

THE UNIVERSITY OF MINNESOTA

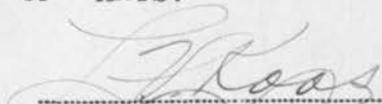
GRADUATE SCHOOL

Report

of

Committee on Thesis

The undersigned, acting as a Committee of the Graduate School, have read the accompanying thesis submitted by Percival W. Hutson for the degree of MASTER OF ARTS. They approve it as a thesis meeting the requirements of the Graduate School of the University of Minnesota, and recommend that it be accepted in partial fulfillment of the requirements for the degree of MASTER OF ARTS.



Chairman





September 18, 1923

THE UNIVERSITY OF MINNESOTA  
GRADUATE SCHOOL

Report  
of  
Committee on Examination

This is to certify that we the  
undersigned, as a committee of the Graduate  
School, have given Percival W. Hutson  
final oral examination for the degree of

MASTER OF ARTS

We recommend that the degree of

MASTER OF ARTS

be conferred upon the candidate.

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Date September 18, 1923

A Study  
of  
The Training of the High-School Teachers of the  
State of Minnesota  
In Relation to the Subjects They Teach

A Thesis Submitted to  
the Faculty of the Graduate School  
of the  
University of Minnesota

By  
P. W. Hutson

In Partial Fulfillment of the Requirements for the  
Degree of Master of Arts

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*Ed. J. J. J.*

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## CHAPTER I

### Introduction

Of all the factors that govern the successful functioning of the educational process none are more important than the teacher's preparation and her program of duties. This is attested to by the body of law and machinery of inspection which society has built up to control these two factors and render them adequate to cope with the increasing complexity of the educational task. The Department of Education of the State of Minnesota issues a 19-page pamphlet describing the "laws and rules governing the certification of teachers". Each school must have only teachers "certified" to have attained certain minimal standards of preparation, in order that expert service may be assured. In its 50-page booklet on "Standards for Graded Elementary Schools and High Schools", we find that the Department has laid down many rules limiting and defining the teacher's program of work. It would be interesting to trace the development and growth of these bodies of regulations, not only in Minnesota, but also in other states. Such is not, however, the purpose of this thesis. They are mentioned merely in illustration of the public awareness of the importance of these two factors in the successful operation of our schools. They suggest quite pointedly that educational practices have in the past been modified and improved by the imposition of higher and higher standards for the teacher's preparation and the teacher's program. They point to a closer study of those factors as desirable for the effecting of future improvement in our educational machinery.

That we are far from having attained perfection in these respects is felt vaguely or concretely by all thinking persons in contact with the school situation. The agencies for assisting teachers to find positions often see them take up tasks for which they are not prepared; superintendents are not able to find candidates with the necessary type of training, so they hire people whose qualifications only approximate the desirable; principals assign programs for which they know the teachers are not properly fitted; teachers are frequently telling their schoolmates at conventions about their experiences in teaching subjects which they never studied; and very few children complete high school without having taken some subject under a teacher of whose inadequate preparation they were fully aware. Two other groups, very influential in the educational situation, feel these difficulties less directly. They are the teacher-training faculties and the certificating authorities.

To attack intelligently the difficulties set forth in the preceding paragraph with a view to overcoming them, we need a larger knowledge and clearer definition of them. It was for the purpose of collecting and presenting sufficient evidence to make possible the statement of a few clear-cut generalizations on the training of the high-school teachers of Minnesota in relation to their programs of work that the College of Education instituted and paid the postage and printing expenses of the investigation which it is the object of this paper to report. Without reliable and scientific data to acquaint teacher-training institutions with the situations their graduates have to meet, their faculties must formulate curricula, prescribe courses, and advise students on the

subjective basis of their own impressions, desires, and interests. It was the realization of the need of finding a sounder basis for determining what should constitute the training of high-school teachers that prompted the College to promote this study.

It should be stated by way of introduction and acknowledgment that the method used in this investigation parallels very closely that of a study made in the state of Washington by Doctors Leonard V. Koos and Clifford Woody. Their work represents the first attempt to gather sufficiently refined information concerning high-school teachers' preparation to make possible an examination of its adequacy for the subjects being taught. It was published in the Eighteenth Yearbook of the National Society for the Study of Education,\*and because of the numerous comparisons which will be made with it throughout this report, it will be referred to as "the Washington study".

The collection of the information which is here tabulated, organized, and interpreted was accomplished through the cooperation of a large number of city superintendents, high-school principals, and high-school teachers in the state of Minnesota. To all the teachers in the public high schools of the state and in the high-school departments of state graded schools was sent a questionnaire (see Exhibit A) calling for information concerning the extent of their training in academic and pedagogical subjects, and the classes which they were then teaching. To all the city superintendents of the state (to high-school principals in the Twin Cities and Duluth)

\*Koos and Woody: "The Training of Teachers in the Accredited High Schools of the State of Washington," Eighteenth Yearbook of the National Society for the Study of Education, Part I, pp. 213-257.

as the authorities responsible for the selection and nomination of high-school teachers, was sent a similar questionnaire ( see Exhibit B) asking them to indicate the minimum training in academic and pedagogical subjects necessary adequately to prepare teachers of the various subjects for the systems under their control. These statements of the source of the information collected need one qualification: the questionnaires were sent to the teachers and principals of only two of Minneapolis' five high schools and to two of St. Paul's five high schools, since it was felt that these would be sufficient to give a thoroughly representative sample, and the labor of tabulating could thereby be cut down by an appreciable fraction.

In all, about 3100 blanks were sent to teachers and 425 to superintendents and principals. This was done in November, 1921. From the former were received 1134 replies, usable in some part if not as a whole, and from the latter, 125 replies. The replies of the superintendents and principals will hereafter be referred to in this study as "the superintendents' replies", owing to the fact that there are so few principals included in the study, and for the sake of convenience in discussion.

As the returns came from high schools varying widely in size, it seemed advisable to group the replies on that basis. The large high school and the small one naturally represent different teaching situations. As in the Washington study, all replies from teachers of high schools having faculties of 30 or more members, were thrown in one category called throughout this report, Group I. Replies from teachers on faculties numbering from 11 to 29 inclusive were classified as Group II, and those

from accredited high schools of 10 teachers or fewer were classified as Group III. The replies from teachers in high school departments of state graded schools (unaccredited) were classified as Group IV. Almost all of the latter group came from schools which are placed in a "special list" by the state department of education as being worthy of having their high-school work recognized by the university for admission credit. The numbers of replies falling in each group are as follows:

Group I	---	310
Group II	---	351
Group III	--	345
Group IV	---	128

There were sufficient replies from the superintendents to make possible the same division, except that Groups I and II were put together, since there were only 8 replies in the former. The numbers falling in each group are as follows:

Groups I & II	--	33
Group III	-----	62
Group IV	-----	30

In the tables which follow throughout this thesis it will be seen that the numbers of teachers or superintendents in each group seldom correspond with those just given, but are smaller in almost every instance. This discrepancy is due to the fact that not all the blanks were usable in every part; some of the information either was not given at all, or the material written in very evidently indicated a misunderstanding of what was asked for.

A logical treatment of the subject seems to call first for a description of the teachers' programs as reported. Then, having the teaching situation before us, we can set forth the teachers' specialized preparation for the subjects taught, their

general academic training, and their training in pedagogical subjects, and discuss the adequacy of this training for the work the teachers are called upon to do. The training will also be compared with such ideal standards as have been set up by recognized authorities.

## CHAPTER II

### The Teachers' Programs

#### A. The Number of Subjects Instructors Are Required to Teach.

It will be seen in Exhibit A that the teachers were asked to report the classes they were teaching during the year 1921-'22, and also to name other high-school subjects they had taught in previous years. Table I below is a tabulation of the responses to show the number of different subjects that were being taught or had been taught by the teachers of each of the four groups. In determining what should constitute a "subject", it was decided to follow the lines of cleavage most commonly used in the departmentalization of a college of liberal arts, and accordingly throughout this report each one of the following has been regarded as a subject: English, mathematics, Latin, Greek, German, French, Spanish, history, political science, economics, sociology, chemistry, physics, botany, zoology, biology, physical geography and geology, astronomy, physiology, agriculture, public speaking, home economics, shop and mechanical drawing, music, graphic arts, commercial subjects (other than economics), and physical education. It will be seen, therefore, by way of illustration, that the teacher of classes in ancient, modern, and American history is considered as teaching one subject, as is the teacher of freshman, sophomore, and junior English, or the teacher of algebra and geometry.

The reader will note that Table I shows the number and percentage of teachers in each group who were then teaching (present) or who had at some time taught (past and present) one subject, two subjects, etc. For example, beginning at the upper

TABLE I

NUMBER OF DIFFERENT SUBJECTS THE GROUPS OF TEACHERS  
ARE TEACHING OR HAVE TAUGHT

Number of Different Subjects	Present								Past and Present							
	Group I		Group II		Group III		Group IV		Group I		Group II		Group III		Group IV	
	Times Reported	Per Cent of Group														
1	219	71.3	193	55.2	104	30.2	3	2.4	35	13.7	62	20.2	40	13.4	2	1.8
2	64	20.8	97	27.7	98	28.4	37	29.1	45	17.6	58	18.9	37	12.4	17	15.6
3	22	7.2	38	10.8	81	23.5	34	26.8	77	30.1	56	18.3	60	20.2	15	13.8
4	1	.3	18	5.1	49	14.2	29	22.8	45	17.6	58	18.9	61	20.4	19	17.4
5	1	.3	3	.9	9	2.6	19	15.0	21	8.2	36	11.9	37	12.4	19	17.4
6			1	.3	3	.8	4	3.1	16	6.2	16	5.3	20	6.7	14	12.9
7					1	.3	1	.8	10	3.9	11	3.6	22	7.4	13	11.9
8									5	2.0	7	2.3	12	4.0	3	2.8
9									1	.4	1	.3	6	2.1	2	1.8
10															4	3.7
More than 10									1	.4	1	.3	3	1.0	1	.9
TOTAL	307	99.9	350	100.0	345	100.0	127	100.0	256	100.1	306	100.0	298	100.0	109	100.0

left-hand corner, we read that 219 teachers, or 71.3% of the 307 reporting in Group I, were teaching one subject, that 64, or 20.8% were teaching two subjects. And passing on over to Group IV, it may be seen that 3 teachers, or 2.4% of the 127 reporting, were teaching one subject. The significance of this table appears as we compare the percentages of teachers in each group who were teaching the different numbers of subjects. In glancing over the columns for the four groups under "Present", we can readily sense the difference between teachers' programs in the small and the large high school. The fraction of those in Group I who were teaching one subject is nearly  $\frac{3}{4}$ , but it drops to a little over  $\frac{1}{2}$  for Group II, to less than  $\frac{1}{3}$  for Group III, and to a very negligible fraction for Group IV. The per cent of those in Group I who were teaching three subjects or more, it may be observed by hasty computation, was 7.8%, of Group II, 17.1%, of Group III, 41.4%, of Group IV, 68.5%. It is, of course, common knowledge that the teachers in the smaller high schools have to teach a wider range of subjects than those in the larger high schools. Table I shows just the extent to which that is true. And the figures must be startling to any person who realizes that in general the teacher-training institutions do not pretend to give adequate preparation for teaching in more than one or two subjects.

It is quite in order at this point for the writerto record the impression he gained while tabulating the questionnaires, that the above figures probably do not paint the situation quite as badly as it really is. Due to the fact that some teachers did not know the subjects or some of the subjects they would be assigned for the second semester, they could not record all the

classes they were teaching "during the current year". The extent of this shortcoming in the responses could not well be tabulated, but it was quite evident and involved perhaps as many as 1/5 of the teachers.

Confirmation of the suspicion that our teachers are teaching more subjects than they were trained for, may be gathered in a sweeping glance at the right half of Table I, under "Past and Present". This part of the table shows the number of subjects taught by teachers of each group during their entire teaching careers. Very small proportions in all groups have taught but one subject, while a computation shows that the following percentages have taught five or more subjects:

Group I	21.1
Group II	23.7
Group III	33.6
Group IV	51.4

The following percentages have taught three or more subjects:

		(Washington study)
Group I	68.8	67.3
Group II	60.9	64.7
Group III	74.2	80.5
Group IV	82.6	

The figures brought out by the Washington study in a table similar to Table I compare rather closely with those presented for Minnesota, and those which are set forth immediately above are used merely in illustration of the general agreement of the two investigations in this particular aspect. (The Washington study included no unaccredited high schools, hence there was no Group IV to compare with the Group IV of this study.)

It must be admitted from the figures presented that there is vast room for improvement in the teaching situations. In the

TABLE II  
PERCENTAGE DISTRIBUTION OF TEACHERS  
ACCORDING TO YEARS OF EXPERIENCE

Years	Experience in Accredited High Schools				Total Teaching Experience				
	Group I (298)	Group II (338)	Group III (334)	Total (970)	Group I (298)	Group II (338)	Group III (334)	Group IV (123)	Total (1093)
0	3.7	15.6	25.8	15.6	2.0	11.2	20.6	28.4	13.5
0.1-0.9	0.7	0.3	1.8	0.9	0.7	0.6	0.9	3.3	1.0
1.0-1.9	7.7	17.7	20.6	15.7	4.4	12.7	18.0	15.4	12.4
2.0-2.9	9.4	17.7	14.6	14.1	5.7	16.0	12.3	7.3	11.1
3.0-3.9	7.4	11.4	9.6	9.5	6.0	10.9	10.5	8.1	9.2
4.0-4.9	7.4	6.9	5.4	6.5	6.0	10.9	5.1	9.8	7.7
(0.0-4.9)	<u>36.3</u>	<u>69.6</u>	<u>77.8</u>	<u>62.3</u>	<u>24.8</u>	<u>62.3</u>	<u>67.4</u>	<u>72.3</u>	<u>54.9</u>
5.0-9.9	34.9	21.3	14.4	23.1	33.6	22.8	19.1	21.1	24.4
10.0-14.9	13.1	6.0	4.8	7.7	17.1	8.9	7.5	4.1	10.2
15.0-19.9	8.4	1.2	2.4	3.8	7.7	3.3	2.4		3.8
20.0-24.9	4.0	1.8	0.3	2.0	8.4	2.4	1.5	0.8	3.6
25.0-29.9	2.7			0.8	5.4		1.5	0.8	2.0
30.0-34.9			0.3	0.1	1.7	0.3		0.8	0.6
35.0-39.9	0.3			0.1	0.3		0.6		0.3
40.0-44.9	0.3			0.1	0.3				0.1
45.0-49.9									
50.0-54.9					0.7				0.2
TOTALS	<u>100.0</u>	<u>99.9</u>	<u>100.0</u>	<u>100.0</u>	<u>100.0</u>	<u>100.0</u>	<u>100.0</u>	<u>99.9</u>	<u>100.1</u>
First Quartile	3.48	1.49	0.00	1.54	4.91	2.03	1.19	0.00	1.85
Median	6.97	2.9	2.12	3.39	8.63	3.86	2.85	2.39	4.36
Third Quartile	11.47	6.22	4.47	7.75	14.68	7.76	6.99	5.63	9.12

fact that teachers are teaching so many subjects in one community or another we see clearly one explanation for the quality of work that is being done --- teachers can not be adequately prepared in so many subjects. Some steps must be taken to make the teaching situation less difficult.

