1955

Analysis of teaching combinations teaching loads and related preparation of Montana high school teachers 1946-1947

Walter William Ylinen
The University of Montana

AN ANALYSIS OF TEACHING CORRELATIONS, TEACHING LOADS, AND RELATED PREPARATION OF MONTANA HIGH SCHOOL TEACHERS, 1946-1947

by

Walter William Ylinen

B. S., Billings Polytechnic-

Intermountain Union College, 1941

Presented in partial fulfillment of the requirements for the degree of

Master of Arts

Montana State University

1955

Approved by:

Clayton O. Slatten
Chairman, Board of Examiners

Gordon D. Castle
Dean, Graduate School

May 15 1955
Date

ProQuest LLC.
789 East Eisenhower Parkway
P.O. Box 1346
Ann Arbor, MI 48106 - 1346

TABLE OF CONTENTS

LIST OF TABLES

TABLE PAGE

TABLE PAGE

TABLE PAGE

TABLE PAGE

TABLE PAGE

CHAPTER I

INTRODUCTION AND PURPOSE OF STUDY

Introduction. Sparsely settled Montana has a large number of relatively small schools staffed by a few teachers, each teaching in several subject fields. While it is common knowledge that teachers in this state are often required to teach in subject fields in which they have little or no preparation, evidence has been lacking as to the exact nature and extent of such practice. Nor has information been available to reveal to prospective teachers the combinations of teaching fields for which there is demand in the high schools of the state.

The fact that many teachers are not prepared to teach in several subject fields may be due in part to the present pattern of teacher training which calls for training mainly in only two teaching fields. Since the turn of the century there has been a tendency toward more and more specialization in education as in other walks of life. This has led to the system of majors and minors under which college students specialize in one major field and acquire a limited amount of training in a second field known as their minor. It is the writer's observation that, although the choice of a major has generally been made according to a genuine interest and ability in the field, the choice of minors, particularly

in the case of students preparing to become teachers, has less often been based on logical considerations. Irrational choices tend to reduce the number of qualified teachers and may prove costly to the future teacher. This is especially true when the selected minor is not commonly taught with the major. Such considerations as the foregoing lead to the observation that training in three or more subject fields, together with more adequate guidance based on realistic knowledge of the teaching situation in the schools, might improve the quality of teachers. There appears to be need, therefore, for specific data concerning teaching combinations in Montana high schools.

Purpose of study. The major objective of this study was to analyze and present facts concerning (1) subject combinations which teachers were actually called on to teach, (2) the preparation of teachers in these subjects, and (3) the teaching load carried by them in Montana high schools during the 1946-1947 school year. The principle problems involved may be briefly stated as follows:

1. What subject combinations were most commonly taught in Montana high schools? How many of the teachers in each subject field were required to teach in one, two, three, four, or more subject fields?
2. How well prepared were Montana high school teachers,

in terms of college quarter hours of preparation, to teach each of the subjects assigned to them?

a. How well prepared were they in the field in which they had the most preparation?

b. How well prepared were they in the fields other than the one in which they had most preparation?

Use of study. An investigation of teaching combinations and teacher preparation may be of much value, especially in Montana where no previous investigation of the problem has been made. The prospective teacher and his advisor may use the information found in this study to eliminate the unwise choice of minors, or even majors. They may plan an intelligent course of study which is based on factual information. Training in a course of study involving a minor, or minors, and a major which are commonly taught in combination in the high schools will result in the graduation of better qualified teachers having better opportunities of finding suitable positions. Ultimately, better performance on the part of high school students who are taught by more highly qualified teachers may be expected.

This study will also reveal those subject fields in which the average teacher preparation is low. This situation might be improved by modifying training requirements for teachers in those particular fields and by tightening accrediting requirements.

Previous studies. No previous study of subject combinations, teacher preparation, or teaching loads has been made of Montana high schools to the knowledge of the writer. The writer made an effort to find similar studies on a regional or national basis but was unable to do so even after directing a number of letters to the United States Office of Education. Although very few direct comparisons may be made between this study and others, there are several other investigations worthy of mention.

Briar and Briggs made separate but similar surveys of subject combinations and teacher preparation in different Iowa schools in 1930. They found that 47.5 per cent of the high school teachers taught in one field, and that another 41.9 per cent taught in two fields. This left a little over ten per cent to teach in three or more subject fields.[1]

Griffith followed up the earlier studies of Briggs and of Briar in 1936. He found no appreciable difference in the figures since the earlier studies. He notes that the number of teachers who taught in only one subject field increased in proportion to the size of the school, and

---

[1] A. R. Briar, "Subject Combinations in High School Teacher's Programs" (Master's thesis, University of Iowa, Iowa City, Iowa. 1930); Charles W. Briggs, "Subject Combinations in High School Teachers' Programs" (Master's thesis, University of Iowa, Iowa City, Iowa. 1931)

conversely, the number of teachers teaching in two or more subject fields increased as the size of the school decreased.[2]

Iverson made a study of North Dakota high school teachers for the year of 1939-1940 in which he determined that 27.5 per cent of the teachers taught in one field, 34.0 per cent taught in two fields, 19.5 per cent in three fields, 10.5 per cent in four fields, and 6.0 per cent in five fields. Only 2.5 per cent were required to teach in six fields.[3]

Lockard in his study of teachers' preparation and teaching combinations in Kansas during 1946 found that the teaching combinations there had remained relatively stable through the previous sixteen year period. He also found that about fifty per cent of all the Kansas high school teachers were teaching classes in two or more fields. He noted that there had been a slight decrease in the teachers' preparation. He attributed this change to war conditions which drew many qualified teachers away from their

---

[2]Harold G. Griffith, "Teacher's Subject Combinations of High School Teachers in 449 Independent School Districts of Iowa, in 1934-35" (Master's thesis, University of Iowa, Iowa City, Iowa. 1936)

[3]Norman Floyd Iverson, "Subject Combinations of North Dakota High School Teachers" (Master's thesis, Montana State University, Missoula, Montana. 1939) p. 157.

professions into the armed services and into better paying jobs. However, a slightly larger percentage of the high school teachers held Master's degrees in 1946 than in 1938.4

Gene K. Lockard, "A Comparative Study of the College Preparation, Teaching Combinations and Salaries of Kansas High School Administrators and Teachers 1946". (Kansas State College of Emporia Bulletin of Information, Vol. 26, No. 11, Nov. 1946.)

CHAPTER II

PROCEDURE, DEFINITIONS, AND CLASSIFICATIONS

Procedure. On the surface the procedure involved in a study of teaching combinations, teacher preparation and load appears simple, definite, and clear cut--merely a task of tabulating. However, such did not prove to be the case. In this instance, before actual tabulation could be begun, it was necessary to determine the following:

1. The source, or sources, of the required information.
2. The specific courses to be included in each subject field.
3. An arbitrary classification or grouping of schools which would be simple to tabulate and readily understood.
4. A simple method of presenting the teacher's preparation in each subject field in terms of college training.

In order to ascertain the best approach to be followed in this research, an analysis was made of several previous studies of the same type. While the basic patterns used in these analyses were followed in this study, several changes were introduced in order to adapt to the situation in Montana.

Sources of information. Nearly all the data used in compiling the tables were obtained from the Department of Public Instruction, State of Montana, through the courtesy of Miss Elizabeth Ireland, State Superintendent of Public Instruction. The data was copies from the High School Reports, Form A. These reports are submitted by the high school administrators to the State Department of Public Instruction prior to October first of each school year. They give each teacher's class schedule, preparation in each subject field taught, salary, institutions of higher learning attended, degrees, certification, and the number of years of experience. Also included is information concerning the school's enrollment, its accrediting, and the total number of teachers employed.[1]

In many instances complete information concerning the teacher's credits in certain subject fields was not given in these reports. It then became necessary to search through the files of the certification department in the State Department of Public Instruction. Here much of the needed information was found from the transcripts which accompanied the applications for certification of many of the teachers in question. However, these did not give the information on older teachers whose transcripts were not

---

[1] See Appendix A.

required to be filed with the State Department of Public Instruction at the time they were granted their certificates. Additional data were obtained from the records of the registrar of the Montana State University where many of the teachers had received their degrees.

In cases in which the above sources of information failed to give all the necessary data concerning a teacher's preparation, a personal letter was written to the teacher asking his cooperation in supplying the author with the necessary information.[2] For the teacher's convenience a self-addressed post card was enclosed with each letter. It was only necessary for the teacher to fill in two or three blanks with the number of credits he had earned in the particular subject in question and to add his signature if he wished. Sixty-four per cent of the teachers thus contacted returned the post cards with the data requested.[3]

Subject fields. There are very few differences between this study and earlier studies made elsewhere with respect to the specific subjects included in the various subject fields except as indicated by the following statements.

---

[2]See Appendix B.

[3]See Appendix C.

First, four more distinct subject fields are included in this study than were included in the earlier studies. In the earlier studies courses such as history, problems of democracy, civics, government, current events, citizenship, international relations, sociology, social problems, economics, vocational guidance, occupations, orientation and consumer economics were all pooled into one broad subject field called social studies. In this study these courses are separated into two fields, (1) the field of history and (2) the field of other social studies. The subjects included in each field are listed on pages 11 and 12.

Previous studies pooled physics, chemistry, physiology, biology, botany, zoology, and navigation into the broad field of science. In this investigation they are separated into two subject fields, (1) biological science and (2) physical science. The earlier studies included psychology in the field of social studies. In this analysis it is treated as a separate subject field. Likewise, the fine arts were included in the field of English in the earlier studies. They are considered a separate subject field in this study. These distinctions were made in order to adapt this study to the degree requirements of Montana State University and to the certification requirements of the Montana State Department of Public Instruction. The inclusion in this analysis or four more subject fields than in the studies mentioned obviously

limits the possibilities for comparisons.

The subjects included in each of the subject fields are the following:

1.	Agriculture	Vocational agriculture, farm shop, farm machinery, farm management
2.	Fine Arts	Drawing (not mechanical), painting, art
3.	Commercial	Typing, shorthand, bookkeeping, business law, business arithmetic, office machines, secretarial writing, economic geography, co-op
4.	English	English, literature, library, public speaking, oratory, drama, journalism, school paper
5.	History	History, problems of democracy, civics, government, citizenship, international relations
6.	Home Economics	Cooking, sewing, homemaking, child care, home nursing
7.	Industrial Arts	Manual training, sheet metal work, printing, photography, mechanical drawing, graphic arts
8.	Latin	Latin
9.	Mathematics	Algebra, geometry, trigonometry, general arithmetic

10.	Modern Language	German, French, Spanish
11.	Music	Band, chorus, orchestra, glee club, music appreciation, harmony
12.	Biological Science	Biology, botany, zoology, health, physiology, hygiene, general science*
13.	Physical Science	Physics, chemistry, geology, navigation, photography
14.	Psychology	Psychology
15.	Physical Education	Football, basketball, baseball, track, gymnastics
16.	Social Studies	Social problems, social science, economics, vocational guidance, occupations, orientation, consumer goods

Identification of teachers by preparation in their major subject field. In a study of this kind it was necessary to associate each teacher with a specific subject field. Different writers have identified teachers with various subject fields in different ways. According to some writers, for example, to be identified as a history

---

*General Science was included here since the High School Reports, Form A (see Appendix A) indicated that teachers who taught general science tended to have more preparation in biological science than in physical science.

teacher it was necessary for a teacher to teach at least two classes in history and have a college preparation in history equal to, or better than, that indicated for any other subject taught by him. This type of identification could not be used in this analysis because in the majority of the small schools certain teachers are required to teach less than two classes in the field in which they have the greatest preparation. In some instances there were teachers who were not teaching at all in the subject field in which they were most thoroughly prepared.

In this survey a teacher was identified with the subject field in which he had the most preparation, provided he was teaching at least one class in that field. For example, a teacher who taught history and several other subjects but had the most preparation in history was identified as a history teacher regardless of the number of history classes he taught. If he were not teaching in the field in which he had the most preparation, he was identified with that field, from among those in which he was teaching, in which he had the most preparation.

Amount of preparation of teachers. In order that a clear over-all picture of the preparation of teachers might be presented, it was necessary to identify amounts of training in various subject fields. In previous studies the preparation of teachers has usually been expressed in terms

of majors and minors, although in several instances no clear-cut distinction had been made between a major and a minor. This study was more specific concerning the teacher's preparation in that his preparation in each subject field was specifically shown as falling into one of the four following categories: (1) one to nineteen quarter hours, (2)twenty to twenty-nine quarter hours, (3) thirty to forty-four quarter hours and (4) forty-five or more quarter hours of preparation in a subject field. A heading "Credits Unknown" was included in the tables so that the teachers whose preparation in a subject field was unknown could be included.

No information whatsoever could be found concerning the preparation of approximately twenty-five teachers; they were omitted from this analysis. Incomplete or questionable data were included in the appropriate portion of the tables marked "Credits Unknown". All available data were utilized.

The schedules and preparation of 1,314 teachers in 184 high schools of Montana were investigated. This figure included all administrators who taught one or more subjects. Only forty-four superintendents and principals devoted all their time to administrative duties in Montana high schools during the school year of 1946-1947.

Grouping of schools. It was also necessary to group

schools by some means so that the distribution of teachers according to their preparation and teaching load in the various size schools could be shown. Previous studies have utilized the classification of schools as determined by the departments of public instruction in their respective states. If this practice had been followed with Montana high schools there would have been only three groups of schools--first, second, and third class schools--each based upon the population of the school district rather than on the enrollment of the school. However, the enrollments in the year 1946-1947 in the first class districts, which have a population of eight thousand or more, ranged from 505 to 1,625 students; in the second class districts, with a population of one thousand to eight thousand, there were from forty-three to 560 students; in the third class districts, which have less than one thousand people, the enrollment varied from five students to 146 students. It may be seen from these figures that there was much overlapping in enrollment from one class or district to another.

In order to compare schools of various sizes in terms of enrollment, an arbitrary grouping of all Montana high schools on the basis of student enrollment was made. Five such groupings were made as follows: (1) twenty-seven schools with enrollments of one to twenty-five students, (2) forty-three schools with twenty-six to fifty students, (3) forty-

nine schools with fifty-one to one hundred students, (4) forty-seven schools with 101 to 250 students, and (5) eighteen schools with 251 or more students.

Parochial schools were not included in this study.

CHAPTER III

TEACHING COMBINATIONS IN MONTANA HIGH SCHOOLS, 1946-1947

This chapter, with its accompanying tables, presents an over-all picture of subject combinations and teacher load as they existed in Montana high schools in 1946-1947. Chapter IV provides detailed information concerning each specific subject field.

Frequency of the number of subject fields taught by Montana teachers. Table I, page 18, reveals the number and per cent of Montana teachers who were teaching in one subject field only, or in combinations of two or more different subject fields. Of the 1,314 Montana high school teachers covered by this study there were 562, or 42.9 per cent of the total, who taught in only one subject field; 398, or 30.4 per cent, were teaching in two fields. The remaining 26.6 per cent taught in three or more different subject fields.

It is generally true that most teachers begin their teaching careers in the small schools where they are required to teach in several different subject fields. As they gain experience they tend to move to the larger schools where they usually teach in fewer subject fields. The adequacy of the present pattern of certification requiring

TABLE I

THE FREQUENCY WITH WHICH TEACHERS TAUGHT IN ONE SUBJECT FIELD ONLY, OR IN TWO, THREE, FOUR, FIVE, OR SIX SUBJECT FIELDS IN MONTANA HIGH SCHOOLS IN 1946-1947

	Number of teachers	Per cent of teachers
Taught one subject field only	562	42.9
Taught two subject fields	398	30.4
Taught three subject fields	236	18.1
Taught four subject fields	91	6.5
Taught five subject fields	26	2.0
Taught six subject fields	1	---
Total	1,314	100.0

preparation in two subject fields may be questioned in view of the fact that over one-fourth of Montana high school teachers actually teach in three or more fields, particularly since this one-fourth includes a relatively large proportion of beginning teachers in small schools (see Table XXV, page 132.)

Number of teachers teaching in single subject fields only, and the number of teachers in each field that taught in each of the other subject fields. Table II, page 20, indicates the frequency with which other subject fields were being taught by teachers having their greatest preparation in the subject field indicated in column "A." Column "B" gives the number of such teachers. Column "C" gives the number and per cent of these teachers who taught only in that subject field. The frequency with which each of the subject fields was taught by a teacher identified by the subject field listed in column "A" is given in columns 1 through 16. Each frequency is followed by the per cent of the total indicated in column "B." To illustrate, in the fourth row of column "A," English is the subject in which the teacher had the best preparation of all the subjects taught by him. Column "B" gives the total of such teachers as 249. Of these, 120, or 48 per cent (column C), taught nothing but English. Column 1 reveals that no English teacher taught agriculture; column 2 indicates that two

TABLE 11

NUMBER OF TEACHERS IDENTIFIED WITH EACH SUBJECT FIELD IN WHICH THEY HAVE THE GREATEST PREPARATION, NUMBER AND PER CENT TEACHING THAT SUBJECT FIELD ONLY, AND NUMBER AND PER CENT TEACHING THAT SUBJECT FIELD IN COMBINATION WITH EACH OF THE OTHER SUBJECT FIELDS

Subject field in which the teacher had most preparation	Total number of teachers	Number teaching subject only	Agriculture	Fine Arts	Commercial	English	History	Home Economics	Industrial Arts	Latin	Mathematics	Modern Languages	Music	Biological Sciences	Physical Sciences	Physical Education	Psychology	Social Studies
	B	C	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Agriculture	44	25 57%	-	-	-	1-2%	1-2%	-	3-7%	-	6-14%	-	1-2%	6-14%	4-9%	1-2%	-	2-5%
Fine Arts	12	5 42%	-	-	2-17%	4-33%	1-8%	-	-	-	-	-	-	-	-	2-17%	-	1-8%
Commercial C	155	98 63%	-	-	-	25-16%	10-7%	2-1%	3-2%	2-1%	6-4%	1-1%	6-4%	3-2%	3-2%	19-12%	-	3-2%
English	249	120 48%	-	2-1%	29-12%	-	37-15%	6-2%	5-2%	16-6%	12-5%	15-6%	15-6%	22-9% (1-%)	11-4%	14-6%	5-2%	14-6%
History	175	35 15%	-	1-1%	18-10%	39-22%	-	1-1%	16-9%	10-6%	29-17%	5-3%	6-3%	17-10% (9-5%)	9-5%	51-29%	2-1%	59-34%
Home Economics	82	39 48%	-	-	3-4%	12-15%	5-6%	-	1-1%	1-1%	6-7%	1-1%	1-1%	16-20% (2-2%)	3-4%	3-4%	-	3-4%
Industrial Arts	65	44 68%	1-2%	-	-	-	4-6%	-	-	-	9-14%	-	1-2%	4-6% (2-3%)	1-2%	9-14%	-	3-5%
Latin	22	5 45%	-	1-5%	-	9-41%	3-14%	1-5%	1-5%	-	5-23%	2-9%	1-5%	3-14% (1-5%)	2-9%	1-5%	-	-
Modern Languages	32	10 31%	-	-	3-9%	7-22%	4-13%	-	-	7-22%	1-3%	-	1-3%	1-3% (1-3%)	1-3%	2-6%	-	3-9%
Music	90	57 63%	-	3-3%	9-10%	17-19%	5-6%	-	2-2%	-	6-7%	4-4%	-	2-2% (1-1%)	2-2%	2-2%	-	5-6%
Biological Sciences	67	17 25%	1-1%	1-1%	5-7%	11-16%	8-12%	1-1%	5-7%	-	23-34%	3-4%	2-3%	-	18-27%	10-15%	-	7-10%
Physical Sciences	85	12 14%	-	-	4-5%	4-5%	2-2%	-	11-13%	1-1%	34-40%	-	7-8%	42-49% (8-9)	-	12-14%	-	2-2%
Physical Education	56	32 57%	1-2%	-	3-5%	6-11%	6-11%	2-4%	1-2%	-	7-12%	-	-	12-21% (6-11%)	4-7%	-	-	4-7%
Psychology	1	--- --	-	-	-	-	-	-	-	-	1-100%	-	-	1-100%	-	-	-	-
Social Studies	59	8 13%	-	-	7-12%	14-23%	18-31%	3-5%	4-7%	1-2%	15-25%	-	2-3%	9-15% (4-8%)	5-8%	16-27%	4-7%	-
Total	1,314	562	3	9	86	158	107	18	62	41	160	31	45	161	86	162	11	113

*The numbers and per cents appearing within the parenthesis () in column 12 indicates the number of teachers teaching general science and who could not be identified with either biological science or physical science. These figures are included in numbers and per cents appearing outside the parenthesis.

