A STUDY OF THE COST OF THE

KANSAS CITY HIGH SCHOOLS

FOR THE YEAR 1915-1916

BY

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Table of Contents

	Page
Introduction. The Problem	1
Chapter I. Data	
Section 1. Sources and nature of the data	5
Section 2. Collecting and tabulating of the data	5
Section 3. Personnel	8
Chapter II. Study A.	
Section 1. The problem of Study A	9
Section 2. Explanation of Tables I and II	9
Section 3. The 54 common subjects of the four white schools	10
Section 4. The 30 common subjects of the 5 schools	27
Section 5. The four subjects required for graduation	30
Chapter III. Study B.	
Section 1. The problem of Study B.	35
Section 2. First, second, third, and fourth year subjects	38
Section 3. Solids and non-solids	50

12 Sept. 17 N 2

Table of Contents--Continued

Chapter IV. Study C.

Section 1. The problem of Study C	58
Section 2. The highest priced 10 percent of all subjects of all schools	59
Section 3. The highest priced 5 percent of all subjects of all schools	65
Section 4. Sixth hour special subjects	67

Chapter V. Summary of observations and conclusions.

Section 1. Each school considered as a unit	69
Section 2. All schools combined and considered as a unit	79
Section 3. Summary of the results of the thesis as a whole	87

Bibliography	94
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Appendix

Key to Tables I A, I B, I C, I D, and I E	I
Tables I A, I B, I C, I D, and I E	II
Table II	XII

INTRODUCTION.

The problem of this thesis is the study in detail of the cost of the Kansas City high schools for the year 1915-1916.

In view of the fact that the funds of any school district are limited at all times and therefore the school budget must be studied with care especially where it must meet the exigencies of a rapidly growing school population, there come to the school administrators such questions as these. Is there a reasonable degree of uniformity in conditions of economic importance among the high schools of the system? What are the high priced units of work in the different high schools? How much is being invested in these high priced units? In the light of a thorough investigation of the cost of the different units can all of the practices or policies of the past be continued with wisdom in the future? Such questions as these prompted this investigation of the expenditure of money on the Kansas City high schools.

In this study, instruction, overhead expenses, original investment depreciation, equipment, fuel, maintenance and operation, and all other forms of expenses that figure in the making up of the aggregate cost of high schools are taken into consideration.

For convenience, the problem is divided into several studies, as follows:

Study A. A comparative study of different subjects of each school with the same subjects in the other schools and with the average cost of the same subjects for all schools.

Study B. A comparative study of the first, second, third, and fourth year subjects of each school separately and of all schools as a unit; the same study of the solid and non-solid subjects and of the four required subjects for graduation.

Study C. A study of the most expensive subjects - the upper ten per cent and upper five per cent - and the investment in the same.

The specific purpose of each study may be thus stated. The purpose of the first study -Study A- is to bring to view any considerable lack of uniformity that existed among the schools. The purpose of Study B is to point out a variation of cost of the subjects of the different years, of different groups of subjects, and of the subjects specifically required for graduation. The purpose of the third study - Study C - is to show what the most expensive subjects were and the amount invested in them as compared with the other subjects.

Explanation of terms used. The total cost of each school is divided into seven items, as follows: (1) Five per cent of the cost of the site, buildings, and general equipment; (2) Five per cent of value of special equipment of departments; (3) Overhead expense; (4) Salaries of principals and vice principals; (5) Salaries of teachers; (6) Maintenance and operation; (7) Educational supplies.

Under the first item, the term "general equipment" embraces all equipment of the building that is not used for instruction by particular subjects or departments of the school. Heating and ventilation apparatus, light fixtures, desks, chairs, etc., all come under this head.

By special equipment of departments is meant the equipment that is used for the instruction of particular subjects. It includes globes, maps, charts, models, musical and drawing instruments, and the equipment for the study of the sciences and industrial arts, etc., that are intended to be usable for a number of years.

Overhead expense consists of salaries of superintendents and other employees of the district who are not directly connected with any one school, telephone and signal service, office and shop expense, printing and election expense.

To the item of "Salaries of principal and vice principal" is charged all of the salary of the principal and that proportion of the vice principal's time that he devoted to office work. If the vice principal taught three classes a day, two-fifths of his salary is charged to "Salaries of principal and vice principal" and three-fifths to "Teachers' salaries" while school is in session. The eleventh monthly salary of the vice principal is charged to "Salaries of principal and vice principal"

Under the item "Maintenance and Operation" are included the salaries and supplies of custodians and engineers, the cost of fuel, water, light, and power and repairs. "Educational Supplies" for departments includes those materials that are intended to last only one year. It includes such materials as chemicals and other laboratory supplies, basket balls, etc.,

The classification for equipment and supplies given in "Handbook of Instructions for Recording Disbursements for School Purposes" is used as a guide as far as possible in listing equipment and educational material. The handbook referred to above is published by C.F. Williams & Son, Incorporated, Albany, N. Y. The book was compiled by Hiram C. Case, Chief, Statistics Division N. Y. State Education Department. The lists of articles given in the handbook as equipment and supplies are found on pages 23 to 25 inclusive.

By the term "Cost per Pupil Recitation (P-R)" is meant the cost to the district for one recitation period. The method of finding the cost per

P-R and median of costs per P-R will be discussed in connection with each of the items of expenses later.

In Kansas City there are five high schools, four for white pupils and one for the colored. Lincoln is the name of the colored school. The schools for the white pupils are Central, Manual Training, Northeast and Westport. Central, Northeast and Westport are of the regular academic type. Manual Training is the special high school, offering many courses designed to prepare students directly for a vocation that are not offered in either of the other schools.

C H A P T E R I

D A T A

SECTION 1.

Sources and nature of the data. The data used in this study was secured from the different high school records and from the records in the offices of the superintendent of the Kansas City schools and the secretary of the board of education. The record of the attendance at all highs was complete for all classes excepting for that of music in the Lincoln (colored) high school. Considerable time and attention was devoted to music at the Lincoln, one teacher having given all of his time to this work. But no credit was given on music the and no record of attendance was made. The records on the cost of sites, buildings, general equipment, special equipment, overhead expense, cost of instruction, maintenance and operation of plants, repairs and supplies, all appeared complete excepting for the equipment of the domestic science department of Lincoln. The value of that equipment was estimated by the teacher of the department.

SECTION 2.

Collecting and tabulating date. For five per cent of the cost of sites, buildings and general equipment. The costs of the site, of the building and the general equipment of the respective schools were added and of the sum five per cent was taken. The apportioning of the total cost to each subject in a school was based upon attendance. For instance, the five per cent of the total of the costs of site, building, and general equipment of the Manual Training high school was divided by the total attendance of all pupils for the entire year and the quotient thereof was multiplied by the total attendance for the year for Freshman English. That gave the cost to Freshman English for "Five per cent of site, building

and general equipment". Since the cost is apportioned upon attendance, the cost per pupil recitation is, of course, the same for all subjects.

For five per cent depreciation on value of equipment of departments. If the equipment is used for only one subject - say Physiology- five per cent of the value of the entire equipment is charged to that subject and the cost per pupil recitation is found by dividing the value of the equipment by the total attendance for the subject. But if the equipment was used for more than one unit of the same subject - say first and second years of cooking - the method pursued is as follows: The total attendance of all classes of the first and second year classes was added and five per cent of the total cost of the cooking equipment was divided by the total attendance. This quotient was then multiplied by the total attendance of all of the first year classes for the cost to the first year classes and by the total attendance of the second year classes for the cost to the second year classes. The cost per pupil recitation is equal to the five per cent of the total cost of the equipment divided by the total attendance of all of the classes of all units considered. Taking the two years of cooking again as an example, the cost per pupil recitation is the quotient of the five per cent of the cost of the cooking equipment divided by the sum of the total attendance of all classes of both years. This method is necessary because the data on the equipment for the department is not classified by years for use.

The distribution of overhead expense and salaries of principal and vice principal are based upon attendance.

An explanation of the distribution of teachers' salaries can best be made clear by use of illustration. For finding the total cost of teachers' salaries, Virgil in Central is taken for an example. There were only two classes during the year, one the first term and one the second term. The

teacher of Virgil had five classes each term. Consequently the total cost of Virgil for the year was equal to two times the monthly salary of the teacher inasmuch as there were five months in each term and the teacher had five classes daily during each term. Had the teacher had six classes instead of five during the first term and five during the second term, the cost would have been found by taking five-sixths of the teacher's monthly salary for the first term cost and the exact monthly salary of the teacher for the cost of the second term. The cost per pupil recitation is found by dividing the cost of the class for the year by the attendance of the class for the year. The median cost per pupil recitation of any subject is the median of the costs of all of the classes of the subject.

The distribution of the cost of maintenance and operation is based upon floor space. The method used is the following: the total floor space in square feet of all rooms of the school (counting the class rooms only) was first found. The total cost of maintenance and operation of the building was then divided by two times the total floor space, which gave the cost per square foot per term. Next, the floor space of each room was multiplied by the cost per square foot which gave the cost of the room for the term. Then the cost of the room was divided by the number of classes held daily in the room. This gave the cost of the room per class for the term. To find the cost of the room per pupil recitation of any class the cost of the room per class for the term was divided by the total attendance of the class. For example, in Central the total floor space in use was 45,148 square feet. The cost of maintenance and operation was \$18,593.43. Dividing \$18,593.43 by twice 45,148 gave \$.206, the cost per square foot per term. Room 209 contains 1050 square feet of floor space. Thus the cost of this room per term was $1050 \times .206$ or \$216.30. The room was occupied by five classes the

first term and by six classes the second term. Hence to get the cost of the room per class for the first term \$216.30 was divided by five and for the second term six was used as the divisor. Thus the cost of the room per class the first term was \$43.26 while ^{for} the second term the cost per class was only \$36.05. To find the cost per pupil recitation of any class held in room 209 the first term, \$43.26 was divided by the total attendance of the class for the term.

The distribution of the cost of educational supplies was made in the same way that that of special equipment was made.

SECTION 3.

In the collection and distribution of the data, five students of the Polytechnic Institute who had had considerable experience in the office of the Director of the Bureau of Research and Efficiency of the Kansas City schools at compiling data assisted.

CHAPTER II

STUDY A.

SECTION 1.

The Problem. The problem of this study is to ascertain the variation in the cost of groups of studies of the same type in the different schools. It is the purpose to answer these questions through this study. How do the costs of all subjects of the different schools compare? How do the costs of the solids of the different schools compare? How do the non-solids compare? How do the costs of those subjects that are specifically required of all pupils for graduation compare? What are the chief causes of the differences in cost?

SECTION 2.

Explanation of tables I A, I B, I C, I D, I E, and II. These tables are found in the Appendix, pages II-XIV. Since these tables are referred to very frequently in the course of the thesis, a thorough understanding and appreciation thereof are important at this point. Hence a discussion of the tables is given here before entering into the study of the different problems.

Table I A shows in detail the cost of each subject pursued at Central. It gives the investment in each subject as ascribed to each of the seven items of cost and the total of the seven items of cost for each subject. It also gives the median cost per pupil-recitation (Indicated by P-R in the tables) of each subject as ascribed to each

of the seven items of cost and the total of the median costs per P-R of the seven items.

Reading the table from left to right, the list of subjects that were pursued are seen in a verticle column at the left. The first column of figures to the right of the list of subjects shows the amount invested in each subject as ascribed to Item I (Five percent of the cost of the site, building, and general equipment). For Item I the investment in each subject is apportioned according to the attendance of the classes of each subject; hence the cost per P-R is the same for each subject for this item and is indicated only at the bottom of the table. Next to the right of the "Investment" under Item I is found the investment in and the median cost per P-R of each subject as ascribed to Item II (Five percent depreciation on the value of the special equipment of departments). For instance, the investment in Botany for Item II is \$53.58 and the median cost per P-R is \$0.003. It may be noted that the investments in Physiography and Zoology under Item II are \$4.70 and \$6.91 respectively but the cost per P-R for neither subject is given. The cost per P-R is not given because it is less than one mill for these subjects and thus it is considered negligible..Throughout these tables no cost per P-R is recorded that is less than one mill. Next to the cost per P-R of Item II is found the investment in the different subjects as ascribed to Item III (Overhead Expenses) and next to that comes

Item IV (Salaries of Principal and Vice Principal).

The cost per P-R is the same for each subject of each of these two items respectively, as for I, and hence is indicated at the bottom of the table for each item. Next to the right of the investment of the different subjects in Item IV is found the investment in and the median cost per P-R of each subject as ascribed to Item V (Salaries of Teachers); next to that is given the same for Item VI (Cost of Maintenance and Operation) and next to that is found the same for Item VII (Cost of Educational Supplies). At the right of the cost per P-R for Item VII is given the total investment (The sum of the investments of the seven or less items) for each subject and the total of the cost per P-R of the different items for each subject. Thus, observing the first subject, English I, given in the table it may be noted that its investment as ascribed to Item I is \$2024.24; to Item II, nothing; to Item III, \$465.17; to Item IV, \$289.92; to Item V, \$4444.56; to Item VI, \$917.27; to Item VII, nothing; and the total investment in all items is \$8114.04. Likewise, it may be observed that the median cost per P-R of the same subject, Item I, is \$0.022; for Item II, nothing; for Item III, \$0.005; for Item IV, \$0.003; for Item V, \$0.05; for Item VI, \$0.008; for Item VII, nothing; and for the total of all items for cost per P-R, \$0.088. In like manner each subject may be traced across the table and the cost ascribed to the different

items thereof noted.