The data presented on the number of subjects teachers are teaching assumes an even more serious aspect when we examine the length of teaching experience of the members of each group. It will be seen in Exhibit A that the teachers were asked to state their years of experience "prior to the current year" in the various types of schools. From their responses the tabulations were made which resulted in Table II. The numbers in parentheses in the heading are the numbers of teachers in each group making usable responses. These numbers were used as the denominators in the computation of the percentages in the columns below them. In reading the first line of the table proper, we see that the following percentages of the teachers in Groups I, II, and III respectively have had 0 years of experience in accredited high schools: 3.7, 15.6, 25.8. Of all three groups, 15.6% fall in this category. ("Experience in Accredited High Schools" was not computed for Group IV because, since those teachers were not at the time in schools of that class, such figures did not seem pertinent.) Interpreting as fractions the percentages of teachers who have had 0 years of "Total Teaching Experience", we may say that 1/50 of Group I, more than 1/10 of Group II, more than 1/5 of Group III, and considerably more than 1/4 of Group IV fall in this classification. Truly the turnover of teachers in the schools of Groups III and IV must be very rapid. If we read the seventh row of figures across the page, which shows the percentages who have had less than five

years of experience, a similar gradation between groups is evident. We note it also in the medians and first and third quartiles figured for each group at the foot of the table. To summarize, we may say that just as Table I shows that the number of subjects teachers teach varies inversely with the size of the school, so the years of experience of the teachers varies directly with the size of the school.

The Washington study presented no data with which Table II can be compared directly, but the authors did present a subsidiary study (see pp. 218 ff.) showing that 81% of the 126 teachers placed in the high schools of Washington for the year 1916-'17 by the Recommendations Committee of the University of Washington went to high schools employing 10 teachers or fewer, and that of the 126, 53.6% taught either three or four subjects. Somewhat similar data are being assembled by Mr. Erich Selke, Secretary of the Committee on Appointments of the University of Minnesota, and will doubtless be published in the near future but are not at present available. Sufficient evidence has been presented, however, to make clear the fact that the teachers of the least experience are occupying the hardest teaching positions.

#### B. Number and Character of the Subject-Combinations Being Taught.

Further examination of the teachers' programs is profitable if we can determine their relation to the particular subjects, and if we can analyze the subject-combinations to see in what degree and in what respects these show some "rhyme or reason". The responses called for in the questionnaire were such that this can be done, and this section of the report will be devoted to a more detailed description than is represented in Table I.

Graphic Arts	2.3	.6	-	-
Commercial Subjects	9.7	9.1	4.4	-
Physical Education	1.9	2.3	.6	-
Vocational Civics	-	.3	-	-
TOTALS	<u>71.2</u>	<u>55.3</u>	<u>30.3</u>	<u>2.4</u>

TABLE III  
 PERCENTAGE OF THE TEACHERS OF EACH GROUP  
 WHO TEACH SINGLE SUBJECTS

Subject	Group I (307)	Group II (350)	Group III (345)	Group IV (127)
English	16.9	8.9	7.5	-
Mathematics	10.4	7.1	3.5	-
Latin	4.5	1.7	.6	-
Scandinavian	-	-	-	-
German	-	-	-	-
French	2.6	.9	-	-
Spanish	.6	-	-	-
History	4.5	2.3	1.2	-
Political Science	-	.3	-	-
Economics	-	-	-	-
Sociology	1.0	-	-	-
Chemistry	1.3	-	-	-
Physics	2.3	-	-	-
Botany	.3	.3	-	-
Zoology	-	-	-	-
Physiography	-	-	-	-
General Science	1.0	1.1	-	-
Physiology	-	-	-	-
Biology	.6	-	-	-
Agriculture	.3	2.9	.6	-
Public Speaking	.6	.3	-	-
Home Economics	4.9	10.0	8.7	2.4
Shop & Mech. Drg.	4.5	6.3	2.6	-
Music	1.0	.9	.6	-

Table III presents information which will enable the College of Education to advise teachers-in-training which subjects are most commonly taught as single subjects. This table is simply a refinement of the first row of figures under Table I to show how the percentage of teachers teaching single subjects is distributed among the various subjects. Glancing down the columns it appears that English, mathematics, home economics, shop and mechanical drawing, and commercial subjects are the subjects most commonly taught singly. Of the subjects which appear scarcely at all as single subjects, attention is called especially to the social studies and the natural sciences. The Washington study gave similar results and the authors found that the same five subjects as those mentioned above appeared singly with greater frequency than any others.

Table IV accounts in one way for every appearance of each subject in each of the four groups, giving the number of teachers in each group who teach the subject and a distribution to show the percentage of teachers who teach it as a single subject, in a two-subject-combination, in a three-subject-combination, etc. The reader is invited to read the table as should a teacher-training agency in Minnesota, or as should a student in such an institution, seeking an acquaintance with the teaching situation to enable him to make proper preparation for it. For example, the English teacher of Group I in about 69 cases out of 100 is teaching that subject alone, and in about 22 cases out of 100, he is teaching one other subject with it. Group II shows 38.8% teaching English as a single subject and 45.0% teaching it in a two-subject-combination. Groups III and IV are of special interest to the training institution and to the student, because, as has been pointed out, most teachers

TABLE IV

PERCENTAGE DISTRIBUTIONS OF THE VARIOUS  
SUBJECTS TO SHOW THE EXTENT TO WHICH THEY  
APPEAR SINGLY AND IN COMBINATION, IN EACH GROUP

Subject	No. of Tchrs.	Percentage of Times Each Subject Appears						
		As a single subject	In a 2-subj. comb.	In a 3-subj. comb.	In a 4-subj. comb.	In a 5-subj. comb.	In a 6-subj. comb.	In a 7-subj. comb.
English	I	75	69.3	22.7	6.7	1.3		
	II	80	38.8	45.0	11.3	3.8	1.3	
	III	103	25.2	32.0	25.2	15.5	1.0	1.0
	IV	54		33.3	25.9	25.9	13.0	1.9
Math.	I	48	66.7	29.2	2.1	2.1		
	II	60	41.7	33.3	16.7	8.3		
	III	89	13.5	29.2	39.3	16.9		1.1
	IV	54		18.5	33.4	26.0	18.5	3.7
Latin	I	27	51.9	40.7	3.7	3.7		
	II	31	19.4	64.5	9.7	6.5		
	III	53	3.8	35.8	35.8	20.8	1.9	1.9
	IV	20		10.0	35.0	25.0	20.0	5.0
Greek	I	1		100.0				
Scandi- navian	I	3		66.7	33.3			
	II	3		66.7	33.3			
	III	1			100.0			
German	I	2		50.0		50.0		
	II	1			100.0			
	III	3		33.3		33.3	33.3	
	IV	2		50.0	50.0			
French	I	21	38.1	47.6	14.3			
	II	17	17.6	70.6	11.8			
	III	26		30.8	42.3	19.2	7.7	
	IV	7		28.6	14.3	28.6	28.6	
Spanish	I	9	22.2	55.6	22.2			
	II	3		66.7	33.3			
	III	3		33.3	66.7			
	IV	2		50.0		50.0		
History	I	32	43.8	40.5	15.6			
	II	55	14.5	38.2	27.3	14.5	3.6	1.8
	III	89	4.5	20.2	43.8	22.8	5.6	2.2
	IV	51		15.7	31.4	27.4	17.6	5.9
Pol. Sci.	I	11		54.6	45.4			
	II	29	3.4	37.9	24.1	27.6	3.4	3.4
	III	44		6.8	36.4	38.6	11.4	4.6
	IV	19			21.1	36.8	36.8	
Econ.	I	9		33.3	66.7			
	II	19		31.6	21.1	31.6	10.5	5.3
	III	24		8.3	41.7	29.2	16.7	4.2
	IV	12			16.7	16.7	50.0	8.3

TABLE IV -- Cont.

Subject	No. of Tchrs.	Percentage of Times Each Subject Appears							
		As a single subject	In a 2-subj. comb.	In a 3-subj. comb.	In a 4-subj. comb.	In a 5-subj. comb.	In a 6-subj. comb.	In a 7-subj. comb.	
Sociol.	I	7	42.9	28.6	28.6				
	II	12		33.3	8.3	41.7	8.3	8.3	
	III	20		15.0	35.0	30.0	15.0		5.0
	IV	14			14.3	35.7	50.0		
Chem.	I	13	30.8	30.8	30.8		7.7		
	II	26		38.5	46.2	11.5	3.8		
	III	37		21.6	35.1	35.1	2.7	5.4	
	IV	13		15.4	15.4	38.5	15.4	15.4	
Physics	I	15	46.7	40.0	13.3				
	II	27		40.7	40.7	11.1	3.7	3.7	
	III	36		27.8	30.6	38.9	2.8		
	IV	13		15.4	30.8	30.8	15.4	7.7	
Botany	I	6	16.7		66.7		16.7		
	II	8	12.5		25.0	62.5			
	III	13		15.4	15.4	38.7	15.4	7.7	7.7
	IV	16			6.3	25.0	43.8	25.0	
Zoology	I	3			66.7		33.3		
	II	3				66.7	33.3		
	III	16		6.3	31.3	37.5	18.8	6.3	
	IV	7		14.3		14.3	42.9	28.6	
Physiog.	I	5		20.0	60.0		20.0		
	II	5		20.0	40.0	40.0			
	III	11		9.1	18.2	36.4	27.3	9.1	
	IV	17			11.8	58.8	11.8	11.8	5.9
Gen. Sci.	I	16	18.8	25.0	56.9				
	II	32	12.5	18.8	40.6	25.0	3.1		
	III	45		20.0	37.8	35.6	2.2	4.4	
	IV	18		5.6	38.9	11.1	38.9	5.6	
Physiol.	I	3		33.3	33.3		33.3		
	II	8			37.5	50.0	12.5		
	III	14		21.4		42.9	21.4	14.3	
	IV	14		14.3	21.5	21.5	28.6	7.2	7.2
Biology	I	9	22.2	33.3	44.4				
	II	9		11.1	66.7	22.2			
	III	18		5.6	33.3	50.0	5.6	5.6	
	IV	3			33.3	33.3			33.3
Agric.	I	4	25.0	75.0					
	II	14	71.4	21.4	7.1				
	III	8	25.0	50.0		12.5	12.5		
	IV	11		36.4	9.1	18.2	27.3	9.1	

TABLE IV -- Cont.

Subject	No. of Tchrs.	Percentage of Times Each Subject Appears						
		As a single subject	In a 2-subj. comb.	In a 3-subj. comb.	In a 4-subj. comb.	In a 5-subj. comb.	In a 6-subj. comb.	In a 7-subj. comb.
Pub. Spkg	I	9	22.2	66.7	11.1			
	II	15	6.7	60.0	20.0	6.7	6.7	
	III	16		25.0	25.0	31.3	12.5	6.3
	IV	3		33.3		33.3	33.3	
Home Ec.	I	17	86.2		11.8			
	II	37	94.6	2.7	2.7			
	III	47	63.8	27.7	2.1	4.3	2.1	
	IV	19	15.8	52.6	15.8	10.5	5.3	
Shop I	I	15	93.3	6.7				
	II	25	88.0	8.0	4.0			
	III	25	36.0	52.0	8.0	4.0		
	IV	19		15.8	26.3	36.8	15.8	5.3
Music	I	6	50.0	50.0				
	II	7	42.9	42.9	14.3			
	III	6	33.3		50.0			16.7
	IV	3		33.3	33.3		33.3	
Graphic Arts	I	7	100.0					
	II	4	50.0	50.0				
	III	1		100.0				
Com'l Subj.	I	43	69.8	16.3	14.0			
	II	42	76.2	7.1	7.1	4.8	2.4	2.4
	III	48	31.3	22.9	16.7	20.8	6.3	2.1
	IV	26		11.5	26.9	34.6	23.1	3.8
Phys. Ed.	I	7	85.7	14.3				
	II	15	53.3	26.7	6.7	6.7	6.7	
	III	7	28.6	14.3	14.3	28.6	14.3	
	IV	1		100.0				
Voc. Civ	I							
	II	3	33.3			66.7		
	III	1				100.0		
Psych.	I	1		100.0				
	II							
	III	2			100.0			
	IV	2		50.0		50.0		
Library	I							
	II	1		100.0				
	III							
	IV							

get their first experience in schools of those sizes. A simple computation shows that of the teachers of English who reported in Group III, 42.7% teach two or more other subjects, and 66.7%, or just 2/3, of the teachers of English in Group IV teach two or more other subjects. Quite evidently the student should prepare to teach two subjects in addition to English if he is to be equal to what will be expected of him.

Table IV makes possible in the same way the study of the position of each subject in the teaching situation. The reader should be cautioned, however, in every case to note the number of teachers reporting, as in many subjects, for one or more of the groups, the number is so small as to cast just doubt on its representative character. Where the distribution is based on 10 or more teachers, it may probably be regarded as quite reliable. In addition to the illustrative reading already given, the investigator desires to call attention to the fact that the typical teachers of Latin and of French in Group III are teaching two additional subjects; that this is also true in the case of history teachers; that half or more of the Group III teachers of political science, of economics, of sociology are teaching three or more additional subjects; that 70% or more of the Group III teachers of each of the natural sciences teach two or more additional subjects. These are important considerations for a teacher-training institution.

Because colleges of education and prospective teachers are, or should be, especially interested in high schools of the size represented by Group III, Table V is presented. No comment is necessary as this table merely represents a separation of Group III from Table IV, with the distribution given numerically instead of by percentages.