Column "C" gives the number and per cent of total number of teachers teaching subject field only.

English teachers (one per cent calculated to the nearest whole number) taught fine arts. Twenty-nine (12 per cent) taught commercial (column 3) and thirty-seven (15 per cent) taught history (column 5). The balance of the row and the subject fields are to be interpreted in the same manner.

In the bottom row are the totals of each column. The total of column "B" represents the number of teachers investigated for this study. The total of column "C" gives the number of teachers who taught in one subject field only as 562. Totals in columns 1 through 16 give the number of teachers who taught in each subject field but who had a greater preparation in some other subject field. Thus, there were eighty-six teachers who taught commercial but who had a better preparation in some other subject field (bottom row, column 3). To find the number of teachers who taught in a certain subject field, regardless of preparation, it is merely necessary to add the total at the bottom of the column to the total given for the same subject in column "B".

A study of column "C" reveals that 68 per cent of the industrial arts teachers taught nothing but industrial arts. This subject field ranked highest among the sixteen subject fields most often taught alone. Next in rank were music and commercial, each taught by sixty-three per cent of the teachers identified with those subject fields. These were followed by agriculture and physical education, each taught

alone by fifty-seven per cent. English and home economics were taught alone by forty-eight per cent; mathematics by forty-five percent and fine arts by forty-two per cent of the teachers associated with those respective subject fields. These figures indicate that teachers prepared to teach in practical subjects were less frequently called upon to teach in other fields as well. Social studies, history, and physical sciences were the three subject fields taught alone the least frequently.

Many subject fields were not taught in any sort of combination with several of the other subject fields. Agriculture did not occur in combination with fine arts, commercial, home economics, Latin, modern languages, or psychology; modern languages did not occur with agriculture, fine arts, industrial arts or psychology; commercial did not occur with agriculture or psychology. Psychology was not often taught in combination with other subjects mainly because it was offered to the students in only twelve schools. In only one case was psychology taught alone; in this instance, it was the only subject taught by a superintendent.

Teaching combinations. Table III, page 23, ranks in descending order the five subject fields that were taught most often in combination with each specific subject field. The data used in this table were taken from Table II,

TABLE III

TEACHING COMBINATIONS AS THEY RANKED IN MONTANA HIGH SCHOOLS, 1946-1947

A	B	Per Cent teaching in additional fields, ranked in descending order									
Field with which teacher is identified	Per cent teaching in field only	First		Second		Third		Fourth		Fifth	
Agriculture	57%	Biological Sciences and Mathematics each	14%	Physical Science	9%	Industrial Arts	7%	Social Studies	5%		
Fine Arts	42	English	33%	Commercial and Physical Education each	17	History and Social Studies each	8				
Commercial	63	English	16	Physical Educ	12	History	7	Mathematics and Music each	4		
English	48	History	15	Commercial	12	Biological Sciences	9	Latin, Music and Modern Languages each	6		
History	14	Social Studies	34	Physical Educ	29	English	22	Mathematics	17	Commercial	10
Home Economics	48	Biological Sciences	20	English	15	Mathematics	7	History	6	Comm., P. E., Phy. Sci.	4
Industrial Arts	68	Mathematics and Physical Education each	14	History and Biological Sciences	6	Social Studies	5				
Latin	23	English	41	Mathematics	23	History and Biological Sciences	14	Mod. Lang. Phy. Sci.	9		
Mathematics	45	Biological and Physical Sciences each	19	Physical Education	17	Industrial Arts	8	English	7		
Modern Languages	31	English and Latin each	22	History	13	Commercial and Social Studies each	9				
Music	63	English	19	Commercial	10	Mathematics	7	History and Social Studies each	6		
Biological Sciences	25	Mathematics	34	Physical Science	27	English	16	Physical Education	15	History	12
Physical Science	14	Biological Science	49	Mathematics	40	Physical Education	14	Industrial Arts	13	Music	8
Physical Education	57	Biological Sciences	21	Mathematics	12	English and History each	11	Physical Science	7		
Social Studies	13	History	31	Physical Education	27	Mathematics	25	English	23	Biological Sc.	15

page 20, and rearranged so that the reader may readily determine which subjects were most often taught in combination with any certain subject field. Column "A" gives the subject field in which the teacher had the most preparation. Column "B" gives the per cent of the total number of the teachers who taught only the subject field listed in column "A." Columns 1, 2, 3, 4, and 5 give, in descending order of frequency, the subject fields most frequently taught in combination with the subject field named in column "A." To illustrate, history was taught alone by 14 per cent of the teachers (column "B"). Social studies (as listed on page 12) were taught in combination with history 34 percent of the time. It ranked as the subject field most frequently taught in combination with history (column 1). Physical education ranked as the subject field next most frequently taught in combination with history. It was taught by 29 percent of the history teachers (column 2). English ranked third with 22 per cent of the history teachers teaching English (column 3). Mathematics was fourth with 17 per cent (column 4), and commercial was fifth with 10 per cent of the history teachers teaching commercial in addition to history (column 5). The prospective teacher majoring in history would probably do well to have a minor in at least one of these subject fields, especially in one of the first two which

ranked as being most frequently taught in combination with history.

This table also indicates that English was the subject field most frequently taught in combination with one-third of the remaining fifteen subject fields. These fields were fine arts, commercial, Latin, modern languages, and music. Biological science was most frequently taught with four of the remaining subject fields, namely, home economics, mathematics, physical science, and physical education.

CHAPTER IV

AN ANALYSIS OF EACH SPECIFIC SUBJECT FIELD, INCLUDING TEACHER PREPARATION, TEACHING LOADS, AND FREQUENCY DISTRIBUTION IN THE VARIOUS SIZED SCHOOLS

Frequency Distribution of the Number of Teachers Teaching in Each Subject Field and of their Preparation.

Only the salient facts concerning various subject fields are brought out in this chapter which is essentially one of tables. Conclusions and comparisons are to be found in Chapter V.

Distribution of the number of teachers in each subject field in various sized schools. The reader will be assisted in following the discussion of each of the subject fields if he knows the total number of teachers who taught in each subject field irrespective of training in that field, and how they were distributed among the various sized school groups. The writer submits Table IV, page 27, with this purpose in mind. The fact that only forty-seven teachers taught in the field of agriculture, twenty-one teachers in fine arts, and only twelve teachers in psychology warrants caution in the interpretation of the percentages based on these numbers. Several subject fields are most commonly taught in the large schools. For example, there were sixty

TABLE IV

FREQUENCY DISTRIBUTIONS OF THE NUMBER OF TEACHERS IN EACH SUBJECT FIELD IN THE VARIOUS SIZED HIGH SCHOOLS IN MONTANA

	Total Number Teachers	Number of Teachers in in schools with enrollments of				
		1-25	26-50	51-100	101-250	over 250
Commercial	241	20	55	57	65	44
English	407	31	68	79	114	115
History	262	19	51	71	79	65
Home Economics	99	3	10	26	37	23
Industrial Arts	128	7	21	26	33	42
Latin	63	2	7	10	24	20
Mathematics	280	23	52	67	83	59
Modern Languages	63	1	6	13	22	21
Music	136	3	24	27	50	32
Biological Science	229	20	45	57	69	38
Physical Science	172	10	28	50	55	29
Physical Education	217	19	43	53	56	46
Social Studies	172	15	27	39	52	39
Agriculture	47	2	3	12	21	9
Fine Arts	21	1	0	3	6	11
Psychology	12	0	1	4	2	5

teachers who taught in the field of home economics in the large schools (of more than one hundred students), but only thirteen teachers taught in that field in the small schools (of fifty students or less).

Number of teachers teaching a subject field alone or in combination with one or more subject fields. Table V, page 29, reveals an interesting picture of the general preparation of teachers in some of the subject fields in which they were teaching. In the second column are the numbers of teachers who taught only in the subject field named in the first column. In the third column are the numbers of teachers who taught in a subject field listed in the first column and who had a greater amount of preparation in that field than in any other field in which they were teaching. In the fourth column are the numbers of teachers who taught in a subject field but who had a better preparation in some other field in which they were teaching.

The distinction between a teacher identified with a subject field (as English teachers, history teachers, etc.) and a teacher who merely taught in a subject field must be constantly kept in mind throughout this analysis of teacher preparation and load. As explained earlier (page 13) a teacher was identified with the subject field in which he had the most preparation, provided he was teaching at least

TABLE V

NUMBER OF TEACHERS TEACHING A SUBJECT FIELD ALONE, NUMBER OF TEACHERS TEACHING A SUBJECT FIELD IN COMBINATION WITH OTHER SUBJECT FIELDS WHEN BEST PREPARED IN THAT SUBJECT FIELD, AND THE NUMBER OF TEACHERS TEACHING A SUBJECT FIELD IN COMBINATION WITH OTHER SUBJECT FIELDS BUT WITH A BETTER PREPARATION IN ANOTHER FIELD

Subject	Subject only	Best preparation in subject field	Better prepared in another sub. field	Total
Commercial	98	57	86	241
English	120	129	158	407
History	35	140	107	282
Home Economics	39	43	17	99
Industrial Arts	44	21	63	128
Latin	5	17	41	63
Mathematics	55	65	160	280
Modern Languages	10	22	31	63
Music	57	33	46	136
Biological Sciences	17	50	162	229
Physical Sciences	12	73	87	172
Physical Education	31	24	162	217
Social Studies	8	51	113	172
Agriculture	25	19	3	47
Fine Arts	5	7	9	21
Psychology	0	1	11	12

one class in that field. Thus, the numbers of teachers listed in the second and third columns of Table V, page 29 would be identified with the subject field named in column one, but those teachers listed in the fourth column would be identified with some other subject field in which they had the better preparation and in which they were teaching.

This table reveals that the majority of the teachers who taught in the following subject fields had a better preparation in some other subject field in which they were teaching: Latin, mathematics, biological sciences, physical sciences, physical education, psychology, and social studies.

Subject fields and use of tables. The discussion of each subject field is accompanied by a set of four tables. Each table presents a series of frequency distributions showing the amounts of preparation and numbers of fields taught by teachers identified with the specific subject field in question, with breakdown by the size of the schools. The first table (Table__-a) for each subject field deals with all teachers who taught in the subject field under discussion. The other three tables of each set are breakdowns of the first table. Thus, the second table (Table__-b) of each set deals with those teachers who taught in that one subject field only; the third table (Table__-c) with the teachers who taught in several subject fields but who had their great-

est preparation in the field under discussion; and the last table (Table__-d) includes those teachers who taught in several fields, including the one in question, but who had greater amount of preparation in another subject field which they were teaching.

Rather than lead the reader through an abstract explanation of the interpretation of each of the tables, the writer believes it more feasible to make the explanation specific by discussing the first table dealing with the commercial field (Table VI-a). By doing so, the first table and the other three tables for each subject field become self-explanatory.

Commercial. Contained in Table VI-a, page 36, is a frequency distribution of the number of fields taught by 241 teachers who taught in the commercial field, with breakdown by the amounts of preparation in the commercial field and by the size of the schools in which the teachers were located. This frequency table is contained in column 3 above the double line. The balance of the table breaks down these data. In reading the first line in the first horizontal section of the table, the reader finds that there were ninety-eight teachers, or 41 per cent (calculated to the nearest whole per cent) of the total (column 3), who taught in only one field, i.e., only in commercial (column 2). Of these, two were in schools with one to twenty-five students (column 4);

seven in schools with twenty-six to fifty students (column 5), and so forth. The rest of the table is to be read in a similar fashion, the parts of the table below the double line indicating the same type of information for each of the subgroups designating certain amounts of preparation in the commercial field.

Four significant facts are revealed in Table VI-a concerning teachers, their training, and loads in the field of commercial:

1. While the commercial field is ordinarily thought of as a highly specialized field, a significant number of teachers with little college training in the commercial field were teaching commercial subjects. Over one-fourth (29 per cent to nearest whole per cent) had less than twenty quarter credits in the commercial field. It is possible that many of these teachers may have had business college training or experience in the business world. On the other hand, it is encouraging to note that one-half of all the teachers who taught in commercial subjects were known to have thirty or more credits in commercial field; 37 per cent had more than forty-four credits in the commercial field.

2. As would be expected, teachers with little training in the commercial field tended to be in the small schools and those with greater training tended to be in the larger

schools. Of all the teachers known to have only one to nineteen quarter credits in the commercial field, 55 per cent were in the small schools with fifty or less students (columns 4 and 5, second horizontal section). Only 25 per cent were in the large schools with more than one hundred students (columns 7 and 8). On the other hand, only 19 per cent of the teachers with forty-five or more quarter credits in the commercial field were in schools with less than fifty students and 55 per cent were in schools with more than one hundred students (bottom section).

3. A sizeable proportion of the teachers who taught in the commercial field taught in that field only, yet a significant number were assigned classes in numerous additional fields. Of the 241 teachers who taught commercial subjects, 40.8 per cent taught in the commercial field only (line one of the first horizontal section, column 3). Over one-fourth (29 per cent) of all the teachers who taught in the commercial field were teaching in three or more subject fields (same column, lines 3, 4, 5 and 6). It was further noted by the writer during the compilation of the tables that many of the teachers taught more than one subject in a given subject field.

4. There was a tendency for the teachers in the smaller schools to teach in a wider range of subject fields than did their colleagues in the larger schools. Of the seventy-five

teachers in the small schools with fifty or less students, 55 per cent (forty-one teacher) taught in three or more subject fields. In the larger schools with more than one hundred students only 11 per cent of the teachers (twelve of 109) taught in three or more subject fields.

Table VI-d, page 39, indicates that teachers who taught in the commercial field, but had a better preparation in another field, tended to have little preparation in the commercial field. Over sixty per cent of such teachers were known to have only one to nineteen quarter credits in the commercial field. Less than 5 per cent were known to have over forty-four credits in commercial.

These data, while significant in themselves, become more meaningful as comparisons are made with other subject fields, in Tables XXII, page 126, XXIII, page 128, and XXIV, page 130.

The percentage of teachers who taught commercial subjects, and had thirty or more credits or preparation in the commercial field, compares favorably with the percentage of teachers who had an equivalent amount or preparation in the majority of the remaining fifteen subject fields. By comparing similar data in the tables for each of the other subject fields one finds that the percentage of the teachers who had thirty or more credits or preparation in eight of the other subject fields did not vary more than ten per cent

above or below the 50.6 per cent of the commercial teachers who had thirty or more credits of preparation in the commercial field. These fields were Latin, mathematics, modern languages, biological science, physical science, social studies, fine arts, and psychology. The last two fields had very few teachers so figures quoted should be interpreted with caution. A greater percentage of the teachers in the subject fields of English, history, home economics, music, and agriculture had thirty or more credits of preparation in those respective fields than did teachers in the subjects named above.

TABLE VI-a

FREQUENCY DISTRIBUTION OF NUMBER OF FIELDS TAUGHT BY 241 TEACHERS WHO TAUGHT COMMERCIAL FIELD WITH BREAKDOWN BY AMOUNTS OF PREPARATION IN COMMERCIAL FIELD AND BY THE SIZE OF THE SCHOOLS IN WHICH THE TEACHERS WERE LOCATED

Credits in commercial	No. of fields taught	Total No.	%	Number of teachers in schools with enrollments of 1-25	26-50	51-100	101-250	over 250
1	2	3		4	5	6	7	8
	1	98	40.7%	2	7	15	35	39
Total number	2	72	29.9	3	22	24	19	4
teachers ir-	3	40	16.6	4	13	13	9	1
respective of	4	21	8.7	4	10	5	2	
preparation	5	9	3.7	6	3			
	6	1	-.4	1				
Total		241	100	20	55	57	65	44
	1	10			2	1	2	5
	2	22		1	9	7	5	
1-19 cre-	3	21		2	9	6	4	
dits of	4	9		1	7		1	
prepara-	5	6		3	3			
tion	6	1		1				
Total		69	28.6	8	30	14	12	5
	1	11			1	1	5	4
20-29 cre-	2	16		1	5	6	2	2
dits of pre-	3	4			2	2		
paration	4	3		1		2		
	5							
Total		34	14.1	2	8	11	7	6
	1	15			1		7	7
30-44 cre-	2	12			5		7	
dits of	3	4					3	1
preparation	4	2				2		
	5							
		53	13.7	—	6	2	17	8
	1	55		2	3	9	20	21
45 or more	2	19			3	9	5	2
credits of	3	8		1	2	4	1	
preparation	4	5		1	3	1		
	5	2		2				
Total		89	36.9	6	11	23	26	23
	1	7				4	1	2
Number of	2	3		1		2		
credits of	3	3		1		1	1	
preparation	4	2		1			1	
not given	5	1		1				
Total		16	6.6	4	—	7	3	2

TABLE VI-b

FREQUENCY DISTRIBUTION OF THE AMOUNT OF PREPARATION IN THE COMMERCIAL FIELD OF NINETY-EIGHT TEACHERS IN MONTANA HIGH SCHOOLS WHO TAUGHT IN COMMERCIAL FIELD WITH BREAKDOWN BY SIZE OF SCHOOL IN WHICH THE TEACHERS WERE LOCATED

Credits in commercial	TOTAL		Number of teachers in schools with enrollments of				
	No.	%	1-25	26-50	51-100	101-250	over 250
1	2		3	4	5	6	7
1-19 credits of preparation	10	10.2%		2	1	2	5
20-29 credits of preparation	11	11.2		1	1	5	4
30-44 credits of preparation	15	15.3		1		7	7
45 or more credits of preparation	55	56.1	2	3	9	20	21
Number of credits of preparation not given	7	7.1			4	1	2
Total	98	100%	2	7	15	35	39

TABLE VI-c

FREQUENCY DISTRIBUTION OF THE NUMBER OF FIELDS TAUGHT BY FIFTY-SEVEN TEACHERS WITH GREATEST TRAINING IN COMMERCIAL FIELD BUT TEACHING IN ADDITIONAL FIELDS, WITH BREAKDOWN BY AMOUNTS OF PREPARATION IN COMMERCIAL FIELD AND BY THE SIZE OF THE SCHOOL IN WHICH THE TEACHERS WERE LOCATED

Credits in commercial	No. of fields taught	Number of teachers: Total No.	Total %	in schools with enrollments of 1-25	26-50	51-100	101-250	over 250
1	2	3	4	5	6	7	8	9
All	2	38	66.7%	1	13	11	11	2
	3	13	22.8	1	3	6	3	
	4	5	8.8	1	2	2		
	5	1	1.8	1				
Total		57	100.0	4	18	19	14	2
1-19 credits of preparation	2	5			2	1	2	
	3	2			1	1		
	4							
	5							
Total		7	2.3	-	3	2	2	
20-29 credits of preparation	2	8		1	4	2	1	
	3	1				1		
	4	1				1		
	5							
Total		10	17.5	1	4	4	1	
30-34 credits of preparation	2	7			4		3	
	3	3					3	
	4							
	5							
Total		10	17.5		4		6	
45 or more credits of preparation	2	18			3	8	5	2
	3	7		1	2	4		
	4	4		1	2	1		
	5	1		1				
		30	52.6	3	7	13	5	2

TABLE VI-d

FREQUENCY DISTRIBUTION OF THE NUMBER OF FIELDS TAUGHT BY EIGHTY-SIX TEACHERS WHO TAUGHT IN COMMERCIAL FIELD BUT HAD GREATER TRAINING IN ANOTHER SUBJECT FIELD, WITH BREAKDOWN BY AMOUNTS OF PREPARATION IN COMMERCIAL FIELD AND BY THE SIZE OF THE SCHOOLS IN WHICH THE TEACHERS WERE LOCATED

Credits in commercial	No. of fields taught	Number of teachers: Total		in schools with enrollments of				
		No.	%	1-25	26-50	51-100	101-250	over 250
1	2	3	4	5	6	7	8	9
All	2	34	39.5%	2	9	13	8	2
	3	27	31.4	3	10	7	6	1
	4	16	18.6	3	8	3	2	
	5	8	9.3	5	3			
	6	1	1.2	1				
Total		86	100.0	14	30	23	16	3
1-19 credits of preparation	2	17		1	7	6	3	
	3	19		2	8	5	4	
	4	9		1	7		1	
	5	6		3	3			
	6	1		1				
Total		52	60.5	8	25	11	8	
20-29 credits of preparation	2	8			1	4	1	2
	3	3			2	1		
	4	2		1		1		
	5							
Total		13	15.1	1	3	6	1	2
30-44 credits of preparation	2	5			1		4	
	3	1						1
	4	2				2		
	5							
Total		8	9.3		1	2	4	1
45 or more credits of preparation	2	1				1		
	3	1					1	
	4	1			1			
	5	1		1				
Total		4	4.7	1	1	1	1	
Number of credits of preparation not given	2	3		1		2		
	3	3		1		1	1	
	4	2		1			1	
	5	1		1				
Total		9	10.5	4		3	2	

English. Tables VII-a through VII-d deal with English teachers in identically the same manner as do the four previous tables with commercial teachers.