At the bottom of the table is given the total amount invested in each item by all subjects and the grand total amount invested in all items by all subjects. For instance, the total amount invested by Central in Item I by all subjects is \$27216.83, and the grand total invested in all items by all subjects is \$121,332.04.

Tables I B, I C, I D, and I E show in detail the cost of Manual Training, Northeast, Westport, and Lincoln high schools respectively, in the same manner as I A does for Central.

The chief values of these tables lie in their exhibition of:

- (1) The particular item of cost that is responsible for the high cost of any subject; and
- (2) The great variation in the cost of different subjects.

It may be noted from these tables, for instance, that great variations of cost are found in Items V and VI (Teachers' Salaries and Maintenance and Operation), which are responsible for the wide variation in the total cost per pupil-recitation.

For example, table IA (Central) shows that the total cost per pupil recitation of German IV was 53 cents and 9 mills while that of English IV was only 8 cents. The cost of these two subjects so far as items I, III and IV are concerned was the same, as may be seen on the table, but the cost of German IV for teachers' salaries was 44 cents and 5 mills while that of English IV was only 4 cents and 5 mills and therein lies the chief cause of the difference of the cost of the two units.

Table II (See Appendix) shows median cost per pupil recitation of every subject of each school, the total investment in each subject of each school, the median cost per pupil recitation of all subjects of each school and the total investment of all subjects of each school.

SECTION 3.

A study of the fifty-four subjects common to the four schools for white children. On this study Table III pages 13 and 14 shows the cost of instruction (teachers' salaries) and of maintenance and operation of each of the fifty-four subjects. It also shows the average cost of instruction and of maintenance and operation of each subject for the four schools. This is given at the right side of the table. At the bottom of the table is given the total number of subjects of each school that are above the average of the four schools in cost of teachers' salaries and cost of maintenance and operation in each school.

These figures show that Northeast had the largest number of subjects that were above the average of the cost of maintenance and operation and that Central had the next largest number, Northeast having thirty-three subjects, Central having thirty-one, Westport having nineteen and Manual Training sixteen. For cost of teachers' salaries Manual Training had the

largest number of subjects above the average and Northeast next to the largest number; Manual Training, thirty-three; Northeast, twenty-five; Westport, twenty; and Central only nine. Adding the number of subjects of each school of which the teachers' salaries and maintenance and operation are above the average, Northeast ^{has} the largest number, having eighty-eight, Manual Training has the next largest number, having forty-nine, while Central and Westport have forty and thirty-nine respectively.

TABLE IV.

Table showing cost per pupil recitation of fifty-four subjects for (1) Five per cent of site, building, and general equipment, (2) Overhead expense, and (3) Salaries of principal and vice principal of each school.

	Central	M. T.	Northeast	Westport
Five per cent of site, etc.,	\$.022	\$.015	\$.029	\$0.17
Overhead expense	.005	.005	.006	.004
Salaries of principal and vice principal	.113	.004	.003	.003
Total	<u>\$.030</u>	<u>\$.024</u>	<u>\$.038</u>	<u>\$.024</u>

The above table shows that the variation in the cost per recitation of the three items considered is slight, the total of the three items for the highest school (Northeast) being only fourteen mills higher than of the two lowest schools (Manual Training and Westport). This variation is due chiefly to the difference in the value of sites and buildings.

TABLE V, page 15, shows the total cost per pupil recitation of each of the fifty-four subjects common to the four white schools; ^{also} the median of the cost of the fifty-four subjects of each school and of the solid subjects and

non-solid subjects at the bottom of the table. It also shows the average cost of each subject for the four schools. This is given at the right of the table.

Totaling the subjects of each school that cost most compared with the cost of the same subject in the other schools and doing the same with those that cost the least, the following is found:

Number of subjects of Northeast that cost most - twenty-eight

Manual Training that cost most - fifteen

Westport that cost most - six

Central that cost most - five

Westport that cost least - twenty-one

Central that cost least - seventeen

Manual Training that cost least - twelve

Northeast that cost least, - four

TABLE III.

Table showing cost of Teachers' salaries and maintenance and operation on fifty-four common subjects.

	Central		M. T.		Northeast		Westport		Average	
	Tchs. M.& O.		Tchs. M.& O.		Tchs. M.& O.		Tchs. M.& O.		Tchs. M.& O.	
Eng. 1	\$.050	\$.008	\$.051	\$.006	\$.060	\$.008	\$.048	\$.006	\$.052	\$.007
2	.043	.009	.036	.005	.047	.008	.057	.007	.045	.007
3	.052	.007	.066	.007	.058	.008	.055	.006	.057	.007
4	.045	.005	.061	.007	.078	.006	.058	.005	.060	.005
Alg. 1	.056	.008	.060	.007	.051	.007	.057	.008	.056	.007
2	.063	.008	.074	.006	.105	.015	.075	.010	.079	.009
Geom.Pl.	.052	.008	.059	.006	.057	.009	.068	.008	.059	.007
Sol.	.091	.013	.215	.018	.107	.015	.088	.012	.125	.014
Trig.	.165	.026	.116	.011	.087	.010	.098	.011	.116	.014
Psychol.	.109	.018	.186	.013	.066	.007	.072	.007	.108	.011
Physiog.	.032	.009	.072	.015	.035	.016	.046	.013	.046	.013
Physiol.	.037	.019	.045	.017	.057	.015	.063	.014	.050	.016
Botany	.038	.013	.124	.031	.058	.017	.051	.013	.067	.018
Zool.	.046	.012	.050	.022	.061	.017	.043	.017	.050	.017
Chem.1	.070	.028	.078	.020	.085	.017	.067	.012	.075	.019
H.H.	.073	.028	.068	.019	.124	.025	.069	.011	.083	.020
Phys.	.072	.039	.072	.023	.100	.026	.072	.014	.079	.025
Hist.Anc..	.044	.007	.055	.009	.046	.007	.044	.005	.047	.006
M.&M..	.043	.007	.066	.010	.059	.009	.050	.005	.054	.007
Civics	.059	.008	.087	.006	.048	.006	.064	.009	.064	.007
Econom.	.034	.007	.074	.012	.099	.017	.074	.014	.070	.012
Lat. 1	.065	.012	.034	.004	.057	.007	.056	.008	.053	.007
Caesar	.063	.016	.094	.012	.070	.009	.074	.009	.075	.010
Cicero	.086	.012	.086	.010	.078	.010	.070	.009	.080	.010
Virgil	.202	.043	.451	.054	.071	.010	.093	.009	.204	.029
German 1	.050	.006	.056	.005	.082	.010	.055	.007	.060	.007
2	.043	.005	.122	.012	.076	.007	.053	.006	.073	.007
3	.067	.009	.097	.010	.074	.007	.078	.009	.079	.008
French 1	.089	.011	.121	.008	.072	.010	.046	.006	.082	.008
2	.136	.014	.165	.013	.068	.009	.052	.008	.105	.011
Span. 1	.020	.006	.050	.004	.036	.007	.069	.010	.043	.006
2	.033	.011	.104	.010	.082	.018	.083	.028	.075	.016
Book. 1	.045	.007	.066	.010	.033	.011	.050	.014	.048	.010
Sh.Hd. 1	.048	.029	.047	.007	.036	.006	.063	.012	.048	.013
2	.048	.020	.071	.009	.048	.052	.065	.011	.058	.023
Com.Geog..	.021	.013	.058	.009	.038	.016	.053	.005	.042	.010
Arith..	.032	.007	.063	.004	.056	.007	.079	.009	.057	.006
Law	.030	.006	.058	.017	.127	.018	.055	.016	.067	.014
TypeWr.1	.015	.005	.031	.003	.029	.006	.045	.007	.030	.005
Penman.	.018	.005	.038	.007	.029	.006	.109	.036	.048	.013
Draw.F.H1.	.064	.011	.036	.007	.071	.022	.041	.014	.053	.013
2.	.080	.020	.044	.009	.145	.032	.081	.034	.088	.023
Mch.1.	.071	.019	.051	.023	.096	.017	.043	.012	.065	.017
Joinery	.071	.091	.061	.028	.067	.057	.094	.038	.073	.053

	Central		M. T.		Northeast		Westport		Average	
	Tchs. M. & O.		Tchs. M. & O.		Tchs. M. & O.		Tchs. M. & O.		Average	
Turning	\$.061	\$.068	\$.094	\$.030	\$.072	\$.056	\$.089	\$.059	\$.079	\$.053
Forging	.112	.335	.096	.077	.176	.163	.205	.224	.147	.204
D. Sci. 1	.033	.016	.052	.018	.076	.021	.052	.018	.053	.018
2	.126	.057	.092	.032	.204	.057	.051	.017	.108	.040
D. Art 1	.056	.022	.079	.020	.069	.030	.055	.016	.064	.022
2	.060	.027	.082	.022	.064	.029	.057	.016	.065	.023
Gym. 1	.026	.031	.042	.009	.034	.029	.064	.051	.041	.030
Eloc. 1	.032	.014	.071	.008	.039	.009	.053	.013	.048	.011
Pub.Sp. 1	.043	.018	.160	.023	.154	.037	.077	.019	.108	.024
Music 1	.035	.014	.113	.012	.051	.014	.031	.008	.057	.012
Medians	.050	.012	.069	.010	.067	.012	.060	.011		
No. subjects above average	9	31	33	16	25	33	20	19		

TABLE V.

Table showing total cost per P-R on fifty-four subjects.

	C.	M.T.	N.E.	W.	Average
English 1	\$.088	\$.081	\$.106	\$.078	\$.088
2	.082	.065	.093	.088	.082
3	.089	.097	.104	.085	.093
4	.080	.092	.122	.087	.095
Algebra 1	.094	.091	.096	.089	.092
2	.101	.104	.158	.109	.118
Pl.geom.	.090	.089	.104	.099	.095
Sl. Geom.	.134	.257	.160	.124	.168
Trig.	.221	.151	.135	.133	.160
Psychol.	.157	.223	.111	.103	.148
Physiog.	.072	.111	.094	.085	.090
Physiol.	.087	.086	.110	.102	.096
Botany	.106	.183	.141	.092	.130
Zool.	.111	.098	.152	.136	.124
Chem. 1	.136	.132	.152	.109	.132
H.H.	.139	.121	.199	.110	.142
Physics	.172	.127	.191	.089	.143
Hist.Anc.	.071	.088	.091	.073	.080
M.& M.	.080	.100	.106	.079	.091
Civics	.097	.117	.092	.097	.100
Econ.	.071	.110	.154	.112	.111
Lat. 1	.107	.062	.102	.089	.090
Caesar	.109	.130	.117	.107	.115
Virgil	.275	.529	.119	.126	.262
German 1	.086	.085	.130	.086	.096
2	.078	.158	.122	.083	.110
3	.106	.131	.120	.111	.117
French 1	.130	.153	.120	.076	.119
2	.180	.202	.115	.084	.145
Spanish 1	.056	.078	.081	.103	.079
2	.074	.138	.138	.135	.121
Book.	.082	.103	.071	.088	.086
Short. 1	.107	.081	.080	.099	.091
2	.098	.107	.138	.100	.110
Com.Geog.	.067	.091	.092	.082	.080
Arith.	.069	.091	.101	.112	.093
Law	.066	.099	.181	.095	.110
Type W. 1	.100	.122	.141	.154	.129
Penmanship	.106	.138	.146	.338	.182
Draw.F.H.1	.210	.146	.302	.160	.204
2	.224	.166	.446	.280	.279
Mch.1	.246	.202	.308	.160	.229
Joinery	.420	.268	.386	.344	.354
Turning	.338	.308	.360	.374	.345
Forging	.992	.478	.894	1.020	.845
D. Sci. 1	.242	.222	.312	.220	.249
2	.510	.330	.640	.218	.424
Art 1	.220	.241	.278	.192	.234
2	.238	.256	.266	.196	.239

TABLE V.

	Continued.				
	C.	M.T.	N.E.	W.	Average
Gym. 1	\$.176	\$.150	\$.206	\$.280	\$.203
Eloc. 1	.152	.206	.172	.180	.177
Pub.Sp. 1	.182	.414	.458	.240	.323
Music 1	.158	.312	.208	.126	.201
For 54 units					
Median	.107	.130	.136	.107	.113
For solids					
Median	.95	.152	.119	.110	.110
For non-solids					
Median	.222	.226	.305	.219	.236

TABLE VI.

The following table shows in summary the findings of the fifty-four subjects common to the white schools.