TABLE V

NUMERICAN DISTRIBUTION OF THE VARIOUS SUBJECTS  
 REPORTED BY TEACHERS IN GROUP III, TO SHOW THE EXTENT  
 TO WHICH THEY APPEAR SINGLY AND IN COMBINATION

Subject	No. of Tchrs.	Number of Times Each Subject Appears						
		As a single subject	In a 2-subj. comb.	In a 3-subj. comb.	In a 4-subj. comb.	In a 5-subj. comb.	In a 6-subj. comb.	In a 7-subj. comb.
English	103	26	33	26	16	1		1
Math.	89	12	26	35	15		1	
Latin	53	2	19	19	11	1	1	
German	3		1		1	1		
French	26		8	11	5	2		
Spanish	3		1	2				
History	89	4	18	39	20	5	2	1
Pol. Science	44		3	16	17	5	2	1
Economics	24		2	10	7	4	1	
Sociology	20		3	7	6	3		1
Chemistry	37		8	13	13	1	2	
Physics	36		10	11	14	1		
Botany	13		2	2	5	2	1	1
Zoology	16		1	5	6	3	1	
Physiography	11		1	2	4	3	1	
Gen. Science	45		9	17	16	1	2	
Physiology	14		3		6	3	2	
Biology	18		1	6	9	1	1	
Agriculture	8	2	4		1	1		
Pub. Spkg.	16		4	4	5	2		1
Home Ec.	47	30	13	1	2	1		
Shop	25	9	13	2	1			
Music	6	2		3				1
Com'l Subj.	48	15	11	8	10	3	1	
Phys. Ed.	7	2	1	1	2	1		

TABLE VI

## NUMBERS AND PERCENTAGES OF RECURRING TWO-SUBJECT COMBINATIONS

Subject-Combinations	Group I		Group II		Group III		Group IV		Total of Groups I, II, III, IV	
	Times Reported	Per Cent of Group	Times Reported	Per Cent of Group						
Eng.-Latin	4	1.3	10	2.9	11	3.2	2	1.6	27	2.4
Eng.-French			5	1.4	5	1.5	2	1.6	12	1.1
Eng.-Pub. Spkg.	6	1.9	9	2.6	4	1.2			19	1.7
Eng.-History	2	0.6	6	1.7	6	1.7	5	3.9	19	1.7
Eng.-Math.			3	0.9			3	2.3	6	0.5
Eng.-German					2	0.6			2	0.2
Eng.-Com'l					2	0.6			2	0.2
Eng.-Home Ec.							2	1.6	2	0.2
Latin-French	2	0.6	4	1.1	2	0.6			8	0.7
Latin-Spanish			2	0.6					2	0.2
Latin-Math.	3	1.0			3	0.9			6	0.5
French-Spanish	5	1.6							5	0.4
Math-Com'l	3	1.0	3	0.9	4	1.2			10	0.9
Math.-Gen. Sci.	2	0.6	2	0.6	2	0.6			6	0.5
Math.-Physics			2	0.6	4	1.2	2	1.6	8	0.7
Math.-Chem.					2	0.6			2	0.2
Math.-History			3	0.9	2	0.6			5	0.4
Math.-Pol. Sci.			2	0.6					2	0.2
Math.-Shop					3	0.9			3	0.3
Math.-Home Ec.							2	1.6	2	0.2
Gen. Sci.-Agric.	2	0.6							2	0.2
Chemistry-Physics	3	1.0	8	2.3					11	1.0
Physics-Shop					2	0.6			2	0.2
Gen. Sci.-Home Ec.					3	0.9			3	0.3
Physiol.-Home Ec.					3	0.9	2	1.6	5	0.4
Chem.-Home Ec.					2	0.6			2	0.2
Hist.-Pol. Sci.	4	1.3	8	2.3	2	0.6			14	1.2
Hist.-Sociol.			2	0.6					2	0.2
Hist.-Com'l Subj.	2	0.6							2	0.2
Hist.-Latin					2	0.6			2	0.2
Hist.-Home Ec.					2	0.6			2	0.2
Econ.-Sociol.			2	0.6					2	0.2
Econ.-Com'l Subj.			2	0.6	2	0.6			4	0.4
Agric.-Shop					3	0.9	3	2.3	6	0.5

What are these subject-combinations and with what degree of frequency do the same combinations reappear? These are pertinent questions from any teacher-training institution desirous of fitting its graduates for actual teaching situations.

Table VI shows the numbers and percentages of two-subject-combinations which appear twice or oftener in each group. The percentages are computed on the basis of the number of teachers of each group who reported the subjects they were teaching. Glancing down the column of totals it is evident that the recurrence of two-subject-combinations among these 1129 teachers is not such as to indicate any standardization of combinations. Eight appear 10 times or more: English-Latin, English-French, English-Public Speaking, English-History, Mathematics-Commerical Subjects, Chemistry-Physics, History-Political Science. Of the 34 combinations listed, 15 appear only twice, or just enough times so that they can be called "recurring combinations". Evidently there is a chaotic situation in the arrangement of combinations.

The absence of planning and standardization is further portrayed in Table VII which summarizes the combinations. Examining the column of totals, the reader's attention is called to the fact that the 207 teachers reporting two-subject-combinations which recurred are the same individuals for whom Table VI is a more refined tabulation. As mentioned above, they reported 34 different combinations. Right below the 207, it is to be noted that 87 teachers reported non-recurring two-subject-combinations. Observing this figure based on 1129 teachers, it seems very likely that if the programs of all the high school teachers of Minnesota could be examined, there would be at least one example of every two-subject-combination that could possibly be made. If we total

the number of individuals who report recurring and the number who report non-recurring combinations, we find 284 of the former and 325 of the latter. With such instability and disorganization, how can a prospective teacher prepare adequately to meet the teaching program which he may draw in the lottery of position-hunting?

As one step toward classroom efficiency, the teaching situation is clearly in need of reform. The investigator felt that a still closer inspection of the subject-combinations might yield some information which would be of value to any authorities attempting such reforms, and accordingly Table VIII was produced. Because of the exceedingly tangled state of the combinations taught by teachers in Groups III and IV, only the combinations found in Groups I and II were included in this tabulation. The procedure was simply to count all the subjects appearing in combination with English, for example, then make a percentage distribution of them. In illustration, it may be pointed out that 97 subjects (not all different subjects) were found in combination with English. Reading down the first column of figures, we see that 9.3% of the 97 were mathematics, 17.5% were Latin, etc. The numbers in parentheses in the heading of the table are the numbers of subjects found in combination with the subjects named at the head of each column, and which were therefore the denominators used in finding the percentages. Not all combinations were studied but only those in which the subjects named across the top of the table figured. The other subjects appeared so infrequently, as in the case of German or physiography, or so infrequently in combination with any other subject, as in the case of home economics, shop and mechanical drawing, and commercial subjects, that it did not seem likely that

the percentage distributions in those cases would have either great pertinency or high reliability. This table can only be read up and down, not from side to side.

A few interpretations will indicate some combination tendencies which impressed the writer. Glancing down the column of percentages under English, the reader will note that the subjects most frequently combined with English are Latin, French, history, and public speaking, the four constituting 60.8% of the total combinations. Mathematics and commercial subjects comprise 17.5% of the total. The subjects most frequently combined with mathematics are English, physics, general science, and commercial subjects, but there are heavy percentages of Latin, history, political science, chemistry, biology, and physical education. It is difficult to see any notable combination tendency for mathematics. Of the subjects combined with Latin, 62.5% are English, French, and history, with mathematics also constituting 10.4%. Of the subjects combined with French, 75.1% are English, Latin, and Spanish. Of the subjects combined with history, 50.4% are political science, economics, or sociology, and 12.6% are English. In the case of political science, economics, and sociology, from 65.0% to 77.8% of the subjects combined with them are social studies. In the cases of the four sciences appearing at the head of the table, from 60.0% to 85.6% of the subjects combined with them are other sciences, and from 7.9% to 16.7% are mathematics. English is predominantly the subject combined with public speaking.

The factual evidence which is thus presented in Table VIII does not controvert the impression of chaos in the subject-combinations which is conveyed by previous tables, but it does

indicate some tendencies to combine literature and languages, social studies, and natural sciences. This might well serve as a starting point for those whose business it should be to improve the situation.

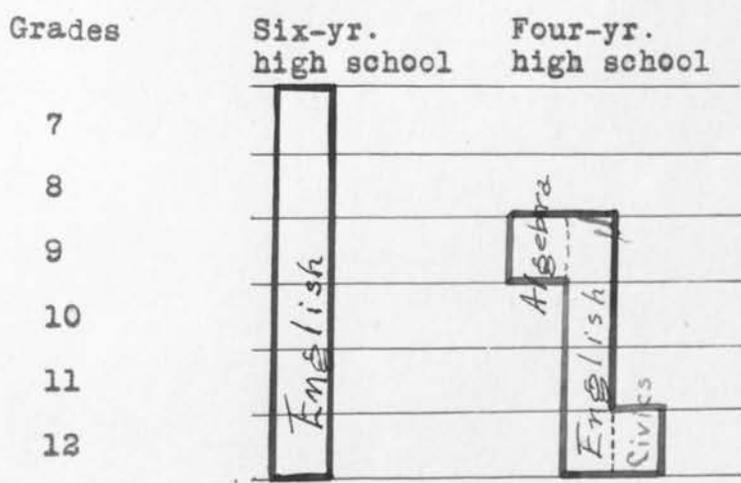
### C. Summary of Findings on the Teachers' Programs with Recommendations for Improvement.

The following are the principal conclusions to be made from the data thus far presented in the report:

1. Teachers are teaching and have taught more subjects than they could possibly be well prepared for.
2. The smaller the high school the more difficult the program.
3. The more inexperienced teachers are in the smaller high schools, which means that they have the heaviest programs.
4. Many subjects are taught scarcely at all as single subjects, and almost every teacher in the smaller high schools should be prepared to teach at least three subjects.
5. Subject-combinations show practically no standardization and represent such a chaotic situation as to render too difficult the adequate preparation of teachers, though some tendencies in combinations are observable which might serve as bases for standardization.

The remedial measure which these aspects of the teaching situation logically demand is the decrease of the number of subjects teachers are called upon to teach and the assignment to each teacher of subjects which bear some semblance of logical relationship to each other. In the Washington study Koos and Woody urge the reorganization of the public school system in the direction of the

six-six or the six-three-three plan as the best means of decreasing the number of subjects assigned to each teacher. Their redommendation seems just as pertinent for Minnesota or for any other state as for Washington. With the longer secondary period, the more possible it is to have each teacher's five or six classes come in a single department, as, for example, in the case of English. The great advantage to be achieved in the direction of specialization which means expert service in a narrow field, may be illustrated by diagrams of hypothetical distributions of a teacher's load, as follows:



This figure is pertinent most particularly, of course, for the smaller high schools where most of the classes are too small to require more than one section. The longer the vertical distribution, naturally the less horizontal the spread need be.

The investigator sampled this situation a little to find out to what extent the longer vertical distribution of the teacher's load was being practiced in the state. It will be noted that the last questions in the superintendent's questionnaire are: "Do any of your high school teachers teach subjects in the 7th and 8th grades? . . . . If so, in which departments? . . . ."

Forty-seven superintendents answered the first question affirmatively and reported 86 departments of which the numerical distribution was as follows:

Home Economics	26
Manual Training	21
English	9
History	8
Mathematics	6
Music	4
Agriculture	3
General Science	1
French	1
Physical Education	1
Community Civics	1
Vocational Civics	1
Penmanship	1
Botany	1
Zoology	1
Geography	1
TOTAL	<u>86</u>

Home Economics and Manual Training catch the reader's eye in this distribution. They constitute more than half the cases. Turning back to Tables III and IV we cannot fail to note that those subjects are more predominantly taught as single subjects than any others. The reason is obvious. Those teachers have their programs filled up with the same subjects in the grades and therefore do not so frequently have to teach different subjects in the high school.

The illustration indicates very well the possibility which the six-year high school offers for the improvement of the teaching situation. Despite the fact that the different sizes of high schools and of the enrollment in the various departments or subjects must frequently result in a few "left-over" classes to be assigned as the particular situation dictates, the spread of the six-year high school in smaller communities helps one to visualize a teacher of social studies, a teacher of English, a teacher of mathematics, a teacher of the natural sciences.

A second means of decreasing the number of subjects each teacher is required to teach would be to eliminate some of the high schools with very small instructional staffs. Any plans for such procedure would necessarily have to be worked out by the state department of education with great care in order not to discourage the commendable desire of any community for such educational advantages. Consolidation would be the remedy wherever possible, but in many communities of the state that would not be possible. The situation is further complicated by the fact that many sections of the state are in a process of more or less rapid development. Accordingly, it is not possible in this paper to make any specific recommendations on this point.

The third step in the improvement of the teaching situation would be the simplification and standardization of the subject-combinations. This is a problem that must be attacked by a coalition of educational authorities. The institutions which train teachers and the superintendents who hire them and assign them programs must agree upon a concerted plan of action. For if the superintendents alone attempt standardization they will not find teachers trained for the combinations they have set up, and if the schools of education proceed to train teachers in combinations without conferring with the superintendents, the teachers will have difficulty in finding situations for which they are fitted. Before this recommendation can be properly outlined and appreciated, the reader should possess a knowledge of the teachers' preparation for the particular subjects being taught. This will be the subject of the next chapter, and at its close the recommendation will be explained.

## CHAPTER III

### Special Preparation for the Subjects Taught

Having some conception of the situations the teachers are required to meet, we are in a position to study the extent of their specialized training for the work they are doing. The most authoritative statement of what the training of the teacher should be is probably the Report of the Committee of Seventeen\*, quoted frequently in the Washington study. That body stated that one of the elements of a teacher's training should be "a detailed and specialized study of the subjects to be taught". From what any observing teacher knows of the breadth of knowledge and experiences which the members of high-school class bring together, and the comparative maturity of some of their minds, such a standard of training is clearly justified. A person of general culture can give training to some high-school students, but to hold the interest of all and to bring about real mental activity in such a group, a specialist is required.

#### A. Special Preparation in Higher Institutions Which Teachers Have Had For Their Teaching-Subjects.

On the upper half of the second page of Exhibit A the reader may observe that the teachers were requested to state the number of high-school units and college semester-hours of credit they earned, subject by subject. From this data, the investigator was enabled to tabulate the special training of each teacher for the subjects he was then teaching. This information is summarized in Table IX for each subject and for each group. However, in all

\*Proc. Nat. Educ. Assn., 1907, pp. 523 ff.

TABLE VII

## NUMBERS AND PERCENTAGES OF RECURRING AND NON-RECURRING

## TWO-, THREE-, FOUR-, AND FIVE- OR MORE-SUBJECT COMBINATIONS

Combinations	Group I		Group II		Group III		Group IV		Total of Groups I, II, III, IV	
	Times Re- ported	Per Cent of Group	Times Re- ported	Per Cent of Group						
Total Recurring 2-sub- ject Combinations	38	12.1	73	20.9	73	21.2	23	18.1	207	18.3
Total Non-Recurring 2- Subject Combinations	25	8.1	24	6.9	24	6.9	14	11.1	87	7.7
Total Recurring 3-sub- ject Combinations	5	1.6	12	3.4	33	9.6	6	4.7	56	5.0
Total Non-Recurring 3- Subject Combinations	18	5.8	26	7.4	48	13.9	28	22.0	120	10.6
Total Recurring 4-sub- ject Combinations			3	0.9	16	4.6	2	1.6	21	1.9
Total Non-Recurring 4- Subject Combinations	1	0.3	15	4.3	33	9.6	27	21.2	76	6.7
Total 5- or More- Subject Combinations (All Non-Recurring)	1	0.3	4	1.1	13	3.8	24	18.9	42	3.7
TOTALS	88	28.4	157	44.9	240	69.6	124	97.6	609	53.9

cases where less than five teachers were involved, no figures are presented, as it was felt that at least five were necessary to insure representative character in some degree. Attention is called to the fact that the number of teachers under consideration in each instance is set forth so that the reader may himself estimate the reliability of the data. For each subject and each group is given the number of teachers without special preparation in higher institutions for the subject taught, as this was felt to be one measure of importance. After the distribution of the semester-hours of preparation of the teachers of each subject in each group was determined, the first quartile, median, and third quartile for each array were figured, and they have been recorded in the three right-hand columns of the table. In the languages some account was taken of the high-school units reported. Since higher institutions not only give credit for high-school work in the languages but also commonly consider two high-school units to be the equivalent of a year of college work, it was felt that the teacher should be credited with that training. From an analysis of freshman and sophomore courses in over 100 standard colleges and universities, the writer had become acquainted with the fact that the modal practice in college beginning language courses is to require four hours each semester. He therefore reasoned that a fair procedure for this study would be to consider each high-school unit in language the equivalent of four semester-hours. On this basis the high-school units in Latin, French, and Spanish were figured into Table IX. For no other subject were high-school units considered.

Glancing down the column showing the number of teachers

without special preparation, the reader will notice in general a tendency for the numbers to be larger for Groups III and IV.

