	1.3
Bacteriology	1	3	.08
Nursing	2	9	.2
Home economics journalism	1	3	.08
Hospital dietetics	2	23	.6
Professional home economics	2	495	13.3
Hotel management	1	123	3.3
Physical education	1	26	0.7
Five-year bachelor of arts and bachelor of science	1	3	.08
Total		3,716	

The data concerning enrollments raise three questions: Shall home economics be developed as a special, highly technical type of education appealing to a relatively limited group of women? Shall it be developed as a medium that will provide a general college education for women more effectively than other curricula? Or shall differentiated home economics curricula be developed which will distinguish clearly between objectives appropriate to technical purposes and those designed for general education? Upon the answer of home economics and the institutions to these questions will depend in large part the distribution of the enrollment of women between home economics and other elements of the educational program.

The size of the student body in home economics in various land-grant colleges in 1927–28 is significant. In 41 land-grant institutions reporting for the year 1927–28, enrollments in each of 15 institutions were fewer than 100; in 17 others they varied from 100 to 300; in 8 others from 300 to 600, and in 1 institution, the enrollment was more than 1,000.

The largest enrollment is in Iowa State College, where 1,026 women have chosen home economics as their major field of study. Kansas State Agricultural College reports the next largest enrollment, 516. The University of Illinois reports 404; Purdue University, 432; Michigan State College, 401; the University of Minnesota, 434; Oregon Agricultural College, 476; the University of Wisconsin, 308.

Another measure of the drawing power of home economics afforded by enrollment figures is the number of students enrolled in home economics as a minor study. Available data in regard to this type of service are very incomplete, but 7 institutions that have a system of majors and minors report for 1927–28 no students minoring in home economics, while 11 others show but 123 students with home economics as a minor. Two institutions, Alabama Polytechnic Institute and the University of Vermont, account for 60 per cent of the home economics minors reported. The apparent conclusion that there is very little interest in home economics as a minor study would hardly be justified upon the basis of the incomplete data furnished, but the evidence is sufficiently startling to suggest that the matter be given institutional study. It may be that further inquiry would reveal that the offerings of home economics need reexamination from the standpoint of the contribution they might make as a point of secondary emphasis for students who are majoring in other fields.

The impression thus produced that home economics is making little appeal to non-home economics majors is modified by the record of the number of students electing one or more courses in home economics. Cornell University reports 1,062 students other than those majoring or minoring in home economics in this group; Utah Agricultural College, 947; University of California, 564; Kansas State Agricultural College, 482; State College of Washington, 309; University of Nebraska, 207; Louisiana State University, 200; University of California at Los Angeles, 144; University of Missouri, 139; University of Minnesota, 125; and the University of New Hampshire, 110.

Men Enrolled in Home Economics

Although home economics offerings are not generally taken advantage of by men, the increase in the enrollment of men is significant. Seventeen institutions report 555 men enrolled for one or more courses during the year 1926–27. Thirteen institutions report a total enrollment of 636 men for the year 1927–28. Oregon Agricultural College leads with 272. Cornell University reports 227 men enrolled for home economics courses, 123 of whom are registrants in the hotel management curriculum. North Dakota Agricultural College reports 62 men enrolled; Iowa State College and the University of Illinois each, 22. As home economics develops specialized areas of instruction in the social fields, especially in those that are concerned with health and business, and as its science work is more completely integrated upon a college level with home and family activities there seems little reason why the number of men

who elect home economics courses should not increase materially. The relationships of home economics to the interests and activities of men are quite different from the relationships of engineering and certain other predominately masculine specializations to the interests of women. A very wide field of business and professional activities in which men engage, touches directly and intimately and is dependent upon the family as a social and economic unit. As these matters are handled increasingly by home economics in accordance with high educational standards, men who contemplate life activities that are closely related to the management and maintenance of the human and material welfare of the family will find it advantageous and even necessary to familiarize themselves with special phases of home economics work.

Scholarship and Loan Funds

Undoubtedly attendance at higher educational institutions is considerably stimulated and increased by special aids afforded through scholarships, fellowships, and loan funds. The question naturally arises, therefore, as to whether home economics enrollments are due to a greater or lesser degree than is the case in other elements of the colleges and universities to special aids of this kind. Inasmuch as women find fewer opportunities than men to earn their own way in college and since institutions quite usually impose more restrictive regulations upon the living conditions and activities of women than upon men students, institutional emphasis upon such assistance to women students would seem entirely logical and desirable. Details in regard to scholarships and fellowships will be found in another section of the survey report,[3] but it is appropriate to call attention in this place to data furnished independently of those used in the special study of institutional aids of this kind.