	Central	M. T.	Northeast	Westport
Median cost per P-R for sites, bldgs., general equipment, overhead expenses, principal and vice principal	\$.0298	\$.024	\$.038	\$.024
No. subjs. of max. cost for total cost per P-R	5	15	28	6
No. subjs. of min. cost for total cost per P-R	17	12	4	21
No. subjs. above avg. cost for teach. salaries	9	33	25	20
No. subjs. above avg. cost for M. & O.	31	16	33	19
No. subjs. above avg. cost for teach or M. & O.	40	49	58	39
Med. cost per P-R for teachers salaries	\$.050	\$.069	\$.067	\$.060
Med. cost per P-R for M. & O.	.012	.010	.012	.011
Med. cost per P-R of totals	.107	.130	.136	.109
Med. cost per P-R of totals of solids	.095	.152	.119	.110
Med. cost per P-R of totals of non-solids	.222	.226	.305	.219

The first line of figures across the page of the table above shows that the cost of sites, buildings, overhead expense and principal and vice principal combined is highest in Northeast and next highest is Central. This is due chiefly to the greater value of the buildings of Northeast and Central than those of Westport and Manual Training. The cost per pupil recitation for this first item is the same on all subjects as the proportionment is made upon attendance. But in the study of the total cost per pupil recitation of subjects, these costs must be considered when the total expenses of each school are studied. To ascertain the running expenses of any subject in a school the cost per pupil recitation of sites, buildings, and general equipment must be subtracted from the total cost per pupil recitation of any subject. To understand the cause of the difference in the number of maximum and minimum subjects in the different schools it is helpful to study the figures that represent the number of subjects

that were above the average of all schools for teachers' salaries and maintenance and operation. The answer to the question, "Why has Northeast twenty-eight maximum subjects, while Manual Training has only fifteen and Westport and Central only six and five respectively?" is to be found largely in the fact that while Northeast had twenty-five subjects whose costs for teachers' salaries were above the average of the four schools, Central had only nine subjects and Westport had only twenty; and while Northeast had thirty-three subjects that were above the average in cost of maintenance and operation, Central had thirty-one, Westport had only nineteen and Manual Training only sixteen. When looking for a reason why on the combined number of subjects that were above the average for teachers' salaries and maintenance and operation, Northeast had fifty-eight as compared with forty-nine for Manual Training, forty for Central and thirty-nine for Westport and why Northeast had twenty-eight maximum subjects while Manual Training had fifteen and Westport and Central had only six and five respectively, there are two helpful observations that may be made from the data of the fifty-four subjects. As noted above it is seen that Northeast had twenty-five subjects above the average while Westport and Central had only twenty and nine respectively for cost of teachers' salaries; and Northeast had thirty-three subjects while Central, Westport and Manual Training had thirty-one, nineteen and sixteen respectively for cost of maintenance and operation. Thus it is seen that Northeast had the largest number of subjects that were above the average for teachers' salaries and was next highest in number of subjects that were above the average for maintenance and operation.

Likewise, the cause of the median of the total cost per pupil recitation of Northeast being highest of the four schools is shown by the data to be due to the fact that Northeast had the highest cost of teachers' salaries, and of cost of sites, buildings and general equipment; and is equal to or greater than any of the others on the cost of maintenance and operation.

To answer the question, "Why did Northeast have so many more subjects than Westport and Central that were above the average cost for teachers' salaries and why was her median cost highest?" three conditions must be considered. (1) The average salary of the teacher of each. (2) The number of classes taught by the teachers of each school. (3) The attendance of the various classes. For the difference between the number of subjects that were above the average in cost of maintenance and operation for the schools and the difference between the median costs per pupil recitation for maintenance and operation, several factors are largely responsible, namely: (1) The median number of classes held in the rooms. (2) The size of the rooms. (3) The attendance of classes. (How these conditions operate will be made clear by reading page 7 which explains the method of apportioning the cost of maintenance and operation.)

Concerning the average salaries of teachers of each school, this was found.

The average salary for Central, \$136.55

The average salary for Manual Training, \$138.65

The average salary for Northeast, \$136.58

The average salary for Westport, \$141.87

The following table shows the variation in the number of classes taught by different teachers and the average number of classes taught per teacher in each school. Since some teachers had more classes one term than the other term, the classes of each term were counted as units and the teachers counted twice. Only those teachers that were employed for full time were considered in this study.

	Number of teachers having						Avg. no. classes per teacher
	3 classes	4 classes	5 classes	6 classes	7 classes	8 classes	
Central	2	0	66	20	0	0	5.18
Manual Trg.	3	11	65	11	3	1	5.03
Northeast	4	0	64	20	0	0	5.13
Westport	0	2	94	24	1	0	5.07
Lincoln	3	0	11	14	2	0	5.40

This table shows that the Lincoln teachers taught most classes, more than half of them having more than five classes daily. Of the four white schools, Central teachers taught most and Northeast next to the most, Central having an average of 5.18 classes per teacher and Northeast 5.13, while Westport and Manual Training had 5.07 and 5.03 respectively.

These two tables--the one on the average salaries of teachers and the average number of classes taught by teachers--show that the high cost of teachers' salaries per pupil recitation for Northeast is not due to high average salaries of teachers nor to teachers having a low average number of classes. Northeast ranks next to the lowest in the average of teachers' salaries, being only three cents higher than the lowest, while it is \$5.29 lower than the average of the highest. And on the other hand, Northeast ranks next to the highest in the average number of classes taught

by the teachers. These two facts having been established, it is evident that a small average attendance is responsible for the high cost of Northeast as compared with the other schools. The cause of the high cost of instruction for Manual Training is quite evident inasmuch as the average number of classes per teacher is lowest of all of the schools and the average salary paid the teachers is next to the highest of all of the schools.

In studying the causes of the differences in the cost of maintenance and operation, it is found that the fuel cost for Central was \$5.80 per pupil for the year; for Manual Training, \$4.34; for Northeast, \$4.66; for Westport, \$4.04. These figures were gotten by dividing the total cost of fuel by the average daily attendance of the school. This shows that Central was most expensive and Northeast next to the highest.

Concerning the number of classes held in the different rooms of the different schools the following was found:

	Central		Man. Trg.		Northeast		Westport	
	1st T	2d T	1stT	2dT	1stT	2dT	1stT	2dT
No. rooms having 1 class daily	1	1	0	0	0	0	0	1
2	0	0	0	0	2	1	2	1
3	2	2	1	2	3	2	0	0
4	2	0	4	2	1	2	1	2
5	20	26	4	5	26	26	0	0
6	18	14	6	7	15	15	14	13
7	0	0	9	10	0	0	17	20
8	0	0	11	9	0	0	12	9

The above table shows that in a majority of the rooms in Central five or six classes were held daily; in a majority of the Manual Training rooms, seven or eight classes were held; in Northeast, five or six classes were held in a majority of the rooms; and in Westport, seven or eight classes were held in a majority of the rooms.

The average size (floor area) of all of the rooms used for classroom purpose in the schools is as follows:

Central,	1049.2 square feet
Manual Training,	844.8
Northeast	1166.4
Westport	951.3

In tabulating the above three points the following is seen:

	Rank of schools:			
	Central	Manual Trg.	Northeast	Westport
In high cost of fuel	1	3	2	4
In least use of rooms	1	2	1	2
In size of rooms	2	4	1	3

These figures show in a comparative way the principal causes of the differences in the cost of maintenance and operation of the schools. In other words, the causes of the median cost per pupil recitation for Central and Northeast, each being 12 mills, while that of Manual Training and Westport is 10 and 11 mills respectively and the reasons for Central having thirty-one subjects and Northeast thirty-three above the average cost of the four schools, while Manual Training and Westport have only sixteen and nineteen respectively are to be found largely in these facts:

(1) The size of the rooms, on the average, in Central and Northeast, is larger than are those of Manual Training and Westport.

(2) Central and Northeast made less use of the rooms than did Manual Training and Westport.

(3) Since the amount of fuel required to heat a room is in proportion to the size of the room and since the less the number of classes held in a room, the larger is the number of rooms required to accommodate a given number of classes, the cost for fuel is highest for the schools having the larger space to heat and making the least use of the space that is heated, as was the case with Northeast and Central.

Table VI, page 17, also shows that the median cost per pupil recitation of the solid subjects that are common to the four schools is highest for Manual Training and next highest for Northeast, the former having as its median \$.152 and the latter \$.119, while Westport and Central have \$.110 and \$.095 respectively. The table shows likewise, that the median cost of the common non-solid subjects is highest at Northeast and next highest at Manual Training, the former having a median of \$.305, the latter \$.226, and Central and Westport \$.222 and \$.219 respectively.

To summarize, Table VI shows regarding the fifty-four subjects common to the four white schools:

(1) That Northeast had most subjects that cost the highest per pupil recitation and Manual Training had next to the most.

(2) That the cause of the greatest number of maximum subjects being in Northeast and the next greatest in Manual Training is in the fact that the cost of teachers' salaries and maintenance and operation are both high for Northeast, while the high cost of the Manual Training subjects is due to the cost of teachers' salaries.

(3) That Northeast and Central were far more expensive so far as Maintenance and operation is concerned than were Manual Training and Westport.

(4) That so far as teachers' salaries are concerned, Manual Training is plainly the most expensive school.

(5) That for the solid subjects, the cost per pupil recitation is highest at Manual Training.

(6) That for the non-solid subjects, the cost per pupil recitation is highest at Northeast.

(7) That for the total costs per pupil recitation of all of the fifty-four subjects Northeast is highest and Manual Training is next highest.

Section 4. Thirty subjects common to all schools.

Table 7, page 26, shows the average of the median cost per pupil recitation of each subject of the four white schools that are common to the five schools and the median cost per pupil recitation of the same subjects of Lincoln. This table shows that of the thirty subjects common to the five schools there are thirteen of the Lincoln that are above the average of the same subjects of the four white schools. On the other hand, the table shows that the median of the averages of the four white schools is less than the median of the subjects of the Lincoln, the average of the white schools being \$.113 $\frac{3}{4}$ and the median of the Lincoln, \$.117 $\frac{1}{2}$. Compared with the average of the white schools there are four subjects in Lincoln that are quite high in their cost per pupil recitation. They are household chemistry, commercial arithmetic, and domestic science I and II. The high cost of household chemistry and commercial arithmetic as compared with the same of the white schools is due in each case to small attendance in the Lincoln classes, household chemistry having an average of 3.65 and commercial arithmetic, 6.4. The high cost of the two domestic science classes was due to the Lincoln teacher having only three classes and one of the classes having an average daily attendance of only 3.3. As may also be seen from the table, the average of the median of the white schools is considerably higher than the median of the same subject of the Lincoln on domestic art I and II, joinery, turning, and Virgil. The cause of the low cost in Lincoln of domestic art I

is two-fold: (1) the salary of the teacher was low and (2) there was a low cost of maintenance and operation due to the fact that seven classes were held daily in the room and the room is small. Joinery and turning were low in Lincoln for these reasons: the teacher of these classes had six classes daily; all of the six classes were held in one and the same room, which made the cost of instruction and maintenance and operation low. The equipment for these subjects in Lincoln is quite limited.

The low cost of Virgil was due to the teacher having had six classes and all having been held in the same room, making the cost of instruction and maintenance and operation low. To look at it from another point of view, the question may be asked, "What is the cause of the high cost of domestic art I and II, joinery, turning, and Virgil in the white schools as compared with the cost of the same subject in the Lincoln school?"

To answer this question the first reference should be made to Table V, page 15 to ascertain what schools were responsible for the high average of these subjects. It shows that for domestic art I, all four white schools were higher than Lincoln, Westport having the lowest cost which is \$.192, while Northeast is highest, \$.278. The principal cause of the high cost of the white schools in this subject is the comparatively small enrollment in the classes. In Northeast the average attendance for all classes was 17 which made the cost of instruction and maintenance and operation high. In domestic art II, the same condition prevailed, the cost at Northeast being \$.266 and at Westport \$.196, and the cause of the cost is the same as for domestic art I. For joinery, Central and Northeast were the highest schools, their cost

per pupil recitation being \$.420 and \$.386 respectively as compared with \$.344 and \$.268 for Westport and Manual Training respectively. Referring to Table III, page 13, it is seen that Central's high cost is due, at least in a large measure, to a high cost of maintenance and operation; it being \$.091, while that of the other schools were \$.028, \$.057, and \$.038. And the high cost of maintenance and operation was largely due to three things; namely, comparatively small enrollment, a large room where the classes were held and only a few classes held in the room daily. Northeast's high cost was largely due to the high cost of equipment and cost of supplies. For turning all four schools were high, Manual Training being the lowest in cost. In all of these schools the high cost was largely due to small classes. The high average of Virgil was caused by Central and Manual Training and the cause in both cases was the small attendance, it being 2.8 on the average at Manual Training and 7.6 at Central. The table shows that, on the whole, the averages of the white schools are quite well balanced by those of Lincoln, the subjects discussed above being the only ones that are widely different. The difference between the average of all of the subjects in all the white schools and the median cost per pupil recitation of all subjects in Lincoln is greater than that for the thirty common subjects as the following shows:

Average of the medians of all subjects of four white schools,	\$.1275
Median of all subjects in Lincoln,	.114
Average of the median of the thirty common subjects in four white schools,	.1175
Median cost of the thirty common subjects in Lincoln,	.11375

Section 5. Subjects required for graduation in all schools.