As might be expected, more teachers (407) taught in the field of English than in any other subject field (Table VII-a, page 43).

Less than one-third (29 per cent) taught in the field of English only; over one-third (35 per cent) taught in the field of English and one additional subject field; another one-third (35 per cent) taught in the English field and two or more additional fields.

The tendency for teachers in the small schools to teach in a variety or subject fields was unusually evident in the case of English teachers. In the large schools only 17 per cent of the teachers who taught in the English field taught in two additional fields. In the small schools more than four times as large a proportion (72 per cent) of the teachers were called upon to teach in the English field and two or more additional fields.

Two-thirds of all the teachers who taught in the English field had thirty or more credits of preparation in English. As a measure of preparation, this statement may be somewhat misleading because, in almost all cases, about one-third of this training (i.e., 9-10 credits) is required

freshman English which it is not reasonable to consider as special preparation in English. Furthermore the field of English is so broad (including literature, grammar, speech, drama, journalism) that the thirty credits ordinarily provides little more than introductory work in several phases of the field or, what may be worse, may fail to include more than one of these phases.

There were twelve full-time librarians, all in the larger schools (Table VII-b, page 44). They are identified by the numbers in parentheses in column 7. This table also reveals that of the 129 teachers who had the best preparation in English and who taught one or more additional subject fields, 59 per cent taught in two fields, and 31 per cent in three fields. Over five per cent taught in four fields while another five per cent taught in five fields.

The next table, Table VII-c, page 45, discloses that there were 158 teachers in Montana high schools who taught English but had a better preparation in some other field. Of these, 42 per cent taught in two subject fields; 34 per cent, in three fields; 18 per cent in four fields, and five per cent in five fields. One teacher taught in six fields. There were 17 per cent who had less than twenty quarter hours in English; 34 per cent who had from twenty to twenty-nine quarter hours. Thus, one-half of the teachers who taught in the English field but had a better preparation in some other

field had less than thirty quarter hours of preparation in the English field.

TABLE VII-a

FREQUENCY DISTRIBUTION OF NUMBER OF FIELDS TAUGHT BY 407 TEACHERS WHO TAUGHT IN ENGLISH FIELD WITH BREAKDOWN BY AMOUNTS OF PREPARATION IN ENGLISH FIELD AND BY THE SIZE OF THE SCHOOLS IN WHICH THE TEACHERS WERE LOCATED

Credits in English	No. of fields taught	Total No.	Total %	Number of teachers in schools with enrollments of 1-25	26-50	51-100	101-250	over 250
1	2	3		4	5	6	7	8
	1	120	29.4%		5	10	35	70
Total number teachers irrespective of preparation	2	143	35.1	2	21	33	44	41
	3	94	23.1	11	24	27	29	3
	4	35	8.6	8	13	7	6	1
	5	14	3.4	9	5			
	6	1	0.2	1				
Total		407	100.0	31	68	79	114	115
	1	7					1	6
1-19 credits of preparation	2	12			3	1	4	4
	3	14		3	2	5	4	
	4	3		2			1	
Total	5							
		36	8.8	5	5	6	10	10
	1	7					4	3
20-29 credits of preparation	2	33		1	6	11	9	6
	3	24		2	4	8	8	2
	4	14		2	6	3	3	
	5	4		0	2			
Total		82	20.1	7	18	22	24	11
	1	20			1	5	3	11
30-44 credits of preparation	2	46			5	14	16	11
	3	22		3	3	6	10	
	4	9		2	4	2	1	
	5	6		4	2			
	6	1		1				
Total		104	25.6	10	15	27	30	22
	1	80			4	5	25	46
45 or more credits of preparation	2	44		1	6	9	13	15
	3	28		3	12	7	5	1
	4	7		2	2	1	1	1
	5	4		3	1			
Total		163	40.0	9	25	22	44	63
	1	6					2	4
Number of credits of preparation not given	2	8			1		2	5
	3	6			3	1	2	
	4	2			1	1		
	5							
		22	5.4		5	2	6	9

TABLE VII-b

FREQUENCY DISTRIBUTION OF THE AMOUNT OF PREPARATION IN THE ENGLISH FIELD OF 120 TEACHERS IN MONTANA HIGH SCHOOLS WHO TAUGHT IN ENGLISH FIELD ONLY, WITH BREAKDOWN BY SIZE OF SCHOOL IN WHICH THE TEACHERS WERE LOCATED

Credits in English	Total		Number of teachers in schools with enrollments of				
	No.	%	1-25	26-50	51-100	101-250	over 250
1	2		3	4	5	6	7
1-19 credits	7	5.8%				1	6*(3)
20-29 credits	7	5.8				4	3 (1)
30-44 credits	20	16.6		1	5	3	11 (1)
45 or more credits	80	66.6		4	5	25	45 (2)
Number of credits not given	6	5.0				2 (1)	4 (4)
Total	120	100.0		5	10	35 (1)	70 (11)

*Includes 12 (10%) full time Librarians, all in schools with enrollments exceeding 100 students. They are indicated by numbers in brackets and are included in numbers beside which they are found.

TABLE VII-c

FREQUENCY DISTRIBUTION OF THE NUMBER OF FIELDS TAUGHT BY 129 TEACHERS WITH GREATEST TRAINING IN ENGLISH FIELD BUT TEACHING IN ADDITIONAL FIELDS, WITH BREAKDOWN BY AMOUNTS OF PREPARATION IN ENGLISH FIELD AND BY THE SIZE OF THE SCHOOL IN WHICH THE TEACHERS WERE LOCATED

Credits in English	No. of fields taught	Number of teachers: Total		in schools with enrollments of				
		No.	%	1-25	26-50	51-100	101-250	over 250
I	2	3	4	5	6	7	8	9
All	2	76	58.9%	2	10	20	24	20
	3	40	31.0	7	14	7	10	2
	4	7	4.5	1	3	2		1
	5	6	4.7	4	2			
Total		129	100.0	14	29	29	34	23
1-19 credits	2	1			1			
	3	1			1			
	4							
	5							
Total		2	1.6		2			
20-29 credits	2	15		1	3	5	2	4
	3			1	1	1	3	1
	4							
	5		17.1					
Total		15		2	4	6	5	5
30-44 credits	2	24			2	9	10	3
	3	7		3	2		2	
	4	2			1	1		
	5	5		3	2			
Total		38	29.5	6	7	10	12	3
45 or more credits	2	36		1	4	6	12	13
	3	25		3	10	6	5	1
	4	5		1	2	1		1
	5	1		1				
Total		67	51.9	6	16	13	17	15

TABLE VII-d

FREQUENCY DISTRIBUTION OF THE NUMBER OF FIELDS TAUGHT BY 158 TEACHERS WHO TAUGHT IN ENGLISH FIELD BUT HAD GREATER TRAINING IN ANOTHER SUBJECT FIELD, WITH BREAKDOWN BY AMOUNTS OF PREPARATION IN ENGLISH FIELD AND BY THE SIZE OF THE SCHOOLS IN WHICH THE TEACHERS WERE LOCATED

Credits in English	No. of fields taught	Total		Number of teachers in schools with enrollments of				
		No.	%	1-25	26-50	51-100	101-250	over 250
1	2	3	4	5	6	7	8	9
	2	67	42.4%		11	15	20	21
	3	54	34.2	4	10	20	19	1
All	4	28	17.7	7	10	5	6	
	5	8	5.1	5	3			
	6	1	6	1				
		158	100.0	17	34	40	45	22
	2	11			2	1	4	4
1-19	3	13		3	1	5	4	
credits	4	3		2			1	
	5							
Total		27	17.1	5	3	6	9	4
	2	18			5	6	7	2
20-29	3	17		1	3	7	5	1
credits	4	14		2	6	3	3	
	5	4		2	2			
Total		53	33.5	5	14	16	15	3
	2	22			3	5	6	8
30-44	3	15			1	6	8	
credits	4	7		2	3	1	1	
	5	1		1				
	6	1		1				
Total		46	29.1	4	7	12	15	8
	2	8			2	3	1	2
45 or more	3	3			2	1		
credits	4	2		1			1	
	5	3		2	1			
Total		16	10.1	3	5	4	2	2
	2	8			1		2	5
No. of	3	6			5	1	2	
credits	4	2			1	1		
not given	5							
		16	10.1		5	2	4	5

History. Only a small percentage of the teachers who taught in the history field (as defined on page 11) taught in that field alone, while the majority of them taught in three or more subject fields. Only 13 per cent taught in the history field alone (Table VIII-a, page 48). Over one-half (55 per cent) taught in the history field and two or more additional subject fields. Many of these teachers were teaching in the related field of social studies (as defined on page 12).

A large proportion of the teachers who taught in the history field in the large schools taught in two or more additional subject fields, but a much greater proportion of the teachers who taught in the history field in the small schools taught in two or more additional fields. In the large schools, 49 per cent of the teachers who taught in the history field taught in two or more additional subject fields. In the small schools, 83 per cent of the teachers who taught in the history field taught two or more additional subject fields.

Two-thirds (64 per cent) of the teachers who taught in the history field, and whose preparation in the history field was known, had thirty or more credits of preparation in the field of history.

TABLE VIII-a

FREQUENCY DISTRIBUTION OF NUMBER OF FIELDS TAUGHT BY 282 TEA CHERS WHO TAUGHT IN HISTORY FIELD WITH BREAKDOWN BY AMOUNTS OF PREPARATION IN HISTORY FIELD AND BY THE SIZE OF THE SCHOOLS IN WHICH THE TEACHERS WERE LOCATED

Credits in History	No. of fields taught	Total		Number of teachers in schools with enrollments of				
		No.	%	1-25	26-50	51-100	101-250	over 250
1	2	3		4	5	6	7	8
	1	35	12.5%			5	6	24
Total number	2	93	33.0		12	19	30	30
teachers	3	87	30.9	7	16	28	29	7
irrespective	4	50	17.7	3	16	19	10	2
of prepara-	5	16	5.7	8	7		1	
tion	6	1	0.4	1				
Total		282	100.0	19	51	71	76	65
	1	3					1	2
	2	4			1	1	1	1
1-19	3	7		2	2	1	2	
credits	4	7		1	4	2		
	5	4			4			
Total		25	8.9	3	11	4	4	3
	1	4				1	1	2
	2	19			1	4	8	6
20-29	3	25		2	5	6	10	2
credits	4	13		1	3	5	4	
	5	5		3	2			
	6	1		1				
Total		67	23.8	7	11	16	23	10
	1	5				2	1	2
	2	34			4	4	9	17
30-44	3	24		1	4	9	9	1
credits	4	12		1	2	7	1	1
	5	3		1	1		1	
Total		78	27.7	3	11	22	21	21
	1	23				2	3	18
	2	34			6	9	12	7
45 or more	3	28		2	5	11	7	3
credits	4	16			7	3	5	1
	5	2		2				
Total		103	36.5	4	18	25	27	29
	1							
	2	2				1		1
Number of	3	3				1	1	1
credits not	4	2				2		
given	5	2		2				
Total		9	3.2	2		4	1	2

TABLE VIII-b

FREQUENCY DISTRIBUTION OF THE AMOUNT OF PREPARATION IN THE HISTORY FIELD OF THIRTY-FIVE TEACHERS IN MONTANA HIGH SCHOOLS WHO TAUGHT IN HISTORY FIELD ONLY, WITH BREAKDOWN BY SIZE OF SCHOOL IN WHICH THE TEACHERS WERE LOCATED

Credits in History	Total		Number of teachers in schools with enrollments of				
	No.	%	1-25	26-50	51-100	101-250	over 250
1	2		3	4	5	6	7
1-19 credits	3	8.6%				1	2
20-29 credits	4	11.4			1	1	2
30-44 credits	5	14.3			2	1	2
45 or more credits	23	65.6			2	3	18
Total	35	100			5	6	24

TABLE VIII-c

FREQUENCY DISTRIBUTION OF THE NUMBER OF FIELDS TAUGHT BY 140 TEACHERS WITH GREATEST TRAINING IN HISTORY FIELD BUT TEACHING IN ADDITIONAL FIELDS, WITH BREAKDOWN BY AMOUNTS OF PREPARATION IN HISTORY FIELD AND BY THE SIZE OF THE SCHOOL IN WHICH THE TEACHERS WERE LOCATED

Credits in History	No. of fields taught	Total		Number of teachers in schools with enrollments of				
		No.	%	1-25	26-50	51-100	101-250	over 250
1	2	3	4	5	6	7	8	9
All	2	57	40.7		10	11	19	17
	3	48	34.3	3	9	16	17	3
	4	30	21.4		12	11	6	1
	5	5	3.6	3	1			
Total		140	100.0	6	32	38	43	21
1-19 credits	2	1			1			
	3	1			1			
	4	2			2			
	5							
Total		4	2.9		4			
20-29 credits	2	7			1	1	3	2
	3	6			1	1	4	
	4	6			2	3	1	
	5							
Total		19	13.6		4	5	8	2
30-44 credits	2	18			2	1	5	10
	3	16		1	2	6	6	1
	4	6			1	5		
	5	3		1	1		1	
Total		43	30.7	2	6	12	12	11
45 or more credits	2	31			6	9	11	6
	3	25		2	5	9	11	6
	4	16			7	3	5	1
	5	2		2				
Total		74	53.0	4	18	21	23	8

TABLE VIII-d

FREQUENCY DISTRIBUTION OF THE NUMBER OF FIELDS TAUGHT BY 107 TEACHERS WHO TAUGHT IN HISTORY FIELD BUT HAD GREATER TRAINING IN ANOTHER SUBJECT FIELD, WITH BREAKDOWN BY AMOUNTS OF PREPARATION IN HISTORY FIELD AND BY THE SIZE OF THE SCHOOLS IN WHICH THE TEACHERS WERE LOCATED

Credits in History	No. of fields taught	Total No.	Total %	Number of teachers in schools with enrollments of 1-25	26-50	51-100	101-250	over 250
1	2	3	4	5	6	7	8	9
	2	36	33.6%		2	8	11	15
	3	39	36.5	4	7	12	12	4
All	4	20	18.7	3	4	8	4	1
	5	11	10.3	5	6			
	6	1	.8	1				
Total		107	100.0	13	19	28	27	20
	2	3				1	1	1
1-19	3	6		2	1	1	2	
credits	4	5		1	2	2		
	5	4			4			
Total		18	16.8	3	7	4	3	1
	2	12				3	5	4
20-29	3	19		2	4	5	6	2
credits	4	7		1	1	2	3	
	5	5		3	2			
	6	1		1				
Total		44	41.1	7	7	10	14	6
	2	16			2	3	4	7
30-44	3	8			2	3	3	
credits	4	6		1	1	2	1	
Total	5							
		30	28.0	1	5	8	8	8
	2	3					1	2
45 or more	3	3				2		1
credits	4							
	5							
Total		6	5.6			2	1	3
	2	3				1	1	1
No. of	3	2				1		1
credits	4	2				2		
not given	5	2		2				
Total		9	8.4	2		4	1	2

Home Economics. The proportion of teachers who taught home economics and had thirty or more credits of preparation in that field ranked very high when compared to the proportion of teachers in other fields with the same amount of preparation. Only in the field of agriculture did the proportion of the teachers with thirty or more credits exceed that of the home economics field. Of all the teachers who taught home economics, and whose training was known, 83 per cent had thirty or more credits in the home economics field (Table IX-a, page 54). In the field of agriculture 91 per cent of the teachers were known to have thirty or more credits of preparation in that field (Table XIX-a, page 116).

The Smith-Hughes requirement that only highly trained teachers teach in these fields of home economics and agriculture probably was the leading factor which caused such a high percentage of the teachers in these fields to have thirty or more credits of preparation in their respective fields. (The Smith-Hughes program requires schools to hire only highly trained teachers to teach in these fields if the schools which offer these courses expect to get Smith-Hughes aid).

Of the home economics teachers (that is, teachers who taught in home economics field only, or those who had the best preparation in home economics field of all the subject fields in which they were teaching) 91 per cent had thirty

or more credits of preparation in the field of home economics (Tables IX-b, page 55 and IX-c, page 56). On the other hand, of the teachers who taught home economics but who had a better preparation in another subject field in which they were teaching, only one teacher in every twelve (8 per cent) had thirty or more credits in the home economics field.

Teachers who taught home economics were not as often called on to teach in more than two fields as were teachers in any other field with the exception of the field of agriculture. Of every five teachers who taught in the home economics field only one teacher (21 per cent) was called on to teach in two or more additional subject fields, two taught one additional subject field, and two teachers taught only in the field of home economics.

The fact that teachers who taught in the home economics field were not as often required to teach in two or more additional subject fields was due partly to the fact that a relatively small number of small schools offered home economics courses. Only thirteen teachers in the seventy small schools of the state taught home economics courses.

TABLE IX-a

FREQUENCY DISTRIBUTION OF NUMBER OF FIELDS TAUGHT BY NINETY-NINE TEACHERS WHO TAUGHT IN HOME ECONOMICS FIELD WITH BREAKDOWN BY AMOUNTS OF PREPARATION IN HOME ECONOMICS FIELD AND BY THE SIZE OF THE SCHOOLS IN WHICH THE TEACHERS WERE LOCATED

Credits in Home Economics	No. of fields taught	Total		Number of teachers in schools with enrollments of				
		No.	%	1-25	26-50	51-100	101-250	over 250
1	2	3		4	5	6	7	8
	1	39	39.4%	1	1	5	11	21
Total number	2	39	39.4		3	10	24	2
teachers	3	14	14.1		2	10	2	
irrespective	4	6	6.1	1	4	1		
of preparation	5	1	1.0	1				
Total		99	100.0	3	10	26	37	23
	1							
	2	1					1	
1-19	3	2				2		
credits	4	2			1	1		
	5	1		1				
Total		6	6.1	1	1	3	1	
	1	4				2*	1	1
	2	4			1		3	
20-29	3	2				2		
credits	4							
	5							
Total		10	10.1		1	4	4	1
	1	5		1*		1		3
	2	4			1		2	
30-44	3	1				1		
credits	4							
	5							
Total		10	10.1	1	1	2	2	4
	1	28				2	10	16
	2	27				9	17	1
45 or more	3	8		1	2	4	1	
credits	4	2		1	1			
	5							
Total		65	65.7	2	3	15	28	17
	1	2			1			1
No. of	2	3			1	1	1**	
credits	3	1				1		
not given	4	2			2			
	5							
Total		8	8.1		4	2	1	1

*Part time teachers

**This teacher had no training in Home Economics

TABLE IX-b

FREQUENCY DISTRIBUTION OF THE AMOUNT OF PREPARATION IN THE HOME ECONOMICS FIELD OF THIRTY-NINE TEACHERS IN MONTANA HIGH SCHOOLS WHO TAUGHT IN HOME ECONOMICS FIELD ONLY, WITH BREAKDOWN BY SIZE OF SCHOOL IN WHICH THE TEACHERS WERE LOCATED

Credits in Home Econ.	Total		Number of teachers in schools with enrollments of				
	No.	%	1-25	26-50	51-100	101-250	over 250
1	2		3	4	5	6	7
1-19 credits	-		-	-	-	-	-
20-29 credits	4	10.3%	-	-	2	1	1
30-44 credits	5	12.8	1	-	-	-	3
45 or more credits	28	71.8	-	-	2	10	16
Number of credits not given	2	5.1	-	1	-	-	1
Total	39	100.0	1	1	5	11	21

TABLE IX-c

FREQUENCY DISTRIBUTION OF THE NUMBER OF FIELDS TAUGHT BY FORTY-THREE TEACHERS WITH GREATEST TRAINING IN HOME ECONOMICS FIELD BUT TEACHING IN ADDITIONAL FIELDS, WITH BREAKDOWN BY AMOUNTS OF PREPARATION IN HOME ECONOMICS FIELD AND BY THE SIZE OF THE SCHOOL IN WHICH THE TEACHERS WERE LOCATED

Credits in Home Econ.	No. of fields taught	Total		Number of teachers in schools with enrollments of				
		No.	%	1-25	26-50	51-100	101-250	over 250
1	2	3	4	5	6	7	8	9
All	2	33	76.7%		3	9	20	1
	3	8	18.6		1	5	2	
	4	2	4.7	1	1			
	5							
Total		43	100.0	1	5	14	22	1
20-29 credits	2	2		1		1		
	3	1			1			
	4							
	5							
Total		3	7.0	1	1	1		
30-44	2	3			1		2	
	3	1					1	
	4							
	5							
Total		4	9.3		1		3	
45 or more credits	2	27				9	17	1
	3	6			1	4	1	
	4	2		1	1			
	5							
		35	81.4	1	2	13	18	1
No. of credits not given	2	1			1			
	3							
	4							
	5							
Total		1	2.3	1				

There were no teachers in the group having 1 to 19 quarter hours of preparation.