The number of scholarships granted to home economics students is very small; in 24 institutions reporting scholarships, only 84 other than State scholarships were granted to home economics students in 1927-28. One-third of these were given at the University of Minnesota. Those granted varied in value from $10 to $900. Where the amounts are definitely specified, 19 are less than $100; 39 between $100 and $150; 3, $150 to $200; 9, $200 to $250; 3, $250 to $300; 1, $350 to $400; 3, $400 to $500; and 1, more than $500. Nine institutions report no scholarships available; four, that scholarships are available, but not specifically for home economics. Two institutions do not report; two others report only State scholarships; while five among those first named show special home economics scholarships available. These figures do not give an accurate picture

[3] Part VI, Student Relations and Welfare.

of scholarships available for the reason that several institutions report "several scholarships," and similar indefinite items.

Among 22 institutions, 103 loan funds available for the use of home economics students are reported. For 19, or about 20 per cent of all loans, no interest is charged; for the other 80 per cent interest, which begins after graduation, varies from 4 to 6 per cent; 4 per cent being the most common rate.

Recent discussion of the social effect of student loan funds has not been entirely favorable. It is argued that such loans start out young graduates under a burden of debt which tends to delay marriage and the establishment of families. To complete an education, especially for the professions, requires an apparently ever-increasing number of years, thus raising the age at which earning is started. Singleness easily becomes a habit during the years of education and early period of small earnings. In brief the burden of repaying an educational loan may become a material factor in the tendency to late marriage and small families among the educated classes. The arguments advanced apply with special force to loan funds for women. Marriage and the establishment of homes is the normal and desirable thing for the majority of college women. In spite of all discussion about young women pursuing careers or continuing gainful employment after marriage, the fact remains that in the great majority of cases, the biological function of child bearing precludes such occupations or delays them until later years. Anything which would diminish to any great extent the number of young women with special home economics training who marry, should be considered seriously. The young woman who has borrowed very much money for her college education often faces a situation in which she must delay marriage and a home because of her unwillingness to put the responsibility of repayment upon her husband. Factual evidence is lacking and probably always will be, to prove this assertion or to ascertain how general the situation is. It is an aspect of loan funds, however, that deserves consideration.

Degrees.

According to reports from 42 institutions, the bachelor's degree for work in home economics was granted by 7 land-grant colleges prior to the year 1900; 8 additional institutions granted degrees between 1900 and 1910; 21 between 1910 and 1920. Six others have granted degrees since 1920.

A study of degrees offered by 26 institutions from which total figures are available for the years between 1920 and 1928, shows a steady increase in number from 695 in 1920, to 1,080 in 1928. Nine hundred and thirty-nine degrees are reported for 1923–24, an in-

crease of 244, or 35 per cent above 1920–21. One thousand and two degrees were granted to home economics graduates in 1926–27, an increase of 63, or 6.7 per cent. In 1927–28, 1,080 degrees were conferred on persons who had specialized in this field, an average increase of 78, or 7 per cent over the previous year.

The entire group of land-grant institutions reporting on this point (43) granted 1,534 first degrees in 1927–28 to students in home economics curricula. Forty-eight per cent of all degrees were granted to students completing the work in teacher training. Thirty-five institutions report 763 bachelor's degrees given for this work in 1927–28. In 13 institutions, the degree was granted by the division of home economics; in 10, by the college of agriculture; and in 6, by the college of education; and in 2, by the college of liberal arts and science. In 4 instances, the name of the major division granting the degree is not specified.

Second in number of graduates for 1927–28 are those completing courses in general home economics. Thirty-six institutions report 462 graduates. In 15 institutions, the degree was conferred by the division of home economics; in 13, by the college of agriculture; in 2, by the college of education; and in 3, by the college of liberal arts and sciences. Three institutions do not specify the name of the major division granting a bachelor's degree for work in general home economics.

The bachelor's degree in home economics with specialization in foods and nutrition was conferred upon 78 persons by 20 institutions in 1927–28. In nine cases the degree was conferred by the division of home economics; in five, by the college of agriculture; in one, by the college of education; and in 3, by the college of liberal arts and science. Two institutions do not specify the name of the division granting the degree.

Seventy-six bachelor's degrees were conferred in 1928 by 16 institutions upon students who had specialized in institutional management. In seven, the degree was granted by the division of home economics; in three, by the college of agriculture; and in one, by the college of education; and one, by the college of liberal arts and science. Three institutions do not specify the name of the major division granting these degrees.

One institution, Iowa State College, reports 1 graduate completing work in the curriculum "family life" in 1928.