In Kansas City a student for graduation must offer one major sequence of at least three subjects and one minor sequence of at least two subjects from mathematics, ancient language, modern language, science, history or commerce. He must also offer a second minor sequence of two subjects from the above courses or from a group of miscellaneous subjects. These requirements are in addition to the specified requirement of three units in English and one unit in algebra. A study of the cost of these four units in each school is important because these units receive the largest enrollment of any units in the schools since they are the only ones specifically required for graduation.

Table VIII

Table showing total costs per pupil recitation of the four required units.

	Central	Man. Trg.	N. E.	Westp.	Lin.	Avg.
Eng. 1	\$.088	\$.081	\$.106	\$.078	\$.075	\$.0856
2	.082	.065	.093	.088	.071	.0798
3	.089	.097	.104	.085	.071	.0892
Alg. 1	.094	.091	.096	.089	.099	.0938
Avg.	.088	.063	.099	.085	.079	

Table VIII shows the total cost per pupil recitation of each school on the four subjects absolutely required for graduation. At the bottom of the table is given the average cost per pupil recitation for the four subjects of each school and at the right is given the average cost per pupil recitation of each subject for the five schools. The averages at the bottom of the table show that Lincoln had the lowest cost and Manual Training the next lowest on the four subjects. A study of Tables I A, I B, I C, I D, and I E--see Appendix--will show that the differences of the cost is principally due to a difference in teachers' salaries. Hence a study of the cause of the difference of teachers'

salaries is important at this point. To expedite matters, only two subjects will be studied in detail instead of taking all four subjects. First and Second English are chosen for study. In this study three factors must be taken into consideration. 1. Attendance of pupils in the classes of these subjects. 2. Salaries paid the teachers who teach these classes. 3. The number of classes taught by these teachers.

The following table answers the questions that arise in connection with the first and second factors; namely, (1) What was the average attendance of the classes of these units? (2) What was the average of the salaries paid the teachers of these units?

Table IX

A	Central	M. T.	N. E.	Westp.	Lincoln
Avg. teachers' sal. 1st Eng.	\$139.00	\$126.00	\$152.00	\$134.00	\$118.00
2d Eng.	115.00	110.00	128.00	141.00	103.00
Avg. of 2 yrs.	127.00	118.00	140.00	137.50	110.50
Avg. daily attendance					
1st Eng.	28.91	27.66	24.66	26.69	26.99
2d Eng.	27.30	28.72	24.84	24.44	27.99
Avg. of 2 yrs.	28.10	28.19	24.75	25.56	27.49

The above table indicates quite clearly that the chief cause of the differences in the cost of instruction was due to the difference paid the teachers of these subjects in the different schools. Lincoln, which had the lowest total cost per pupil recitation for the four subjects as shown on Table VIII also had the lowest average salary paid her teachers of these subjects, her average being \$7.50 less than that of Manual Training,

which had the lowest average of the white schools. Again, Manual Training, which had the lowest average total cost per pupil recitation as indicated by Table VIII, likewise had the lowest average salary paid the teachers of these subjects, her average being \$9 less than that of Central, which had the next lowest average of the white schools. Also, it may be seen that Northeast, which had the highest total cost per pupil recitation of all the schools on these subjects (see Table VIII) likewise had the highest average salary paid the teachers, the average salary paid the teachers of Northeast being \$22 per month higher than was that of Manual Training.

However, the factor of attendance must not be overlooked. It does surely affect the cost, for the smaller the attendance the greater does the cost per pupil recitation become. In these subjects, however, the effect is not great as the difference in the average attendance is not great. Yet it is interesting and worthwhile to note that Northeast, which had the highest total cost per pupil recitation, had the lowest average attendance, while Manual Training, which had the lowest total cost per pupil recitation of the white schools, had the highest average attendance.

Concerning the third factor that enters into the cost per pupil recitation for instruction--the number of classes taught by the teachers--these conditions prevailed.

Lincoln had ten first year English classes (five first term and five second term) of which two were taught by a teacher who had six classes daily. Lincoln had six second year English classes (three first term and three second term) of which two were taught by a teacher who had

six classes daily. Thus one-fourth of the classes for the two years were taught by teachers who had six classes.

Central had thirty-two first year classes (sixteen first term and sixteen second term) of which four were taught by teachers who had six classes daily. None of the second year classes were taught by six hour teachers.

All of the teachers of the four required units in all of the other schools taught five classes each,daily.

In summary, judging from the study of the two subjects,it may be stated that the low average cost of Lincoln on the four required subjects as compared with the other schools was due, so far as instruction is concerned, to two things: (1) Low salaries paid the Lincoln teachers. (2) Many more of the Lincoln teachers, proportionately, taught six classes than did the teachers of the other schools.

The low average of Manual Training was due chiefly to lower paid teachers. The high average of Northeast was due to high salaried teachers and low attendance.

It is of interest to note in passing that Table VIII indicates that in every school save Westport, the cost of second year English was lower than first year English, the average for the five schools of the first year being \$.085 and that of the second year \$.079. Observation of Tables I A, I B, I C, I D, I E show that this condition was not due to any extent to a difference in maintenance and operation but rather to a different instructional cost. This condition is shown clearly in Table IX to be due to having more of the higher salaried teachers

in charge of the first year classes than of the second year classes in all schools except Westport. The attendance of two schools, Central and Westport, was slightly less for the second than for the first year, while in the other three schools the opposite condition was found. But in all cases the difference of attendance was slight. On the other hand, it will be noted that the average teacher's salary of the first year over that of the second year at Central was \$24; at Manual Training, \$16; at Northeast, \$24; and at Lincoln, \$15; Westport, on the contrary, having had an average of \$7 less the first year than the second year.

CHAPTER III

STUDY B.

Section 1. Problem of Study B.

In this Chapter two problems will be considered in order.

The problems are:

1. The average cost of groups or types of subjects in each of the schools. They will be studied under two divisions which are: (a) First year, second year, third year, and fourth year subjects, each taken as a unit.

(b) Solid and non-solid subjects, each taken as a unit.

2. The second problem of the chapter is to ascertain the consistency of the cost per pupil recitation of the different subjects of the groups of subjects studied in problem one.

A brief discussion follows of the meaning here attached to the word consistency and of the method employed with which to arrive at a knowledge of the degree of consistency that there was in the cost of the groups of studies considered. For the meaning of consistency, an illustration rather than a definition is offered here. If you compare the cost of two subjects each of which had a number of classes as did first year English and first year Algebra you may express the opinion that the classes of Algebra I were more consistent than were the classes of English I, or in other words, that Algebra I was more consistent than English I was and your

reason for thinking thus may be that you have noticed that Algebra II was less likely to make a high average cost because English I had

several classes that had a much higher cost than did any of Algebra I. But such observation is not sufficient evidence that Algebra I is more consistent than is English I for English I may unfortunately be consistent in having a high average cost. If all classes of a subject, say Algebra I, had the same cost per pupil recitation, it would be said that Algebra I was absolutely consistent. If a few of the classes cost five cents per pupil recitation and a few cost five and one quarter cents, while a few others cost six cents, but a very large per cent of the classes cost five and one half cents, it would be said that Algebra I was fairly consistent. In other words, in order to study consistency it is necessary to examine the deviations because the wider the deviations, the less the consistency.

To illustrate the method employed to find the standard deviation in the cost of the classes of any subject, the costs of first year subjects of Central are employed in the following table.

TABLE B. I.

Costs per P-R Ex. in mills	Deviations from Means	Square of Deviations
88	- 94	2401
94	- 43	1849
87	- 50	2500
106	- 31	961
97	- 40	1600
107	- 20	2601
86	- 51	2601
130	- 6	49
56	- 81	6561
82	- 5	25
210	+ 63	3969
420	+ 283	80089
<u>220</u>	+ 83	<u>6889</u>
Average 137		109894

$\frac{109894}{13} = 8453$, average of square of deviations.

$\sqrt{8453} = 91.93$, standard deviation.

Explanation. The first column of figures are the costs of the different first year subjects of Central, expressed in mills. The average of all of these figures is found to be 137. The second column shows how much above or below the average any particular subject cost was, the costs above the average having plus in front and those below having minus. The third column was found by squaring the second, and the rest of the calculations was as follows: The sum of the square of deviations was divided by the numbers of subjects considered ($\frac{109894}{13} = 8453$) and of the quotient the square root was taken ($\sqrt{8453} = 91.93$) which gave what is known as the standard deviation. To express the standard deviation in terms of per cent, the standard deviation is divided by the average and multiplied by 100 ($\frac{91.93 \times 100}{137} = 67$) which gives what is known as the coefficient of variation and expresses the degree of consistency.

A discussion of the significance and theory of Standard Deviation and Coefficient of Variation is found in the book "Primer of Statistics," by Elderton.

Section 2.

A study of 1st, 2d, 3d, and 4th year subjects.

In this study all of the subjects that were offered only to pupils of one and the same year in high school and all of the subjects which were largely pursued by pupils of only one and the same year were considered. Subjects that were offered freely to any students whether a freshman, sophomore, junior or senior were not considered. On the following page is given a table of the results found concerning the five schools for each of the four years.

TABLE B. II.

Table showing average cost per P-R, standard deviation, and coefficient of variation of the different schools by years.

CENTRAL	Average cost P-R	Stand.Dev.	Coef.of Var.
1st yr.	\$.137	91.93	67
2d yr.	.139	77.70	55
3d yr.	.219	209.56	95
4th yr.	.197	155.24	78
MANUAL TRAINING			
1st yr.	.142	72.98	51
2d yr.	.215	177.79	82
3d yr.	.220	131.38	55
4th yr.	.335	492.80	147
NORTHEAST			
1st yr.	.169	88.48	52
2d yr.	.183	102.78	56
3d yr.	.236	195.54	82
4th yr.	.259	183.48	71
WESTPORT			
1st yr.	.137	66.03	48
2d yr.	.170	92.08	54
3d yr.	.207	213.93	103
4th yr.	.217	297.37	137
LINCOLN			
1st yr.	.116	48.90	42
2d yr.	.138	61.31	44
3d yr.	.307	360.65	117
4th yr.	.241	202.26	83

Regarding the figures in the column of average cost per pupil recitation in Table BII it must be remembered that these figures represent the averages of medians of the classes of the different subjects of the year. For example, the average (\$.137) for the first year of Central was obtained through the following operations:

1. The cost per P-R of each class of each first year subject was found.
2. The medium cost per P-R of all of the classes of each first year subject was found.
3. The average cost per P-R of all of the subjects of the first year was found by taking the average of the medians of all of the subjects of the year.

In studying this table it will be seen that the lowest average cost per pupil recitation is found to be in the first year in every school. The highest average cost per pupil recitation is found to be in the fourth year in three schools, Manual Training, Northeast and Westport. For Central the third year had the highest average; it having for its average in the third year, \$.219 while that of the fourth year was \$.197. For Lincoln, the third year also had the highest average, it having \$.307 for the third year, and \$.241 for the fourth year.

In three schools, Manual Training, Northeast and Westport the average grows larger from the first to the fourth year. In studying the per cent of increase of the average cost per pupil recitation of the highest year over that of the lowest year in each school, the following was found:

Central, 59 per cent
Manual Training, 135 per cent
Northeast, 53 per cent
Westport, 58 per cent
Lincoln, 164 per cent

This means that the relation of the cost of a first year student to the cost of a third year student in Central is the ratio \$1.00 to \$1.59; the relation of the cost of a first year student to the cost of a fourth year student in Manual Training is in the ratio of \$1.00 to \$2.35; the relation of the cost of a first year student to the cost of a fourth year student in Northeast is in the ratio of \$1.00 to \$1.53; the relation of the cost of a first year student to the cost of a fourth year student in Westport is in the ratio of \$1.00 to \$1.58; and the relation of the cost of a first year student to the cost of a third year student in Lincoln is in the ratio of \$1.00 to \$2.64.

Now let us examine the consistency of the different years of each school. Again observing table BII concerning Central, these points are of interest.

The cost of the second year subjects was most consistent, the standard deviation being only 77.70 as compared with 91.93 for the first year subjects which was the next lowest. It may also be observed that the average cost of the first year subjects was lower than that of the second year subjects. From these two observations it may be concluded that while the average cost of the second year subjects was two mills higher than that of the first year subjects, yet the costs of all subjects of the second year were nearer the same than were those of the first year. In other words, there must have been more subjects in the first year that were not near the cost of the average than there were in the second year or there must have been subjects in the

first year that were further from the average than those were in the second year, one or the other or both.