A hasty computation for Group III shows that approximately 1/9 of the teachers of history, 1/2 of the teachers of political science, 1/3 of the teachers of economics, 1/3 of the teachers of sociology, 1/3 of the teachers of botany, 1/2 of the teachers of physiography, 1/3 of the teachers of physiology, 1/5 of the teachers of shop and mechanical drawing, and 2/3 of the teachers of commercial subjects have had no special preparation in higher institutions for those subjects. These are shockingly large proportions of teachers who have not even made a beginning at the ideal of "a detailed and specialized study of the subjects to be taught". It is also noteworthy that in this column, all groups considered, history, political science, economics, sociology, botany, physiography, physiology, and commercial subjects have the largest proportions of unprepared teachers. Six of these eight subjects are usually represented in the high-school curriculum by a one-semester course only. Such a situation would make it unlikely that a prospective teacher would specialize in them or that a superintendent would hire teachers who had specialized in them. But those subjects are in the high-school program to be taught, and some means should be found for securing adequately prepared teachers of them. With regard to the commercial subjects, it is the distinct impression of the investigator that the majority of those unprepared teachers were teaching commercial law, commercial geography, or commercial arithmetic, and not the skills of stenography, typewriting, and bookkeeping. Evidently the superintendent often has to assign those subjects to someone who will teach them on the strength of his

TABLE VIII

PERCENTAGE REPRESENTATION OF RELATIVE FREQUENCY WITH WHICH THE  
VARIOUS SUBJECTS APPEAR IN COMBINATION WITH EACH OTHER

SUBJECTS	Eng- lish (97)	Mathe- matics (74)	Latin (48)	French (32)	History (111)	Pol. Science (73)	Econ- omics (60)	Soc- iol. (36)	Chem. (63)	Physics (61)	General Science (82)	Biology (30)	Pub. Spkg. (30)
English	-	12.2	35.4	31.3	12.6	4.1	6.7	2.8	1.6	1.6	3.7	3.3	60.0
Mathematics	9.3	-	10.4	3.1	5.4	6.8	3.3	-	7.9	14.8	9.8	16.7	-
Latin	17.5	6.8	-	25.0	4.5	2.7	-	2.8	-	-	1.2	-	-
Greek	-	-	2.1	-	-	-	-	-	-	-	-	-	-
German	1.0	1.4	2.1	3.1	-	-	-	-	-	-	-	3.3	-
French	10.3	1.4	16.7	-	2.7	-	-	-	-	-	-	-	-
Spanish	-	-	6.3	18.8	2.7	1.4	-	-	-	-	-	-	-
Scandinavian	-	-	2.1	3.1	1.8	-	-	-	-	-	1.2	-	-
History	14.4	8.1	10.4	9.4	-	42.5	25.0	27.8	1.6	1.6	3.7	3.3	16.7
Political Science	3.1	8.1	4.2	-	27.9	-	21.7	19.4	-	1.6	2.4	3.3	6.7
Economics	4.1	2.7	-	-	13.5	17.8	-	30.6	-	1.6	1.2	-	10.0
Sociology	1.0	-	2.1	-	9.0	9.6	18.3	-	-	1.6	-	-	-
Chemistry	1.0	6.8	-	-	0.9	-	-	-	-	44.3	17.1	3.3	-
Physics	1.0	12.2	-	-	0.9	1.4	1.7	2.8	42.9	-	13.4	6.7	-
Botany	-	-	2.1	-	0.9	-	-	-	6.3	3.3	8.5	6.7	-
Zoology	-	-	2.1	-	-	-	-	-	3.2	1.6	4.9	3.3	-
Physiology	-	1.4	-	-	-	-	-	-	6.3	3.3	7.3	10.0	-
Biology	1.0	6.8	-	-	0.9	1.4	-	-	1.6	3.3	9.8	-	-
Physiography	-	2.7	-	-	0.9	-	-	-	3.2	-	4.9	3.3	-
General Science	3.1	10.8	2.1	-	2.7	2.7	1.7	-	22.1	18.0	-	26.7	-
Agriculture	-	-	-	-	-	-	-	-	-	1.6	3.7	3.3	-
Public Speaking	18.6	-	-	-	4.5	2.7	5.0	-	-	-	-	-	-
Home Economics	-	-	-	-	-	-	-	-	1.6	-	3.7	3.3	-
Shop & Mech. Drg.	-	-	-	-	-	-	-	-	-	-	-	3.3	-
Music	3.1	2.7	-	3.1	-	-	-	-	-	-	-	-	-
Com'l Subjects	8.2	10.8	2.1	3.1	5.4	1.4	13.3	5.6	-	1.6	3.7	-	6.7
Physical Education	1.0	4.1	-	-	1.8	4.1	1.7	2.8	1.6	-	-	-	-
Vocational Civics	1.0	1.4	-	-	0.9	1.4	1.7	2.8	-	-	-	-	-
Psychology	-	-	-	-	-	-	-	2.8	-	-	-	-	-
Library	1.0	-	-	-	-	-	-	-	-	-	-	-	-
TOTALS	99.7	100.4	100.2	100.0	99.9	100.0	100.1	100.2	99.9	99.8	100.2	99.8	100.1

general culture. It should be mentioned at this point that teachers who had graduated from a nine-months' course in a business college were given credit for 30 semester-hours in commercial subjects, even though such work is not of collegiate grade. Such procedure seemed necessary in view of the fact that so few institutions of collegiate rank give training in the commercial skills.

An illustrative reading of the columns of quartiles and medians would be as follows, beginning with the first line: 25% of the teachers of English in Group I have had less than 18.9 semester-hours of training in English, 50% have had less than 26.7 hours, 75% have had less than 35.5 hours, and the remaining 25% have had more than that number; the middle 50% have had between 18.9 and 35.5 semester-hours. An overview of these figures for each subject shows that they are generally lower for Group II than for Group I, for Group III than for Group II, and for Group IV than for Group III.

The authors of the Washington study invite their readers to examine a table to which Table IX is parallel, in the light of a rough understanding or assumption that a "teaching minor" should consist of a minimum of 12 or 15 semester-hours. Using the same measuring-stick, we can judge by the location of the first quartile that a few teachers of English in every group are insufficiently prepared. In mathematics the preparation of nearly 1/2 may be said to be meager, inadequate, or worse. The Minnesota teachers of Latin compare very favorably with those of Washington, due no doubt to the fact that in the case of the latter, high-school credits were not taken into account as with the former. It seems clear that in Groups II, III, and IV 25% of the teachers of French are not sufficiently prepared to give effective instruction.

The Washington teachers of German were slightly better prepared even though the high-school credits were not translated. A quarter or more of the history teachers of each group are equipped with less hours than the standard calls for, and in Group IV the number runs up to include fully 50%. Considering that three courses in history are commonly taught in the high schools of Minnesota,--- ancient, modern, and American,--- the number of unprepared or poorly prepared teachers would doubtless loom much larger if the divisions taught and the training for each of them could be determined. The Washington study shows even less training for teachers of history, but the authors included political science under the same heading, and as may be judged from the appearance of political science in Table IX, that was probably a factor in lowering the Washington figures. The inadequacy of the training of teachers in political science, economics, and sociology is sufficiently striking to call for no explanatory remarks. Upon looking over the 25 percentiles in Chemistry, as also in physics and biology, we must come to the conclusion that no inconsiderable proportions of those teachers have not gone farther than to take the introductory courses in those subjects. More than half the teachers of botany are inadequately prepared. The training of the teachers of general science was arrived at by adding the total semester-hours taken in all the sciences. In a few cases the hours were all in one science, in many cases they involved only two sciences. Preparation of teachers for instructing in this subject is especially worthy of separate study; large gaps would be revealed. It appears that the teachers of physiology and physiography must be teaching their subjects on the strength of their general culture,

TABLE IX  
SEMESTER-HOURS OF PREPARATION IN HIGHER  
INSTITUTIONS FOR SUBJECTS TAUGHT

Subjects	No. of Teachers Reporting	No. Without Preparation in Higher Institutions	1st Quartile	Median	3rd Quartile
<b>English</b>					
Group I	67	1	18.9	26.7	35.5
Group II	78	0	20.1	26.0	35.8
Group III	99	1	19.2	25.2	34.5
Group IV	45	0	15.1	23.5	31.6
<b>Mathematics</b>					
Group I	41	2	11.3	19.5	27.4
Group II	59	3	8.9	14.7	21.1
Group III	86	6	6.9	13.5	23.5
Group IV	47	4	7.3	13.5	19.1
<b>Latin</b>					
Group I	24	0	28.5	40.0	48.0
Group II	30	0	28.5	36.3	38.8
Group III	50	0	21.7	32.0	38.5
Group IV	17	0	17.3	19.7	35.5
<b>French</b>					
Group I	18	0	21.0	38.0	45.5
Group II	17	1	16.5	23.0	31.8
Group III	25	1	14.3	22.0	26.8
Group IV	7	0	13.5	16.5	21.0
<b>Spanish</b>					
Group I	5	0	15.5	25.5	40.0
<b>History</b>					
Group I	29	1	14.3	19.7	30.5
Group II	54	6	9.5	18.5	31.5
Group III	88	10	7.5	18.0	28.0
Group IV	46	6	6.3	12.8	20.5
<b>Political Science</b>					
Group I	10	1	4.3	6.0	14.3
Group II	29	10	1.5	3.9	11.6
Group III	43	19	1.7	3.8	10.5
Group IV	18	12	1.1	2.3	4.5
<b>Economics</b>					
Group I	9	2	2.3	5.0	14.5
Group II	18	3	5.5	10.0	15.5
Group III	23	7	2.5	4.5	8.3
Group IV	11	3	2.8	5.0	12.8
<b>Sociology</b>					
Group I	5	0	4.6	6.5	9.5
Group II	11	1	3.3	4.3	6.4
Group III	19	6	1.6	5.0	10.2
Group IV	13	3	3.1	4.0	4.9
<b>Chemistry</b>					
Group I	13	1	12.5	23.5	29.6
Group II	26	1	11.7	18.0	25.8
Group III	33	1	12.8	21.0	27.5
Group IV	13	0	9.8	15.8	23.2
<b>Physics</b>					
Group I	12	1	10.0	14.0	18.0
Group II	27	2	6.9	10.1	15.6
Group III	36	3	5.5	8.1	9.0
Group IV	11	1	4.5	7.5	16.5

TABLE IX -- Cont.

Subjects	No. of Teachers Reporting	No. Without Preparation in Higher Institutions	1st Quartile	Median	3rd Quartile
<b>Botany</b>					
Group I	6	1	4.5	6.0	22.5
Group II	8	2	6.0	8.0	30.0
Group III	11	3	4.6	7.0	12.0
Group IV	15	6	1.9	5.0	9.0
<b>General Science</b>					
Group I	16	0	21.3	32.0	46.0
Group II	31	0	24.4	33.5	45.3
Group III	43	0	22.5	40.5	51.0
Group IV	16	0	12.0	27.0	53.0
<b>Biology</b>					
Group I	9	1	12.5	23.0	37.5
Group II	8	0	8.0	15.0	32.0
Group III	18	0	8.8	16.0	24.5
<b>Physiography</b>					
Group III	11	5	2.8	5.5	10.3
Group IV	15	9	0.8	1.7	4.3
<b>Physiology</b>					
Group II	8	2	2.0	4.0	6.0
Group III	13	4	2.4	3.5	5.5
Group IV	13	8	1.2	2.4	4.8
<b>Agriculture</b>					
Group II	13	0	52.5	81.0	97.5
Group III	7	1	63.0	74.5	89.0
Group IV	10	1	12.5	24.0	61.0
<b>Public Speaking</b>					
Group I	8	0	10.0	12.0	24.0
Group II	15	1	6.6	10.5	19.8
Group III	16	5	4.0	9.0	16.0
<b>Home Economics</b>					
Group I	16	1	30.0	45.5	60.0
Group II	37	0	30.6	40.3	49.8
Group III	46	2	31.5	40.8	52.6
Group IV	14	0	18.5	40.0	63.0
<b>Shop &amp; Mech. Drg.</b>					
Group I	12	1	20.0	50.0	65.0
Group II	24	2	24.0	38.0	55.0
Group III	24	5	3.0	13.0	24.0
Group IV	18	3	3.8	8.0	19.7
<b>Commercial Subjects</b>					
Group I	33	11	1.5	27.5	41.5
Group II	39	12	2.4	30.3	37.0
Group III	47	29	1.2	2.4	20.3
Group IV	21	17	0.6	1.2	1.9

as they have not done any "detailed and specialized study" in these fields. In agriculture and home economics we find the best prepared teachers. Public speaking is a subject which the investigator felt at first should be included with English, but upon further thought decided to hold separate because it seemed inadvisable to consider all training in English as proper equipment for the public speaking teacher. Half or more of the teachers of the subject have not taken as much work as the assumed "minor". The teachers of shop and mechanical drawing are well prepared in the schools of Groups I and II but poorly in those of Groups III and IV. The absence of preparation on the part of the teachers of commercial subjects has already been commented upon.

As would naturally be expected, Table IX is an inevitable corollary to Table I. Just as the latter portrayed an increasing number of subjects per teacher as we go from the larger to the smaller schools, so the former shows the poorest teacher-preparation to exist in the schools where the number of subjects per teacher is greatest.

B. The Number of Hours Desired by the Superintendents of the State as Special Preparation for the Teaching-Subjects.

Because it was felt that the superintendents of the state, as the authorities who select and nominate teachers for vacancies in their high-school faculties, should have opinions as to the proper preparation of teachers, which deserved some attention, they were asked in a questionnaire (see Exhibit B) to state their opinions. In particular they were asked to state, in semester-hours, what they considered to be the minimum amount of specialized academic preparation "necessary adequately to prepare teachers"

for teaching courses in certain specified departments in their high schools. They were asked to assume that the teachers of English had earned 4 units in that subject in high school, the teachers of mathematics, 2 units, the teachers of Latin, 4 units, the teachers of a modern foreign language, 2 units, and the teachers of history, 3 units. Following the practice used in computing the actual preparation of teachers of the languages, namely, the evaluating of each high-school unit at 4 semester-hours, the number stated by each superintendent as necessary for teachers of Latin was increased by 16, and the number for teachers of a modern foreign language, by 8, since, as above stated, 4 and 2 high-school units respectively were assumed. Table X is the summary of their opinions.

The table is to be read as follows: The superintendents of Groups I and II registered from 30 to 32 opinions (note numbers in parentheses), and the median number of semester-hours which they would require of a teacher of English in their systems is 40.1. The superintendents of Group II registered from 46 to 60 replies (the number differing with each subject), resulting in a median of 30.5 for their English teachers. The most significant point in the table is the drop from the medians of Groups I and II to those of Group III. Evidently the heads of the smaller schools realize that their teachers cannot be so highly specialized with the varied programs assigned to them.