Although six institutions report curricula in applied art, only two, Iowa State College and Michigan State College, report graduates in 1928 with specialization in this field—the former four, the latter, two.

Eight institutions show 16 graduates with specialization in extension teaching. Numbers of other graduates according to their field

of specialization are: Home management, 2; textiles and clothing, 34; hotel management, 23; household economics and home management, 21; hospital dietetics, 22; nursing, 6; physical education, 5; and homemakers' course, 10.

Seventy-eight per cent of all graduates of divisions of home economics among 39 land-grant institutions in 1927–28, completed work either in general home economics or teacher training. Graduates with specialization in all other curricula, make up only 22 per cent of the total. Such a large percentage of home economics graduates with training in general home economics and for teaching is insignificant. It shows clearly that these curricula may well be the first and major concern of the home economics units in the land-grant institutions. Specialization, for other occupations may be and undoubtedly are important, but from the standpoint of democratic education the curricula in general home economics and in teacher training are still reaching the largest numbers.

Character of the Study Body

Few measures or estimates of the character of the home economics student body are available except the very one-sided records and judgments that emphasize deficiencies. Thirty-seven institutions report that the outstanding weakness in the training of students graduating since 1925 is lack of coordination of training. This judgment is that of supervisors of home economics education, the directors of home economics departments, and of those in charge of teacher placement. Other points in order of frequency in which they are reported are: (1) Inability to speak and write the English language correctly; (2) deficiency in training in fundamental sciences, and lack of training in fundamentals of organization; (3) deficiency in academic training and incompleteness of training in home economics subject; (4) discipline; (5) lack of training in office organization. Sixteen institutions make special notations in which other points of weakness in training pointed out show emphasis upon the inadequacy of training on the social side—philosophies, attitudes, personality, ability to adjust self and training to needs of different social groups.

How much four years of undergraduate association and instruction can do to change habits built up through 15 or 20 years is, of course, a matter for speculation, but these reports indicate the recognition of a problem. It is equally obvious, of course, that these criticisms are in fact directed toward the college of home economics offerings and methods. They constitute a recognition of the failures and a challenge to correct them much more truly than a comment upon the study body itself.

Employments and Placements of Students

Under modern social conditions a great number of young women, as well as men, are gainfully employed. Most of the students in home economics expect to and will pursue some gainful occupation for at least a few years after graduation. The distribution of home economics graduates among various life occupations is treated in some detail by the section of this survey that deals with graduates and ex-students.[4] The reader is referred to that section for factual information in regard to this matter. The subject is introduced here in order to record the methods used by the institutions in guiding and placing home economics students.

The methods used to acquaint students with demands in the fields allied with the training offered are significant, in that they measure in some degree the success of the training itself. Among 32 institutions reporting, 16 report occasional assemblies of students for lectures on the vocations which are open to young women with home economics training. Eight report that student advisors confer with students concerning vocational opportunities. Nine report personal interviews between students and members of the staff or persons who are engaged in vocational work. The University of Missouri reports that the home economics department participate in vocational guidance conferences arranged by the Women Student Government Association. The University of Wisconsin reports that the home economics department has cooperated with the department of psychology in studying needs within the university, in proposing a program for the entire university, and has been one of the most active departments in carrying plans into effect.

Fourteen institutions report using the advisor system for entering freshmen, not only to acquaint the student with courses and other offerings, but to keep in touch with her during the progress of her study for the purpose of guidance toward a desired end.

Demand for persons with home economics training is determined by home economics departments in various ways. Thirteen institutions report using the demand of previous years as a guide; 17, that conferences with the State supervisor of home economics education keeps them in close touch with the need for teachers. Ten institutions report that demand has always exceeded supply. Significant is the close cooperation shown with administrative heads in the teaching field. Very little is reported regarding association with workers in other fields. This is somewhat surprising since there is an increasing number of openings in the business world for women trained in home economics.

[4] Part V, Alumni and Former Students.

One method of determining demand for employment as well as the use made of the special type of education offered by home economics is by making studies of graduates. This method is not generally employed, seemingly, since only 11 institutions report any studies of graduates. Twenty-two report that no studies have been made; eight do not report. Most of the studies are concerned with teacher training.

Intimately connected with the subject of the opportunities open to home economics graduates and the placement of such students, are the contacts and affiliations of home economics units in the land-grant institutions with organizations and agencies outside the institutions. These relationships are significant in this connection in that they indicate something of the degree to which home economics is establishing itself as a distinct field of education, and they also serve to indicate whether home economics is developing as an extremely academic area of education or tends to associate itself with the practical affairs of the world. Both these aspects of outside relationships have considerable bearing upon the training and occupations of graduates.