The outstanding point with regard to Central is that the third year had the highest average cost and the widest variation, making it the least consistent of the four years. In examining the costs of the different subjects of each year of Central it is found that the extremes of each year were as follows:

First year,	56	420; Difference, 364
Second year,	74	338; Difference, 264
Third year,	80	992; Difference, 912
Fourth year,	66	539; Difference, 473

From the above it may be seen that the least difference between the extreme costs is found in the second year and the largest difference is in the third year which would be expected after a study of Table BII. It is also interesting to note that the difference between the extremes of the third year, or in other words, the range of variation of the third year was almost twice that of the fourth year, nearly three times that of the first year and nearly four times that of the second year.

The subjects that had the extreme costs of each of the four years were as follows:

Subjects of min.cost	Cost per P-R of Min.subjs.	Subjects of Max.cost	Cost per P-R of Max. subjs
1st yr. Spanish I	\$.056	Joinery	\$.420
2d year. Spanish II	.074	Turning	.338
3d yr. M.& M.Hist.	.080	Forging	.990
4th yr. Com. Law	.066	German IV	.539

Perhaps the unexpected thing that is brought out by the above figures is the fact that not one of the minimum cost subjects is a required subject for graduation.

In studying the consistency in the cost of the subjects by years of Manual Training these facts appear.

It is easily seen that Manuals 's highest average cost and widest variation of cost are in the fourth year. A striking point to notice regarding Manual Training is that the average cost of the fourth year subjects was more than twice that of the first year subjects and that the coefficient of variation of the fourth year was nearly three times that of the first year. The following figures which represent the extreme costs of each year of Manual Training are interesting because of the wide range between them.

Costs of extreme subjects by years and the differences

1st year, \$.062	\$.268; difference \$.206
2d year, .065	.836; difference .771
3d year, .097	.476; difference .379
4th year, .091	2.534; difference 2.443

The comparison of the figures of the second and third years are interesting because they illustrate the point that a wide variation of costs does not necessarily mean a high average cost or on the other hand that a consistent group of subjects will not necessarily need to have a low average cost. From Table BII it may be seen that the average cost of the second year was less than that of the third year, and yet the coefficients of variation of the two years as well as the difference between the extremes given above show that the variation of the

second year is greater than that of the third year. The figures show that the cost of the various subjects of the third year were more consistently higher than were those of the second year, because in spite of the fact that the cost of the highest subject of the second year was \$.836, while that of the third year was only \$.476, making the former nearly twice than of the latter, the latter, nevertheless, had the higher average cost.

The outstanding point of the Manual figures is to be noticed about the fourth year. The figures of the fourth year do not only show that this year's average cost was the highest of any in Manual and that the costs of the subjects of this year were by far the least consistent of any year in Manual but they also show that the average cost of this year was higher than that of the same year or any other year of any of the other schools and that this year is also the least consistent of any year of any school. Following are the subjects that had the extreme average costs.

	Subjs.of Min.cost	Cost per P-R of Min. Subjs.	Subjs.of Max.Cost	Cost per P-R of Max. Subjs.
1st yr.	Latin I	\$.062	Joinery	\$.268
2d yr.	English II	.065	Pattern Making	.836
3d yr.	English III	.097	Forging	.476
4th yr.	Com.Geog.and Com.Arith.	.091	Chemistry Adv.	2.534

These figures show that the specified subject for graduation - English- has the lowest average cost in two years, second and third, and that three of the highest subjects were non-solids, while the most expensive subject, not alone in Manual but in any high school in the city, was Advanced Chemistry. The high

cost of this subject was due to a very small attendance, the average daily for the year being only 1.22.

At Northeast it is found that the least consistency existed in the third year. Northeast bears the distinction of being the most consistent, high school in the city which is shown by the figures in the column of Coefficients of Variation. However, this does not indicate, it must be borne in mind, that Northeast was the least expensive school in the city. In fact Table II, page XIV* shows that Northeast was next to the most expensive school. Table BII indicates the same thing in the column of average costs. Northeast as a whole represents a fairly consistent high cost type of school.

At Northeast the extreme subjects (as to the average cost) ^{of} each year and their respective average cost were as follows

Subjs.of Min.cost	Cost per P-R of Min.Subjs.	Subjs.of Max.cost	Cost per P-R of Max.Subjs.
1st yr. Hookkp.I	\$.061	Joinery	\$.386
2d yr. Short Hd.I	.080	Draw.F.H.II	.446
3d yr. English III	.104	Forging	.894
4th yr. Com.Geog.	.092	Dom.Sci.II	.640

The above figures show that the third year of Northeast was least consistent, the difference between the extremes being \$.790 as compared with \$.548, the next greatest difference.

Westport is the only school that increased regularly both in average cost and in variation of cost from the first to fourth years. It may be noted that the consistency of the first and second years were nearly the same, the coefficients of variation being 48 and 54 respectively, while the coefficient

of variation of the third year is nearly twice that of the second year and the variation of the fourth year is a third greater than that of the second year. The cause of the wide variation in cost of the third and fourth years over than of the first and second years would make an interesting problem for further investigation. The following subjects represent the minimum and maximum average costs of each year in Westport.

Subjs.of Min.cost	Cost per P-R of Min.Subjs.	Subjs.of Max.cost	Cost per P-R of Max. Subjs.
1st yr. French I	\$.076	Joinery	\$.344
2d yr. Anc.Hist.	.073	Turning	.374
3d yr. M.& M.Hist.	.079	Forging	1.020
4th yr. Amer.Hist.	.077	4th yr.Mch.Arts	1.326

It is interesting to note that all four of the maximum subjects are in Manual Training and that three of the minimum are history, none of them a specifically required subject for graduation. In looking into the cause of the very high cost of Forging and Fourth Year Mechanical Art it was found that it was due chiefly to two things. (1) The first was the small attendance. Forging had one class of which the average attendance for the year was only 3.27 while the average attendance of the other class was only 10.79; and the average attendance for the year for fourth year Mechanical Art was only 3.84.

(2) In the case of Forging the equipment of the department and cost of supplies were very expensive while in the case of the fourth year Mechanical Arts the special equipment was very expensive.

Table BII shows that at Lincoln the first year was the most consistent of any year in any school, the coefficient of variation being only 42. The table also shows that the average cost of this year was the lowest of any year in any school. This year's record was an example of a consistent, low cost of subjects. It may also be noted that the second year of Lincoln was a close second to the first year in consistency, the coefficient of variation being only two higher than that of the first year. It was not only second to the most consistent in Lincoln but in any school.

The highest average cost and widest variation of cost for Lincoln are found in the third year. This is in most cases of high average cost and wide variation, is due largely to very small attendance in some classes. In this case the subject that had the lowest attendance and the highest average cost was Domestic Science I which had one class of which the average daily attendance for the year was only 3.8. The high cost of this subject was partly due to the fact that the teacher had only three classes daily. The low average cost of the first year was due chiefly to the fact that the cost of instruction and of maintenance and operation were both low, a large majority of the teachers having had six classes daily and most of the rooms in which most of the classes were held having been occupied by six or seven classes daily. The following table shows the subjects that were maximum and minimum for each year in Lincoln.

Subjs.of Min.cost	Cost per P-R of Min. Subjs.	Subjs.of Max.Cost	Cost per P-R of Max.Cost Subjects
1st yr.Eng.I & Civics	\$.075	Joinery	\$.234
2d yr. English II	.071	Turning	.262
3d yr. English III	.071	Domestic Sci.I	1,122
4th yr.English IC	.068	Domestic Sci.II	.648

In summing up the points that are brought out and deserve special attention in the study of subjects by years in the different schools, we have the following observations.

1. Considering the schools as a unit it is found that the average cost of second year subjects and the variation of the cost of second year subjects were not much above that of the first year subjects, the average costs of the two years being ^{\$.146 and} \$.169 respectively, while the coefficients of variation of the two years were .52 and 58 respectively. The increase in the average cost and in the variation of cost of the third year subjects over the second year subjects was markedly larger than the increase of the second over the first. The increase of the fourth year average cost and variation of costs were less than the increase of the third year over the second, the increase of the fourth year over the third year on average cost being about one half the amount of that of the second year over the first, while the increase of the fourth year over the third year was about twice that of the second year over the first, ^{yr} variation of cost. The following are the averages for each year, taking the five schools together by years.

	1st year	2d year	3d year	4th year
Avg.of avg.cost per P-R	\$.146	\$.169	\$.239	\$.249
Avg.of coef.of variation	.052	.058	.090	.103

The outstanding subject of the first year for high cost

was Joinery, it being the most expensive first year subject in every school. Turning held the highest place in the second year in every school except Northeast. Forging was highest in the third year in all schools except Lincoln.

2. Considering each school individually.

Concerning Central it was observed that her per cent of increase of the average cost per pupil recitation of the highest year over that of the lowest year was \$.059 making the relation of the cost of a first year subject to the cost of a third year subject in Central equivalent to the ratio of \$1.00 to \$1.59; whereas the first year had the lowest average cost, the second year was the most consistent.

The third year had the highest average cost and was the least consistent. The most expensive subject in Central was Forging, a third year subject, of which the average cost per pupil recitation was 99 cents.

Following are the striking points of Manual Training.

- (a) The relation of the average cost of a first year student to that of a fourth year student is in the ratio of \$1.00 to \$2.35
- (b) The highest average cost and the widest variation in the cost of subjects were found in the fourth year.
- (c) The fourth year was the highest in average cost of any year in any school and the consistency was the least of any year in that school.
- (d) The most expensive subject of the fourth year and likewise the most expensive subject in any school was Advanced Chemistry of which the average cost was \$2.534 per pupil recitation.

Northeast was plainly the most consistent school in the city which when connected up with the fact that Northeast was next to the highest in average cost brings plainly to light the fact that Northeast was the most consistent, high school in the city. The third year in Northeast, was the most inconsistent.

Westport bears the distinction of being the only school that increased regularly in both average cost per pupil recitation and variation of cost from the first year to the fourth. The per cent of increase in the average cost of the fourth year over the first year was fifty-eight. The maximum subject, regarding average cost, for each year at Westport was in the Manual Training department.

The most striking point to be observed about Lincoln is that the first year was the most consistent of any year in any school and the average cost of this year was the lowest of any year in any school. The second year was a close second to first year in consistency. The highest average cost and widest variation in cost were both found in the third year.

In observing the highest average cost and widest variation of cost for the different schools it will be seen that the average cost was highest in two schools in the third year and in three schools in the fourth year. The widest variation of cost was found in three schools in the third year and in two schools in the fourth year.

SECTION 3.

A study of solid and non-solid subjects of each school. The terms "Solid" and "Non-solid" are local. Because

little of no preparation outside of the class room is required in the non-solid subjects, two credits in these subjects are given the same value as one credit in the solid subjects. It must be remembered, however, that the cost per pupil recitation in all tables show the cost of both the solid subjects and non-solid subjects per pupil recitation per unit credit. In other words, the cost per pupil recitation for solid subjects and non-solid subjects were found by exactly the same method, excepting that one step was necessary for the non-solids that was not required for the solids. After the different steps in the calculation for the solids were completed, with the non-solids, the figures were simply doubled. Hence the cost as given in any table is for a unit's credit alike for solid and non-solid subjects. The subjects considered in this study are not merely the ones common to all of the schools but every subject offered in each school. In all schools combined there were fifty-three solids and forty-seven non-solids.

Table BIII, page 52, shows the average cost per pupil recitation, standard deviation and the coefficient of variation of the solids and non-solids of each school. It also shows the average of the solids and non-solids combined of each school and with regard to the average cost and the coefficient of variation. At the bottom of the table are given the average of the average cost of the solids of all schools combined and the same for the non-solids. The same averages are given for the coefficient of variation.

Table B III.

Table showing the average cost per P-R, the standard deviation and coefficient of variation of the solid and non-solid subjects of each school.

CENTRAL	Average cost per P-R	Stand.Dev.	Coef.of Var.
Solids	\$.131	103.24	78
Non-solids	.275	206.71	75
Average	.203		76 1/2
MANUAL TRAINING			
Solids	.186	146.78	78
Non-solids	.308	161.03	52
Average	.247		65
NORTHEAST			
Solids	.141	87.88	62
Non-solids	.328	154.52	47
Average	.239 1/2		54 1/2
WESTPORT			
Solids	.104	23.32	22
Non-Solids	.304	249.73	82
Average	.204		52
LINCOLN			
Solids	.127	84.46	66
Non-solids	.428	329.99	77
Average	.277 1/2		71 1/2
Average of solids -	.137 4/5		73 1/5
Average of non-solids -	.328 3/5		66 3/5

In this study the purpose is to compare (1) the average cost and variation in the cost of the solids and non-solids in each school as a unit and (2) to compare the same points with regard to the two groups of subjects in the entire city as a unit.

Now observing the average cost and variation of cost of Central as given in Table BIII, it will be seen that the average cost of the solids as compared with that of the non-solids was approximately one to two and that the coefficients of variation of the solids and non-solids were very nearly the same, that of the solids being only three higher than that of the non-solids. The coefficient of variation of both solids and non-solids shows that the variation of costs for this grouping of subjects was not high in either group.