TABLE IX-d

FREQUENCY DISTRIBUTION OF THE NUMBER OF FIELDS TAUGHT BY SEVENTEEN TEACHERS WHO TAUGHT IN HOME ECONOMICS FIELD BUT HAD GREATER TRAINING IN ANOTHER SUBJECT FIELD, WITH BREAKDOWN BY AMOUNTS OF PREPARATION IN HOME ECONOMICS FIELD AND BY THE SIZE OF THE SCHOOLS IN WHICH THE TEACHERS WERE LOCATED

Credits in Home Econ.	No. of fields taught	Total		Number of teachers in schools with enrollments of				
		No.	%	1-25	26-50	51-100	101-250	over 250
1	2	3	4	5	6	7	8	9
All	2	6	35.3%			1	4	1
	3	6	35.3		1	5		
	4	4	13.5		3	1		
	5	1	5.9	1				
Total		17	100.0	1	4	7	4	1
1-19 credits	2	1					1	
	3	2				2		
	4	2			1	1		
	5	1		1				
Total		6	35.3	1	1	3	1	-
20-29 credits	2	2					2	
	3	1				1		
	4							
	5							
		3	17.6			1	1	
30-44 credits	2	1						1
	3	1				1		
	4							
	5							
Total		2	11.8			1		1
45 or more credits	2							
	3	1			1			
	4							
	5							
Total		1	5.9		1			
No. of credits not given	2	2				1	1	
	3	1				1		
	4	2			2			
	5							
Total		5	29.4		2	2	1	

Industrial Arts. A significant proportion of the teachers who taught in the industrial arts field had little college preparation in the industrial arts field. Of the 128 teachers who taught industrial arts subjects, fifty (39 per cent) were known to have less than thirty credits of preparation in that field (Table X-a, page 60). Information concerning the college preparation in the industrial arts field of twenty-nine (22 per cent) teachers could not be found.

While many of the teachers in this field had little college preparation in industrial arts, many had had special training in various technical branches of the armed services, airplane, and automotive factories; still others had worked in shops and foundries and thus had gained practical experience.

A little over one-third (35 per cent) of the teachers who taught industrial arts taught in only that field. Slightly more than one-fifth (21 per cent) taught in two fields; only a few more (23 per cent) taught in three subject fields. One out of every six (16 per cent) teachers who taught industrial arts taught in three additional fields as well.

Of the twenty-seven teachers who taught industrial arts in the small schools, all but one taught in two or more additional subject fields. In the larger schools, about one

out of every eight (13 per cent) teachers who taught indus-
trial arts taught in two or more additional subject fields.

TABLE X-a

FREQUENCY DISTRIBUTION OF NUMBER OF FIELDS TAUGHT BY 128 TEACHERS WHO TAUGHT IN INDUSTRIAL ARTS FIELD WITH BREAKDOWN BY AMOUNTS OF PREPARATION IN INDUSTRIAL ARTS FIELD AND BY THE SIZE OF THE SCHOOLS IN WHICH THE TEACHERS WERE LOCATED

Credits in Ind. Arts	No. of fields taught	Total		Number of Teachers in schools with enrollments of				
		No.	%	1-25	26-50	51-100	101-250	over 250
1	2		3	4	5	6	7	8
Total number teachers irrespective of preparation	1	44	34.5%			3	14	27
	2	27	21.1		1	2	11	13
	3	29	22.7		12	8	7	2
	4	21	16.5	1	6	13	1	
	5	7	5.5	5	2			
Total		128	100.0	6	21	26	33	42
1-19 credits	1	4						
	2	3				1	2	
	3	11			6	1	4	
	4	8			3	5		
	5	4		3	1			
Total		30	23.6	3	10	7	6	4
20-29 credits	1	5				1	2	2
	2	6			1		3	2
	3	3			1	2		
	4	6		1	2	3		
	5							
Total		20	15.8	1	4	6	5	4
30-44 credits	1	5						5
	2	2					1	1
	3	5			1	3	1	
	4	2				1	1	
	5							
Total		14	10.9		1	4	3	6
45 or more credits	1	21				1	6	14
	2	8					4	4
	3	4			1	2	1	
	4	2				2		
	5							
Total		35	27.6		1	5	11	18
No. of credits not given	1	9				1	6	2
	2	8				1	1	6
	3	6			3		1	2
	4	3			1	2		
	5	3		2	1			
Total		29	21.9	2	5	4	8	10

TABLE X-b

FREQUENCY DISTRIBUTION OF THE AMOUNT OF PREPARATION IN THE INDUSTRIAL ARTS FIELD OF FORTY-FOUR TEACHERS IN MONTANA HIGH SCHOOLS WHO TAUGHT IN INDUSTRIAL ARTS FIELD ONLY, WITH BREAKDOWN BY SIZE OF SCHOOL IN WHICH THE TEACHERS WERE LOCATED

Credits in Ind. Arts.	Total		Number of teachers in schools with enrollments of				
	No.	%	1-25	26-50	51-100	101-250	over 250
1	2		3	4	5	6	7
1-19 credits	4	9.1%					4
20-29 credits	5	11.4			1	2	2
30-44 credits	5	11.4					5
45 or more credits	21	47.7			1	6	14
Number of credits not given	9	20.4			1	6	2
Total	44	100.0			3	14	27

TABLE X-c

FREQUENCY DISTRIBUTION OF THE NUMBER OF FIELDS TAUGHT BY TWENTY-ONE TEACHERS WITH GREATEST TRAINING IN INDUSTRIAL ARTS FIELD BUT TEACHING IN ADDITIONAL FIELDS, WITH BREAKDOWN BY AMOUNTS OF PREPARATION IN INDUSTRIAL ARTS FIELD AND BY THE SIZE OF THE SCHOOL IN WHICH THE TEACHERS WERE LOCATED

Credits in Ind. Arts	No. of fields taught	Total		Number of teachers in schools with enrollments of				
		No.	%	1-25	26-50	51-100	101-250	over 250
1	2	3	4	5	6	7	8	9
	2	13	61.9%		1	1	6	5
All	3	5	23.8		1	3	1	
	4	3	14.3			2	1	
	5							
Total		21	100.0		2	6	8	5
	2	1				1		
1-19	3							
credits	4							
	5							
Total		1	4.8			1		
	2	4			1		2	1
20-29	3							
credits	4							
	5							
Total		4	19.0		1		2	1
	2	2					1	1
30-44	3	2				2		
credits	4	1					1	
	5							
Total		5	23.8			2	2	1
45 or more	2	6					3	3
credits	3	3			1	1	1	
	4	2				2		
	5							
Total		11	52.4		1	3	4	3

TABLE X-d

FREQUENCY DISTRIBUTION OF THE NUMBER OF FIELDS TAUGHT BY SIXTY-THREE TEACHERS WHO TAUGHT IN INDUSTRIAL ARTS FIELD BUT HAD GREATER TRAINING IN ANOTHER SUBJECT FIELD, WITH BREAKDOWN BY AMOUNTS OF PREPARATION IN INDUSTRIAL ARTS FIELD AND BY THE SIZE OF THE SCHOOLS IN WHICH THE TEACHERS WERE LOCATED

Credits in Industrial Arts	No. of fields taught	Total		Number of teachers in schools with enrollments of				
		No.	%	1-25	26-50	51-100	101-250	over 250
1	2	3	4	5	6	7	8	9
All	2	14	22.2%			1	5	8
	3	24	38.1		11	5	6	2
	4	18	28.6	1	6	11		
	5	7	11.1	5	2			
Total		63	100.0	6	19	17	11	10
1-19 credits	2	2					2	
	3	11			6	1	4	
	4	8			3	5		
	5	4		3	1			
Total		25	39.7	3	10	6	6	
20-29 credits	2	2					1	1
	3	3			1	2		
	4	6		1	2	3		
	5							
Total		11	17.5	1	3	5	1	1
30-44 credits	2							
	3	3			1	1	1	
	4	1				1		
	5							
Total		4	6.3		1	2	1	
45 or more credits	2	2					1	1
	3	1				1		
	4							
	5							
Total		3	4.8			1	1	1
Number of credits not given	2	8				1	1	6
	3	6			3		1	2
	4	3			1	2		
	5	3		2	1			
Total		20	31.7	2	5	3	2	8

Latin. Latin was the only classical language taught in Montana high schools during 1946-1947.

Only sixty-three teachers taught Latin (Table XI-a, page 65). Of these, nine were in the small schools (of fifty students or less). Only five teachers taught Latin only.

The preparation of one teacher remained unknown. Of the remainder, one-half had thirty or more credits of preparation in Latin.

Two-thirds of the teachers who taught Latin had a better preparation in another subject field in which they were teaching (Table XI-d, page 68).

TABLE XI-a.

FREQUENCY DISTRIBUTION OF NUMBER OF FIELDS TAUGHT BY SIXTY-THREE TEACHERS WHO TAUGHT IN LATIN FIELD WITH BREAKDOWN BY AMOUNTS OF PREPARATION IN LATIN FIELD AND BY THE SIZE OF THE SCHOOLS IN WHICH THE TEACHERS WERE LOCATED

Credits in Latin	No. of fields taught	Total No.	Total %	Number of teachers in schools with enrollments of 1-25	26-50	51-100	101-250	over 250
1	2	3		4	5	6	7	8
	1	5				2	1	2
Total number	2	28			1	1	11	15
teachers	3	21		2	5	4	9	1
irrespective	4	8			1	3	2	2
of prepara-	5	1					1	
tion. Total		63	100.0%	2	7	10	24	20
	1	2				1		1
1-19	2	5			1		1	1
credits	3	6				2	4	
	4	2			1	1		
	5	1					1	
Total		14	22.2		2	4	6	2
	1	1					1	
20-29	2	9					5	4
credits	3	3		2		1		
	4	4				1	2	1
	5							
Total		17	27.0	2		2	8	5
	1							
30-44	2	11				1	5	5
credits	3	8			3	1	3	1
	4							
	5							
Total		19	30.2		3	2	8	6
	1	1						1
45 or more	2	5						5
credits	3	4			2		2	
	4	2				1		1
	5							
Total		12	19.0		2	1	2	7
	1	1				1		
Number of	2							
credits	3							
not given	4							
	5							
Total		1	1.6			1		

TABLE XI-b

FREQUENCY DISTRIBUTION OF THE AMOUNT OF PREPARATION IN THE LATIN FIELD OF FIVE TEACHERS IN MONTANA HIGH SCHOOLS WHO TAUGHT IN LATIN FIELD ONLY, WITH BREAKDOWN BY SIZE OF SCHOOL IN WHICH THE TEACHERS WERE LOCATED

Credits in Latin	Total		Number of teachers in schools with enrollments of				
	No.	%	1-25	26-50	51-100	101-250	over 250
1	2		3	4	5	6	7
1-19 credits	2	40%			1		1
20-29 credits	1	20				1*	
30-44 credits							
45 or more credits	1	20					1
Number of credits not given	1	20			1*		
Total	5	100%			2	1	2

*Two were part time teachers.

TABLE XI-c

FREQUENCY DISTRIBUTION OF THE NUMBER OF FIELDS TAUGHT BY SEVENTEEN TEACHERS WITH GREATEST TRAINING IN LATIN FIELD BUT TEACHING IN ADDITIONAL FIELDS, WITH BREAKDOWN BY AMOUNTS OF PREPARATION IN LATIN FIELD AND BY THE SIZE OF THE SCHOOL IN WHICH THE TEACHERS WERE LOCATED

Credits in Latin	No. of fields taught	Total		Number of teachers in schools with enrollments of				
		No.	%	1-25	26-50	51-100	101-250	over 250
1	2	3	4	5	6	7	8	9
All	2	7	41.2%				1	6
	3	8	47.0	1	2	2	3	
	4	2	11.8			1		1
	5							
Total		17	100.0	1	2	3	4	7
20-29 credits	2	1						1
	3	2		1		1		
	4							
	5							
Total		3	17.6	1		1		1
30-44 credits	2	2					1	1
	3	3			1	1	1	
	4							
	5							
Total		5	29.4		1	1	2	1
45 or more credits	2	4						4
	3	3		1		2		
	4	2			1			1
	5							
Total		9	52.9	1	1	2		5

There were no teachers in the group having 1 to 19 quarter hours of preparation.

TABLE XI-d

FREQUENCY DISTRIBUTION OF THE NUMBER OF FIELDS TAUGHT BY FORTY-ONE TEACHERS WHO TAUGHT IN LATIN FIELD BUT HAD GREATER TRAINING IN ANOTHER SUBJECT FIELD, WITH BREAKDOWN BY AMOUNTS OF PREPARATION IN LATIN FIELD AND BY THE SIZE OF THE SCHOOLS IN WHICH THE TEACHERS WERE LOCATED

Credits in Latin	No. of fields taught	Total		Number of teachers in schools with enrollments of				
		No.	%	1-25	26-50	51-100	101-250	over 250
1	2	3	4	5	6	7	8	9
All	2	21	51.2%		1	1	10	9
	3	13	31.7	1	3	2	6	1
	4	6	14.6		1	2	2	1
	5	1	2.7					
Total		41	100.0	1	5	5	19	11
1-19 credits	2	3				1	1	1
	3	6				2	4	
	4	2			1	1		
	5	1					1	
Total		12	29.3		2	3	6	1
20-29 credits	2	8					5	3
	3	1		1				
	4	4				1	2	1
	5							
Total		13	31.7	1	-	1	7	4
30-44 credits	2	9				1	4	4
	3	5			2		2	1
	4							
	5							
Total		14	34.1		2	1	6	5
45 or more credits	2	1						1
	3	1			1			
	4							
	5							
		2	4.9		1			1

Mathematics. The majority of the teachers who taught mathematics (53 per cent) had less than thirty credits of preparation in the mathematics field; 29 per cent had less than twenty credits (Table XII-a, page 71).

A sizeable number of teachers who taught mathematics in the large schools had little training in the mathematics field. Not quite one-half (46 per cent) of the teachers who taught mathematics in the large schools had less than thirty credits of preparation in the mathematics field; one-fifth (21 per cent) had less than twenty credits of preparation.

Over one-half (54 per cent) of all the teachers who taught mathematics were known to have a better preparation in another subject field in which they were teachin (Table XII-d, page 74).

Over one-half (55 per cent) of the teachers who taught in the mathematics field, and whose preparation was known taught in two or more additional subject fields. Even in the large schools (of over one hundred students) one-third (33 percent) taught in two or more additional subject fields. Moreover, of the 120 teachers who were identified as mathematics teachers (in the sense that they were teaching mathematics only, or had their greatest amount of preparation in the field of mathematics of any subject field in which they were teaching) considerably over one-fourth (29 per cent) were teaching in three or more subject fields (Tables

XII-b and XII-c, pages 72 and 73). Of the 120 mathematics teachers, 72 per cent (eighty-five teachers) had thirty or more credits in the mathematics field; of this group of eighty-five teachers, over two-thirds (68 per cent) were in the large schools and 29 per cent were teaching in three or more subject fields.

TABLE XII-a

FREQUENCY DISTRIBUTION OF NUMBER OF FIELDS TAUGHT BY 280 TEACHERS WHO TAUGHT MATHEMATICS FIELD WITH BREAKDOWN BY AMOUNTS OF PREPARATION IN MATHEMATICS FIELD AND BY THE SIZE OF THE SCHOOLS IN WHICH THE TEACHERS WERE LOCATED

Credits in Mathematics	No. of fields taught	Total		Number of teachers in schools with enrollments of				
		No.	%	1-25	26-50	51-100	101-250	over 250
1	2	3		4	5	6	7	8
Total number teachers irrespective of preparation	1	55	19.6		3	4	14	34
	2	71	25.3	1	7	16	28	19
	3	93	33.2	2	22	33	32	4
	4	41	14.6	4	14	14	8	1
	5	19	6.8	12	6		1	
	6	1	0.4	1				
Total		280	100.0	20	52	67	83	58
1-19 credits	1	6			1	2	2	1
	2	18			2	4	7	5
	3	30		2	7	12	8	1
	4	17		1	6	6	4	
	5	11		5	5		1	
Total		82	29.3	8	21	24	22	7
20-29 credits	1	11				2		9
	2	22			2	8	7	5
	3	25			4	7	14	
	4	7		2	2	2	1	
	5	2		2				
	6	1		1				
Total		68	24.1	5	8	19	22	14
30-44 credits	1	10			1		5	4
	2	15		1	2	1	8	3
	3	26			7	10	8	1
	4	7			3	2	1	1
	5	4		3	1			
Total		62	22.1	4	14	13	22	9
45 or more credits	1	28			1		7	20
	2	16			1	3	6	6
	3	10			4	3	1	2
	4	4			2	1	1	
	5	1		1				
Total		59	21.1	1	8	7	15	28
No. of credits not given	1							
	2	2				1	1	
	3	4				3	1	
	4	2		1	1			
	5	1		1				
Total		9	3.2	2	1	4	2	

TABLE XII-b

FREQUENCY DISTRIBUTION OF THE AMOUNT OF PREPARATION IN THE MATHEMATICS FIELD OF FIFTY-FIVE TEACHERS IN MONTANA HIGH SCHOOLS WHO TAUGHT IN MATHEMATICS FIELD ONLY, WITH BREAKDOWN BY SIZE OF SCHOOL IN WHICH THE TEACHERS WERE LOCATED

Credits in Mathematics	Total		Number of teachers in schools with enrollments of				
	No.	%	1-25	26-50	51-100	101-250	over 250
1	2		3	4	5	6	7
1-19 credits	6	10.9%		1	2	2	1
20-29 credits	11	20.0			2		9
30-44 credits	10	18.2		1		5	4
45 or more credits	28	50.1		1		7	20
Total	55	100.0		3	4	14	34

TABLE XII-c

FREQUENCY DISTRIBUTION OF THE NUMBER OF FIELDS TAUGHT BY SIXTY-FIVE TEACHERS WITH GREATEST TRAINING IN MATHEMATICS FIELD BUT TEACHING IN ADDITIONAL FIELDS, WITH BREAKDOWN BY AMOUNTS OF PREPARATION IN MATHEMATICS FIELD AND BY THE SIZE OF THE SCHOOL IN WHICH THE TEACHERS WERE LOCATED

Credits in Mathematics	No. of fields taught	Total		Number of teachers in schools with enrollments of				
		No.	%	1-25	26-50	51-100	101-250	over 250
1	2	3	4	5	6	7	8	9
All	2	30	46.2%	1	3	8	8	10
	3	29	44.6	1	8	10	8	2
	4	5	7.7	1	1	2	1	
	5	1	1.5	1				
Total		65	100.0	4	12	20	17	12
1-19 credits	2	3				1	1	1
	3	1		1				
	4							
	5							
Total		4	6.2	1		1	1	1
20-29 credits	2	5				3	1	1
	3	7			2	2	3	
	4	1		1				
	5	1		1				
Total		14	21.5	2	2	5	4	1
30-44 credits	2	9		1	2	1	3	2
	3	12			2	5	4	1
	4	1				1		
	5							
Total		22	33.8	1	4	7	7	3
45 or more credits	2	13			1	3	3	6
	3	9			4	3	1	1
	4	3			1	1	1	
	5							
Total		25	38.5		6	7	5	7

XII-d

FREQUENCY DISTRIBUTION OF THE NUMBER OF FIELDS TAUGHT BY 160 TEACHERS WHO TAUGHT IN MATHEMATICS FIELD BUT HAD GREATER TRAINING IN ANOTHER SUBJECT FIELD, WITH BREAKDOWN BY AMOUNTS OF PREPARATION IN MATHEMATICS FIELD AND BY THE SIZE OF THE SCHOOLS IN WHICH THE TEACHERS WERE LOCATED

Credits in Mathematics	No. of fields taught	Total No.	Total %	Number of teachers in schools with enrollments of 1-25	26-50	51-100	101-250	over 250
1	2	3	4	5	6	7	8	9
All	2	41	25.6%		4	8	20	9
	3	64	40.0	1	14	23	24	2
	4	36	22.5	3	13	12	7	1
	5	18	11.3	11	6		1	
	6	1	0.6	1				
Total		160	100.0	16	37	43	52	12
1-19 credits	2	15			2	3	6	4
	3	29		1	7	12	8	1
	4	17		1	6	6	4	
	5	11		5	5		1	
Total		72	44.3	7	20	21	19	5
20-29 credits	2	17			2	5	6	4
	3	18			2	5	11	
	4	6		1	2	2	1	
	5	1		1				
	6	1		1				
Total		43	27.1	3	6	12	18	4
30-44 credits	2	6					5	1
	3	14			5	5	4	
	4	6			3	1	1	1
	5	4		3	1			
Total		30	18.8	3	9	6	10	2
45 or more credits	2	3					3	
	3	0						
	4	1			1			
	5	1		1				
Total		5	3.2	1	1		3	
No. of credits not given	2	0						
	3	3				1	1	1
	4	6		1	1	3	1	
	5	1		1				
Total		10	6.3	2	1	4	2	1

Modern Languages. The modern languages taught in Montana high schools in 1946-1947 were German, French and Spanish.