Only 8 of the 42 institutions reporting in regard to these associations show any considerable breadth of such contacts and activities by reason of the number and variety of their affiliations and cooperations.

As might be expected the greatest activity of national character is found in connection with the American Home Economics Association, the national professional association of those engaged in home economics work. Thirteen institutions report 21 members of home economics staff holding office in the association; 11 report carrying on projects with it. Three institutions report carrying on projects with the aid of the American Association for Vocational Education; 17 report the association helpful in promoting legislative measures of concern to home economics in land-grant colleges.

The activity that is most frequently mentioned as carried on in cooperation with other national organizations is that of conferences, probably the most ineffective and least significant of all forms of association.

Cooperation with organizations upon a State basis shows a somewhat different emphasis. Here cooperation is largely in the matters of supplying speakers and helping with programs. Very few institutions report cooperating on projects with State agencies. Since the extension service has so wide an influence in most of the States, it is probable that many of the services the resident colleges formerly rendered are delegated to county representatives. Very few show any activity in the matter of providing or arranging exhibits. For

example, among 32 State fair associations reported active, 11 only receive cooperation from resident home economics. This may indicate the better organization of county extension services; or it may indicate that resident home economics is emphasizing a type of education less concerned with handicrafts, canned fruit, baking, and garment construction.

Local cooperations reported are of much the same character and receive relatively the same degree of emphasis. Activities reported are for the most part with city schools and charitable organizations, probably because these two are well organized. Very little cooperation is shown with rural schools or with county health work. Six institutions show considerable cooperation with vocational schools or classes—University of Idaho, Kansas State Agricultural College, Cornell University, Ohio State University, West Virginia University, and University of Wisconsin.

Federated women's clubs are the organizations with which home economics is cooperating actively in the greatest number of ways according to reports received. They have without doubt, done much to bring to the attention of the public as well as to organized groups, the need of the type of education which home economics has developed. They are a vitally interested group, composed entirely of women, therefore, an organized part of the group whose problems home economics has made it its business to study and help in solving.

A study of the replies from 41 institutions shows that 28 have established definite cooperative activities with commercial agencies. These cooperations are in the main of three types: Those confined to use of illustrative or demonstration materials; those offering opportunities for field and practice work for home economics students; and those concerned with association in research or special investigations.

Half of the institutions report assistance by use of demonstration materials. The types mentioned most often are those used in household management, clothing, and textiles. Colorado Agricultural College reports loans of etchings, batiks, pottery, and hand-wrought silver, and other art treasures from artists and shops. This is evidence of the recognition of the place fine arts should occupy in the experience of students and especially of persons whose occupation will in all likelihood be that of home builders.

Four institutions, Michigan State College, University of Nebraska, Montana State College, and Rutgers University, mention cooperation from commercial organizations in affording opportunities to home economics students for practice work. Two mention opportunity for practice in salesmanship, buying, and tea-room management. One states that members of the staff in clothing and house furnishing

departments give lectures in local stores. Two institutions mention practice work in institutional management: One with a railroad; one with local tea rooms and cafeterias.

Four institutions report cooperation in research and investigations with commercial concerns. The University of California reports graduate students working on a study of the keeping qualities of various papers in cracker cartons; also a study of the effect of cocoanut oil on loaf volume of bread. Kansas State Agricultural College reports testing of recipes for a national concern and the determination of vitamin content of certain canned foods commercially packed. Purdue University reports one member of the staff working part time on rural electrification. Oklahoma Agricultural and Mechanical College reports that home economics furnishes a short course one week in length for a public utilities corporation.

Commendable as these affiliations are it is remarkable that so few of the home economics units in land-grant colleges have established similar relations. They might well find in such relationships many elements of value to resident home economics instruction, quite apart from preparation for specific occupations. For instance, commercial concerns are teaching the American family and the American home in thousands of ways each day. It would be well for home economics to help set up standards both of product and ethical procedure so that the housewife who is the largest buyer in the country, may have some further assistance in catching up in the "backward art of spending." Just how this can be done is something that must be worked out. Home economics should be one to lead in establishing somewhat the same relationship with commercial firms that medicine, agriculture, and other fields of education have established for the purpose of working out standards for commodities in their fields. This is a gigantic undertaking. Home economics should exert a wide influence based on scientific investigation.

Chapter X.—Conclusions and Recommendations

1. As compared with the traditional fields established in the higher educational world, home economics has had a very brief time in which to isolate and to create subject matter, to devise organizations, train staffs, and formulate purposes in terms of a college standard that has itself been revolutionized during the past 15 years.