Regarding Manual Training it may be observed that the average cost of the solids as compared with that of the non-solids was in the ratio of three to five and the variation of the cost of the solids was considerably greater than that of the non-solids. Considering the relation of the average cost of the solids to that of the non-solids in the light of the average of averages of the solids and non-solids as seen at the bottom of the table, the cost of the solids in Manual Training High School was markedly high while on the other hand the cost of the non-solids was considerably below the average of averages. The amount that the average cost of the solids of Manual Training was above the average of averages is more than twice the amount that the non-solids of Manual was below the average of averages.

For Northeast the table shows that the average cost of the solids as compared with that of the non-solids was about seven to sixteen and that the variation of the cost of the solids was considerably greater than was that of the non-solids. It is interesting to note that the relation between the average cost of solids and non-solids in Northeast was practically the same as the relation between the two groups for the city, which was seven to sixteen. When observing the coefficients of variation of the other schools it will be noted that the coefficient for the non-solids of Northeast was the lowest of any school and that that of the solids was next to the lowest of any school showing that whereas the solids were considerably less consistent than the non-solids yet as compared with other schools even the solids were quite consistent. Another point that the table brings to view concerning Northeast is this. The variation of the non-solids was the lowest of any school and the average cost was next to the highest of that of any school; these facts put together show that the cost of non-solids in Northeast was consistently high for it may always be concluded that the classes were consistently high if the average cost was high and the coefficient of variation was low.

Concerning Westport the table shows that the relation of the average cost of the solid subjects to that of the non-solids was one to three and that the relation of the variation of the cost of the solids to that of the non-solids was one to four. Observing the average cost and the coefficient of variation of all schools it will be seen that both of these points

were considerably lower for solids for Westport than for any other school. Thus it may be safely stated that Westport was the most consistent, low cost school so far as solids are concerned. And although the average cost of the non-solids was three times that of the solids in Westport still the average cost of Westport was next to the least of all of the schools. The fact that the coefficient of variation of the non-solids was four times that of the solids and was also the highest of any school on non-solids indicates that the variation of the cost of non-solids in Westport was very great. The following figures verify the statement regarding the condition brought^{out} in the discussion above. The non-solid subjects in Westport that had the lowest average cost was the Glee Club which had eleven cents for its average cost per pupil recitation, and, the subject that had next to the lowest average cost was Vocal Music which had twelve cents and six mills for its cost. At the other extreme are to be found Forging and fourth year Mechanical Art which had for their average cost \$1.02 and \$1.32 respectively.

The greatest difference between the average cost of solids and non-solids in any school was found in Lincoln where the ratio was one to three and one-half. It will be noted on the other hand that the variation of cost in both solids and non-solids was not great, the coefficients of variation being only 66 and 77 respectively. Lincoln bears the distinction of having the highest average cost of any school for non-solids.

Now, in studying the average cost and variation of the cost of the solids and non-solids of the city as a unit it was

found that the average of the averages of cost for the solids was \$1.328 $\frac{3}{5}$, the relation of the solids to the non-solids being seven to sixteen. The averages of the coefficients of variation of the solids and non-solids show that the cost of the non-solids was more consistent than the cost of the solids was, the average of the coefficients of the solids and non-solids being $73 \frac{1}{5}$ and $66 \frac{3}{5}$ respectively.

Two comparisons between schools on average costs, one on solids and the other on non-solids are of very great significance in this study. Table BIII shows that the average cost per pupil recitation of the solids in Manual Training exceeded the average cost per pupil recitation of the solids in Westport by eight cents and 2 mills, the relation of the average cost of the solids of Manual Training to that of Westport being nine to five. This means that for solid subjects the same credit or value was given to work that cost, relatively speaking, \$5.00 in Westport and \$9.00 in Manual Training. With regard to the non-solids the following comparison is striking. The average cost per pupil recitation in Manual Training was 27 cents and 6 mills while that of Lincoln was 42 cents and 8 mills. Putting these figures in the form of a ratio, the relation of the average cost in Manual Training to that of Lincoln is four to six. The significance of this comparison is that the same work for which \$4.00 was paid in Manual Training, \$6.00 was paid for in Lincoln.

It is interesting to note with regard to the relation between the averages of the average costs of the solids and non-solids for the city that the ratio was seven to sixteen.

This means that the same credit or value was given to work in solids that cost \$7.00 as was given to work in non-solids that cost \$16.00. In other words, the district paid on the average \$7.00 for a credit given a student in solids and \$16.00 for a credit in non-solids. Below are several questions regarding solids and non-solids that may be worthy of study.

(1) Was instruction in solids worth \$9.00 in Manual Training when only \$5.00 was paid for the same in Westport?

(2) Was instruction in non-solids worth \$6.00 in Lincoln when only \$4.00 was paid for the same in Manual Training?

(3) How much money should be invested in non-solids as compared with solids when the average cost for non-solids was \$16.00 as compared with a cost of \$7.00 for solids, for an equal credit to the student?

CHAPTER IV. STUDY C.

SECTION 1. PROBLEM OF STUDY C.

The problem of this chapter is to point out the expensive subjects of each school and show the amount invested in these subjects.

From an article entitled "Scientific Management in the Schools", written by F.E. Spaulding, Superintendent of schools, Newton, Mass., and found in the School Journal issued May 1913, the following quotation is taken: "Whether we desire to do it or not, we express our relative valuations of different subjects under given conditions by the per centage of our available funds that we expend for each",

Table II, page ^{XIV}*, shows the disposition of the budget for the Kansas City high schools for the year 1915-16 in every particular. There are an even hundred subjects invested in by one or the other of the five schools. Fifty-four of the one hundred are common to all of the white schools and thirty are common to all five schools. The table gives the price paid per pupil recitation for each subject and the amount invested in each subject by each school. At the bottom of the page are given the total amount invested in each school and the median cost per pupil recitation of all subjects in each school. This table also illustrates very clearly the value of penetrating analysis as a means of revealing significant facts; for the facts that this analysis reveals concerning the variation in the cost of different subjects are most striking.

* Appendix

An academic discussion of the value of different high school subjects educationally is interesting. But it is also futile. There can never be a permanent, universal answer given to such questions as these: Which is more valuable, a course in Latin or a course in Forging? Which is more valuable, a share in a bank or an acre of land? But there are temporary, relative, and local assignments of value of everything that man has and desires. I do not know what the absolute value of a pupil recitation in Chemistry or Forging or Greek or English is. But I am quite sure, because of local financial conditions and other considerations, that not a great deal more should be invested in Advanced Chemistry by Manual Training high school at the price of \$2.534 per pupil recitation, nor in Forging by Westport at \$1.02, nor in second year Domestic Science by Lincoln at \$1.122 when the cost of English is only \$.075 to \$.122 per pupil recitation in the different schools.

The purpose, then, of this study is not to make an attempt at assigning values to different subjects offered in the high schools but on the contrary to show the relative value assigned by the district of Kansas City for the year 1915-16 to the high priced subjects taught in the schools as compared with the median cost of all subjects offered in the schools.

SECTION 2.

The highest priced ten per cent of all subjects offered in all of the high schools.

Table II shows that Central offered sixty-two subjects; Manual Training, eighty-one subjects; Northeast, seventy-two;

Westport, seventy-three; and Lincoln, thirty-five. Thus counting each subject as many times as there were schools that had classes in the subject, the total number of subjects offered in all , schools was three hundred and twenty-three. Taking ten per cent of three hundred and twenty-three gives thirty-two and a fraction. Thus the thirty-two subjects that have the highest cost per pupil recitation in one or the other school, as indicated on Table II, are ten per cent of all subject offered in all schools and are the most expensive.

Table C I, page 61, gives these thirty-two subjects and also gives the amount of money invested in each subject. At the bottom of the page is given the average of the median cost per pupil recitation of all subjects of all schools, the total amount invested in all schools combined, and the per cent of the total amount invested that was invested in the thirty-two subjects.

TABLE C I.

Table showing the ten per cent of all subjects given in all schools that are the highest priced subjects.

School	Subject	Median cost per P-R	Amount invested
Central	Forging	\$.992	\$978.21
	Domestic Sci II	.510	1410.03
	French III	.402	384.11
	German IV	.539	323.86
	Joinery	.420	2364.30
			<u>\$5460.51</u>
Manual Tr.	Adv. Chemistry	2.534	445.20
	Machine Shop	.694	2626.51
	Electricity	.694	1344.75
	Forging	.476	2513.24
	Mch. Drawing III	.412	1025.43
	Turning II	.836	563.47
	Steam	.614	1198.51
	Virgil	.529	329.42
	Domes. Sci. III	.416	493.72
			<u>\$10540.25</u>
Northeast	Forging	.894	1578.61
	Greek II	.621	395.14
	Pub. Sp. I	.458	333.99
	H. H. Manag.	.452	170.35
	Elocution II	.386	1866.65
	Domes. Sci. II	.640	771.97
	Mch. Drawing IV	.522	868.58
	Free Hand Draw. II	.446	572.91
	Joinery	.386	2049.71
	German IV	.375	407.70
			<u>\$9015.70</u>
Westport	Mch. Art (4th yr.)	1.326	496.61
	Forging	1.020	1420.15
	Free Hand Draw. IV	.396	909.09
	Turning	.374	1760.23
			<u>\$4586.08</u>
Lincoln	Domes. Sci. I	1.122	1576.09
	II	.648	800.08
	Gas Engine	.616	921.41
	H.E.Chem.	.498	358.70
			<u>\$3656.28</u>

1. Average of median cost per P-R of all subjects of all schools - 125 mills.
2. Total amount invested in the thirty-two subjects - \$33,300.82.
3. Total amount invested in all schools for the entire year - \$550,919.35.
4. The per cent of the total investment that is invested in the thirty-two subjects - 6 plus %.

Concerning the number of subjects of the thirty-two that were located at the different schools the following was found:

	No. of the 32 subjs.	Total No. of subjs. offered
Located at Central	5	62
Manual Training	9	81
Northeast	10	72
Westport	4	73
Lincoln	4	35

This shows that nearly one third of the thirty-two highest priced subjects were located at Northeast. Twice as many were located at Northeast as at Central. More than twice as many of the subjects were pursued by pupils in Northeast and in Manual Training as were pursued at Central. At Lincoln which had only one half as many subjects in all as Westport had in all were located as many of the thirty-two as there were at Westport. Here the significant question to be asked is this. Is it equitable to have twice as many of the high prices subjects located at any one school as are located at any of the other schools of the same type?

Concerning the per cent of the total amount invested in each school that was invested in the subjects found among the thirty-two, the following was observed with regard to each school.

Central	-	4 plus %
Manual Training	-	9 plus %
Northeast	-	7 plus %
Westport	-	3 plus %
Lincoln	-	10 plus %

The above figures show that there was a great variation among the schools in the percentage of the total amount invested by each that was invested in the high priced subjects. And the

significant question here is this. Why should Northeast invest seven dollars out of every hundred on high priced subjects when Westport and Central, schools of the same type, invested only four and three dollars respectively out of every hundred invested in all subjects.

TABLE C II.

This table shows the cost per pupil recitation for each of the four white schools of those of the thirty-two subjects that were common to all four schools.

Subject	Cost at Central	M.T.	Northeast	Westport	Average
Forging	992	478	894	1020	845
Domestic Sci.II	510	330	640	218	424
Joinery	420	268	386	344	354
Turning	338	308	360	375	345
Virgil	275	529	119	126	262
Public Speaking I	182	414	458	240	323
Free Hand Draw.II	224	166	446	280	279

In observing the averages of the above table it must be borne in mind that the thirty-two subjects were not selected upon the basis of the average cost of the subjects for all schools but by counting each subject as often as there were schools that offered the subject and selecting the thirty-two highest subjects from all subjects of all schools.

Subtracting the cost of the subjects given in the above that was incurred by five per cent depreciation of sites, buildings and general equipment, and overhead expenses, the cost of instruction, maintenance and operation for each remains only and results in the following table.

TABLE C III.

This table shows the cost per pupil recitation for instruction, maintenance and operation for each of the four white schools of those of the thirty-two subjects that are common to all four schools.

Subject	Cost at Central	M.T.	Northeast	Westport
Forging	\$.965	\$.458	\$.859	\$.979
Domestic Sci. II	.483	.310	.605	.197
Joinery	.393	.248	.351	.323
Turning	.311	.288	.325	.354
Virgil	.248	.509	.084	.105
Public Speaking I	.155	.394	.423	.219
Free Hand Draw. II	.197	.146	.411	.259

In the above table a wide variation is again noted with regard to the cost of the different subjects. The widest variations, however, are to be found in Forging and Virgil. It shows that for Forging Central paid 96 cents and 5 mills per pupil recitation while Manual Training paid only 45 cents and 8 mills, Central, therefore, having paid more than twice as much for Forging as did Manual Training. Concerning Virgil it will be noted that Manual Training paid 50 cents and 9 mills per pupil recitation while Northeast paid only 8 cents and 4 mills, Manual Training thus having paid six times as much for Virgil as did Northeast.