Table X also indicates the ranges of the opinions with each group and for each subject. The reader cannot fail to be struck with the idea that each end of most of the distributions runs into absurdity. The tabulator must record at this point his impression that some of the questionnaires were filled in

TABLE X

SEMESTER-HOURS OF PREPARATION IN HIGHER  
INSTITUTIONS DESIRED FOR TEACHERS OF  
CERTAIN HIGH-SCHOOL SUBJECTS BY THE  
SUPERINTENDENTS

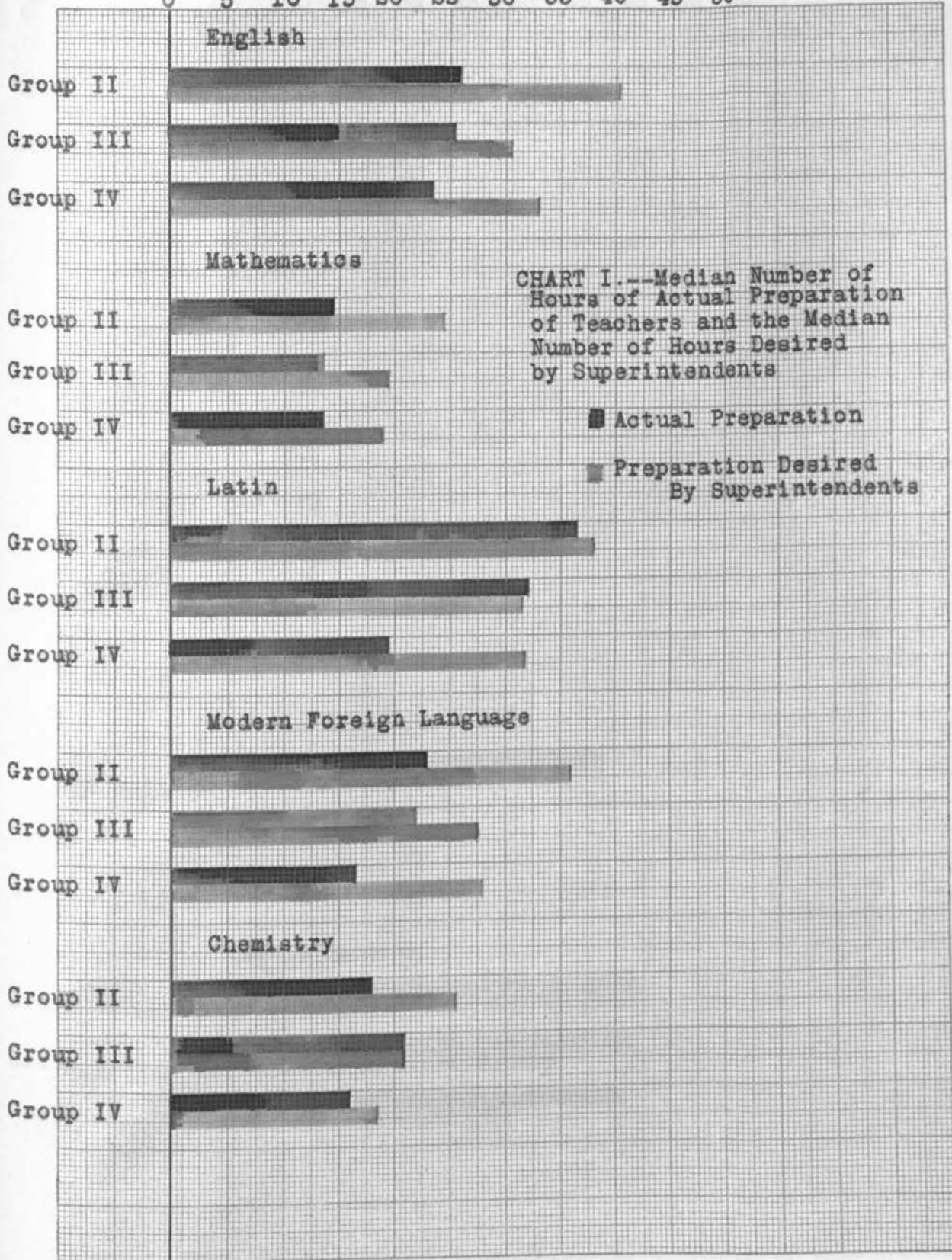
	English	Mathe- matics	Latin	Modern Foreign Language	Chemistry	Physics	Botany	History	Manual Training	Home Economics
M E D I A N S										
Groups I&II (30-32)	40.1	24.6	38.0	36.0	25.5	23.5	19.3	31.3	38.0	40.8
Group III (46-60)	30.5	19.5	31.8	27.2	20.8	20.0	12.9	24.6	25.8	33.5
Group IV (23-29)	33.0	19.0	31.8	27.7	18.8	18.5	15.8	27.0	21.5	29.5
R A N G E S of H O U R S										
Group I & II	18-80	7-70	24-56	14-68	10-50	6-48	6-40	14-80	9-80	12-100
Group III	6-80	6-50	16-70	6-58	5-45	5-45	4-45	6-72	6-96	6-84
Group IV	12-72	6-35	20-46	16-44	6-66	2-35	3-25	9-53	10-70	6-70

hastily and without much thought. As an example, one superintendent desired that a home economics teacher in his school should have 84 hours of preparation in her subject and further on indicated that every teacher should have 48 hours in pedagogical subjects. Because it is an 'opinion' questionnaire the writer believes that the results should not be taken seriously as setting up standards. A median between absurd extremes may be based primarily on a large number of sound judgments, but still it has the possibility of being affected by the poor judgments. Besides some evidence of haste in the responses, the tabulator was strongly impressed with the different interpretations that had undoubtedly been given to the directions. To some superintendents the expression "minimum total.....necessary adequately to prepare teachers" meant without doubt "the lowest possible number of hours", or only that which is "barely necessary"; to others it surely meant "desirable" or "advisable". Such a direction can be interpreted at just as wide extremes as the meanings which Jefferson and Hamilton read into the "necessary and proper" clause of the federal constitution.

The relation between the actual preparation of teachers and the preparation desired by superintendents is portrayed in Chart I. For superintendents, "Group II" represents Groups I and II, but for the teachers it represents only Group II. The clear impression made by the diagrams is that the superintendents of each group desire more preparation in each subject taught than the teachers have, with the exception of home economics and Group III in Latin and Chemistry. The general trend of superintendents' opinions as compared with actual preparation is so uniform as to command attention despite such limitations of an 'opinion'

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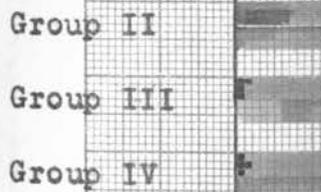
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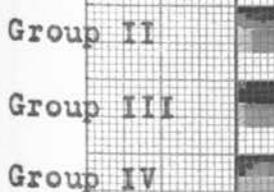
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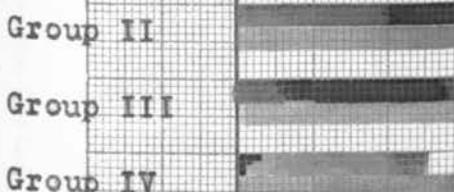
Physics



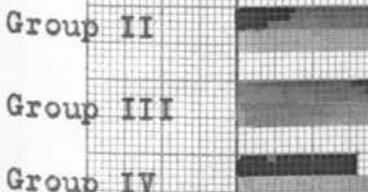
Botany



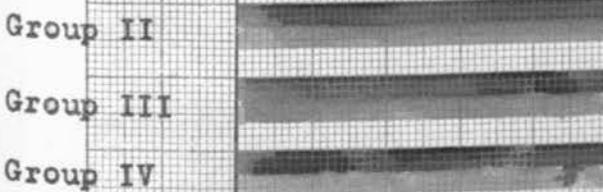
History



Manual Training



Home Economics



questionnaire as have been stated.

Because of the disparity between actual and desired training which Chart I shows, there might be some grounds for believing that the teachers had not attended higher institutions long enough to acquire the desired amount of preparation. Table XI is a partial answer to that doubt, however. It shows the numbers and percentages of each group who have advanced degrees, bachelor's degrees, or are undergraduates. Those listed under the heading "Some Work Toward Advanced Degree" are, of course, included under "Bachelor's Degree". A slight computation shows that the following percentages have at least a bachelor's degree:

Group I	81.6
Group II	80.6
Group III	88.2
Group IV	79.6
TOTAL	83.1

On the face of it, one might judge that about 17% of the high school teachers of Minnesota did not measure up to that standard of the North Central Association of Colleges and Secondary Schools which calls for a bachelor's degree from an accredited college or university as the primary qualification of teachers of academic subjects in high schools. But it must be remembered that among the teachers whose preparation has been studied for this report are large numbers who teach such special subjects as music, home economics, shop and mechanical drawing, commercial subjects, graphic arts, physical education. These people are not required to be holders of college degrees to meet the standards of the North Central Association.

A truer picture of the Minnesota situation in this particular is afforded by a short study recently completed under the direction of Dr. M. E. Haggerty, Dean of the College of Education

TABLE XI

NUMBERS AND PERCENTAGES OF TEACHERS WHO HAVE ADVANCED DEGREES, BACHELOR'S DEGREES, AND WHO ARE UNDERGRADUATES

Academic Classification	Group I		Group II		Group III		Group IV		Totals	
	No.	%	No.	%	No.	%	No.	%	No.	%
Advanced Degrees	31	10.0	11	3.1	8	2.3	4	3.1	54	4.8
Some Work Toward Advanced Degree:										
1. Academic:	20	6.5	9	2.6	7	2.1	3	2.3	39	3.4
2. Professional	15	4.8	11	3.1	12	3.5	7	5.5	45	4.0
3. Acad. & Prof'l	20	6.5	8	2.3	6	1.7	1	0.8	35	3.1
4. Undesignated	16	5.2	26	7.4	19	5.5	8	6.2	69	6.1
	<u>71</u>	<u>22.9</u>	<u>54</u>	<u>15.4</u>	<u>44</u>	<u>12.8</u>	<u>19</u>	<u>14.8</u>	<u>188</u>	<u>16.6</u>
Bachelor's Degree	222	71.6	272	77.5	296	85.9	98	76.5	888	78.3
Undergraduates	51	16.4	67	19.1	41	11.9	26	20.4	185	16.3
No answer	6	1.9	1	0.3					7	0.6
TOTALS	310	99.9	351	100.0	345	100.1	128	100.0	1134	100.0

of the University of Minnesota, and not yet published. This study was made from reports in the office of the state department of education and included a tabulation of the percentage of teachers of each subject who have degrees, which the writer has been permitted through the kindness of Dean Haggerty to use in this thesis. The figures are as follows:

Academic subjects:

English	93.3
Mathematics	93.2
Latin	96.3
Greek	100.0
French	96.5
German	100.0
Spanish	97.7
Scandinavian	100.0
History	94.8
Political Science	90.5
Social Science	90.4
Economics	94.3
Chemistry	96.2
Physics	93.6
Botany	100.0
Biology	95.1
General Science	94.6
Zoology	96.7
Psychology	100.0

Special Subjects:

Agriculture	95.9
Americanization	100.0
Art	27.2
Commercial Subjects	52.2
Drawing	13.6
Home Training	72.1
Industrial Training	18.0
Library	92.4
Manual Training	22.1
Music	53.6
Normal Training	22.5
Physical Ed. (Men)	50.7
Physical Ed. (Women)	55.0

These figures enable us to cast out any assumption that the impoverished training of some of Minnesota's high-school teachers for the subjects they teach is due to too short a period of training. Even taking the gross figures resulting from the

investigator's questionnaire, only 17% are found to be undergraduates, and this is not a large enough percentage to explain the situation with regard to the training of the teachers.

It seems not inappropriate at this point to call the reader's attention to the fact that the Minnesota situation in regard to the training of her high-school teachers, seems recently to have suffered a rather gross misrepresentation which has been spread broadcast because it appeared in a national educational journal. In the course of an article in The Educational Review for June, 1922, Dr. H. R. Bonner, former specialist in statistics with the United States Bureau of Education, gives a bar diagram (p. 30) which indicates that about 69.5% of the teachers in the accredited high schools of Minnesota are graduates of colleges or universities. The source of Dr. Bonner's information is not known, but in the face of the facts which have come out of this study, and those which Dean Haggerty has collected, it would seem that the source should be made evident. Glancing again at Dean Haggerty's percentages, we see that only the teachers of art, Commercial subjects, drawing, industrial training, manual training, music, normal training, and physical education have smaller percentages of college graduates among their numbers than Dr. Bonner's figure of 69.5% for the entire state. It must be plain to anyone that there are not enough teachers in those departments to bring down the high percentages that prevail among the teachers of academic subjects and the other special subjects so as to produce any such average for the state as Dr. Bonner gives.

C. Summary of Findings on the Special Academic Training for the Subjects Taught, With Recommendations for Improvement.

Upon the data presented in this chapter the following are the principal conclusions to be drawn:

1. When measured by standards which can scarcely be considered too high, many of the high-school teachers of Minnesota are insufficiently prepared for the subjects they are teaching. Especially is this true in the smaller high schools.

2. The superintendents of the state desire their teachers to have considerably more training than is the case, thus giving some indication that they do not willingly hire teachers who are lacking in preparation for the subjects assigned.

3. The all too meager preparation of many teachers for their teaching subjects cannot be attributed to their having too short a period of training.

In addition to the remedial measures proposed at the close of Chapter II, namely, the decreasing of the number of subjects each teacher is required to teach by the organization of the junior-senior high school and elimination so far as possible of the very small high school, the writer would ask that the teacher-training institutions face squarely the fact that they must train teachers for the teaching of at least three subjects. Further than that, they should cooperate with associations of high-school administrators to effect a simplification and standardization of the combinations so that teachers may be prepared in certain subjects and then find positions for which they are fitted. The authors of the Washington study urge that effective action depends on the cooperation of "voluntary agencies operating over wide areas", such as the National

Educational Association and the North Central Association of Colleges and Secondary Schools, because of the fact that teachers cross state lines continually. They point to the fact that the 496 teachers included in their investigation were trained in 183 different higher institutions located in 28 different states.)

The writer is in entire accord with this view, but he is also of the opinion that the College of Education of the University of Minnesota should re-vamp some of its own practices immediately for the advantage of its own future graduates. The College bulletin giving announcements for 1921-22 described the university's teacher certificates which have for some years been offered. All the certificates were for single subjects. During the year 1921-22 two important additions were made to this list of certificates. One is a certificate in natural science, to secure which the student must make, following carefully an outlined plan, some study of at least four of the five natural sciences. The other is a certificate in social studies, to secure which the student must make appreciable contact with history, political science, economics, sociology. If the reader will re-examine Table VIII and re-read the interpretations, he will find that the facts justify the creation of these certificates. He will also see justification for creating a certificate or certificates to cover combinations in language and literature. But the old certificates in single subjects still are granted. The facts indicate that most of these should be discontinued. Why permit a student to train himself to be a teacher of chemistry or political science when there are no such positions outside of the Twin Cities? And yet the retention of those certificates encourages just that sort of narrow

specialization. The College of Education cannot remodel the teaching programs of the state, but its faculty can guide the students into the combinations toward which Table VIII shows teaching situations tend, and they will be that much more likely to find positions for which they are prepared than if they specialize too narrowly or choose hit-or-miss combinations in their elections.

It is time that teacher-training institutions recognized that the prospective teacher must be prepared to be something of a general practitioner, or, more properly, a specialist on broad lines. Their policy has been on the whole to train him to be a narrow specialist, a policy which is out of joint with its guiding factors.

On the other hand, the certificating system of the state tends to force the high-school teacher into too broad a general practice. The college graduate receives a license which enables him to teach any subject in any high school, and which exerts no pressure on local authorities to secure persons of exact qualifications. Just how far the state might go in stipulating that teachers be trained in the subjects they teach, the writer would not presume to state. But he can point out that in California there must be sent to city and county boards of education a recommendation for each prospective teacher from the school in which he has taken his graduate work (California requires one year of graduate work for high school teachers), countersigned by the secretary of the state board of education. "Each recommendation shall state on its face the major and minor subjects which the holder thereof has taken in the institution, or the kind of work the candidate is qualified to do."\*

\*"Regulations Governing Certification of Teachers", Bulletin No. 10-A, 1919, California State Board of Education.