2. There are four main tendencies or conceptions in interpretation of home economics purposes:

(*a*) *The development of handicraft skill in the operation of home keeping.*—No institution to-day admits that the major objective of its home economics work is that of developing handicraft skill in the operations of home keeping.

(*b*) *The development of home managers capable of handling the labor, the financing, and the social relationships that arise in the family unit.*—The statements of objectives by home economics departments show that more than two-thirds of the statements are determined by desire to provide education that will serve the purposes revealed by more or less conscious and thoroughgoing analysis of the family. Women are increasingly seeking and finding interests that are more closely related to other institutional and social groupings than to the homes which they maintain, and there would seem to be no reason why the other individual interests and abilities of women should be submerged in the family unit.

(*c*) *Preparation for specific gainful employment.*—All the 42 institutions that describe their home economics objectives include in one form or another statements of objectives in terms of gainful employment—teaching, dietetics, extension service, institutional management, journalism, and business concerned with the buying, selling, or servicing of products used in homes. It should be fairly obvious that these employment objectives are not fully determined and can not be determined by analysis of family and home activity and relationships.

(*d*) *The objective of combined scientific and social education.*—This objective may be described as one that attempts to combine scientific and social education by utilizing as a medium and incentive

the activities and relationships that arise from home and family life. In so far as this is a just statement of a definite home economics objective it requires solution of practical problems and experimental procedures that may well be of greater significance in higher education than the mere segregation of another area of educational endeavor. The processes that will be required if this problem is to be solved in the field of home economics will result in the creation of new subject matter, in new treatment of old subjects, and in daring experimental combinations of methods and courses.

3. The organization of home economics in the institutions tends to reflect and to determine to a considerable degree the conceptions of home economics objectives that are dominant in the land-grant colleges as a group.

There are in the land-grant institutions four types of assignment that reflect institutional conceptions of home economics objectives: (1) Assignment of home economics to the college of arts and sciences; (2) assignment to the college of education; (3) assignment to the college of agriculture; and (4) assignment to a position coordinate with the traditional major divisions in university organization.

(*a*) Retention of home economics in the college of arts and sciences tends to restrict the development of new and wider home economics objectives, since administrative control is centered in an educational position that is unlikely to devote a large degree of vigor and initiative to the special development of this field.

(*b*) Assignment of the home economics work to schools of education becomes inappropriate as women in increasing numbers enter occupations other than teaching. If all home economics work is conducted by this major division the practice is not in harmony with the relations that exist between other subject-matter fields and the school of education. On the other hand, it is just as much out of harmony with accepted principles of institutional organization to assign home economics teacher-training exclusively to a major division other than the school of education when a well-developed school of education exists in the institution.

Practice in the land-grant college with reference to the relationships that the home economics units bear to home economics teacher training shows considerable variety and indicates frequent departure from sound principles of organization.

(*c*) Affiliation of home economics work with the college of agriculture has provided opportunity in many instances for rather free development. Further evidence also points in this direction, since many of the home economics units still in colleges of agriculture are well developed and exercise a degree of autonomy far in excess of the self-control permitted to other subject-matter departments.

(*d*) When home economics instruction is conceived in terms of utilizing subject matter derived from home and family relationships as a medium for a combined humanistic and scientific college education it is entirely logical to set up an independent major division of home economics coordinate with the other schools and colleges of the institution. The tendency to make the home economics unit an independent one is in some instances a conventional notion of what is needed rather than an indication that home economics objectives are such as to require separate control.

4. Failure to articulate all home economics instruction, extension, and research through the head of home economics resident instruction is likely to result in undesirable duplication and a variety of standards within the institution.

5. When home economics matters must pass through a number of subordinate administrative heads before reaching the president it is relatively safe to assume that the immediate heads of home economics work may frequently be compelled to modify their objectives and activities in accordance with policies and attitudes determined primarily upon grounds other than those of development of home economics purposes.

6. Representation of the home economics units on the governing faculty bodies is so limited that a query may well be raised concerning the reasons for this situation. On the other hand, there is a somewhat liberal representation of home economics teachers upon institutional standing committees. That home economics should be represented so frequently on the curriculum committee, one of the most important institutional committees, is testimony by a large number of institutions that the home economics staff is recognized as having a contribution to make.

The facilities and the restrictions that are due to the formal position of home economics in the institutional organization serve to promote or to limit definition and attainment of objectives, but aggressive and competent home economics leadership or sympathetic administrative impetus may secure for home economics an organization of such size and of such character as to attain very advanced objectives even though its apparent position in the organization as a whole indicates restricted purposes.