Concerning the average price paid per pupil recitation for the thirty-two high subjects as compared with the average of the median price paid for all subjects by all high schools, this was found:

Average price paid for the thirty-two high subjects - \$.660
 Average of the median price paid for all subjects of
 all schools - \$.125
 Ratio between average cost of thirty-two subjects to average
 cost of all subjects - 5 to 1.

Concerning the amount invested in the thirty-two subjects as compared with the amount invested by all schools in all subjects, the ratio was found to be one to sixteen. The significance of this comparison is in the fact which it discloses; namely, that for every \$16.00 invested in all of the work in the high schools in Kansas City \$1.00 is invested in that ten per cent of all subjects that cost on the average five times as much as does the average of all subjects.

SECTION 3.

The highest priced five per cent of all subjects offered in all schools.

The method or basis for selecting the highest five per cent of all subjects is the same as that used in Section 2 for selecting the highest ten per cent.

TABLE C IV.

Table showing the highest priced five per cent of all subjects given in all schools.

School	Subject	Median cost per P-R	Amount invested in subject
Central	Forging	\$.992	\$968.21
	German IV	.532	323.85
Manual Training —			
	Adv.Chem.	2.534	445.20
	Turning II	.836	563.47
	Machine Shop	.694	2626.51
	Electricity	.694	1344.75
	Steam	.614	1198.51
	Virgil	.529	329.42
Northeast	Forging	.894	1578.61
	Domes.Sci.II	.640	771.97
	Greek II	.621	395.14
Westport	Mch.Arts (4th yr.)	1.326	496.61
	Forging	1.020	1420.15
Lincoln	Domes.Sci.I	1.122	1576.09
	II	.642	800.08
	Gas Engine	.616	921.41

The following observations of Table CIV are important , because they point out conditions that are not detected by a casual study of the table.

The figures below show the ratio between the average cost per pupil recitation of the subjects of each school that appear among the list of Table C IV giving the five per cent of all subjects, that are highest priced, and the average of the median cost per pupil recitation of all subjects of all schools.

Central	- 6 to 1
M. T.	8 to 1
Northeast	-5 1/2 to 1
Westport	-9 to 1
Lincoln	- 6 to 1

Here are a few questions that must be met and answered in the face of the above figures:

(1) Can the district afford to pay at Central six times as much on the average for its two most expensive subjects as the city does on the average for all work? If the answer is in the negative then one of two things must be done:

1. Conditions must be changed so that the price paid becomes reduced to that point where the district can afford to maintain them at Central, or (2) the subjects must be discontinued at Central.

(2) Manual Training offered eighty-one subjects and of that number six appear on the list of the highest priced five per cent of subjects in the city. Thus one thirteenth of Manual's subjects are among the five per cent highest priced subjects in the city. The question that these figures present for an answer is this. Can the district afford to maintain at

at Manual Training high school her present number of subjects that cost the district eight times as much as does the average of the median of all subjects of all schools? If the answer is in the negative the same problem presents itself that was found in connection with the two subjects of Central.

(3) At Westport the average cost per pupil recitation for fourth year Mechanic Art and Forging was nine times the average cost of all subjects of all schools. Can the district afford to pay nine cents for the same amount of instruction in fourth year Mechanic Art or Forging at Westport when it pays only one cent on the average for instruction on all subjects in all schools?

SECTION 4.

Sixth Hour Subjects.

In Kansas City a number of teachers teach six classes daily, considering the sixth class as being extra work donated to the district upon request of pupils for advanced work. Looking at these sixth hour classes from that point of view the teachers have been permitted in some cases to organize classes of small enrollment and thus for such classes the cost per pupil recitation was high. The following of the list of subjects that come in the ten per cent highest priced subjects in the city were subjects taught by teachers who had six classes daily.

School	Subject	Cost per P-R.
Central	German IV	\$.539
Manual Training	Advanced Chem.	2.534
	Virgil	.529
Northeast	Elocution II	.386
	Greek II	.621
Westport	Mch.Art (4th yr.)	1.326

The students who pursued these subjects were given credit on them and the subjects were regularly given in the curriculum of subjects. The record of the classes were in regular order as all other classes. Many of the Lincoln teachers taught six classes regularly and a number of the teachers of other schools taught six classes. Thus in this study the records of these special classes are considered the same as those of all other subjects.

In the future, the elimination of some of the highest priced subjects will depend upon the attitude of the Board of Education, Superintendent and Principals toward the organization of small classes upon the ground that they are special sixth hour classes. It will be noted that the two highest priced subjects that appear in the list of five per cent highest priced subjects also appear in the list of sixth hour special subjects.

Chapter V.

Summary of Observations and Conclusions.

Section 1. Each year considered as a unit.

(1) Summary of the five schools as compared with each other on the cost per pupil recitation.

Putting all of the 323 subjects of the five schools into an array according to the median cost per pupil recitation of each subject it was found that the upper and lower quartiles were represented by the schools as follows.

Table S I

Table showing the number of subjects in each school that were in the upper and lower quartiles and also showing the per cent that these subjects are of the total number of subjects given in each school.

School	No. subjs. in upper quartile	Per Cent of all subjs. in upper quartile	No. subjs. in lower quartile	Per Cent of all subjs. in lower quartile
Central	11	17.7	22	35.4
Manual Training	28	34.5	16	19.7
Northeast	21	29.1	9	12.5
Westport	15	20.5	22	30.1
Lincoln	7	20.00	11	31.4

Joinery, turning and forging are the only subjects that are in the list of upper quartile subjects of each of the four white schools. Joinery and turning are also on the upper quartile list of Lincoln, but Lincoln did not offer forging. The following of the upper quartile lists were offered in all of the white schools:

(Letters in parentheses indicate the schools of which the subject was in the upper quartile.)

1. Virgil (M.)	5. Vocal Music I (M.)	9. Mch. Draw I (N.,C.)
2. Pub. Sp. II (M.)	6. Domes. Art I (M.,N.)	10. Free Hd. Draw I (N.)
3. Domes. Sci. I (C.,N.,L.)	7. Domes. Art II (N.,M.,
C.)	11. III (M., W.)
4. Domes. Sci. II (M.,C.,L.)	8. Sol. Geom. (M.)	12. Penmanship (W.)
		13. Gym. I (W.)

In view of the fact that all of the above thirteen subjects were given in one or more of the schools at a less cost per pupil recitation than \$.234 (\$.234 is the minimum cost per pupil recitation for any of the subjects in the upper quartile list) is evidence that it is possible for all of the thirteen subjects of the above list to be given at a cost of not more than \$.234 per pupil recitation. The cause of the variation in the cost of the above thirteen subjects, as brought out in Study A, is chiefly to be found in a variation in the cost of instruction and in maintenance and operation. As to the variation in cost of instruction the cause lies in the variation (1) in the salary paid teachers, (2) number of classes held by teachers and (3) attendance of classes. As to the maintenance and operation, the cause of the variation is a variation in (1) the number of classes held in the rooms, (2) the size of the rooms, and (3) attendance of the classes.

Table S II.

This table shows the subjects of each school that are in the upper quartile list and not offered in any other school. It also gives the cost per pupil recitation of each subject.

Manual Training		Northeast	
Subject	Cost Per P.R.	Subject	Cost per P.R.
Adv. Chem.	\$2.534	Greek II	\$.621
Pattern Making	.836	H. H. Management	.451
Machine Shop	.694	Millinery	.352
Electricity	.694	Vocal Music II	.238
Steam	.614		
Domes. Sci. III	.416		
Domes. Sci. IV	.264		
Domes. Art III	.246		
Lunch	.234		
Piano	.342		
Pub. Speak. II	.264		
Printing	.252		
Office Training	.292		

Westport
Mechanic Art
(4th yr.) 1.326

Lincoln
Gas Engine .616

Central offered no subject included in the upper quartile that was not offered by any other school.

It should be noted here that Household Management in Northeast is in a measure the equivalent of Domestic Science II in Manual Training. Likewise Millinery in Northeast and Domestic Art^{III} in Manual Training are largely equivalent courses. But they appear in the records of the two schools under different names and not being identical in content they have been considered as different courses.

Comparing the schools by observing Table S I, page 69, and Table S II, we find that Manual Training has the largest number of subjects in the upper quartile and more than twice as many subjects in the upper quartile list that were not offered in any other school. Concerning these two points Northeast holds second place. Thus it is seen that the subjects responsible for the large number of subjects in the upper quartile list of Manual Training are the special subjects; that is, the subjects

that were offered by no other school.

It will be noted that all subjects in Table S II of the Manual Training list are non-solids except one, advanced chemistry. The fact that they are non-solids explains very largely the cause of the twelve subjects being in the upper quartile and the cause of the high cost of advanced chemistry as given on page 45 is chiefly due to very small attendance.

In observing the Northeast subjects in Table S II it will be seen that as in the Manual Training list all, except one, are non-solids.

Perhaps the most striking point concerning the observations on the lower quartile subjects of all of the five schools is the fact that of the eighty subjects in the lower quartile only four, commercial geography, ancient history, English II, and algebra I, are in the list of lower quartile subjects of each of the four white schools and that only two of them, English II and ancient history, appear among those of Lincoln. This emphasizes the fact that there is a great variation in the cost of the lower quartile subjects as well as in the upper quartile subjects.

From Table S I it may be observed that Central, Westport, and Lincoln are considerably higher than Manual Training and Northeast in the per cent of their entire number of subjects that are in the lower quartile. The observations of Study A reveal concerning Central the fact that the large number of comparatively low cost subjects, or, in other words, the large per cent of subjects that are in the lower quartile is chiefly due to a considerable degree of consistency in large enrollment of classes. As to Westport there were two conditions that are prominent factors in putting thirty per cent of all subjects in the lower quartile list.

The two conditions were these: (1) The enrollment was comparatively larger and (2) the number of classes held in a room was quite consistently large. Lincoln's high per cent of lower quartile subjects must be ascribed to these facts: (1) that the salaries of the teachers were low on the average and a much larger per cent of the teachers taught six classes than did the white teachers, and (2) that the number of classes held in the rooms was on the average higher than for any other school.

(2) In summary, the following are the important observations made of the different schools, each considered within itself.

1. Central.

(a) With regard to 1st, 2d, 3d, and 4th year subjects.

The lowest average cost per pupil recitation was found to be in the first year, the highest was for the third year. The relation of the average cost of a first year unit to that of a third year unit is $\frac{59}{100}$ in the ratio of 1 to $1 \frac{59}{100}$ or in round numbers the ratio is 1 to $1 \frac{1}{2}$.

Concerning the consistency in the cost per pupil recitation Study B shows that the second year subjects rank highest and the first year subjects rank next highest. The third year subjects had the widest variation of costs, making the cost of the subjects of this year the least consistent of all years. The difference in the average cost per pupil recitation of the two extreme subjects of the third year was more than twice the difference of the extremes of the first year.

(b) The approximate ratio of the solids of Central to the non-solids of Central with regard to the average cost per pupil recitation is 1 to 2, the average of the solids being 131 mills and of the non-solids 275. See Table B III, page 52. This table also shows that the variation in the cost of the solids and non-solids is practically the same, the coefficient of variation of the solids being 78 and that of non-solids 75. Considering the conditions under which the cost of the non-solids are obtained, it is to be expected that the average cost of the solids should be twice that of the solids. Hence, so far as the administration or organization of the school is concerned it might with justice be said that ^{the} figures show an excellent condition.

2. Manual Training.

(a) In making a summary of the observations of the average cost of the 1st, 2d, 3, and 4th year subjects of Manual Training one's attention is attracted especially to these points: (1) Both the highest average cost per pupil recitation and the widest variation in the cost of the subjects are found in the fourth year. (2) The average cost per pupil recitation of the fourth year subjects is more than $2\frac{1}{4}$ times that of the first year subjects, the average being 335 mills and 141 mills respectively, while the coefficient of variation of the fourth year subjects is nearly three times that of the first year subjects, the coefficients being 147 and 51 respectively. (3) The average cost of the second year is approximately the same as that of the third year subjects, but the variation of the second year subjects is considerably greater than that of the first year, the coefficients of variation being 82 and 55 respectively. The high average cost of the fourth year subjects is due chiefly (1) to a large number of non-solids and (2) to the extremely high cost of advanced chemistry, which is \$2.534 per pupil recitation.

(b) The average of the cost per pupil recitation of the solids, as compared with that of the non-solids, is in the ratio of 3 to 5. The variation of the cost of the solids is considerably greater than that of the non-solids. Table BIII, page 52, shows that the average cost of the solids in Manual Training is markedly higher than the average of the averages of all schools, while on the other hand, the cost of the non-solids is considerably below that of the average of the averages. However, it may be observed also from the same table that Manual Training has the next highest average for non-solids for the white schools. The high average of the solids of Manual is due to a great variation of costs and the upper extreme cost being very high—\$2.534.