Data concerning the modern languages and Latin were similar in many respects: (1) As in Latin, there were sixty-three teachers who taught modern languages (Table XIII-a, page 77). (2) The percent of teachers who had thirty or more credits of preparation in their respective fields was much the same in both Latin and modern languages. Of the teachers who taught modern languages, and whose preparation was known, 44 per cent had thirty or more credits in modern languages while 50 per cent of the teachers who taught Latin had thirty or more credits in Latin. (3) Practically the same number of teachers in both the modern languages and Latin taught in the small schools and in the large schools. Seven teachers taught modern languages in the small schools (of fifty or less students) while nine teachers taught Latin; forty-three teachers taught modern languages in the large schools (of more than one hundred students) while forty-four taught Latin.

Teachers who taught Latin were more often required to teach two or more additional subject fields than were teachers who taught modern languages. Sixteen per cent of the teachers who taught modern languages taught in that field only, while eight per cent of the teachers who taught

Latin taught Latin only. Nearly the same proportion of the teachers in each field taught one additional subject (48 per cent of the teachers who taught modern languages taught in one additional subject field; 44 per cent of the teachers who taught Latin taught one additional subject field). Nearly one-half (48 per cent) of the teachers who taught Latin were teaching in two or more additional subject fields as compared to the 38 per cent of the teachers who taught modern languages.

TABLE XIII-a

FREQUENCY DISTRIBUTION OF NUMBER OF FIELDS TAUGHT BY SIXTY-THREE TEACHERS WHO TAUGHT IN MODERN LANGUAGE FIELD WITH BREAKDOWN BY AMOUNTS OF PREPARATION IN MODERN LANGUAGE FIELD AND BY THE SIZE OF THE SCHOOLS IN WHICH THE TEACHERS WERE LOCATED

Credits in Mod. Lang.	No. of fields taught	Number of teachers: Total No.	Total %	in schools with enrollments of 1-25	26-50	51-100	101-250	over 250
1	2	3		4	5	6	7	8
Total number teachers irrespective of preparation	1	10	15.9%			1	3	6
	2	29	46.0			4	14	11
	3	16	25.4	1	3	7	3	2
	4	7	11.1		3	1	1	2
	5	1	1.6					
Total		63	100.0	1	7	13	22	21
1-19 credits	1	2					2	
	2	5					4	1
	3	6			2	4		
	4	1				1		
Total		14	22.1		2	5	6	1
20-29 credits	1	2				1	1	
	2	9				1	4	4
	3	5		1		2	1	1
	4	3			2		1	
	5	1			1			
Total		20	31.6	1	3	4	7	5
30-44 credits	1	1						1
	2	8				2	4	2
	3	4			1	1	2	
	4							
	5							
Total		13	20.5		1	3	6	3
45 or more credits	1	5						5
	2	6				1	1	4
	3	1						1
	4	2						2
	5							
Total		14	22.1			1	1	12
No. of credits not given	1							
	2	1					1	
	3							
	4	1			1			
	5							
Total		2	3.2		1		1	

TABLE XIII-b

FREQUENCY DISTRIBUTION OF THE AMOUNT OF PREPARATION IN THE MODERN LANGUAGE FIELD OF TEN TEACHERS IN MONTANA HIGH SCHOOLS WHO TAUGHT IN MODERN LANGUAGE FIELD ONLY, WITH BREAKDOWN BY SIZE OF SCHOOL IN WHICH THE TEACHERS WERE LOCATED

Credits in Mod. Lang.	Total		Number of teachers in schools with enrollments of				
	No.	%	1-25	26-50	51-100	101-250	over 250
1	2		3	4	5	6	7
1-19 credits	2	20%				2	
20-29 credits	2	20			1	1	
30-44 credits	1	10					1
45 or more credits	5	50					5
Total	10	100			1	3	6

TABLE XIII-c

FREQUENCY DISTRIBUTION OF THE NUMBER OF FIELDS TAUGHT BY TWENTY-TWO TEACHERS WITH GREATEST TRAINING IN MODERN LANGUAGE FIELD BUT TEACHING IN ADDITIONAL FIELDS, WITH BREAKDOWN BY AMOUNTS OF PREPARATION IN MODERN LANGUAGE FIELD AND BY THE SIZE OF THE SCHOOL IN WHICH THE TEACHERS WERE LOCATED

Credits in Mod. Lang.	No. of fields taught	Number of teachers: Total		in schools with enrollments of: 1-25	26-50	51-100	101-250	over 250
		No.	%					
1	2	3	4	5	6	7	8	9
All	2	16	72.7%			3	5	8
	3	4	18.2			2	1	1
	4	2	9.1				1	1
	5							
Total		22	100.0			5	7	10
1-19 credits	2	1					1	
	3							
	4							
	5							
Total		1	4.5				1	
20-29 credits	2	2						2
	3	1				1		
	4	1					1	
	5							
Total		4	18.2			1	1	1
30-44 credits	2	7				2	3	2
	3	2				1	1	
	4							
	5							
Total		9	40.9			3	4	2
45 or more credits	2	6				1	1	4
	3	1						1
	4	1						1
	5							
		8	36.7			1	1	1

TABLE XIII-d

FREQUENCY DISTRIBUTION OF THE NUMBER OF FIELDS TAUGHT BY THIRTY-ONE TEACHERS WHO TAUGHT IN MODERN LANGUAGE FIELD BUT HAD GREATER TRAINING IN ANOTHER SUBJECT FIELD, WITH BREAKDOWN BY AMOUNTS OF PREPARATION IN MODERN LANGUAGE FIELD AND BY THE SIZE OF THE SCHOOLS IN WHICH THE TEACHERS WERE LOCATED

Credits in Mod. Lang.	No. of fields taught	Total No.	Total %	Number of teachers in schools with enrollments of 1-25	26-50	51-100	101-250	over 250
1	2	3	4	5	6	7	8	9
	2	13	42.0			1	9	3
All	3	12	38.7	1	3	5	2	1
	4	5	16.1		3	1		1
	5	1	3.2					
Total		31	100.0	1	6	7	12	5
	2	4					3	1
1-19	3	6			2	4		
credits	4	1				1		
	5	1					1	
Total		12	38.7		2	5	4	1
	2	7				1	4	2
20-29	3	4		1		1	1	1
credits	4	2			2			
	5	1			1			
Total		14	41.9	1	3	2	5	3
	2	1					1	
30-44	3	2			1		1	
credits	4							
	5							
Total		3	9.7		1		2	
	2							
45 or more	3							
credits	4	1						1
	5							
Total		1	3.2					1
No. of	2	1					1	
credits	3							
not given	4	1			1			
	5							
Total		2	6.4		1		1	

Music. The preparation of teachers who taught in the field of music ranked relatively high in terms of the percentage of the teachers who taught music and had thirty or more credits of preparation in music. Only in the fields of agriculture and home economics did the percentage of teachers who taught those subjects, and had thirty or more credits, rank higher. Of all the teachers whose preparation in music was known, over three-fourths (77 per cent) had thirty or more credits of preparation in music (Table XIV-a, page 83).

Few teachers with a small amount of preparation in the music field were teaching music in the large schools--only six of the eighty-two teachers who taught music in the large schools had less than thirty college credits in music.

The college preparation of 18 per cent of the teachers who taught music could not be determined. Many of these teachers indicated that they had done advanced work in music in nationally known conservatories of music and through private instruction. If their work in music under these conditions could have been translated into quarter credits of college preparation, the percentages in the above statements would, no doubt, have been raised.

More than four of every ten teachers (42 per cent) who taught music taught in that field alone; on the other hand, a similar proportion (39 per cent) were teaching in two additional fields. In the small schools twenty-one of the twenty-seven teachers (78 per cent) who taught music

taught in two or more additional subject fields. Seventeen of the eighty-two teachers (25 per cent) in the large schools were teaching in two or more additional subject fields.

TABLE XIV-a

FREQUENCY DISTRIBUTION OF NUMBER OF FIELDS TAUGHT BY 136 TEACHERS WHO TAUGHT IN MUSIC FIELD WITH BREAKDOWN BY AMOUNTS OF PREPARATION IN MUSIC FIELD AND BY THE SIZE OF THE SCHOOLS IN WHICH THE TEACHERS WERE LOCATED

Credits in Music	No. of fields taught	Total		Number of teachers in schools with enrollments of				
		No.	%	1-25	26-50	51-100	101-250	over 250
1	2	3		4	5	6	7	8
Total number teachers irrespective of preparation	1	57	41.9%		3	4	25	25
	2	26	19.1	1	2	8	10	5
	3	37	27.2		11	12	12	
	4	13	9.6		7	3	3	
	5	3	2.2	2	1			
Total		136	100.0%	3	24	27	50	32
1-19 credits	1	2			1		1	
	2	1		1				
	3	8			2	3	3	
	4	2			2			
	5	1		1				
Total		14	10.3	2	5	3	4	
20-29 credits	1	3				1	1	1
	2	2				2		
	3	6			2	4		
	4							
	5							
Total		11	8.1	-	2	7	1	1
30-44 credits	1	2						2
	2	6				1	3	2
	3	4			2	1	1	
	4	2			1		1	
	5							
Total		14	10.3		3	2	5	4
45 or more credits	1	44			1	1	21	21
	2	10				2	6	2
	3	13			4	3	5	1
	4	3				1	2	
	5	2		1	1			
Total		72	52.9	1	6	7	34	24
Number of credits not given	1	6			1	2	2	2
	2	7			2	3	1	1
	3	6			1	1	3	1
	4	6			4	2		
	5							
Total		25	18.4		8	8	6	3

TABLE XIV-b

FREQUENCY DISTRIBUTION OF THE AMOUNT OF PREPARATION IN THE MUSIC FIELD OF FIFTY-SEVEN TEACHERS IN MONTANA HIGH SCHOOLS WHO TAUGHT IN MUSIC FIELD ONLY, WITH BREAKDOWN BY SIZE OF SCHOOL IN WHICH THE TEACHERS WERE LOCATED

Credits in Music	Total		Number of teachers in schools with enrollments of				
	No.	%	1-25	26-50	51-100	101-250	over 250
1	2		3	4	5	6	7
1-19 credits		3.5%		1		1	
20-29 credits	3	5.3			1	1	1
30-44 credits	2	3.5					2
45 or more credits	44	77.2		1	1	21	21
Number of credits not given	6	10.5		1	2	2	1
Total	57	100.0		3	4	25	25

TABLE XIV-c

FREQUENCY DISTRIBUTION OF THE NUMBER OF FIELDS TAUGHT BY THIRTY-THREE TEACHERS WITH GREATEST TRAINING IN MUSIC FIELD BUT TEA CHING IN ADDITIONAL FIELDS, WITH BREAKDOWN BY AMOUNTS OF PREPARATION IN MUSIC FIELD AND BY THE SIZE OF THE SCHOOL IN WHICH THE TEACHERS WERE LOCATED

Credits in Music	No. of fields taught	Total		Number of teachers in schools with enrollments of				
		No.	%	1-25	26-50	51-100	101-250	over 250
1	2	3	4	5	6	7	8	9
	2	13	39.4%			3	7	3
All	3	16	48.5		5	5	5	1
	4	3	9.1			1	2	
	5	1	3.0		1			
Total		33	100.0		6	9	14	4
	2							
20-29	3	3			1	2		
credits	4							
	5							
Total		3	9.1		1	2		
	2	2					1	1
30-44	3	2			2			
credits	4							
	5							
Total		4	12.0		2		1	1
	2	10				2	6	2
45 or more	3	11			2	3	5	1
credits	4	3				1	2	
	5	1			1			
Total		25	75.8		3	6	13	3
	2	1				1		
No. of	3							
credits	4							
not given	5							
Total		1	3.0			1		

There were no teachers in the group having 1 to 19 quarter hours of preparation.

TABLE XIV-d

FREQUENCY DISTRIBUTION OF THE NUMBER OF FIELDS TAUGHT BY FORTY-SIX TEACHERS WHO TAUGHT IN MUSIC FIELD BUT HAD GREATER TRAINING IN ANOTHER SUBJECT FIELD, WITH BREAKDOWN BY AMOUNTS OF PREPARATION IN MUSIC FIELD AND BY THE SIZE OF THE SCHOOLS IN WHICH THE TEACHERS WERE LOCATED

Credits in Music	No. of fields taught	Total		Number of teachers in schools with enrollments of				
		No.	%	1-25	26-50	51-100	100-250	over 250
1	2	3	4	5	6	7	8	9
	2	13	28.3%	1	2	5	3	2
All	3	21	45.7		6	7	7	1
	4	10	21.7		7	2	1	
	5	2	4.3	2				
		46	100.0	3	15	14	11	3
	2	1		1				
1-19	3	8			2	3	3	
credits	4	2			2			
	5	1		1				
Total		12	26.1	2	4	3	3	
	2	2				2		
20-29	3	3			1	2		
credits	4							
	5							
Total		5	10.8		1	4		
	2	4				1	2	1
30-44	3	2				1	1	
credits	4	2			1		1	
	5							
Total		8	17.3		1	2	4	1
	2							
45 or more	3	2			2			
credits	4							
	5	1		1				
Total		3	6.5	1	2			
	2	6			2	2	1	1
No. of	3	6			1	1	3	1
credits	4	6			4	2		
not given	5							
Total		18	39.1		7	5	4	2

Biological Science. The biological science field was the field least often taught alone or in combination with only one additional subject field (Table XV-a, page 90). Only seventeen of the 229 teachers (7 per cent) who taught in the biological science field taught in that field only; 29 per cent taught in the biological science field and one additional subject field. This meant that nearly two-thirds (63 per cent) of the teachers who taught in the biological science field were teaching in two or more additional subject fields. In the small schools, 92 per cent of all the teachers who taught in the biological science field taught in two or more additional subject fields. Even in the large schools 40 percent of the teachers who taught in the biological science field taught in two or more additional subject fields.

The college preparation in the biological science field of 219 of the 229 teachers who taught biological sciences was known. Over one-half of these teachers (51 per cent) had less than thirty credits of preparation in the biological science field. In the large schools, 41 per cent of the teachers who taught in biological science field had less than thirty credits in that field; one-half of these had less than twenty credits.

Of the sixty-seven biological science teachers (i.e., teachers who taught in the biological science field only, or

had the best preparation in the biological science field of any field taught by them), only seventeen (25 per cent) taught in that field only; one-third (33 per cent) taught in the biological science field and one additional subject field; and twenty-eight (42 per cent) taught in the biological science field and two or more additional subject fields (Tables XV-b and XV-c, pages 91 and 92.

These same tables reveal that 85 per cent of the biological science teachers (i.e., teachers who taught in the biological science field only, or who had their best preparation in the biological science field of any subject field taught by them) had thirty or more credits of preparation in the biological science field. Over one-half (52 per cent) of the biological science teachers with thirty or more credits of preparation in the biological science field taught in the large schools and less than one-fourth (24 per cent) of the teachers with thirty or more credits taught in the small schools. There were only ten biological science teachers with less than thirty credits of preparation in the biological science field, of whom eight were in the large schools but none were in the small schools.

Two-thirds (66 per cent) of the teachers who taught in the biological science field had a better preparation in another subject field in which they were teaching (Table XV-d, page 93).

Biological science teachers who taught in additional subject fields most often taught in the fields of mathematics (34 per cent) and physical science (27 per cent). (Tables II and III, pages 18 and 20.)

TABLE XV-a

FREQUENCY DISTRIBUTION OF NUMBER OF FIELDS TAUGHT BY 229 TEACHERS WHO TAUGHT IN BIOLOGICAL SCIENCE FIELD WITH BREAKDOWN BY AMOUNTS OF PREPARATION IN BIOLOGICAL SCIENCE FIELD AND BY THE SIZE OF THE SCHOOLS IN WHICH THE TEACHERS WERE LOCATED

Credits in Bio. Science	No. of fields taught	Total No.	Total %	Number of teachers in schools with enrollments of 1-25	26-50	51-100	101-250	over 250
1	2		3	4	5	6	7	8
	1	17	7.4%		1	1	4	11
Total number	2	67	29.3	1	3	14 (1)	32 (4)	17 (6)
teachers	3	84	36.7	5 (2)	19 (6)	25 (8)	29 (5)	6 (2)
irrespective	4	42	18.3	2	15 (4)	17 (6)	4 (1)	4 (2)
of preparation	5	18	7.9	11 (2)	7 (2)			
	6	1	0.4	1				
Total		229	100.0	20	45	57	69	38
	1	1				1		
1-19	2	15 (1)			1	3 (1)	11	
credits	3	27 (3)		3 (1)	5	10 (2)	8	1
	4	14 (8)			4 (2)	7 (4)	1	2 (2)
	5	9 (3)		6 (2)	3 (1)			
Total		66	28.9	9	13	21	20	3
	1	2						1
20-29	2	9				4	4	1
credits	3	25 (8)			1	9 (3)	12 (4)	3 (1)
	4	8 (2)			3 (1)	4 (1)		1
	5	2		2				
Total		46	20.1	2	4	17	17	6
	1	4			1		1	2
30-44	2	25 (6)			1	5	13 (4)	6 (2)
credits	3	19 (11)		2 (1)	8 (6)	5 (3)	2	2 (1)
	4	11 (2)		1	2	5 (1)	2 (1)	1
	5	5		3	2			
	6	1		1				
Total		65	28.4	7	14	15	18	11
	1	10					2	8
45 or more	2	14		1	1	2	4	6
credits	3	10			3	1	6	
	4	7			5	1	1	
	5	1			1			
Total		42	18.3	1	10	4	13	14
	1							
Number of credits	2	4 (4)						4 (4)
not given	3	3 (1)			1		1 (1)	
	4	2 (1)		1	1 (1)			
	5	1 (1)			1 (1)			
Total		10		1	3		1	4

All figures enclosed in parenthesis () represent the number of General Science teachers included in the figure outside parenthesis.