7. In a number of the land-grant colleges multiplication of departments has proceeded at a rate not justified by the size of staff and by the academic ranking given to staff members. As presented in the reports from the institutions the internal organization of home economics units throws very little light upon the suitability of the existing organization to the attainment of any specific type of objective. Internal organization needs readjustment for the definite purpose of

adapting organization machinery to the accomplishment of a very well-defined purpose.

8. Home economics is establishing its subject-matter field in the esteem of other areas of college instruction. Expansion of the service that home economics can render to other divisions of the institution depends upon the degree of success attained in efforts to establish new and more thoroughgoing analyses of relationships and combinations of home economics subjects.

9. It is significant that among a group of persons engaged in the direction of education that depends upon homemaking for its incentive, so small a number have had experience in the fundamental relationship of marriage. It is desirable that institutional and State restrictions upon the employment of married women be removed wherever they exist and that an adjustment of home economics instruction especially be made in order that women actually responsible for their own homes may more easily be employed upon a part-time basis.

10. It is of special interest that in 41 institutions only 25 persons on the undergraduate staff are reported as having the doctor's degree. Inasmuch as the Ph. D. is the most commonly recognized badge of scholarship and of academic respectability, home economics, and institutional administrations may well take measures to employ new members with the doctor's degree or to encourage study while in service which will enable present members of the home economics staff to obtain the Ph. D.

11. In view of the paucity of the Ph. D.'s among the members of home economics staffs, it would appear probable that the graduate work in home economics is upon the master's degree level in most of the land-grant colleges.

12. A serious deficiency in the academic training of home economics staffs becomes evident when it is realized that almost half of the persons employed in this division hold no degree higher than the bachelor's. The proportion of the home economics staff whose highest degree is the bachelor's should be greatly reduced and employment of persons without any academic degree should be confined to a few specialized fields in which degree training is seldom afforded and is even less frequently desirable.

13. Home economics needs scholarly material both in the scientific and social aspects of its work. An increase in the value of interpretative material of more or less popular type is also desirable. It should be one function of college home economics staffs to take the leadership in providing publications of both types.

14. In 43 of the institutions reporting the head of home economics is directly responsible for recommending new appointments. If the character of these selections is inferior or superior to the standards

prevailing in the institution as a whole the responsibility rests largely with the home economics unit itself, except as the unit may be restricted or aided by salary scales that compare unfavorably or favorably with those of other divisions.

15. The principles or policies that have actually operated with reference to the promotion of home economics staff members in the land-grant institutions should be those that operate for the institutions as a whole.

16. Several theories seem to be applied in the land-grant colleges with reference to the basis of payment of women members of the staffs: (1) The principle of equal work and equal rank demand equal pay for men and women; (2) adjustment of pay to the financial needs of staff members which results in a lower range for women who are unmarried; and (3) determination of pay upon the basis of training and creative activity. Whatever theoretical approval may be given to the first of these principles and whatever the arguments that may be advanced against the second, it is difficult to disprove that institutional management upon the basis of the third method has not resulted in the lower present actual standard.

17. It is evident that a study should be made in each institution of the actual duties performed in order that a reorganization and a reassignment of administrative detail may be made which will not only prevent waste but which will release the time of trained administrative personnel for the more important phases of staff management.

18. Among the most important features of institutional management of the staff is the provision made for maintenance and improvement of faculty quality by means of attendance at professional meetings, study while in service, and leaves for graduate work elsewhere. These matters are of special significance for the home economics unit in view of the need for research experience and development of higher standards of staff training.

19. The home economics staff in land-grant institutions during the past five years has had a very large turnover. Factors operative are the low salaries paid, slow promotion, the increased interest of commercial firms in the home economics trained woman, offering larger salaries to successful people; marriage, which must always make fairly large inroads where the staff is composed to any considerable extent of young women; and the competition among colleges for persons who have proved their worth. Constructive staff management might easily reduce the effect of some of these factors.

20. The head of home economics is in 40 institutions responsible for recommending the purchase of new books in her field. It should be noted in this connection that unless full advantage of this opportunity is taken by the head of the home economics unit, responsibility

for inadequate library collections in this field rests to a large degree upon her shoulders.

21. The establishment of nursery schools in connection with home economics departments has a threefold purpose, namely, to give pre-parental training to students majoring in home economics; to give opportunity for parents to observe scientific methods of guiding young children; and to provide for research in child development and behavior.

22. In the nursery schools it appears that actual home situations are perhaps more closely related to laboratory practice and instruction in child training and development than is the case with any other phase of home economics instruction. It is probable that the same cooperative methods and technique might be employed profitably in the study of clothing for the family, food for the family, family finance, and family relationships. Less artificial situations in the schoolroom and laboratory should be developed thereby.