The above illustration is set forth merely as a suggestion. Whatever the obstacles may be it is certain that the state system of certification can and should be tightened up to help bring about a closer relationship between the teacher's training and his work.

## CHAPTER IV

### General Academic Training of the High-School Teacher

It may be rightfully assumed by all interested in the cause of education that the high-school teacher must be a person of general culture, as well as possessing proper preparation in his teaching-subjects. One of the aims of high-school instruction has commonly been designated as the "cultural" aim, and such an aim obviously calls for "cultured" instructors. Accordingly, we are not surprised to find in the report of the Committee of Seventeen the following recommendation: "The program of studies selected by each student should include work in subjects outside of those in which he is making special preparation, sufficient to give some insight into the different fields of knowledge and to avoid the dangers of over-specialization." The Committee further asked that the teacher's preparation include "One or more subjects from a group including history, economics, and sociology, which will give the teacher a proper outlook upon the social aspects of education", ..... "a course in general psychology and at least one from a group of subjects including history of philosophy, logic, and ethics, which will give the teacher a proper outlook upon education as the development of the individual." The motive underlying these provisions is clearly that of giving the prospective teacher an adequate cultural background.

A. General Academic Preparation of the High-School Teachers  
of Minnesota.

The degree to which the teachers studied in this investigation approximate the standards just mentioned may be judged from Table XII. At the top of each column of figures are the numbers of teachers furnishing the data. The percentage in each column are based on these figures. This table takes no account of the amount of work the teachers have had in the various subjects, but only tells the percentage of them who earned some credit in higher institutions in the subjects listed. This information was tabulated from the responses to the request for "Detailed Academic Preparation", as set forth in the upper half of the second page of the questionnaire (see Exhibit A). Glancing at the column of totals it will be seen that 93.4% of the teachers have had some work in English and 69.8%, some work in mathematics. (A similar table in the Washington study gives the figure for English as 95.2% and for mathematics as 87.2%). History has been studied in college by 66.9% and psychology by 64.9%. Only the following subjects have been studied in higher institutions by more than 50% of the teachers: English, mathematics, German, history, economics, sociology, and psychology. (At the foot of the table is given a summary which pictures rather more tangibly the breadth of the teachers' training than the subject-by-subject analysis. The totals column is reproduced here for the sake of comparison with Washington teachers:

	Minnesota	Washington
Some Foreign Language	82.1	86.9
Some Ancient Language	34.1	53.7
Some Modern For. Language	77.3	82.0
Some Social Study	87.5	92.1
Some Science	89.2	89.4

TABLE XII

PERCENTAGES OF TEACHERS WHO HAVE HAD PREPARATION IN  
HIGHER INSTITUTIONS IN THE DIFFERENT SUBJECTS AND SUBJECT-GROUPS

Subject or Subject-Groups	Group I (263)	Group II (342)	Group III (337)	Group IV (117)	Total of all Grps. (1059)
English	92.0	93.3	94.1	95.0	93.4
Mathematics	71.9	68.1	68.4	74.4	69.8
Latin	39.5	28.4	31.5	19.7	31.2
Greek	15.6	9.1	13.1	12.8	12.4
German	63.5	54.5	56.7	58.1	57.8
French	51.7	40.9	44.5	40.2	44.7
Spanish	13.3	11.4	13.7	14.5	12.9
History	60.8	64.7	70.6	76.0	66.9
Political Science	25.9	20.4	32.7	28.2	26.6
Economics	47.5	52.0	50.8	51.3	50.4
Sociology	42.7	53.8	54.1	54.7	51.2
Chemistry	44.5	48.0	52.6	52.1	49.0
Physics	27.8	28.9	33.5	32.4	30.5
Botany	36.9	36.0	44.5	40.2	39.4
Zoology	35.4	46.2	52.0	53.8	46.2
Physiog. & Geology	24.3	23.9	24.4	25.6	24.4
Astronomy	17.9	16.1	21.4	15.4	18.1
Physiology	23.2	28.9	30.6	28.2	28.0
Agriculture	5.7	7.3	8.1	12.8	7.7
Psychology	55.2	67.6	68.9	67.5	64.9
Philosophy & Ethics	33.5	40.1	32.1	29.0	34.7
Public Speaking	40.3	48.8	49.3	53.8	47.4
Home Economics	11.4	18.4	18.7	14.5	16.3
Shop & Mech. Drg.	8.4	17.3	12.5	18.8	13.9
Music	12.9	18.1	10.4	23.9	15.0
Graphic Arts	8.7	5.3	8.6	6.8	7.4
Commercial Subjects	8.7	11.1	8.6	5.9	9.2
Some Foreign Language	83.6	78.0	84.6	83.0	82.1
Some Anct. Language	42.2	31.9	35.0	26.5	34.8
Some Mod. For. Language	79.8	74.0	79.0	76.9	77.3
Some Social Study	81.7	86.7	91.5	93.2	87.5
Some Science	79.1	90.7	94.6	92.3	89.2

The reason for the Washington percentages being slightly higher throughout is not apparent as both studies show approximately 17% as undergraduates. It may very likely be due, however, to a larger proportion of special teachers in Minnesota in 1921 than in Washington in 1917. Minnesota's liberal policy of state aid for special departments in the high schools has fostered their rapid multiplication and development. Figures cannot be gathered from the Washington study to make possible a comparison in this respect.

When we consider the percentages who have studied a foreign language, a social study, and a science, as well as English and mathematics, it may be said that the teachers of the state are not far lacking in general academic training, and that they conform reasonably well to the standards of the Committee of Seventeen except in their preparation in psychology and in philosophy and ethics.

One additional significance that will undoubtedly impress itself upon the reader is in the shift of percentages between groups in certain subjects. For instance, the ancient languages lose ground from Group I to Group IV, while the social studies and the sciences gain ground. From what we already know about the length of time that has elapsed since the teachers of Group I took their training as compared with those of Group IV, we have here some evidence on the shift of emphasis in the curriculum of the liberal arts college.

#### B. Superintendents' Opinions as to Adequate General Academic Training.

For the sake of comparison with the general academic training which the high-school teachers of the state have, the superintendents were asked to indicate what preparation they thought the teachers in their systems ought to have. The form in which

the request was made may be seen on page three of Exhibit B. It will be observed that the location of the check marks they used indicated whether the different subjects should be taken in high school only, in college only, in both, or in either.

Table XIII is the summary of the superintendents' responses, showing the opinions of each group for each subject. The table is to be read as follows: Of the 33 superintendents in Groups I and II who responded, none would have the teacher's preparation in English confined to the high school only, nor would any have it confined to the college only, but 97.0% say the teacher should study English in both high school and college. And glancing at the fourth and fifth columns we see that this is the total percentage of those who think the subject to be a necessary element in the teacher's training. Of the 58 superintendents in Group III who responded, 1.7% would prescribe English as an element in the teacher's collegiate training only, 96.6%, high school and college, 1.7%, either high school or college, with a total of 100% voting for English somewhere in the teacher's training. The number of responses in Group IV, it will be observed, was 28. The percentages for each subject were figured on the basis of the same number of responses as are shown for English.

An examination of the column of totals reveals that in all the subjects except ancient languages, graphic arts, and agriculture, larger percentages of the superintendents of Group IV desired training for their teachers than of the superintendents of Groups I and II. And usually the percentages are higher for the superintendents of Group III than for Groups I and II. The explanation for this difference may very likely lie in the fact that the small school head know that they have more use for

TABLE XIII

PERCENTAGES OF SUPERINTENDENTS  
WHO WOULD PRESCRIBE THE VARIOUS SUBJECTS AS NECESSARY ELEMENTS IN  
THE GENERAL ACADEMIC TRAINING OF ALL HIGH-SCHOOL TEACHERS

Subjects	High School	Col-lege	H.S.& Coll.	Either	Total
English					
Groups I & II (33)	0.0	0.0	97.0	0.0	97.0
Group III (58)	0.0	1.7	96.6	1.7	100.0
Group IV (28)	3.6	0.0	96.4	0.0	100.0
Latin					
Groups I & II	24.2	0.0	15.1	12.2	51.6
Group III	22.4	1.7	10.3	25.9	60.4
Group IV	17.9	3.6	17.9	7.2	46.5
Mathematics					
Groups I & II	51.6	0.0	39.4	0.0	91.0
Group III	31.1	1.7	58.6	8.6	100.0
Group IV	39.3	0.0	57.2	3.6	100.0
Greek					
Groups I & II	0.0	9.1	0.0	0.0	9.1
Group III	0.0	5.2	0.0	5.2	10.4
Group IV	0.0	3.6	0.0	3.6	7.2
Modern Foreign Language					
Groups I & II	9.1	9.1	15.1	18.2	51.5
Group III	3.5	13.8	20.7	25.9	63.8
Group IV	3.6	7.2	42.8	28.5	82.1
Philosophy and Ethics					
Groups I & II	0.0	60.6	9.1	6.1	75.9
Group III	0.0	74.3	0.0	5.2	79.4
Group IV	0.0	85.6	0.0	0.0	85.6
Public Speaking					
Groups I & II	9.1	3.0	45.6	21.2	79.0
Group III	0.0	17.3	37.9	41.4	96.5
Group IV	3.6	14.3	57.2	10.7	85.7
Manual Training or Home Economics					
Groups I & II	6.1	3.0	18.2	9.1	36.4
Group III	20.7	5.2	19.0	15.5	60.4
Group IV	32.1	3.6	21.4	17.9	74.9
Music					
Groups I & II	21.2	0.0	18.2	24.2	63.6
Group III	15.5	1.7	24.1	22.4	63.8
Group IV	21.4	3.6	21.4	17.9	64.3
Graphic Arts					
Groups I & II	9.1	3.0	6.1	12.2	30.3
Group III	8.6	3.5	6.9	6.9	25.8
Group IV	7.2	3.6	0.0	7.2	17.9
Physical Training					
Groups I & II	3.0	6.1	39.4	15.2	63.6
Group III	5.2	6.9	39.7	10.3	62.0
Group IV	0.0	7.2	46.4	14.3	67.8

TABLE XIII -- Cont.

Subjects	High School	Col-lege	H.S.& Coll.	Either	Total
<b>Agriculture</b>					
Groups I & II	3.0	0.0	0.0	0.0	3.0
Group III	-	-	-	-	-
Group IV	-	-	-	-	-
<b>History</b>					
Groups I & II	15.1	0.0	78.9	3.0	97.2
Group III	12.0	3.5	69.0	12.0	96.5
Group IV	10.7	0.0	85.6	3.6	100.0
<b>Economics</b>					
Groups I & II	9.1	33.3	21.2	21.2	84.7
Group III	3.5	25.8	27.6	37.9	94.7
Group IV	3.6	32.1	28.6	32.1	96.5
<b>Sociology</b>					
Groups I & II	0.0	39.4	27.3	21.2	88.0
Group III	1.7	41.4	15.5	36.2	94.7
Group IV	3.6	39.4	25.0	25.0	93.0
<b>Political Science</b>					
Groups I & II	21.2	9.1	48.5	15.1	94.0
Group III	8.6	10.3	51.7	22.4	93.0
Group IV	25.0	10.7	50.0	14.3	100.0
<b>Chemistry</b>					
Groups I & II	24.2	6.1	18.2	24.2	72.7
Group III	15.5	1.7	25.8	46.5	89.6
Group IV	17.9	10.7	25.0	32.1	85.6
<b>Physics</b>					
Groups I & II	15.1	12.1	18.2	24.2	69.6
Group III	15.5	8.6	12.0	48.3	84.5
Group IV	25.0	0.0	28.6	32.1	85.6
<b>Botany</b>					
Groups I & II	9.1	6.1	12.1	30.3	57.5
Group III	15.5	6.9	6.9	39.7	69.0
Group IV	25.0	3.6	25.0	35.8	89.3
<b>Zoology</b>					
Groups I & II	9.1	6.1	9.1	27.2	51.5
Group III	13.8	12.0	5.2	25.8	56.9
Group IV	10.7	7.2	17.9	32.1	67.8
<b>Physiography</b>					
Groups I & II	9.1	9.1	6.1	24.2	48.4
Group III	8.6	1.7	6.9	32.8	50.0
Group IV	28.5	14.3	7.2	14.3	64.3
<b>Astronomy</b>					
Groups I & II	0.0	9.1	3.0	12.1	24.2
Group III	0.0	20.7	1.7	8.6	31.0
Group IV	0.0	25.0	3.6	7.2	35.8
<b>Physiology</b>					
Groups I & II	15.1	6.1	18.2	27.2	66.7
Group III	25.9	1.7	17.2	36.2	81.0
Group IV	53.8	3.6	7.2	32.1	96.5
<b>Psychology</b>					
Groups I & II	0.0	66.7	9.1	12.1	88.0
Group III	0.0	67.2	6.9	13.8	88.0
Group IV	0.0	82.2	3.6	14.3	100.0

TABLE XIII -- Cont.

Subjects	High School	Col-lege	H.S.& Coll.	Either	Total
Some Foreign Language					
Groups I & II	36.4	12.1	24.2	24.2	66.7
Group III	24.1	17.2	22.4	44.8	74.1
Group IV	21.4	14.2	46.4	46.4	85.7
Some Ancient Language					
Groups I & II	27.3	6.1	15.2	12.1	54.5
Group III	20.7	6.9	26.9	29.3	58.6
Group IV	17.9	7.1	21.4	10.7	42.9
A Social Science					
Groups I & II	27.3	39.4	81.8	33.3	90.0
Group III	13.8	48.3	75.9	55.2	100.0
Group IV	32.1	46.4	89.3	39.3	100.0
A Science					
Groups I & II	42.4	21.2	24.2	45.5	81.8
Group III	39.7	22.4	36.2	70.7	98.3
Group IV	64.3	35.7	42.9	53.6	100.0

general practitioners than for narrow specialists. Their responses without doubt reflect a common thought that their teachers must often be assigned subjects to teach on the strength of their general culture. Therefore, they want teachers who have made some contact with many fields. This seems the more surely to be the proper explanation when we look back at Table X and observe that the smaller school heads do not ask that their teachers have such extended training in their teaching-subjects as do the larger school heads.

Because the superintendents have been separated into groups, it is not evident exactly what percentage of the whole number desire that their teachers have contact with the different subjects, but we have no trouble in noting that at least 3/4 of the whole number are of the opinion that the following subjects are necessary elements in the general academic training of a teacher: English, mathematics, philosophy and ethics, public speaking, history, economics, sociology, political science, chemistry, physics, physiology, psychology. Over half, but less than 3/4, desire that their teachers should have had some contact with Latin, a modern foreign language, manual training, or home economics, music, physical training, botany, zoology, and physiography. On the third sheet of the table is a further summary which shows the percentages who desire that their teachers shall have had contact with some language, with some social study, and with some natural science. Comparing this table with Table XII, we conclude that the superintendents want teachers a little more broadly trained than they get them. But no close comparison of these tables is possible because Table XIII has reference to high-school as well as college training, while Table XII summarizes

training in higher institutions only.

C. Summary of Findings on General Academic Training, with  
Re  
Recommendations.

1. The general academic training of the Minnesota high-school teachers measures up not unfavorably with the standards established by the Committee of Seventeen with the exception that too large numbers have had no contact with psychology and with philosophy and ethics. Otherwise they seem on the whole to have touched the main fields of knowledge necessary for proper breadth of culture.