TABLE XV-b

FREQUENCY DISTRIBUTION OF THE AMOUNT OF PREPARATION IN THE BIOLOGICAL SCIENCE FIELD OF SEVENTEEN TEACHERS IN MONTANA HIGH SCHOOLS WHO TAUGHT IN BIOLOGICAL SCIENCE FIELD ONLY, WITH BREAKDOWN BY BY SIZE OF SCHOOL IN WHICH THE TEACHERS WERE LOCATED

Credits in Bio. Sci.	Total		Number of teachers in schools with enrollments of				
	No.	%	1-25	26-50	51-100	101-250	over 250
1	2		3	4	5	6	7
1-19 credits	1	5.9%			1		
20-29 credits	2	11.8				1	1
30-44 credits	4	23.5		1		1	2
45 or more credits	10	58.8				2	8
Total	17	100.0		1	1	4	11

TABLE XV-c

FREQUENCY DISTRIBUTION OF THE NUMBER OF FIELDS TAUGHT BY FIFTY TEACHERS WITH GREATEST TRAINING IN BIOLOGICAL SCIENCE FIELD BUT TEACHING IN ADDITIONAL FIELDS, WITH BREAKDOWN BY AMOUNTS OF PREPARATION IN BIOLOGICAL SCIENCE FIELD AND BY THE SIZE OF THE SCHOOL IN IN WHICH THE TEACHERS WERE LOCATED

Credits in Bio. Science	No. of fields taught	Total		Number of teachers in schools with enrollments of				
		No.	%	1-25	26-50	51-100	101-250	over 250
1	2	3	4	5	6	7	8	9
All	2	22	44.0	1	1	4	9	7
	3	14	28.0		4	1	8	1
	4	11	22.0	1	5	3	2	
	5	2	4.0		2			
	6	1	2.0	1				
Total		50	100.0	3	12	8	19	8
1-19 credits	2	1					1	
	3							
	4							
	5							
Total		1	2.0				1	
20-29 credits	2	2					2	
	3	3					2	1
	4	1				1		
	5							
Total		6	12.0			1	4	1
30-44 credits	2	5				2	2	1
	3	2			1	1		1
	4	3		1		1	1	
	5	1			1			
	6	1		1				
Total		12	24.0	2	2	4	3	2
45 or more credits	2	14		1	1	2	4	6
	3	9			3		6	
	4	7			5	1	1	
	5	1			1			
Total		31	62.0	1	10	3	11	6

TABLE XV-d

FREQUENCY DISTRIBUTION OF THE NUMBER OF FIELDS TAUGHT BY 162 TEACHERS WHO TAUGHT IN BIOLOGICAL SCIENCE FIELD BUT HAD GREATER TRAINING IN ANOTHER SUBJECT FIELD, WITH BREAKDOWN BY AMOUNTS OF PREPARATION IN BIOLOGICAL SCIENCE FIELD AND BY THE SIZE OF THE SCHOOLS IN WHICH THE TEACHERS WERE LOCATED

Credits in Bio. Sci.	No. of fields taught	Total		Number of teachers in schools with enrollments of				
		No.	%	1-25	26-50	51-100	101-250	over 250
1	2	3	4	5	6	7	8	9
	2	45 (11)				10 (1)	23 (4)	10 (6)
All	3	70 (23)		5 (2)	15 (6)	24 (8)	21 (5)	5 (2)
	4	31 (13)		1	10 (4)	14 (6)	2 (1)	4 (2)
	5	16 (4)		11 (2)	5 (2)			
		162	- 100%	17	32	48	46	19
	2	14 (1)			1	3 (1)	10	
1-19 credits	3	27 (3)		3 (1)	5	10 (2)	8	1
	4	14 (8)			4 (2)	7 (4)	1	2 (2)
	5	9 (3)		6 (2)	3 (1)			
Total		64	39.5	9	13	20	19	3
	2	7				4	2	1
20-29	3	22 (8)			1	9 (3)	10 (4)	2 (1)
credits	4	7 (2)			3 (1)	3 (1)		1
	5	2		2				
Total		38	23.5	2	4	16	12	4
	2	20 (6)			1	3	11 (4)	5 (2)
30-44	3	17 (11)		2 (1)	7 (6)	5 (3)	2	2 (1)
credits	4	8 (2)			2	4 (1)	1 (1)	1
	5	4		3	1			
Total		49	30.2	5	11	11	14	8
	2							
45 or more	3	1				1		
credits	4							
	5							
Total		1	0.6			1		
Number of	2	4 (4)						4 (4)
credits	3	3 (1)			2		1 (1)	
not given	4	2 (1)		1	1 (1)			
	5	1 (1)			1 (1)			
Total		10	6.2	1	4		1	4

This table includes General Science taught by teachers who taught General Science but not biological or physical science and whose credits were given in such a way they could not be separated into Biological Science and Physical Science. These are included in the above figures and the number of such teachers appear enclosed in parenthesis () beside the number in which they are included.

Physical science. Data concerning the subject load of teachers who taught in the physical science field follow very closely the pattern found in the biological science field. Only seven per cent of the teachers who taught in the physical science field taught in that field only (Table XVI-a, page 96). Thirty-one percent taught in the physical science field and one additional field, while 60 per cent taught in the physical science field and two more subject fields. In the small schools 95 per cent of the teachers who taught in the physical science field taught in three or more subject fields, while in the large schools 42 per cent of the teachers who taught in the physical science field taught in three or more subject fields.

The preparation of teachers who taught in the physical science field differs somewhat from the preparation of teachers who taught in the biological science field. Of all the teachers whose preparation in the physical sciences was known, 58 per cent had thirty or more credits of preparation in the physical science field. In the biological science field the corresponding percentage was 49 per cent. In the large schools, 38 per cent of the teachers who taught in the physical science field had less than thirty credits in the field of physical science; the biological science field, 41 per cent. One-half (51 per cent) of the teachers who taught in the physical science field had a better preparation in

another subject field in which they were teaching.

Of the eighty-five physical science teachers (i.e., teachers who taught in the physical science field only or teachers who had the best preparation in the physical science field of all fields taught by them), twelve (14 per cent) taught in the physical science field only, thirty-seven (44 per cent) taught in the physical science field and one additional field, and thirty-six (42 per cent) taught in the physical science field and two or more additional subject fields (Tables XVI-b and XVI-c, pages 97 and 98. Of all the teachers who taught in the physical science field and in two or more additional subject fields, nine were in the small schools and twelve were in the large schools.

Of the eighty-five physical science teachers seventy-three (86 per cent) had thirty or more credits of preparation in the physical science field, and of these forty-six were in the small schools and only eight in the large schools.

Physical science teachers who taught in additional subject fields most often taught in the biological science field. Mathematics was the field next most often taught by physical science teachers as was the case with teachers of biological sciences (Table II, page 18 and Table III, page 20).

TABLE XVI-a

FREQUENCY DISTRIBUTION OF NUMBER OF FIELDS TAUGHT BY 172 TEACHERS WHO TAUGHT IN PHYSICAL SCIENCE FIELD WITH BREAKDOWN BY AMOUNTS OF PREPARATION IN PHYSICAL SCIENCE FIELD AND BY THE SIZE OF THE SCHOOLS IN WHICH THE TEACHERS WERE LOCATED

Credits in Phys. Sci.	No. of fields taught	Total		Number of teachers in schools with enrollments of				
		No.	%	1-25	26-50	51-100	101-250	over 250
1	2	3	4	5	6	7	8	9
Total number teachers irrespective of preparation	1	12	7.0%		1	2	3	6
	2	57	33.1		1	16	24	16
	3	62	26.0	3	11	19	22	7
	4	30	17.4	2	9	13	6	
	5	11	6.4	5	6			
Total		172	100.0	10	28	50	55	29
1-19 credits	1	1					1	
	2	8			2	3	5	3
	3	13			2	3	5	3
	4	9		1	2	5	1	
	5	4		2	2			
Total		35	20.3	3	7	11	11	3
20-29 credits	1							
	2	1				7	3	1
	3	16			3	6	6	1
	4	7			3	2	2	
	5	2			2			
Total		36	20.9		8	15	11	2
30-44 credits	1	5				1	2	2
	2	10				2	4	4
	3	12			4	4	3	1
	4	9			4	3	2	
	5	4		3	1			
Total		40	23.3	3	9	10	11	7
45 or more credits	1	6			1	1		
	2	28				4	13	11
	3	18		1	2	6	7	2
	4	5		1		3	1	
	5	1	37.7		1			
Total		58		2	4	14	21	17
No. of credits not given	1							
	2							
	3	3		2			1	
	4							
	5							
Total		3	1.7	2			1	

TABLE XVI-b

FREQUENCY DISTRIBUTION OF THE AMOUNT OF PREPARATION IN THE PHYSICAL SCIENCE FIELD OF TWELVE TEACHERS IN MONTANA HIGH SCHOOLS WHO TAUGHT IN PHYSICAL SCIENCE FIELD ONLY, WITH BREAKDOWN BY SIZE OF SCHOOL IN WHICH THE TEACHERS WERE LOCATED

Credits in Phys. Sci.	Total		Number of teachers in schools with enrollments of				
	No.	%	1-25	26-50	51-100	101-250	over 250
1	2		3	4	5	6	7
1-19 credits	1	8.3%				1	
20-29 credits							
30-44 credits	5	41.6			1	2	2
45 or more credits	5	50.0		1	1		4
Total	12	100.0%		1	2	3	6

TABLE-XVI-c

FREQUENCY DISTRIBUTION OF THE NUMBER OF FIELDS TAUGHT BY SEVENTY-THREE TEACHERS WITH GREATEST TRAINING IN PHYSICAL SCIENCE FIELD BUT TEACHING IN ADDITIONAL FIELDS, WITH BREAKDOWN BY AMOUNTS OF PREPARATION IN PHYSICAL SCIENCE FIELD AND BY THE SIZE OF THE SCHOOL IN WHICH THE TEACHERS WERE LOCATED

Credits in Phys. Sci.	No. of fields taught	Total		Number of teachers in schools with enrollments of				
		No.	%	1-25	26-50	51-100	101-250	over 250
1	2	3	4	5	6	7	8	9
	2	37	50.7%			8	16	13
All	3	28	38.4	1	5	11	9	2
	4	6	8.2		1	4	1	
	5	2	2.7	1	1			
Total		73	100.0	2	7	23	26	15
	2	2				1	1	
1-19	3	2			1	1		
credits	4							
	5							
Total		4	5.5		1	2	1	
	2	1				1		
20-29	3	6			1	3	2	
credits	4							
	5							
Total		7	9.6		1	4	2	
	2	7				2	2	3
30-44	3	6			2	2	2	
credits	4	4			1	2	1	
	5	2		1	1			
Total		19	26.0	1	4	-	5	3
	2	27				4	13	10
45 or more	3	14		1	1	5	5	2
credits	4	2				2		
	5							
		43	58.9	1	1	11	18	12

TABLE XVI-d

FREQUENCY DISTRIBUTION OF THE NUMBER OF FIELDS TAUGHT BY EIGHTY-SEVEN TEACHERS WHO TAUGHT IN PHYSICAL SCIENCE FIELD BUT HAD GREATER TRAINING IN ANOTHER SUBJECT FIELD, WITH BREAKDOWN BY AMOUNTS OF PREPARATION IN PHYSICAL SCIENCE FIELD AND BY THE SIZE OF THE SCHOOLS IN WHICH THE TEACHERS WERE LOCATED

Credits in Phys. Sci.	No. of fields taught	Total		Number of teachers in schools with enrollments of				
		No.	%	1-25	26-50	51-100	101-250	over 250
1	2	3	4	5	6	7	8	9
All	2	20	23.0%		1	8	8	3
	3	34	39.1	2	6	8	13	5
	4	24	27.6	2	8	9	5	
	5	9	10.3	4	5			
Total		87	100.0	8	20	25	26	8
1-19-credits	2	6			1	2	3	
	3	11			1	2	5	3
	4	9		1	2	5	1	
	5	4		2	2			
Total		30	34.5	3	6	9	9	3
20-29 credits	2	10				6	3	1
	3	10			2	3	4	1
	4	7			3	2	2	
	5	2			2			
Total		29	33.3		7	11	9	2
30-44 credits	2	3					2	1
	3	6			2	2	1	1
	4	5			3	1	1	
	5	2		2				
Total		16	18.4	2	5	3	4	2
45 or more credits	2	1						1
	3	4			1	1	2	
	4	3		1		1	1	
	5	1	10.3		1			
Total		9		1	2	2	3	1
No. of credits not given	2							
	3	3		2			1	
	4							
	5							
Total		3	3.5	2			1	

Physical Education. Information concerning the preparation of an unusually large proportion of the teachers who taught in the physical education field could not be found. No data of the preparation were found for 38 per cent of the teachers who taught in the physical education field.

Of the teachers who taught in the physical education field, and whose preparation was known, roughly two-thirds (63 per cent) had less than thirty credits of preparation in the physical education field (Table XII-a, page 103). This percentage was the highest percentage of teachers in any subject field to have less than thirty credits of preparation in their respective fields.

Of the teachers who taught in the physical education field, and had less than thirty credits of preparation in that field, one-fourth (26 per cent) were in the small schools while more than one-third (38 per cent) were in the large schools. Of those teachers who had thirty or more credits of preparation in the physical education field one-fifth (20 per cent) were in the small schools and nearly three-fourths (72 per cent) were in the large schools.

The majority of the teachers who taught in the physical education field taught in at least three different fields. One-seventh of the teachers (14 per cent) taught in the physical education field only (of which number only one teacher taught in a school with less than one hundred

students); one-fourth (25 per cent) of the teachers who taught in the physical education field taught in one additional subject field while three-fifths (60 per cent) were actually teaching in two or more additional subject fields. In the small schools, 84 per cent of the teachers who taught in the physical education field were required to teach in at least two additional subject fields; even in the large schools over one-third (34 per cent) of the teachers who taught in the physical education field taught in two or more additional fields.

Of the 217 teachers who taught in the physical education field, one-fourth (fifty-five teachers) could be identified as physical education teachers, that is, as teachers who taught in the field of physical education only, or those who had the best preparation in the field of physical education of any subject field taught by them (Table XVII-b and XVII-c, pages 104 and 105). Thirty-one of these fifty-five physical education teachers taught in the physical education field only; thirteen taught in the physical education field and one additional field. The remaining eleven physical education teachers taught in two or more additional subject fields. Three-fourths of the physical education teachers had thirty or more credits of preparation in the physical education field. There were only seven (17 per cent) physical education teachers with thirty or more credits of

preparation in the field of physical education in the small schools while there were thirty-two (30 per cent) physical education teachers with an equivalent preparation in the large schools. There were eight physical education teachers in the large schools who had less than thirty credits of preparation in the physical education field but none were found in the smaller schools.

Physical education teachers most often taught in the biological science and mathematics fields (Tables II and III, pages 18 and 20).

TABLE XVII-a

FREQUENCY DISTRIBUTION OF NUMBER OF FIELDS TAUGHT BY 217 TEACHERS WHO TAUGHT IN PHYSICAL EDUCATION FIELD WITH BREAKDOWN BY AMOUNTS OF PREPARATION IN PHYSICAL EDUCATION FIELD AND BY THE SIZE OF THE SCHOOLS IN WHICH THE TEACHERS WERE LOCATED

Credits in Phys. Educ.	No. of fields taught	Total		Number of teachers in schools with enrollments of				
		No.	%	1-25	26-50	51-100	101-250	over 250
1	2	3		4	5	6	7	8
	1	31	14.3%		1		10	20
Total number	2	55	25.3		9	9	20	17
teachers	3	68	31.3	3	15	23	21	6
irrespective	4	45	20.7	5	11	21	5	3
of prepara-	5	18	8.3	11	7			
tion & Total		217	100.0	19	43	53	56	48
	1	3					1	2
1-19	2	5				2	1	2
credits	3	30		2	6	12	10	
	4	16		2	3	10	1	
	5	6		4	2			
Total		60	27.6	8	11	24	13	4
	1	4					2	2
20-29	2	6				1	4	1
credits	3	9			1	3	4	1
	4	5		1		3	1	
	5	1		1				
Total		25	11.5	2	1	7	11	4
	1	6					1	5
30-44	2	7			1		3	3
credits	3	4				1	3	
	4	5		1	3		1	
	5	1		1				
Total		23	10.6	2	4	1	8	8
	1	11					2	9
45 or more	2	8					4	4
credits	3	5			1	3		1
	4							
	5	3		2	1			
Total		27	12.4	2	2	3	6	14
	1	7			1		4	2
Number of	2	29			8	6	8	7
credits	3	20		1	7	4	4	4
not given	4	19		1	5	8	2	3
	5	7		2	4			
Total		82	37.8	5	25	18	18	16

TABLE XVII-b

FREQUENCY DISTRIBUTION OF THE AMOUNT OF PREPARATION IN THE PHYSICAL EDUCATION FIELD OF THIRTY-ONE TEACHERS IN MONTANA HIGH SCHOOLS WHO TAUGHT IN PHYSICAL EDUCATION FIELD ONLY, WITH BREAKDOWN BY SIZE OF SCHOOL IN WHICH THE TEACHERS WERE LOCATED

Credits in Phys. Educ.	Total		Number of teachers in schools with enrollments of				
	No.	%	1-25	26-50	51-100	101-250	over 250
1	2		3	4	5	6	7
1-19 credits	3	9.6%				1	2
20-29 credits	4	12.8				2	2
30-44 credits	6	19.3				1	5
45 or more credits	11	35.3				2	9
No. of credits not given	7	22.5		1		4	2
Total	31	100.0%		1		10	20

TABLE XVII-c

FREQUENCY DISTRIBUTION OF THE NUMBER OF FIELDS TAUGHT BY TWENTY-FOUR TEACHERS WITH GREATEST TRAINING IN PHYSICAL EDUCATION FIELD BUT TEACHING IN ADDITIONAL FIELDS, WITH BREAKDOWN BY AMOUNTS OF PREPARATION IN PHYSICAL EDUCATION FIELD AND BY THE SIZE OF THE SCHOOL IN WHICH THE TEACHERS WERE LOCATED

Credits in Phys. Educ.	No. of fields taught	Total		Number of teachers in schools with enrollments of				
		No.	%	1-25	26-50	51-100	101-250	over 250
1	2	3		4	5	6	7	8
All	2	13	54.1		1		5	7
	3	6	25.0		1	1	2	2
	4	1	4.1		1			
	5	4	16.7	3	1			
Total		24	100.0	3	4	1	7	9
20-29 credits	2							
	3	1						1
	4							
	5							
Total		1	4.1					1
30-44 credits	2	5			1		1	3
	3	2					2	
	4	1			1			
	5	1		1				
Total		9	37.4	1	2		3	3
45 or more credits	2	8					4	4
	3	3			1	1		
	4							
	5	3		2	1			
Total		14	58.2	2	2	1	4	5

There were no teachers in the group having 1-19 quarter hours of preparation.

TABLE XVII-d

FREQUENCY DISTRIBUTION OF THE NUMBER OF FIELDS TAUGHT BY 162 TEACHERS WHO TAUGHT IN PHYSICAL EDUCATION FIELD BUT HAD GREATER TRAINING IN ANOTHER S UBJECT FIELD, WITH BREAKDOWN BY AMOUNTS OF PREPARATION IN PHYSICAL EDUCATION FIELD AND BY THE SIZE OF THE SCHOOLS IN WHICH THE TEACHERS WERE LOCATED

Credits in Phys. Educ.	No. of fields taught	Total		Number of teachers in schools with enrollments of				
		No.	%	1-25	26-50	51-100	101-250	over 250
1	2	3	4	5	6	7	8	9
	2	42	25.9%		8	9	15	10
All	3	62	38.3	3	14	22	19	4
	4	44	27.2	5	10	1	5	3
	5	14	8.6	8	6			
Total		162	100.0	16	38	32	39	17
	2	5				2	1	2
1-19	3	30		2	6	12	10	
credits	4	16		2	3	10	1	
	5	6		4	2			
Total		57	35.2	8	11	24	12	2
	2	6				1	4	1
20-29	3	8			1	3	4	
credits	4	5		1		3	1	
	5	1		1				
Total		20	12.3	2	1	7	9	1
	2	2					2	
30-44	3	2				1	1	
credits	4	4		1	2		1	
	5							
Total		8	4.9	1	2	1	4	
	2							
45 or more	3	2				2		
credits	4							
	5							
Total		2	1.2			2		
	2	29			8	6	8	7
No. of	3	20		1	7	4	4	4
credits	4	19		1	5	8	2	3
not given	5	7		3	4			
Total		75	46.3	5	24	18	14	14

Social Studies. A smaller percentage of the teachers who taught in the social studies field had thirty or more credits of preparation in the social studies field than did teachers in the same category in the history field. Of the teachers who were teaching in the social studies field, and whose preparation was known, 46 per cent had thirty or more credits in the social studies field (Table XVIII-a, page 109); in the history field, the corresponding percentage was 67 per cent.

Only eight of the 172 teachers (5 per cent) who taught in the social studies field taught in that field only; one-third (34 per cent) taught in the social studies field and one additional subject field; 62 per cent taught in the social studies field and two or more additional subject fields. This followed much the same pattern of distribution as was found in the history field.

There were fifty-nine social studies teachers (i. e., teachers who taught in the social studies field only or who had the best preparation in the social studies field of any subject field taught by them) (Table XVIII-b and XVIII-c, pages 110 and 111). Of these, eight (14 per cent) taught in the social studies field only; twenty-three (39 per cent taught in the social studies field and one additional subject field; and twenty-eight (47 per cent) taught in the social studies field and two or more additional subject

fields. There were seven social studies teachers in the large schools who taught in three or more subject fields.

Over four-fifths (81 per cent) of the social studies teachers had more than thirty credits of preparation in the social studies field. Of these teachers, twenty-six (44 per cent) were in the large schools and nine (16 per cent) were in the small schools.

Almost two-thirds of the teachers who taught in the social studies field had a better preparation in another subject field taught by them (Table XVIII-d, page 112).

Thirty-one per cent of the social studies teachers taught in the field of history, and 34 per cent of the history teachers taught in the field of social studies (Table II, page 18). Both social studies teachers and history teachers taught in the field of physical education next most frequently.