23. Objectives maintained as ideals may be ever so carefully worked out and enthusiastically championed but practical realization will depend upon the adequacy of resources devoted to provision of a competent staff and suitable physical facilities. On the other hand, financial resources that should be adequate in amount may fail to serve the needs of the home economics unit if poor management results in expenditures that are poorly directed to accomplishment of definite objectives. When objectives themselves are vague, confused, contradictory, no consistent basis or principle of economical financial expenditure is possible and the tendency is to confuse economy with parsimony.

24. The director of home economics and members of her staff serving as department heads within the home economics unit know well the needs of the department. She should be in close touch with the financial situation, not only in her department and college, but in the institution as a whole, and should have an important share in shaping the home economics budget with regard to development of a unit best qualified to accomplish accepted home economics objectives.

25. It would be unfortunate for home economics development if courses and curricula should become conventionalized prior to the best adaptation of means to accomplishment of well-defined objectives. Inconsistency and change are much less objectionable than consistency and permanence of practice upon a mediocre level.

26. It is somewhat surprising that a group as keenly interested in the development of its work as is the home economics group should determine its new offerings to so slight an extent upon the basis of scientific analysis of the activities and interests of women.

27. From the varied ways in which so large a number of departments of home economics in land-grant colleges are working to avoid duplication of high-school work it is clear that further systematic study of this problem is desirable. In part, solution probably lies in development of research in home economics that will provide subject matter sufficiently advanced to be distinctly separate in type from that offered in secondary schools. Problems of articulating college and secondary offerings in home economics will nevertheless demand adjustment by the colleges upon the basis of present offerings in both units. In this process the obligation rests most heavily upon the college.

28. The home economics staffs are attacking the problem of duplication of offerings with considerable energy by means of frequent revision of courses, observation of classes, conferences, and use of course outlines. Probably in part because of the tentative nature of home economics development, the home economics unit displays more interest in and use of these methods than is the case of the older and better established subject-matter fields.

29. Stimulating and constructive courses may best be developed by a determination and delimitation of objectives, by group review of course outlines, by the employment of carefully worked out bibliographies and other guides for reading, and by the use of carefully selected equipment. It is the relationships between library facilities, adequate equipment, and the extent to which these relationships are discovered and employed in service of objectives that will determine in large measure the strength or weakness of courses.

30. Home economics should contemplate reconstruction of its curricula in such fashion as to provide for two years of upper division work to which admission may be obtained simply and easily by general junior college preparation.

31. Although there is a tendency to start serious specialization at the beginning of the third year in college, graduate work is rapidly becoming something still more highly specialized and requiring content and method distinct from those of senior college courses. Home economics should prepare to direct its further development in harmony with these tendencies.

32. Graduate work in home economics, as is the case in other fields in land-grant colleges that do not have highly developed graduate schools, is too largely merely a continuation for a longer period of time of the same sort of work that is offered in the undergraduate years.

33. The increasing emphasis upon all forms of adult education and consequent development of methods and techniques appropriate to such instruction make it evident that home economics may well

give greater attention to courses designed for the special training of home economics extension workers.

34. It is earnestly recommended that home economics leaders consider the possibility of utilizing subject matter in the fields of health and sanitation to a much greater extent than at present as a means of accomplishing the objectives of home economics.

35. Home economics has not reached such a degree of common agreement concerning the major objectives of general home economics curricula as would seem to be indicated by the frequency with which homemaking and general culture are stated as objectives.

36. The undergraduate student who does not expect to enter a professional or technical field is the primary concern of those who would construct a general home economics curriculum on the college level. This curriculum should be definitely directed to this end. The purpose is large and its attainment will constitute an outstanding contribution to American education. Other purposes may well be set aside or delayed.

37. The assignment of objectives to home economics teacher-training curricula is almost as confused as the assignment of objectives to general home economics curricula. Curricula designed to prepare students to be teachers of home economics show a material difference from those in general home economics in only one significant respect—the number of hours of education required when the two curricula are compared institution by institution.

38. When definite technical objectives are ascribed to foods and nutrition curricula, other names would be more appropriate. The term food and nutrition curriculum has no common meaning or significance among the institutions that list such a curriculum.

39. The 17 institutions that offer a curriculum in textiles and clothing show the same confusion and vagueness of definition of objectives that are apparent in the foods and nutrition curriculum and probably for much the same fundamental cause, confusion of subject matter with purpose.

40. The range in number of semester hours in all fields of home economics subject matter in the extension curricula is sufficient demonstration that there is little agreement upon what is necessary to provide the technical home economics material demanded by an extension curriculum and that some institutions are offering so-called extension curricula that are well devised to excite the prevalent doubtful attitude that extension leaders take in regard to their effectiveness as actual preparation for extension work.