2. That the percentages who have had contact with the various subjects is not larger may be due to the large numbers of special teachers in Minnesota high schools, teaching programs fostered by the state's policy of liberal aid for special departments.

3. The superintendents seem to be desirous of securing teachers with the breadth of training that the Committee of Seventeen deemed advisable except that 20% or 25% do not feel that a course in philosophy or ethics is essential.

4. The teaching situation in the small schools, as it pertains to the large number of subjects each teacher is required to teach is apparently reflected in the desire of the heads of the smaller schools for greater breadth of training than is desired by the heads of the larger schools.

It seems the facts that have been disclosed emphasize once more the desirability of standardizing subject-combinations in practice and in training, so as to make available to the smaller high schools teachers adequately prepared to teach three or four subjects. The superintendents of smaller systems would not then

have to look for a jack-of-all-trades when they set out to hire a high-school teacher. While contact with many fields is desirable, that is not the type of training that should be relied upon as preparation for the teaching of any subject, yet as long as we have the present chaotic situation in the subject-combinations, that preparation is the sort that must be relied upon. The smaller school heads realize that it is better than none, and accordingly they ask for it; they know that a person so trained will be more useful in their schools than one who presents a university teacher's certificate in physics or botany or political science. The College of Education should take action to see that its graduates have the balance of specialized and of general academic training which the situation evidently calls for.

## CHAPTER V

### Training In Pedagogical Subjects

The problems of how to teach high-school subjects have been recognized much more recently than the problems of how to teach elementary-school subjects. Until a decade or so ago large proportions of college graduates took high-school teaching positions with no trace of study in methodology, no feeling that methodology was particularly worthy of study. Gradually, however, we have seen this aspect of the teacher's training recognized in the expansion of small university departments of education to the rank of colleges, the imposition of pedagogical requirements by state departments of education, the tightening of the rules of accrediting associations. The bulletin of the College of Education of the University of Minnesota, giving announcements for 1921-'22, says, on page 18: "Beginning with the year 1921-'22, the University teacher's certificate will be granted only to graduates of the College of Education. Students expecting to receive this certificate upon graduation shall be registrants in the College of Education from the beginning of the junior year." Thus does the scientific study of education come into its own.

The Committee of Seventeen, which reported in 1907, fifteen years ago, was composed of far-sighted men who set up standards for the pedagogical training of high-school teachers, standards that are worthy today. They advocated that the training of every teacher should include courses in the following subjects:

1. History of education (both general and secondary education)
2. Educational psychology, with emphasis on adolescence

3. Principles of education
4. Special methods in teaching subjects
5. Organization and management of school systems
6. Practice teaching
7. School hygiene

Having this recommendation in mind, let us examine the facts of preparation of the teachers in service.

#### A. The Pedagogical Training of the High-School Teachers of Minnesota.

Glancing at Exhibit A the reader will note that the teachers included in this investigation were asked to indicate the number of semester-hours of credit they had earned in the various courses in education. The summary of the responses is given in Table XIV which shows the percentage of the teachers of each group and of the total who had taken work in the courses named in the left-hand margin. To facilitate the reader's comparison of actual preparation with the minimum set up by the Committee of Seventeen, the names of certain subjects in Table XIV have been underlined. These are comparable with those prescribed by the Committee. "Technique of Teaching" is included because courses in "general method" are mentioned in the Committee's explanation of "Special methods in teaching-subjects".

An examination of the totals column reveals that large percentages have not realized the standards set up by the Committee. Less than 3/4 have taken a course in the history of education; the percentages who have studied "Principles of Education" and "Principles of Secondary Education" total but 65.1%; just a few over half have taken courses in the teaching of special subjects;

TABLE XIV

PERCENTAGE OF TEACHERS WITH PREPARATION  
IN THE DIFFERENT PEDAGOGICAL SUBJECTS

Subjects	Total of Groups				
	Group I (300)	Group II (348)	Group III (339)	Group IV (125)	I, II, III, IV (1112)
<u>History of Education</u>	69.3	72.7	70.9	71.1	71.0
Philosophy of Education	28.0	18.7	19.2	17.6	21.2
<u>Principles of Education</u>	53.3	41.1	42.5	33.3	44.0
Administration and Supervision	31.0	27.3	31.9	36.8	30.8
<u>Teaching of Special Subjects</u>	52.0	52.6	51.0	58.4	52.6
<u>Principles of Secondary Education</u>	24.3	21.5	19.5	16.8	21.1
High School Curriculum	9.7	7.5	10.1	12.8	9.4
Educational Measurements	9.0	6.6	8.9	16.0	9.0
Mental Measurements	4.0	5.8	5.9	11.2	5.9
<u>Technique of Teaching</u>	31.7	41.1	44.0	49.6	40.4
<u>Practice Teaching</u>	38.7	60.7	60.8	67.2	55.7
Elementary School Curriculum	4.7	2.9	3.5	12.0	4.9
Educational Sociology	19.0	26.1	28.0	36.8	26.0
<u>Educational Psychology</u>	50.0	72.1	58.2	62.4	60.8
Genetic Psychology or Adolescence	13.3	12.4	12.1	12.0	12.5
Psychology of High School Subjects	7.7	6.0	4.7	8.0	6.3
Industrial and Voc- ational Education	14.3	14.4	10.6	16.0	13.4
Foreign Schools	3.7	1.5	2.1	0.8	2.1
AVERAGES	25.8	27.3	26.9	29.9	

"Technique of Teaching" (general method) has been studied by but 2/5; a little more than half have experienced "Practice Teaching"; 3/5 have studied "Educational Psychology", and 1/8, "Genetic Psychology". "School Hygiene" does not appear at all.

Slight differences in statement prevent a full comparison with the Washington study, but the following totals from each study which are here set down, are legitimately comparable:

	Minnesota	Washington
History of Education	71.0	69.9
Administration & Supervision	30.8	27.9
Teaching of Special Subjects	52.6	37.7
Educational Measurements	9.0	7.5
Technique of Teaching	40.4	46.3
Practice Teaching	55.7	34.6
Educational Sociology	26.0	16.2
Educational Psychology	60.8	73.1
Genetic Psychology	12.5	22.8
Industrial and Vocational Education	13.4	11.9

The Washington teachers excel notably in training in psychology, while the Minnesota teachers have had decidedly more training in practice teaching and in courses in the teaching of special subjects. Both groups fall considerably short of the minimal standards set up by the Committee of Seventeen.

Table XIV has additional significance if we examine the shift of percentages for each subject. History of education holds its own from Group I to Group IV; philosophy of education and principles of education have lost ground decidedly (possibly these

courses are to some extent relics of the time when the study of education was more cultural than vocational); educational measurements, mental measurements, technique of teaching, practice teaching educational sociology, and educational psychology all show rather notable gains, the last four reflecting without doubt the more recently imposed requirements of the state department of education and the College of Education of the University. At the foot of the table are the average percentages for each of the courses. This is just a rough measure to compare the total extent to which each of the groups has studied education. An increase from Group I to Group IV is shown but is not noteworthy, considering the crudeness of the form of measure.

It will be noticed in Exhibit A that the teachers were asked to state their total number of hours of credit in educational subjects. As will be observed in Table XV below, the fraction of those who complied with that request was only a little more than half. Many did not state the numbers of hours they had taken in each of the subjects, but only gave evidence by a check mark of having taken a course or courses in the various subjects, so they could give no total. Concerning those who had written in the semester-hours for the subjects they had studied but had not written in any total, the tabulator did not compute a total. Such procedure did not seem advisable, because if the teacher could not state the total number of hours taken in education, certainly the tabulator could not.

TABLE XV  
NUMBER OF SEMESTER-HOURS IN PROFESSIONAL SUBJECTS

	Group I	Group II	Group III	Group IV
Number of teachers in group	310	351	345	128
Number of teachers reporting total hours in education	143	190	183	78
Number reporting having had no professional training	0	3	3	1
Average number of semester-hours in professional subjects	21.0	18.8	19.5	20.4

The investigator does not feel that the averages set forth in Table XV necessarily represent the exact situation as regards the professional training of the teachers in the high schools. Too many teachers failed to state their total hours in education. It is notable, however, that Groups III and IV average up so evenly with Groups I and II, because the latter groups have taken much more graduate work in education than the former.

B. Superintendents' Opinions as to Adequate Training in Pedagogical Subjects.

The superintendents were asked (see Exhibit B) to "indicate the number of semester-hours of credit in professional subjects which" they would "regard as minimal adequate professional training for high-school teachers." Table XVI is a digest of their opinions.

TABLE XVI

NUMBER OF SEMESTER-HOURS IN PEDAGOGICAL SUBJECTS  
DESIRED BY SUPERINTENDENTS FOR HIGH-SCHOOL TEACHERS

	Groups I&II (31)	Group III (57)	Group IV (30)
Median Number of Hours	24.7	23.5	24.7
Range of Hours	12-74	6-184	9-81

The "Range of Hours indicates some absurd replies as in the case of the superintendents' opinions on specialized academic preparation. Accordingly, to show the averages for each group would not give as accurate a picture as the medians. For a technically proper comparison of Tables XV and XVI, medians should perhaps have been computed for the former. But the numbers of individuals represented in Table XV are so large as to assure the investigator that the medians would be practically the same as the averages. Comparing, then, the central tendencies shown in the two tables, we may say that the teachers have had about 80% as much training in courses in education as the superintendents desire. The superintendents of the three groups differ very little in their opinions as to what a teacher's training ought to be.

The superintendents were also asked to distribute the number of hours they recommended among the various divisions of training in education which they considered essential. Table XVII summarizes their opinions. As in previous tables the numbers in parentheses in the heading signify the numbers in each group who gave usable responses for this section of the questionnaire. The table is to be read as follows: Of the 33 superintendents in Groups I & II, 79.0% would have the teacher take some work in the history of education, 51.5% would have him take some work in the

TABLE XVII

PERCENTAGES OF SUPERINTENDENTS WHO CONSIDERED COURSES IN THE VARIOUS  
DIVISIONS OF TRAINING IN EDUCATION TO BE ESSENTIAL TO A  
TEACHER'S PREPARATION IN THAT FIELD

Subject	Groups I&II (33)	Group III (57)	Group IV (30)	Total (120)	Avg. No. of Hours Recommended
History of Education	79.0	68.5	80.0	74.4	3.10
Philosophy of Education	51.5	40.4	26.6	40.0	2.77
Principles of Education	63.7	63.2	73.5	65.7	2.89
Administration & Supervis.	45.5	58.0	53.4	53.3	2.82
Teaching of Special Subj.	79.0	73.7	50.0	68.1	3.57
Principles of Secondary Education	72.7	59.7	50.0	60.7	2.57
High-School Curriculum	66.5	50.8	53.4	55.8	2.25
Educational Measurements	63.5	61.5	53.4	60.0	2.20
Mental Measurements	42.5	43.8	60.0	47.5	1.97
Technique of Teaching	75.7	59.6	80.0	69.2	3.04
Practice Teaching	88.0	79.0	83.5	82.5	4.08
Elem.-School Curriculum	33.3	28.1	26.6	29.2	2.03
Educational Sociology	45.4	35.1	46.7	40.7	2.55
Educational Psychology	85.0	72.0	70.0	75.0	2.93
Genetic Psychology	39.4	29.8	46.7	36.7	2.34
Psychology of High-School Subjects	42.4	43.9	36.7	41.6	2.18
Industrial & Vocational Education	18.2	17.6	10.0	15.8	2.16
Foreign School Systems	9.1	14.0	16.6	13.3	1.94

philosophy of education etc.

An examination of the totals shows that more than 4/5 of the superintendents believe that practice teaching is essential, while 3/4 would have the teacher study the history of education and educational psychology. The other subjects considered essential by more than half the superintendents are principles of education, administration and supervision, teaching of special subjects, principles of secondary education, high school curriculum, educational measurements, and technique of teaching. It is notable that these subjects receiving the largest votes of the superintendents are for the most part the ones that the Committee of Seventeen recommended. A comparison of the figures in Table XVII with the actual percentages of teachers who have taken these subjects, as shown in Table XIV, indicates that in general the teachers emphasized in their training the subjects most strongly recommended by the superintendents, but considerably smaller percentages have taken the subjects than there are of superintendents who desire that they should have been taken.

The extreme right-hand column in Table XVII gives an additional clue to the evaluation which superintendents place upon the different subjects. It simply tells the average number of hours which the superintendents would have the teachers devote to the various subjects. On the whole it will be seen to indicate that the subjects which the largest percentages of superintendents would include in the teacher's training are the ones to which they would have him devote the most time.

C. Summary of Findings on Pedagogical Training of High-School Teachers, With Recommendations.

1. Insofar as the recommendations of the Committee of Seventeen constitute a valid measure, many of the high-school teachers of the state are inadequately prepared in pedagogical subjects.

2. Some shift of emphasis in pedagogical subjects is noticeable.

3. Many subjects in education which have been taken by considerable proportions of the teachers were not mentioned by the Committee of Seventeen.

4. The teachers of the different groups have apparently had approximately equal amounts of work in education.

5. The superintendents of the state desire more pedagogical training for their teachers than they have.

6. The superintendents value most highly the same pedagogical subjects as were recommended by the Committee of Seventeen.

Some of the subjects appearing in the tables of this chapter, and which were not mentioned by the Committee of Seventeen, represent the advance which the scientific study of education has made since the Committee made its report, 15 years ago. These subjects are apparently being studied by increasingly large proportions of prospective teachers and are recommended by large numbers of superintendents. They occupy important places in college of education curricula. It would seem advisable to have a new evaluation of the pedagogical subjects by some body which today represents the best educational thought of the nation as did the Committee in 1907. The teacher's time in training is limited and should be spent only on those subjects which contribute the most to his professional success. The situation seems to indicate that

new standards should be set up in pedagogical training before recommendations can be made to make more effective the teacher's classroom performance.

## CHAPTER VI

### Concluding Remarks

This study was instituted, it will be recalled, to gather evidence concerning two very important factors in the functioning of our secondary schools,---the preparation of the teachers and the programs of duties which are assigned them. While the facts presented do not afford as refined a measure as would be desirable for some purposes, there can be no doubt that they point to:

1. The existence of many teaching positions which are impossible for teachers to fill satisfactorily because of the large number and diverse character of the subjects to be taught.
2. A high correlation between smallness of school, difficulty of positions, and inexperience of teachers.
3. The infrequent appearance of many subjects in teachers' programs except in combination with one or more other subjects.
4. The inadequacy of the specialized training of many teachers for the subjects taught, especially in the smaller schools, the inadequacy not being due to too short a period of training on the part of the teachers.
5. The approximate attainment of good standards in the general academic training of the teachers.
6. The inadequate preparation of high-school teachers in pedagogical subjects, measured by available standards.
7. The evident desire of superintendents for better all around training of teachers, the heads of the smaller schools desiring less in specialized training for teaching-subjects and more in general academic training than the heads of the larger schools.

In consideration of these facts, several remedial measures have been advocated and discussed at some length. They may be summarized as follows:

1. Adoption of means to decrease the number and diversity of teaching-subjects per teacher, the principal means to that end being the reorganization of smaller school systems on the six-six basis, the six-year high school permitting more of a vertical distribution of the teacher's work and less of the horizontal.

2. The simplification and standardization by the cooperative effort of school administrators and teacher-training institutions, of the subject-combinations assigned to teachers.