TABLE XVIII-a

FREQUENCY DISTRIBUTION OF NUMBER OF FIELDS TAUGHT BY 172 TEACHERS WHO TAUGHT IN SOCIAL STUDIES FIELD WITH BREAKDOWN BY AMOUNTS OF PREPARATION IN SOCIAL STUDIES FIELD AND BY THE SIZE OF THE SCHOOLS IN WHICH THE TEACHERS WERE LOCATED

Credits in Soc. Studies	No. of fields taught	Total		Number of teachers in schools with enrollments of				
		No.	%	1-25	26-50	51-100	101-250	over 250
1	2	3	4	5	6	7	8	9
Total number teachers irrespective of preparation	1	8					1	7
	2	58		1	3	7	22	25
	3	55		4	12	16	17	6
	4	40		5	7	16	11	1
	5	10		4	5		1	
	6	1		1				
Total		172	100.0%	15	27	39	52	39
1-19 credits	1	1						1
	2	17		1		1	6	9
	3	19		1	7	5	4	2
	4	11		2	1	4	3	1
	5	2			2			
Total		50	29.1	4	10	10	13	13
20-29 credits	1	3						3
	2	11				2	6	3
	3	12		1	2	2	6	1
	4	12		1	2	5	4	
	5	4		1	2		1	
	6	1		1				
Total		43	25.0	4	6	9	17	7
30-44 credits	1	0						
	2	15			3	1	3	8
	3	18		2	2	7	5	2
	4	10			3	4	3	
	5	2		2				
Total		45	26.1	4	9	12	11	10
45 or more credits	1	4					1	3
	2	15				3	7	5
	3	6			1	2	2	1
	4	7		2	1	3	1	
	5	2		1	1			
Total		34	19.8	3	3	8	11	9

TABLE XVIII-b

FREQUENCY DISTRIBUTION OF THE AMOUNT OF PREPARATION IN THE SOCIAL STUDIES FIELD OF EIGHT TEACHERS IN MONTANA HIGH SCHOOLS WHO TAUGHT IN SOCIAL STUDIES FIELD ONLY, WITH BREAKDOWN BY SIZE OF SCHOOL IN WHICH THE TEACHERS WERE LOCATED

Credits in Soc. Studies	Total		Number of teachers in schools with enrollments of				
	No.	%	1-25	26-50	51-100	101-250	over 250
1	2		3	4	5	6	7
1-19 credits	1	12.5%					1
20-29 credits	3	37.5					3
30-44 credits							
45 or more credits	4	50.0				1	3
Total	8	100.0				1	7

TABLE XVIII-c

FREQUENCY DISTRIBUTION OF THE NUMBER OF FIELDS TAUGHT BY FIFTY-ONE TEACHERS WITH GREATEST TRAINING IN SOCIAL STUDIES FIELD BUT TEACHING ADDITIONAL FIELDS, WITH BREAKDOWN BY AMOUNTS OF PREPARATION IN SOCIAL STUDIES FIELD AND BY THE SIZE OF THE SCHOOL IN WHICH THE TEACHERS WERE LOCATED

Credits in Soc. Studies	No. of fields taught	Number of teachers: Total No.	Total %	in schools with enrollments of 1-25	26-50	51-100	101-250	over 250
1	2	3	4	5	6	7	8	9
All	2	23	45.1%		1	4	10	8
	3	13	25.5			6	6	1
	4	11	21.6	2	4	5		
	5	4	7.8	2	2			
Total		51	100.0	4	7	15	16	9
1-19 credits	2	1				1		
	3							
	4							
	5							
Total		1	2.0			1		
20-29 credits	2	1					1	
	3	3				1	2	
	4	1			1			
	5	1			1			
Total		6	11.8		2	1	3	
30-44 credits	2	7			1		2	4
	3	6				3	2	1
	4	5			2	3		
	5	1		1				
Total		19	37.3	1	3	6	4	5
45 or more credits	2	14				3	7	4
	3	4				2	2	
	4	5		2	1	2		
	5	2		1	1			
Total		25	49.0	3	2	7	9	4

TABLE XVIII-d

FREQUENCY DISTRIBUTION OF THE NUMBER OF FIELDS TAUGHT BY 113 TEACHERS WHO TAUGHT IN SOCIAL STUDIES FIELD BUT HAD GREATER TRAINING IN ANOTHER SUBJECT FIELD, WITH BREAKDOWN BY AMOUNTS OF PREPARATION IN SOCIAL STUDIES FIELD AND BY THE SIZE OF THE SCHOOLS IN WHICH THE TEACHERS WERE LOCATED

Credits in Soc. Studies	No. of fields taught	Number of teachers: Total No.	Total %	in schools with enrollments of 1-25	26-50	51-100	101-250	over 250
1	2	3	4	5	6	7	8	9
	2	35	31.0%	1	2	3	12	17
	3	42	37.2	4	12	10	11	5
All	4	29	25.7	3	3	11	11	1
	5	6	5.3	2	3		1	
	6	1	.9	1				
Total		113	100.0	11	20	24	35	23
	2	16		1			6	
1-19	3	19		1	7	5	4	2
credits	4	11		2	1	4	3	1
	5	2			2			
Total		48	42.5	4	10	9	13	3
	2	10				2	5	3
20-29	3	9		1	2	1	4	1
credits	4	11		1	1	5	4	
	5	3		1	1		1	
	6	1		1				
Total		34	30.1	4	4	8	14	4
	2	8			2	1	1	4
30-44	3	12		2	2	4	3	1
credits	4	5			1	1	3	
	5	1		1				
Total		26	23.0	3	5	6	7	5
	2	1						1
45 or more	3	2			1			1
credits	4	2				1	1	
	5							
Total		5	4.3		1	1	1	2

Agriculture. Only forty-seven teachers taught in the field of agriculture in Montana high schools in 1946-1947.

The percentage of teachers who taught in the field of agriculture and had thirty or more credits of preparation in that field was the highest percentage found for teachers in any subject field. There were 91 per cent of the teachers who taught in the agriculture field who had thirty or more credits of preparation in the agriculture field (Table XIX-a, page 116). Only four teachers had less than thirty credits of preparation in that field. As mentioned before (page 52), the requirements set up by the Smith-Hughes program are largely responsible for the large percentage of teachers in the agriculture field having thirty or more credits in agriculture.

Two of the four teachers who taught in the field of agriculture, and had less than thirty credits of preparation in the field, taught in the large schools. Of the teachers who taught in the agriculture field, and had thirty or more credits of preparation, 63 per cent were in the large schools (of more than one hundred students), 8 per cent were in the small schools (of fifty or fewer students).

Teachers who taught in the field of agriculture were called on less frequently than in any other subject matter group to teach in two or more additional subject fields.

More than one-half (53 per cent) of the teachers who taught in the agriculture field taught in that field only; 32 per cent taught in the field of agriculture and one additional subject field. This left only 15 per cent of the teachers who taught in the agriculture field who were required to teach in two or more additional subject fields.

Two-thirds of all the teachers who taught in the agriculture subject field were teaching in the larger schools. That agricultural subjects were not more often taught in the small schools probably was due to the lack of space and equipment and to the high cost of supporting a well rounded agricultural course.

There were forty-four agriculture teachers (i. e., teachers who taught in the agriculture field only, or who had the best preparation in the agriculture field of any subject field taught by them) (Table XIX-a, page 116). Twenty-five of these taught in the field of agriculture only, fourteen taught in the field of agriculture and one additional subject field, and five taught in the field of agriculture and two or more additional subject fields. Only one agriculture teacher in the large schools taught in three or more different subject fields.

Over nine-tenths (91 per cent) of the agriculture teachers had thirty or more credits of preparation in that field. There were three agriculture teachers in the small

schools with thirty or more credits in the agriculture field compared to the twenty-five teachers in the large schools with thirty or more credits in the agriculture field compared to the twenty-five teachers in the large schools with the same preparation.

Agriculture teachers (those with the best preparation in agriculture field of any field taught by them) most often taught in the biological science field or the physical science field (Table II, page 18 and Table III, page 20).

TABLE XIX-a

FREQUENCY DISTRIBUTION OF NUMBER OF FIELDS TAUGHT BY FORTY-SEVEN TEACHERS WHO TAUGHT IN AGRICULTURAL FIELD WITH BREAKDOWN BY AMOUNTS OF PREPARATION IN AGRICULTURAL FIELD AND BY THE SIZE OF THE SCHOOLS IN WHICH THE TEACHERS WERE LOCATED

Credits in Agriculture	No. of fields taught	Total No.	Total %	Number of teachers in schools with enrollments of 1-25	26-50	51-100	101-250	over 250
1	2	3		4	5	6	7	8
	1	25	53.2%			6	13	6
Total number	2	15	31.9			5	7	3
teachers	3	3	6.4		2		1	
irrespective	4	3	6.4	1	1	1		
of preparation	5	1	2.1	1				
Total		47	100.0	2	3	12	21	9
	1	1				1		
1-19	2	2					1	1
credits	3							
	4							
	5							
Total		3	6.4			1	1	1
	1							
20-29	2							
credits	3							
	4	1			1			
	5							
Total		1	2.1		1			
	1	3					1	2
30-44	2							
credits	3	1					1	
	4							
	5							
Total		4	8.5				2	2
	1	19				6	10	3
45 or more	2	13				5	6	2
credits	3	2			2			
	4	2		1		1		
	5							
Total		36	76.6	1	2	12	16	5
	1	2					1	1
No. of	2							
credits	3							
not given	4							
	5	1		1				
Total		3	6.4	1			1	1

TABLE XIX-b

FREQUENCY DISTRIBUTION OF THE AMOUNT OF PREPARATION IN THE AGRICULTURAL FIELD OF TWENTY-FIVE TEACHERS IN MONTANA HIGH SCHOOLS WHO TAUGHT IN AGRICULTURAL FIELD ONLY, WITH BREAKDOWN BY SIZE OF SCHOOL IN WHICH THE TEACHERS WERE LOCATED

Credits in Agriculture	Total		Number of teachers in schools with enrollments of				
	No.	%	1-25	26-50	51-100	101-250	over 250
1	2		3	4	5	6	7
1-19 credits	1	4.0%				1	
20-29 credits							
30-44 credits	3	12.0				1	2
45 or more credits	19	76.0			6	10	3
Number of credits not given	2	8.0				1	1
Total	25	100.0%			6	13	6

TABLE XIX-c

FREQUENCY DISTRIBUTION OF THE NUMBER OF FIELDS TAUGHT BY NINETEEN TEACHERS WITH GREATEST TRAINING IN AGRICULTURAL FIELD BUT TEACHING IN ADDITIONAL FIELDS, WITH BREAKDOWN BY AMOUNTS OF PREPARATION IN AGRICULTURAL FIELD AND BY THE SIZE OF THE SCHOOL IN WHICH THE TEACHERS WERE LOCATED

Credits in Agriculture	No. of fields taught	Total		Number of teachers in schools with enrollments of				
		No.	%	1-25	26-50	51-100	101-250	over 250
1	2	3	4	5	6	7	8	9
All	2	14	73.7%			5	6	3
	3	3	15.8		2		1	
	4	2	10.5	1		1		
		19	100.0	1	2	6	7	3
1-19 credits	2	1						1
	3							
	4							
	5							
Total		1	5.6					1
30-44* credits	2							
	3	1					1	
	4							
	5							
Total		1	5.6				1	
45 or more credits	2	13				5	6	2
	3	2			2			
	4	2		1		1		
	5							
Total		17	89.5	1	2	6	6	2

*There were no teachers in the group having 20-29 quarter hours of preparation, therefore that group was omitted from this chart.

Fine Arts. Twenty-one teachers taught fine arts. Of this number seventeen teachers were in the large schools and only one teacher was in the small schools (Table XX-a, page 120). Two teachers who taught fine arts were part time teachers.

Four teachers who taught fine arts had less than twenty credits of preparation in the fine arts field, five had from twenty through twenty-nine credits, four had thirty to forty-four credits, and six had over forty-four credits of preparation in the fine arts field.

Five teachers who taught fine arts taught in that field only; nine teachers taught fine arts and one additional field; and seven teachers taught fine arts and two or more additional fields.

TABLE XX-a

FREQUENCY DISTRIBUTION OF NUMBER OF FIELDS TAUGHT BY TWENTY-ONE TEACHERS WHO TAUGHT IN FINE ARTS FIELD WITH BREAKDOWN BY AMOUNTS OF PREPARATION IN FINE ARTS FIELD AND BY THE SIZE OF THE SCHOOLS IN WHICH THE TEACHERS WERE LOCATED

Credits in Fine Arts	No. of fields taught	Total No.	Total %	Number of teachers in schools with enrollments of 1-25	26-50	51-100	101-250	over 250
1	2	3		4	5	6	7	8
Total number teachers irrespective of preparation	1	5	23.8%				1	4
	2	9	42.8			2	1	6
	3	5	23.8				4	1
	4	2	5.5	1		1		
	5							
Total		21	100.0	1		3	6	11
1-19 credits	1							
	2	2				1		1
	3	2					2	
	4							
	5							
Total		4	19.1			1	2	1
20-29 credits	1	1						1
	2	1						1
	3	2					2	
	4	1				1		
Total		5	23.8			1	2	2
30-44 credits	1	1					1	
	2	2					2	
	3	1					1	
	4							
	5							
Total		4	19.1				4	
45 or more credits	1	2						2
	2	3				1		2
	3							
	4	1		1				
	5							
Total		6	28.6	1		1		4
No. of credits not given	1	1						1
	2	1					1	
	3							
	4							
	5							
Total		2	9.5				1	1

TABLE XX-b

FREQUENCY DISTRIBUTION OF THE AMOUNT OF PREPARATION IN THE FINE ARTS FIELD OF FIVE TEACHERS IN MONTANA HIGH SCHOOLS WHO TAUGHT IN FINE ARTS FIELD ONLY, WITH BREAKDOWN BY SIZE OF SCHOOL IN WHICH THE TEACHERS WERE LOCATED

Credits in Fine Arts	Total		Number of teachers in schools with enrollments of				
	No.	%	1-25	26-50	51-100	101-250	over 250
1	2		3	4	5	6	7
1-19 credits							
20-29 credits	1	20%*					1*
30-44 credits	1	20				1	
45 or more credits	2	40					2
Number of credits not given	1	20 *					1*
Total	5	100%				1	4

*Two were part time teachers, one with 20-29 credits, the other unknown.

TABLE XX-c

FREQUENCY DISTRIVUTION OF THE NUMBER OF FIELDS TAUGHT BY SEVEN TEACHERS WITH GREATEST TRAINING IN FINE ARTS FIELD BUT TEACHING IN ADDITIONAL FIELDS, WITH BREAKDOWN BY AMOUNTS OF PREPARATION IN FINE ARTS FIELD AND BY THE SIZE OF THE SCHOOL IN WHICH THE TEACHERS WERE LOCATED

Credits in Fine Arts	No. of fields taught	Total		Number of teachers in schools with enrollments of				
		No.	%	1-25	26-50	51-100	101-250	over 250
1	2	3	4	5	6	7	8	9
	2	5	71.4%			1		4
All	3	1	14.3					1
	4	1	14.3	1				
	5							
Total		7	100.0	1		1		5
	2	2						2
30-44	3	1						1
credits	4							
	5							
Total		3	42.9					3
	2	3				1		2
45 or more	3							
credits	4	1		1				
	5							
Total		4	57.1	1		1		2

No teacher in this group had less than 30 quarter hours in Fine Arts.

There were no teachers in the group having 1-19 or 20-29 quarter hours of preparation. Therefore, that group was omitted from this chart.

TABLE XV-d

FREQUENCY DISTRIBUTION OF THE NUMBER OF FIELDS TAUGHT BY NINE TEACHERS WHO TAUGHT IN FINE ARTS FIELD BUT HAD GREATER TRAINING IN ANOTHER SUBJECT FIELD, WITH BREAKDOWN BY AMOUNTS OF PREPARATION IN FINE ARTS FIELD AND BY THE SIZE OF THE SCHOOLS IN WHICH THE TEACHERS WERE LOCATED

Credits in Fine Arts	No. of fields taught	Total		Number of teachers in schools with enrollments of				
		No.	%	1-25	26-50	51-100	101-250	over 250
1	2	3	4	5	6	7	8	9
All	2	4	44.4%			1	1	2
	3	4	44.4				4	
	4	1	11.1			1		
	5							
Total		9	100.0			2	5	2
1-19 credits	2	2				1		1
	3	2					2	
	4							
	5							
Total		4	44.4			1	2	1
20-29 credits	2	1						1
	3	2					2	
	4	1				1		
	5							
Total		4	44.4			1	2	1
No. of credits not given	2	1					1	
	3							
	4							
	5							
Total		1	11.1				1	

None of the Fine Art teachers had over 30 quarter hours in Fine Arts when they had better preparation in some other subject field they were teaching.

Psychology. Twelve teachers taught in the field of psychology, and none taught in that field only (Table XXI, page 124).

No teacher who taught psychology had more than forty-four credits of preparation in the field of psychology. There were five teachers who had between thirty and forty-four credits of preparation in psychology. Four teachers teaching psychology were known to have less than twenty credits in that field. Seven teachers taught in the field of psychology and one additional subject field. The remaining five teachers taught in the field of psychology and two or more subject fields.

TABLE XXI-a

FREQUENCY DISTRIBUTION OF NUMBER OF FIELDS TAUGHT BY 12 TEACHERS WHO TAUGHT PSYCHOLOGY WITH BREAKDOWN BY AMOUNTS OF PREPARATION IN PSYCHOLOGY FIELD AND BY THE SIZE OF THE SCHOOLS IN WHICH THE TEACHERS WERE LOCATED

Credits in Psychology	No. of fields taught	Total		Number of teachers in schools with enrollments of				
		No.	%	1-25	26-50	51-100	101-250	over 250
1	2	3	4	5	6	7	8	9
Total number teachers irrespective of preparation	2	7	58.3%		1	1		5
	3	2	16.7	1	1			
	4	2	16.5		1	1		
	5	1	8.3		1			
	6							
Total		12	100.0	1	4	2		5
1-19 credits	2	3			1	1		1
	3	1			1			
	4							
	5							
Total		4	33.3		2	1		1
20-29 credits	2							
	3	1		1				
	4							
	5							
Total		1	8.3	1				
30-44 credits	2	2						2
	3							
	4	2			1	1		
	5	1			1			
Total		5	41.7		2	1		2
No. of credits not given	2	2						2
	3							
	4							
	5							
Total		2	16.7					2

No teacher teaching Psychology had over 44 quarter credits in Psychology.

General Summarization of Subject Fields

The data for the remaining four tables were taken from the tables accompanying the discussions of each of the specific subject fields. These tables summarize the specific data into a form such that the comparisons of the preparation and load of the teachers in each of the various fields may be made.

Frequency distribution of the preparation of teachers in each subject field. In Table XXII, page 127, frequency distributions of the percentages of teachers in each subject field having various amounts of preparation in those fields are to be found. This table includes a section "Credits Unknown" to account for the teachers for whom the preparation in a subject field could not be determined.

The fields of agriculture, home economics, and music had the highest percentage of teachers with thirty or more credits of preparation in their respective fields. Of the forty-seven teachers who taught in the agriculture field, over 90 per cent had thirty or more credits of preparation in that field; over three-fourths had forty-five or more credits of preparation. Less than nine per cent had less than thirty credits of preparation in the field of agriculture. The preparation of six per cent of the teachers who taught in the field of agriculture could not be determined.

TABLE XXII

PERCENTAGE OF TEACHERS HAVING A GIVEN AMOUNT OF PREPARATION IN A SUBJECT FIELD TAUGHT BY THEM

Subject	Total No. of teachers	45 or more credits	30-44 credits	20-29 credits	1-19 credits	Credits unknown
Agriculture	47	77%	9%	2%	6%	6%
Home Economics	99	66	10	10	6	8
Music	136	53	10	8	10	18
English	407	40	26	21	9	5
History	282	37	28	24	9	3
Physical Sci.	172	34	23	20	20	2
Commercial	241	37	14	14	29	7
Fine Arts*	21	29	19	24	19	10
Latin	63	19	30	27	22	2
Psychology*	12	--	42	8	33	17
Industrial Arts	128	28	11	16	24	22
Biological Sci.	229	18	28	20	29	4
Social Studies	172	20	26	25	29	--
Mathematics	280	21	22	24	29	3
Mod. Languages	63	22	21	32	22	3
Physical Educ.	217	12	11	12	28	38

*Very few teachers in these fields. Therefore, per cents should be viewed with caution.

Physical education, modern languages, and mathematics fields were the fields which had the smallest percentage of teachers with thirty or more credits of preparation in their respective fields.