41. In the curricula in institutional management there is a notable absence of courses in mathematics or business administration which

would acquaint those preparing to follow the occupation of managing any institution with business methods, accounting, and similar fundamentals.

42. The curricula offered in applied art, home management, and family life, child care, and development represent no significant or specific contribution to the problem of adaptation of subject-matter material to attainment of specific and important objectives. They appear to represent still further the tendency to multiply the number and names of curricula without corresponding differentiation of content or purpose.

43. The most obvious superficial situation revealed by study of home economics courses and curricula is confusion of objectives, confusion of means adapted to the attainment of objectives, and confusion of lines of demarcation between subject-matter fields. The impression is created that home economics is bewildered by the wealth of possibilities, by the necessity of selecting from the multitudinous materials available those best suited for its purposes, by the variety of demands, and by the chasms of ignorance that must be bridged.

44. The tradition of the 4-year college course represents the background and environment in which the college curriculum in general home economics has developed. The problem of the general home economics curriculum becomes one, therefore, of determining which of four general policies it shall follow. Shall it adhere to the principle of the 4-year arts and science course in which interest is aroused by [illegible]setting courses of specific home economics character throughout the entire period? Shall it attempt to develop what may be called an isolated college of general home economics in which the basic core about and through which the abstract sciences and humanities are made to function upon the consciousnes[illegible] its students is home interest? Or shall it accept the principle that home economics shall during the first two years complete the general education of its students by utilizing home economics subject matter to vitalize the elements of education that in their abstract form appeal less to women and to follow this general training by other specialized 2-year curricula looking to occupational or research preparation? Or shall it abandon any special emphasis upon home economics during the first two years, and, depending upon a type of general education designed to prepare during this period for almost any kind of specialization, undertake to set up distinct 2-year general, vocational, and research curricula in home economics upon the basis of these two years of general education? All these tendencies are evident in current educational development. The survey does not recommend any single one of these plans to general home economics for

adoption by all institutions. It does earnestly recommend that in harmony with the policy of the institution of which it is a part each home economics unit definitely select one of these four choices and reexamine its curricula, especially its general home economics curriculum, in accordance with the general theory and policy adopted.

45. The general home economics curriculum that contemplates a general college education especially designed for women is the basic function and service of home economics education. This implies, however, no belittling of more specific vocational functions which should be served through their own curricula. The need for vocational specialization in the fields in which women find employment is highly desirable.

46. From the strictly vocational standpoint many of these occupations do not require four years of college training in the specialty that is applicable. Many of the women who look forward to life employment in certain vocations may not profitably devote two years of junior college to general education as foundation for specialization. In these cases which can be determined only by careful personnel judgment of the student and by careful analysis of the contemplated occupation, the vocational preparation may well be given upon the lower division or junior college level. Curricula should be devised for this purpose.

47. On the other hand, several of the vocational curricula now dispersed through four years may well be concentrated into two years of senior college or upper division work based upon two years of general junior college training.

48. General home economics curricula and curricula designed to prepare for home economics vocations should be distinguished from those that contemplate preparation for research.

49. Research in the sociological and economic aspects of women's interests and especially in the problems of women's education should have as much earnest attention as research in the physical sciences; perhaps more emphasis should be given since the conventional investigations in the field of the social sciences is less directly applicable to home economics problems than is the case of research in physical sciences.

50. The undoubted values of the laboratory method have in other fields as well as in home economics led to overemphasis upon and substitution of routines and insignificant procedures for basic instructional values that may be acquired by this method. The entire matter of laboratory method and its place in teaching needs through reexamination in home economics as in other fields.

51. The individual conference method of instruction under which the student is largely thrown upon his own resources and in which

it is the function of the instructor to provide the student with guidance in methods of attack and procedure rather than with subject matter is used to a very limited extent in home economics instruction by the land-grant colleges.

52. It is highly desirable that home economics departments establish relationships with homemakers, commercial concerns, and other persons and agencies in order to work out a cooperative program which will include an opportunity for student practice under the guidance or supervision of persons capable of wise direction.

53. Seventy-eight per cent of all graduates of divisions of home economics among 39 land-grant institutions in 1927–28 completed work either in general home economics or teacher training. Such a large percentage shows clearly that these curricula may well be the first and major concern of the home economics units in the land-grant institutions.

54. Home economics should lead in establishing somewhat the same relationship with commercial firms that medicine, agriculture, and other fields of education have established for the purpose of working out standards for commodities in their fields. This is a gigantic undertaking. Home economics should exert a wide influence based on scientific investigation.

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