3. Such guidance of its students by the College of Education of the University of Minnesota that they will be more properly prepared in content subjects for the positions they are most likely to secure upon graduation, the most immediate steps being the abolition of most of the single subject certificates and the establishment of additional certificates for the more common subject-combinations.

4. The tightening up of state certification to the end that the teacher may be licensed for a particular and not a general position.

The entire situation points clearly to the need for standardization---standardization of positions and standardization of teachers. High-school teaching requires specialists, but in the smaller high schools it is not feasible to employ specialists so narrowly trained as in the larger high schools. To what extent can we effect this standardization? Great obstacles confront us. There are high schools of many sizes in Minnesota, and they have

different curricula; students in training for teaching have widely variant interests which they wish to satisfy in their election of studies; and Minnesota teachers come from all over the union. But the short history of high schools tells us that standardization must come. It is an evident aspect of their evolutionary character. In fact, we have already in large measure achieved it (what is the work of the North Central Association and of state departments of education but standardization, bringing all schools up to certain standards in buildings, equipment, teachers' programs, teachers' preparation, etc.?). We see in this movement toward standardization the desire of society to have units and elements of definitely known value in this increasingly complex world. The facts presented in this study just demand a further standardization of two of the factors of education than we have as yet achieved. To those who see only the difficulties, we admit the impossibility of making holes and pegs exactly complementary, but we say that we must approach this goal more nearly than we have. So long as there exists such a hiatus between the training of the teachers and the jobs they fill, there must be a deplorable loss of power in our educational machinery.

The business world affords us plenty of analogies in the careful division of labor. Under pressure of competition every business house is forced to divide its operations as advantageously as the size of its plant will permit, and to find men or train them for positions which are created for specialists to fill. The firm that creates many positions that can be filled only by jacks-of-all-trades soon goes "to the wall" --- poor management.

What sort of economics is it, then, that would have a

high-school teacher, whose training in a specialty requires a very long time at the best, take up a program which calls for skill in several such specialties, specialties what are often unrelated? And again, what sort of economics is it for a teacher-training institution to send to high schools of faculties of five or ten members, teachers who are specialized to the degree required by a school with a faculty of fifty?

This last question brings us to another which must be given some consideration in fairness to those to whose attention the facts of this study have been especially recommended. What measure of responsibility must be shouldered by colleges of education for the training of teachers now in the field? The question immediately calls to mind the fact that many of the institutions which are sending out teachers are liberal arts colleges with a weak department of education for giving a few courses in methods. The colleges of education in connection with our universities are young and weak, and though steadily assuming larger powers, they as yet have little control over the prospective teacher's content courses. As far as content is concerned, the teacher's training is still almost wholly governed by liberal-arts aims and traditions, rather than vocational considerations. Accordingly, the evidence presented must be viewed to some extent as a recommendation for larger control by colleges of education over the teacher-training function, to the end that the training may be given the proper vocational slant.

A very logical and highly essential extension of this study should be made to determine to what extent there now is a vocational slant in the teacher's training in content courses. Just as this

study has sought to answer the questions,

What is the teacher's work? and

To what extent is she trained for that work?

the extension should seek to answer the question,

What is the teacher trained for?

This would involve an examination of all the teacher's courses in content, regardless of the work she is doing. It would reveal what combination of subjects she is prepared to handle. When contrasted with the work she is doing, it would show to what extent she is utilizing or not utilizing her training. If possible, it would be highly desirable to get a more refined measure of the teacher's training than a mere statement of the number of hours in each of the various departments, for it is not the completion of a certain number of hours so much as it is the character of the courses in the department that matters. For example, because a teacher has credit for 18 semester hours in history it is not a very certain indication that she is prepared to teach ancient, medieval and modern, and American history in the high school. Her 18 hours of training may have been confined to courses in the history of England and Western Europe. It is not the object of this paragraph, however, to go into the details of technique of any additional investigation, but merely to point out further work that should be done in examining the effectiveness of our present organization of teacher-training.

As a final remark, the writer would call attention to the substantial agreement of the data presented in this investigation with that of the Washington study. Taking a larger number of teachers and school administrators, he has arrived at results which verify in a striking manner the findings in Washington. There is significance in this point. It suggests that the conditions found

Exhibit A

**To Minnesota High School Teachers:**

The following questionnaire is being submitted to all teachers of high school subjects in Minnesota by one of the graduate students of the College of Education. Its purpose is to secure such a general survey of the preparation of high school teachers as will result in a clearer definition of the problems that are to be met and solved in that field. I believe that a complete response will enable the College of Education more completely to perform its function of preparing high school teachers. Accordingly, I recommend this brief questionnaire for your early attention and reply. It will require but a few moments of your time to set down the information asked for and to turn the sheet in to your principal or superintendent.

Very sincerely yours,

M. E. HAGGERTY,

Dean of the College of Education, University of Minnesota

**RECORD OF TEACHER, PRINCIPAL, OR SUPERINTENDENT (Underscore position)**

To be filled out by individual whose record is here reported

Name ..... School and City.....  
 (Last) (First)

**Preparation:**  
 High School (Place).....No. Yrs..... Year Graduated.....  
 Normal (Place).....No. Yrs..... Year Graduated.....  
 College .....No. Yrs..... Year Graduated.....  
 Post Graduate.....Degrees held.....  
 Academic..... No. Semester Hours..... Dates taken.....  
 \*Professional ..... No. Semester Hours..... Dates taken.....

**Experience,—No. Yrs. taught prior to current school year:**  
 In rural schools and grades.....  
 In non-accredited high schools (or H. S. departments in state graded systems).....  
 In accredited high schools (state high schools).....  
 In present position.....

**Detailed Professional Preparation:** Indicate the number of hours of credit received for those of the following professional subjects you have studied in normal school or college.

	Hours	Hours
History of Education.....		Elementary School Curriculum.....
Philosophy of Education.....		Educational Sociology or Social
Principles of Education.....		Aspects of Education.....
Administration and Supervision.....		Educational Psychology.....
Teaching of Special Subjects		Genetic Psychology and
What subjects?.....		Adolescence .....
Principles of Secondary Education.....		Psychology of H. S. subjects.....
High School Curriculum.....		Industrial and Vocational Education.....
Educational Measurements.....		Foreign School Systems.....
Mental Measurements.....		
Technique of Teaching		
(i.e., General Method).....		
Practice Teaching.....		
Total No. of hours of credit in educational subjects?.....		

Check in the above list the courses that have been most useful to you in the actual work of teaching. Underscore the courses that have made most clear to you the significance of the work of teaching.

**Detailed Academic Preparation:** Indicate the total number of units of credit earned in high school and hours of credit earned in normal school or college in each of the following subjects. (A high school unit is to be interpreted as the successful pursuit of a study five times a week for 36 weeks.) (An hour of credit is here understood to be an hour of recitation or lecture per week during a half school year of approximately 18 weeks. In case you have had quarter instead of semester hours, report 2/3 the number.)

	High School Units	College Hours		High School Units	College Hours
English .....			Astronomy .....		
Mathematics .....			Agriculture .....		
Latin .....			Physiology .....		
Greek .....			Philosophy and Ethics.....		
German .....			Psychology (not Educ'l).....		
French .....			Public Speaking .....		
Spanish .....			Home Economics.....		
History .....			Shop Work and Me-		
Political Science .....			chanical Drawing....		
Economics .....			Music .....		
Sociology .....			Graphic Arts.....		
Chemistry .....			Commercial (other than		
Physics .....			Economics) .....		
Botany .....					
Zoology .....					
Physiog. and Geology.....					

**Classes you are teaching during the current year:**

Subjects	Indicate 1st or 2nd Semester	Periods per Wk.	Weeks in Course
.....	.....	.....	.....
.....	.....	.....	.....
.....	.....	.....	.....
.....	.....	.....	.....
.....	.....	.....	.....
.....	.....	.....	.....
.....	.....	.....	.....
.....	.....	.....	.....
.....	.....	.....	.....
.....	.....	.....	.....

Name other high school subjects you have taught in previous years.....

If you were to make further preparation for your present position, what work would you emphasize? .....

Why? .....

\* As used in this questionnaire "professional" refers to training in Education.

to exist in two states of the great Northwest may be found to be duplicated in many states and to be present in a greater or lesser degree over the entire country. A national study is desirable; but one or two additional samplings of the facts in other localities may very likely give a sufficient foundation of fact to enable national agencies to take action looking toward the improvement of conditions. Since, as has already been shown, the teachers of a state are trained in many states, national action of teacher-training institutions is most desirable, and it is to be hoped that national agencies will hasten to complete the chain of evidence with regard to actual teacher-preparation, and then formulate a program of remedial measures.

Exhibit B

To the Superintendent:

The College of Education of the University of Minnesota has a duty to discharge in the training of teachers and school administrators. For a more complete performance of this function, we constantly feel the need of keeping in closer contact with the conditions that exist throughout the state. Only to the extent that we know the educational situation are we able to shape our policies satisfactorily.

Accordingly, I have authorized one of our graduate students to submit a brief questionnaire to the city superintendents of the state and one to the public high school teachers of the state. I believe that a complete response from all parts of the state will result in a clearer definition of the problem of preparing high school teachers. May I ask your cooperation in seeing that the blanks are properly distributed to the high school teachers, filled, collected, and returned as soon as possible, preferably not later than November 21st?

Yours very sincerely,  
M.E. Haggerty  
Dean of the College of Education  
University of Minnesota

QUESTIONNAIRE

(To be answered by the school authority - i.e., the principal or superintendent - in whom the power of selection or nomination is vested.) GLANCE THROUGH QUESTIONNAIRE BEFORE BEGINNING TO FILL OUT.

Name of person answering.....position.....City.....  
Do you wish to receive a summary of the findings of this study?.....  
If so, it will be sent to you.

A. SPECIALIZED ACADEMIC PREPARATION. In your opinion what is the minimum total number of hours of college grade in each of the particular departments named below which is necessary adequately to prepare teachers for teaching courses in those departments in your high school? (An "hour" is understood to mean an hour of recitation or lecture per week during a half year.) Under each department check the courses that should constitute the major. Assume the teacher earned the number of high school units indicated after each department.

1. English. (4 H.S. units) No. of college hours necessary? .....

....Rhetoric	....Spenser
....Journalism	....Milton
....General Survey of English Literature	....18th Century Prose and Poetry
....Old and Middle English	....Modern Drama
....Chaucer	....The Bible as Literature . . .
....Shakespeare	.....
....Browning and Tennyson	.....
....American Literature	.....
....The English Novel	.....
....The short Story	.....
....Public Speaking and Debate	.....

2. Mathematics (2 H.S. units) No. of College hours necessary?.....
 

....Solid Geometry	....Analytic Geometry
....Adv. Algebra (third half year)	....Descriptive Geometry
....College Algebra	....Theory of Equations
....Trigonometry	....History of Mathematics
....Differential Calculus	.....
....Integral Calculus	.....
  
3. Latin. (4 H.S. units ) No of college hours necessary?.....
 

How many units of Latin are offered in your high school?.....
  
4. A Modern Foreign Language. (2 H.S. units) No. of college hours necessary?...
 

..... Distribute the hours to Composition and Grammar.....

Conversation Courses.....

Reading Courses.....
  
5. Chemistry. No. of college hours necessary?.....
 

....General Chemistry	....Industrial Chemistry
....Organic Chemistry	....Chemistry of Foods
....Qualitative Chemistry	....Physical Chemistry
....Quantitative Chemistry	.....
  
6. Physics. No. of college hours necessary?.....
 

....General Physics	....Light
....Mechanics	....Sound
....Electricity and Magnetism	.....
....Heat	.....
  
7. Botany. No. of college hours necessary?.....
 

....General Botany	....Plant Physiology
....Bacteriology	....Plant Pathology
....Ecology	....Heredity and Evolution
....Histology	.....
....Morphology	.....
  
8. History. (3 H.S. units) No. of college hours necessary?.....
 

....Oriental	....English History
....Rome	....Economic History
....Greece	....Political Science
....Middle Ages	....Economics
....Renaissance & Reformation	....Sociology
....Modern Europe	.....
....American History	.....
  
9. Manual Training. No. of college hours necessary?.....
 

....Carpentry	....Architectural Drawing
....Cabinet making	....Machine Design
....Wood Turning	....Freehand Drawing
....Forge	....Shop Management
....Foundry	....Gas Engine
....Pattern Making	.....
....Mechanical Drawing	.....

10. Home Economics. No. of college hours necessary?.....
- |                          |                         |
|--------------------------|-------------------------|
| ....Foods and Cookery    | ....Textiles            |
| ....Dietetics            | ....Costume Design      |
| ....Home Nursing         | ....Home Decoration     |
| ....Household Management | ....Household Physics   |
| ....Laundering           | ....Household Chemistry |
| ....Clothing             | .....                   |
| ....Needlework           | .....                   |

B. \*PROFESSIONAL TRAINING OF TEACHERS. Indicate the number of semester hours of credit in professional subjects which you regard as minimal adequate professional training for high school teachers.....  
 Distribute these hours among those of the following divisions of the field you consider essential to such preparation:

	Hours		Hours
History of Education	....	Elementary School Curriculum	....
Philosophy of Education	....	Educational Sociology or	
Principles of Education	....	Social Aspects of Education	....
Administration & Supervision	....	Educational Psychology	....
Teaching of Special Subjects (Special Methods)	....	Genetic Psychology and Adolescence	....
Principles of Secondary Education	....	Psychology of H.S. subjects	....
High School Curriculum	....	Industrial and Vocational Education	....
Educational Measurements	....	Foreign School Systems	....
Mental Measurements	....	.....	....
Technique of Teaching (i.e., General Method)	....	.....	....
Practice Teaching	....	.....	....

\* As used in this questionnaire "professional" refers to training in pedagogy.

C. GENERAL ACADEMIC PREPARATION. Please indicate by check marks (✓) in the columns below, the subjects of study which you consider to be necessary elements in the general academic preparation of a teacher trained adequately for service in your high school, regardless of subjects to be taught. (The location of your check marks will indicate whether the different subjects should be taken in high school, in college, in both, or in either.)

	High School	Col-lege	Either High School or college		High School	Col-lege	Either High School or College
English	....	....	....	Philosophy	....	....	....
Latin	....	....	....	and Ethics	....	....	....
Mathematics	....	....	....	Public Spkg.			
Greek	....	....	....	and Debate	....	....	....
Modern For- eign Language	....	....	....	Manual Trng. or Home Econ.	....	....	....

History	.....	.....	.....	Music	.....	.....	.....
Economics	.....	.....	.....	Graphic Arts	.....	.....	.....
Sociology	.....	.....	.....	Physical Trng.	.....	.....	.....
Civics or Pol- itical Science	.....	.....	.....	or Mil. Trng.	.....	.....	.....
Chemistry	.....	.....	.....	.....	.....	.....	.....
Physics	.....	.....	.....	.....	.....	.....	.....
Botany	.....	.....	.....	.....	.....	.....	.....
Zoology	.....	.....	.....	.....	.....	.....	.....
Physiog. & Geol.	.....	.....	.....	.....	.....	.....	.....
Astronomy	.....	.....	.....	.....	.....	.....	.....
Physiology	.....	.....	.....	.....	.....	.....	.....
Psychology	.....	.....	.....	.....	.....	.....	.....

- D. Do any of your high school teachers teach subjects in the 7th and 8th grades?  
.....If, so, in which departments? .....

Note:-If you are now teaching classes in high school, please fill out one of the enclosed teacher's questionnaires.