Frequency distribution in the various sized schools of teachers with thirty or more credits of preparation in their field and of those with less than thirty credits of preparation. Table XXIII, page 129, includes data on only those teachers whose preparation was known. (This fact accounts for the difference in the per cent figures given for each subject field in the first row of this table and the sum of the per cent figures given in the columns 3 and 4 of the preceding table). This table reveals the per cent of the total number of teachers with thirty or more credits of preparation in each field, the per cent of the total number of teachers with less than thirty credits of preparation in the field, and then shows the difference in the preparation of teachers in the large schools and in the small schools. (As defined in Table XXIII).

The data for the field of English in this table are as follows: Sixty-nine per cent of the teachers who taught in the field of English, and whose preparation was known, had thirty or more credits of preparation in that field. Of the teachers who had less than thirty credits of prepara-

TABLE XXIII

THE PER CENT OF THE TEACHERS WITH THIRTY CREDITS OR MORE OF PREPARATION IN A SUBJECT FIELD; PER CENT OF TEACHERS WITH LESS THAN THIRTY CREDITS OF PREPARATION IN THE SUBJECT FIELD IN THE SMALL SCHOOLS AND THE LARGE SCHOOLS; PER CENT OF TEACHERS WITH THIRTY OR MORE CREDITS OF PREPARATION IN THE SUBJECT FIELD IN THE SMALL SCHOOLS AND IN THE LARGE SCHOOLS

Subject field	Preparation		1-29 credits of preparation		30 or more credits of preparation	
	1-29 credits	30 plus credits	in small schools	in large schools	in small schools	in large schools
			1-25 students	26-50 students	101-250 students	251 or more
Agriculture	9%	91%	25%	50%	8%	63%
Home Economics	17	83	19	38	9	68
Music	23	77	36	24	12	79
English	31	69	30	47	22	60
History	33	67	35	44	20	54
Physical Science	42	58	25	38	18	57
Commercial	46	54	37	29	19	61
Fine Arts*	47	53	0	78	10	80
Latin	50	50	13	68	16	74
Psychology*	50	50	60	20	40	40
Industrial Arts	51	49	36	38	4	78
Biological Science	49	51	25	41	30	52
Social Studies	54	46	26	54	23	52
Mathematics	55	45	28	43	22	61
Modern Languages	56	44	18	55	4	82
Physical Education	63	37	26	38	20	72

*Very few teachers in these subjects.

tion in the English field, 30 per cent were in the small schools and 47 per cent were in the large schools. Of the teachers who had thirty or more credits of preparation in the field of English 60 per cent were in the large schools and 22 per cent were in the small schools.

Data for the other subject fields in this table should be read in the same manner.

Teaching field load. Table XXIV, page 131, shows the per cent of the teachers who were teaching in a given subject field alone, or in combination with one additional subject field or in combination with two or more subject fields. For example, there were 13 teachers who taught in the history field only, 33 taught in the history field and one additional subject field, and 55 taught in the history field and two or more additional subject fields.

Number of teachers with a certain load in various sized schools. Table XXV, page 133, shows the number of subject fields taught by teachers in the various sized schools. The bottom row shows the total number of teachers in each of the different sized schools. This table confirms the fact that as a rule teachers in the larger schools are required to teach in fewer subject fields than do their

TABLE XXIV

THE PER CENT OF THE TEACHERS TEACHING IN EACH FIELD ONLY, OR IN ONE ADDITIONAL FIELD, OR TWO OR MORE ADDITIONAL SUBJECT FIELDS

Subject field	Per cent who taught subject field only	Per cent who taught subject field and one additional field	Per cent who taught subject field and two or more additional fields
Agriculture	53%	32%	15%
Home Economics	39	39	21
Music	42	19	39
English	29	35	36
History	13	33	60
Physical Science	7	33	60
Commercial	41	30	29
Fine Arts*	24	43	33
Latin	8	44	45
Psychology*	---	58	42
Industrial Arts	35	21	44
Biological Science	7	29	63
Social Studies	4	34	62
Mathematics	20	25	55
Modern Languages	16	46	38
Physical Education	7	33	60

*Very few teachers in these fields.

TABLE XXV

FREQUENCY DISTRIBUTION OF THE NUMBER OF TEACHERS TEACHING IN A GIVEN NUMBER OF SUBJECT FIELDS IN THE VARIOUS SIZED HIGH SCHOOLS OF MONTANA

Number of subject fields taught by the teacher	Number of teachers in schools with an enrollment of				
	1-25	26-50	51-100	101-250	250 and over
1	3	22	58	174	305
2	5	43	87	149	114
3	14	56	75	75	16
4	9	29	34	15	4
5	15	10	0	1	0
6	1	0	0	0	0
Total number teachers	47	160	254	414	439 =1,314

colleagues in the smaller schools.

CHAPTER V

SUMMARY, CONCLUSIONS, AND IMPLICATIONS

Summary. In Montana, which has a small scattered population in a large land area, are many small high schools and relatively few large high schools. This situation naturally creates many school problems, among them the inadequate supply of properly trained teachers to occupy the varied teaching positions. No known, intensive study concerning the teachers' training, subject combinations and teaching field load in the different sized schools of Montana had been made up to this time. The writer undertook to do this for the school year 1946-1947.

This analysis presents data concerning the subject combinations the teachers were actually teaching, the preparation of these teachers in the subject fields in which they were teaching, and their teaching field load in 1946-1947.

The prospective teacher (and his advisor) can use these data to plan a more useful course for preparation of the candidate. These data can be used to aid in the choice of appropriate minors and other courses of study to accompany the student's chosen major subject. This should result in the graduation of more well qualified teachers who

can fill openings requiring teachers who can teach in two or more subject fields. It would then be possible to expect better performance on the part of the high school students whom they will teach.

These same data show the subject fields in which there is a shortage of qualified teachers, or in which the average teacher training is low. These conditions may be improved by modifying teacher training requirements in those particular fields and, perhaps, changing the accrediting requirements to include several subject fields as required training before teaching certificates are granted.

No previous studies of the problem in Montana prior to 1947 were found. The writer studies three similar investigations made in Iowa (in 1930, 1931 and 1946), one in North Dakota (in 1936) and one in Kansas (in 1946). No. pertinent comparisons could be made of these studies and this analysis of the Montana problem because the contents of the subject fields and the methods of grouping schools differed greatly.

The data for this analysis were collected almost entirely from the High School Reports, Form A, which were obtained from the Department of Public Instruction, State of Montana. These forms, submitted annually by the high school administrators to the State Department of Public Instruction, give each teacher's class schedule, preparation in each

subject field taught, salary, institutions of higher learning attended by the teacher, degrees, certification, and the number of years of teaching experience. Also included are the school enrollment, its accreditation, and the number of teachers in the school. Much of the data that could not be secured from these forms were found in the certification department of the State Department of Public Instruction, and in the office of the registrar of the Montana State University where many of the teachers in question had obtained their degrees. As a last resort, a personal letter was directed to the teacher asking for the missing information. Enclosed with the letter was a self-addressed postal card on which it was only necessary for the teacher to fill in two or three blanks with numbers indicating the number of credits he had in the subject fields in question. All these data were tabulated and later organized into the tables used in the analysis. There is a set of four tables accompanying each subject field. Each set deals with a given subject field in the same manner.

The sixteen subject field groups used in this analysis were chosen in order to conform with the degree requirements of Montana State University and with the certification requirements of the Montana State Department of Public Instruction. The number of subject fields and the contents of some of them make it impossible to make compari-

sons between this study and those mentioned earlier.

The ability to identify a teacher in an analysis of this type is necessary. In this analysis, a teacher was identified by the subject field in which he was teaching and in which he had the most preparation, regardless of the number of classes in that subject field he may have taught, and regardless of his preparation in a field other than those in which he was teaching. Many teachers were not teaching in the field in which they had the most preparation.

Categories of schools were based on the size of the school enrollment. It was impossible to group the schools according to the class to which they belonged because their enrollments over-lapped greatly. Therefor, different school groups were arbitrarily decided upon. They were schools with enrollments of 1 to 25 students, schools with 26 to 50 students, schools with 51 to 100 students, schools with 101 to 250 students, and schools with 251 or more students.

The first table in each set of four tables for each subject field gives the frequency distribution of the preparation in a subject field of all teachers who taught in that subject field alone or in combination with one or more additional subject fields according to their preparation in that subject field, the school enrollment, and the number of subject fields taught by them. The remaining three tables

are breakdowns of the first table in order to show more concisely the data concerning that subject field.

This survey covered the teaching field loads and preparation of 1,314 teachers in 184 Montana high schools for the school year 1946-1947.

Conclusions. Forty-two per cent of the teachers taught in one subject field only; 30 per cent taught in two fields; 18 per cent taught in three fields; 6.5 per cent taught in four fields, and 2 per cent taught in five fields. One teacher taught in six different fields. Since more than one-fourth of the teachers (27 per cent) were teaching in three or more fields, and since most teachers get their start in teaching careers in the small schools where they most generally have to teach in more than two fields, the prospective teacher perhaps should obtain training in at least three fields.

There appeared to be no consistency in the teaching combinations from one school to another among the schools. Individual teachers in the smaller schools taught in a greater variety of subject fields than did their colleagues in the large schools. It seems unreasonable to expect a teacher to be assigned to more than three different subject fields.

Data concerning the subjects taught by teachers out-

side of their major and/or minors indicate a lack of sufficient and proper knowledge concerning the existing teaching combinations, especially during the time the teacher is obtaining his training. Advisors should have data by which to guide the prospective teacher in his selection of basic courses, including his major, minor or minors, and perhaps other courses.

Many subjects never occur in any sort of combination with other subject fields (Table II, page 20). Agriculture never appeared with fine arts, commercial, home economics, Latin or modern languages; commercial never appeared with agriculture or psychology; and modern arts never occurred with agriculture, fine arts, industrial arts or psychology.

Biological sciences, physical sciences, social studies, and physical education were most often taught in combination with two or more additional subject fields.

Generally speaking, approximately one-half of the teachers who taught in each of ten subject fields, and whose preparation was known, had thirty or more credits of preparation in those fields (Table XXII, page 127). These fields were physical science, commercial, fine arts, Latin, psychology, industrial arts, biological science, social studies, mathematics, and modern languages. Considerably more than one-half of the teachers in agriculture, home economics, music, English, and history fields had thirty or more credits of preparation in those fields.

Ninety-one per cent of the teachers who taught in the agriculture field, and whose college preparation in that field was known, had thirty or more credits of preparation in that field (Table XIX-a, page 116). Agriculture ranked highest of any field in the percentage of its teachers having thirty or more credits of preparation. Home economics ranked second with 83 per cent; music was third with 77 per cent; and English was fourth with 69 per cent of its teachers having thirty or more credits of preparation in that field.

Teachers in the large schools were generally better prepared to teach the subject fields they taught than were the teachers in the small schools. In all subject fields, a far greater percentage of the teachers in the large schools had thirty or more credits of preparation in the fields they than did the teachers in the small schools (Table XXIII, page 129). Large schools with more subjects offered in a particular subject area were able to place teachers in assignments for which these teachers had concentrated areas of training.

Home economics, agriculture, fine arts, Latin and modern languages were not frequently taught in the small schools. In the seventy small schools, thirteen or fewer teachers were teaching in each of these fields. The high cost of supporting the vocational subject fields and

supplying adequate space, equipment, and qualified teachers rule out the vocational subject fields in most small schools. The languages and fine arts are not required subjects for graduation, so they are seldom taught in the small schools.

The commercial field had 29 per cent of its teachers who had less than twenty credits of preparation in the field of commercial. The writer noted that most of these teachers were in the small schools and were teaching typing in which they probably had adequate training.

Implications. Studies similar to the present study should be carried on from time to time to determine the trends and changes. This study was made during an abnormal period which existed immediately after World War II when teacher shortages were acute. Many of the teachers had been called into the armed services and had not yet returned. Others had left the teaching profession for high paying jobs in defense plants. Many of these expected to return to the teaching profession. Many of the young men and women were drafted into the armed services during the time they would otherwise have been in school preparing for the teaching profession and thus the normal flow of new teachers into the teaching profession was limited. Conditions may be expected to change in the teaching field as economic conditions return toward normal.

High school administrators should be required to make

complete, accurate, and legible returns of the High School Reports, Form A, to the State Department of Public Instruction. Many of the returns viewed by the investigator were not clear, or complete, and many were ambiguous. To this end the Form A Report blanks should be accompanied by detailed instructions from the State Department of Public Instruction explaining the procedures to follow in filling in each type of information required on the forms. Ambiguity concerning many of the questions on the forms could thus be prevented.

The fact that information concerning the preparation of eighty-two of the 217 teachers who taught in the field of physical education could not be determined raises a question as to the number of these teachers who were actually qualified to teach in the field of physical education. The question becomes more acute when consideration is given the fact that thirty-four of these teachers were in the large schools (over one hundred students) and an additional eighteen teachers were in the next larger size school group. Physical education was the subject field in which the most information concerning teacher preparation was lacking.

BIBLIOGRAPHY

BIBLIOGRAPHY

A. THESES

Briar, A. R., "Subject Combinations in High School Teachers' Programs," Master's thesis, University of Iowa, Iowa City, Iowa, 1930

Briggs, Charles W., "Subject Combinations in High School Teachers' Programs." Master's thesis, University of Iowa, Iowa City, Iowa, 1930.

Chilgren, Minding Samuel, "Subject Combinations of Minnesota Teachers in the Six-Year High Schools." Master's thesis, Montana State University, Missoula, Montana, 1943.

Griffith, Harold G.,"Teachers' Subject Combinations of High School Teachers in 449 Independent Districts of Iowa for 1934-1935." Master's thesis, University of Iowa, Iowa City, Iowa, 1936.

Iverson, Norman Floyd, "Subject Combinations of North Dakota High School Teachers." Master's thesis, Montana State University, Missoula, Montana, 1939.

B. PERIODICALS

Anderson, Earl W., "Combinations of Subjects," Educational Research Bulletin, Ohio State University, Vol. VIII, pp. 234-238, May 29, 1929.

Diettert, Chester C., "Teacher Load and Extra Curricular Activities," School Activities, Vol. IX, p. 203, January, 1938.

Douglass, Harl R., and Taylor, William, "Light Loads and Heavy: Measurement in Montana High Schools," Nations Schools, Vol XVIII, pp. 35-37, August, 1936.

Lockard, Gene K., "A Comparative Study of the College Preparation, Teaching Combinations, and Salaries of Kansas High School Administrators and Teachers (1946)," Kansas State Teachers College of Emporia Bulletin of Information, Vol 26, No. 11, November, 1946.

Malmber, Constantine F., "Teaching Combinations in High

School," Review of Educational Research, Vol VII, pp. 284-287, June 1937.

Potthoff, Edward F., "Teaching Combinations: Reducto ad Absurdum," School Review, Vol 43., pp. 417-427, June 1935.

Quanbeck, Martin and Douglass, Harl R., "Teaching Loads in High Schools," Nations Schools, Vol 15, pp. 37-39, June 1937.

Umstadd, J. D., "Teaching Combinations in High Schools," Review of Educational Research, Vol. IV, pp. 302-307, 343-345, June, 1934.

APPENDIX A

HIGH SCHOOL REPORT, FORM A

Report of the ..... High School ..... Montana ..... County

School District No. ..... (If not a county high school)

Superintendent ..... Principal .....

STATE OF MONTANA
DEPARTMENT OF PUBLIC INSTRUCTION
HIGH SCHOOL REPORT

School Year 19..... to 19.....

PART A

TO THE PRINCIPAL OR SUPERINTENDENT: Kindly fill in, sign, and submit to the county superintendent of schools. The county superintendent will check for certification of teachers and sign the report and return to the State Department of Public Instruction, State Capitol, Helena, Montana, not later than October 5th. The county superintendent should receive this report not later than October 1st.

I. CALENDAR

1. Date school opened .....
2. Date school will close .....
3. Vacation dates .....
4. Examination dates .....

II. ACCREDITING

1. No. of years of accrediting received last year .....
2. No. of years of high school work done this year .....
3. No. of years of accrediting asked for this year .....
4. Remarks .....

III. ORGANIZATION AND ADMINISTRATION

1. Method of promotion: Annual .....
   Semi-annual ..... or .....
2. What grade is required for passing? .....
3. No. of pupils carrying more than four regular high school subjects .....
4. How often are reports sent to parents? .....
5. Do you keep a record of each pupil's work and attendance in permanent form? .....
   In a fire-proof vault? .....
6. The number of eighth grade graduates in the district last year .....
7. Number of these graduates now in high school .....
8. Length of class period .....
9. September enrollment in grades .....
10. September enrollment in high school .....

Grade	Boys	Girls	Total
9th	"	"	"
10th	"	"	"
11th	"	"	"
12th	"	"	"
			"
			"

IV. TEACHER TIME

	Men	Women	Total	No. Per. Per Week
1. Teachers giving full time to H. S. work (do not include supt. or prin.)				
2. Teachers giving part time to H. S. work (do not include supt. or prin.)				

3. Number of periods superintendent gives to:
   a. High school supervision .....
   b. High school class work .....
   c. Study hall work .....
   d. Administrative duties .....
4. Number of periods principal gives to:
   a. High school supervision .....
   b. High school class work .....
   c. Study hall work .....
   d. Administrative duties .....
5. Were all teachers employed upon the recommendation of the principal, superintendent, or county superintendent? .....
6. If not, why not? .....
7. Remarks .....

V. BOARD OF EDUCATION

President .....

Secretary or clerk .....

report is submitted by .....

TEACH

	NAME OF TEACHER	I Period Time ____to____ Subject	No. In Class	Qr. Hrs. of Col. Prep.	II Period Time ____to____ Subject	No. In Class	Qr. Hrs. of Col. Prep.	III Period Time ____to____ Subject	No. In Class	Qr. Hrs. of Col. Prep.
1	Supt.									
2	Prin.									
3	Jr. Hi. Prin.									
4	Grade Prin.									
5										
6										
7										
8										
9										
10										
11										
12										
13										
14										
15										
16										
17										
18										
19										
20										
21										
22										
23										
24										
25										
26										
27										
28										
29										
30										
31										
32										
33										
34										
35										
36										
37										

NOTE: List names of teachers alphabetically, listing administrative officers first. List all subjects taught by the teachers in the preparation the teacher has had in the field in which this subject is listed—English, History and Social Sciences, etc. State salar

2M 7-47 1551b

OGRAM

, Hrs. of Col. Prep.	V Period Time ____to____ Subject	No. in Class	Qr. Hrs. of Col. Prep.	VI Period Time ____to____ Subject	No. in Class	Qr. Hrs. of Col. Prep.	VII Period Time ____to____ Subject	No. in Class	Qr. Hrs. of Col. Prep.	VIII Period Time ____to____ Subject	No. in Class	Qr. Hrs. of Col. Prep.	Yearly Salary

he time of beginning and ending of each period, and number enrolled in each subject. Give the number of quarter hours of college olumn. State number of teachers each administrator has under his supervision in space after name.

Preparation and Certification

	NAME OF TEACHER	Degree	School Attended	Major	Minor	Years Experience	*Cert. Held	Date Issued
1	Supt.							
2	Prin.							
3	Jr. Hi. Prin.							
4	Grade Prin.							
5								
6								
7								
8								
9								
10								
11								
12								
13								
14								
15								
16								
17								
18								
19								
20								
21								
22								
23								
24								
25								
26								
27								
28								
29								
30								
31								
32								
33								
34								
35								
36								
37								
38								
39								
40								

*S. S.—Secondary State.
T. S. S.—Temporary Secondary State
S. L.—Secondary Life.
T. E. S.—Temporary Elem. State.
E. L.—Elementary Life.
E. S.—Elementary State.
P.—Professional.
S. B. Blanket Life.

The above teachers are properly certified except the ones marked

.....
dent of School

APPENDIX B

LETTER TO RESPONDENTS

APPENDIX B

417½ Blaine Street
Missoula, Montana
April 18, 1947

Dear Sir:

In my research for a Master's degree at the Montana State University on the problem concerning teacher preparation and subject combinations taught by them in Montana high schools during the curreat year, I failed to find adequate information concerning your credits to completely separate those credits belonging into the field of biological sciences from those belonging into the field of physical sciences. It is that information I am asking of you now.

The information gained from this study will be used to counsel prospective teachers now in training and your cooperation will be appreciated.

The enclosed postal card is for your convenience.

Sincerely yours,

Walter W. Ylinen

APPENDIX C

COPY OF SELF ADDRESSED POST CARD

APPENDIX C

COPY OF SELF ADDRESSED POST CARD

Lewistown, Montana

Dear Sir:

In reply to your inquiry, I have the following (quarter) credits in:

Biological Sciences _____

Physical Sciences _____

Yours truly,