3. Northeast.

(a) The average cost of the subjects of the different years increase from the first to the fourth year, the per centage of increase of the average of the fourth year over that of the first being 53. Table B II shows that the variation of the cost of the subjects of all four years is low, that of the third year being the highest. The cost of the subjects of all four years was high quite consistently.

(b) The average cost of solids as compared with the non-solids is in the ratio of 7 to 16. The grouping of the subjects of Northeast into solids and non-solids is significant because it verifies the observation under "(a)" that Northeast was high quite consistently for Table B III shows that the variation of both groups is low, being the lowest of any school and that the average cost of both groups was quite high, both being next to the highest of any school.

4. Westport.

(a) The average cost of the subjects and the variation in the cost of the subjects of each year increases from the first to the fourth. This is a condition found in no other school. The increase in per cent of the average cost of the fourth year subjects over that of the first year is 58. The cause of the increase in the average cost of the fourth year over that of the first is due to the wide variation in the cost of the subjects of the fourth year and the upper extreme subjects being very high. The costs of the two highest priced subjects of the fourth year were \$1.326 and \$1.020 respectively.

(b) Table B III shows that the relation of the average cost of the solid to that of the non-solids is 1 to 3 and that the relation of the variation in the cost of the solids and non-solids is in the ratio of 1 to 4. Westport was the most consistently low-cost school so far as solids is concerned. The cause of the high average cost of the non-solids, as compared with the solids, is due (1) to the great variation in the cost of the non-solids and (2) the upper extreme of this variation of costs being very high.

5. Lincoln.

(a) The average cost and variation in the cost of the subjects of the first year in Lincoln are the lowest of any year, and, by the way, are the lowest of any year of any school. The highest average cost and widest variation is found in the third year.

(b) The ratio of the average cost of the solids to that of the non-solids is 1 to 3 1/2. This is due to a low average cost of solids and a very high average cost for non-solids; for, observing Table B III, it will be seen that the average cost of the Lincoln solids is next to the lowest in the city and the average cost of non-solids is higher for Lincoln than for any other school, it being 30 per cent higher than the highest of the white schools.

(3) There are two possible view points from which to observe the high priced subjects of the Kansas City high schools. To group the high priced subjects of each school separately is one. To array all of the subjects of all of the schools and take the high priced subjects of the array regardless of schools is the other.

The following table shows the highest priced 10 per cent of the subjects of each school, giving also the median cost per pupil recitation of each subject and the average of the median costs of all subjects of each school.

See next page for Table S III.

Table S III.

Showing the highest priced 10 per cent subjects of each school.

Central		Manual Trg.		Northeast		Westport		Lincoln	
Subject	P.R.	Subject	P.R.	Subject	P.R.	Subject	P.R.	Subject	P.R.
Forging	\$.992	Adv. Chem.	\$2.534	Forging	\$.894	Mch. Arts	\$1.326	D. Sci. I	\$1.222
German IV	.539	Pattern Mk.	.836	D.Sci.II	.640	Forging	1.020	II	.648
D. Sci. II	.510	Electricity	.694	Greek II	.621	F.H.D.IV	.396	Gas Eng.	.616
Joinery	.420	Mch. Shop	.694	Mc. DrawIV	.522	Turning I	.376	H. H. Chem.	.498
French III	.402	Steam	.614	Pub. Sp. I	.458	Joinery	.344		
Turning	.338	Virgil	.529	H. H. Man.	.452	Penmanship	.338		
		Mech. Draw.IV	.480	F.H. DrawII	.446	Typewr. II	.312		
		Forging	.476						
Avg.	\$.533		\$.607		\$.576		\$.587		\$.721
Median of									
all subjs.	\$.107		\$.151		\$.140		\$.112		\$.114

Upon observing the figures of the table above, several questions at once arise. Is it equitable and just to give one class instruction in a subject that costs the district \$2.534 per pupil recitation, another \$1.326, when the median cost per pupil recitation for the different schools is from \$.107 to \$.151? If not, what can be done with the expensive subjects? One of two things may be done: (1) Eliminate the subjects or (2) by some means bring about a reduction in the cost of the subjects. Lincoln invested \$1560.09 in Domestic Science at \$1.122 per pupil recitation. Can the district afford to continue to invest more or even so much in this subject at the price paid at Lincoln last year?

The table also shows that a large per cent of the subjects that are most expensive are non-solids. The fact is that most non-solids are expensive, primarily because they are non-solids. Additional causes for the high cost of the extremely high non-solids is small attendance or high cost of maintenance and operation due to the fact that the rooms occupied by the classes were used by only a few classes as well as to small attendance, or both small attendance and little use of rooms. The chief cause of the high cost of the solids is small attendance.

Section 2. Summary of all schools combined and considered as a unit.

Combining the data of the five schools the following studies, in summary, are undertaken:

- (a) A comparison of the cost of subjects by years.
- (b) A comparison of the cost of solids and non-solids.
- (c) The problem of the expensive subjects.

(a) Where there is a liberal number of elective subjects in small high schools it may quite reasonably be expected that the fourth year classes, and even the third year classes, will be more expensive than the first and second year classes. This is true for several reasons among which the following are prominent: (1) Most students will work off during the first and second years as much as possible the required English, mathematics, history, foreign languages and such sciences as physiology, all of which are in themselves not expensive subjects, as less expensive equipment is required for these subjects than for such subjects in science as chemistry and physics, which are usually offered to third and fourth year pupils. Then, too, it is considered possible to conduct efficiently larger classes in English, mathematics, history and languages than in the laboratory sciences and industrial subjects. (2) Since the students are less restricted in the choice of their courses in the fourth and even in the third year than in the first two years, there is a greater demand on the part of the students of the upper two years for a differentiation of courses than there is by those of the first and second years. Thus in offering a greater number of subjects to the upper classes, while the number of students in the upper classes is fewer than in the lower classes,

it is much more difficult in the upper than in the lower classes to organize the work and classes satisfactorily from the standpoint of the student and at the same time from the standpoint of the economic administration of the school.

So far as the first reason, given above, for the increase of the cost of third and fourth year classes is concerned, the large city schools doubtless have the same condition to a great extent. But because of the large number of students in the third and fourth year classes in the cities, the second reason given does not apply to city high schools. It seems, therefore, worth the while to examine the conditions in Kansas City with regard to the comparative cost of the work of the different years.

Table S IV.

The following table shows the average cost per pupil recitation of the four white schools and of all five schools by years.

Average cost per pupil recitation for:

	1st year	2d year	3d year	4th year
For white schools	\$.146	\$.176	\$.220	\$.252
For all schools	.140	.169	.239	.249

The above table shows plainly that there is a regular and marked increase in the cost per pupil recitation from the first to the fourth year. The following figures show the average variation of the cost of the subjects of the white and of all schools by years. They show that the variation of the cost of the subjects increased from the first year upward and this indicates the cause of the increase in the cost per pupil recitation from year to year.

Table S V.

Table showing the average of the coefficients of variation of the four white schools and of all schools by years.

Average of the coefficients of variation for:

	1st yr.	2d yr.	3d yr.	4th yr.
For white schools	54	61	83	108
For all schools	52	58	90	103

The following table points out clearly the fact that the cause of the increase in the variation as shown in Table S II from the first to the fourth year is due to the slight increase or decrease on the one hand in average cost per pupil recitation of the subjects in each school that cost the least per pupil recitation and the great increase on the other hand in the average cost per pupil recitation of the subjects in each school that cost the most per pupil recitation. This shows that the increase in the variation of the cost of the subjects of the fourth and the increase in average cost per pupil recitation of the subjects of the fourth year over the variation in cost and the average cost per pupil recitation is due not to a decrease in the cost from year to year of the subject of minimum cost but to the increase in the cost from year to year of the subject of maximum cost. See Table S VI immediately following.

Table S VI.

Showing the average cost per pupil recitation of the subjects of each of the white schools that cost the least and of that subject that cost the most, for each year.

	For subj. of min. cost	For subj. of max. cost
Average cost per P.R. 1st year	\$.066	\$.354
2d year	.072	.498
3d year	.090	.845
4th year	.083	1.259
Increase of average of fourth year over first year	.017	.905

To further examine the conditions that were responsible for the increase in the cost of the work of the advanced classes over that of the lower classes would quite surely point out a way to reduce the cost of the extremely high priced subjects of the third and fourth years.

(b) Concerning the relative cost per pupil recitation of the solids and non-solids of all school combined, Table B III on page 52 shows that the average cost of the solids of last year was \$.137 per pupil recitation and that of the non-solids was \$.328. The approximate relation, therefore, of the cost per pupil recitation of the solids to that of the non-solids for 1915-16 is in the ratio of 7 to 16. Thus the following conclusion, based upon the evaluation placed upon the solids and non-solids as indicated by the price paid, therefore, may be drawn. If a recitation in English, civics, geometry, economics or any

other solid was worth seven cents, a recitation in cooking, music, drawing, joinery or any other non-solid was worth sixteen cents in Kansas City last year. If the price paid for non-solids as compared with solids was too high the problem that presents itself for solution is:

What shall be done with the non-solids? Eliminate them or change the present requirements for instruction therein so as to reduce the cost? As to whether or not any of the non-solids should be eliminated is a question that cannot be discussed in this theme. Toward the reduction of the cost of the solids, as it appears to the writer, there are two methods that may be employed; namely, (1) increase the number of classes to the teacher in certain subjects and (2) put some of the subjects on the basis of solids.

(c) The problem of the expensive subjects. Unfortunately, or fortunately, educational values cannot be estimated in dollars and cents and as before stated there can be no permanent universal value given to any unit in education. But inasmuch as there is a limited budget that must at all times be reckoned with in the administration of any school ^{and} inasmuch as the valuation that a school district places upon a subject or unit of work is judged by the comparative price paid for the subject, it becomes an important duty of the administrators of every school to study seriously and intelligently with regard to what shall disqualify any subject that may be on the schedule of courses or that may present itself for adoption. As a guide in this duty one definite thing that can be done, and is important to do, is to set up a standard and examine, so far as the financing of the subject is concerned,

the conditions relative to the subject from that basis. As to what the correct basis is for the examination of a subject with the purpose of eliminating the subject, or reducing the investment in the subject, or reducing the price paid for the subject per pupil recitation is, of course, an arbitrary matter that must be influenced by local conditions. In this study it is assumed that it is profitable to consider the ten per cent of all subjects that were the highest priced and, in summary, the following are the most significant facts observed in the study concerning these subjects:

(1) In these subjects \$33,300.82 were invested, which is a little more than six per cent of the total investment in all subjects.

(2) The average cost per pupil recitation of the thirty-two subjects that constitute the upper ten per cent was \$.66. The average of the median costs per pupil recitation of all subjects was \$.125. Thus the relation of the average cost per pupil recitation of the upper ten per cent subjects to the average of the median costs of all subjects is approximately 5 to 1.

(3) Three-fourths of the subjects included in the list of upper ten per cent subjects were non-solids.

(4) The average of the cost of the four highest priced subjects is exactly twelve times the average of the median costs of all subjects.

(5) Northeast had twice as many of the upper ten per cent subjects as did Central, Westport or Lincoln. Manual Training had only one less of these subjects than did Northeast.

(6) Ten per cent of all of the subjects of Lincoln and nine per cent of all of the subjects of Manual Training are included in the list of upper ten per cent subjects.

(7) Seven of the upper ten per cent subjects were given in each of the four white schools and a study of Table C I, page 61, shows that only one of them, forging, appears on the list of upper ten per cent subjects of each school. Concerning these six subjects the observations are significant because of the difference in the cost of the same subject in two schools. Domestic Science II cost only \$.218 per pupil recitation at Westport; at Northeast, \$.640. Joinery cost only \$.268 at Manual Training; at Central it cost \$.420. Virgil cost only \$.119 at Northeast; at Manual Training it cost \$.529. Public Speaking I cost only \$.182 at Central; at Northeast, \$.458. Free Hand Drawing II cost only \$.116 at Manual Training; at Northeast it cost \$.446.

The important question that arises after the above summary is this, "Have the conditions that were responsible for the high cost of certain subjects in certain schools and for the great variations in the cost of most subjects of the upper ten per cent been removed?" If not, what probably are the chief causes of the presence of the condition? In reply to these questions it is to the point to observe that the study has shown at different points that one or the other of the following conditions or several of them combined were responsible for the high cost of the different subjects.

1. Small enrollment or attendance in class.
2. Slight use of the class rooms occupied.
3. Small classes occupying large rooms.
4. High cost of special equipment and supplies.
5. Double time given to a credit in non-solids.

Consideration of all of the first four points will be worth while in the examination of any subject of high cost. The high cost of some of the non-solids can probably be reduced materially only by placing them on the basis of solids.

Table C I, page 61, shows the investment in the high priced ten per cent subjects by each school and the figures on page show the per cent of the total amount invested in each school that was invested in the high priced subjects. The following figures show the facts on these two points.

	Investment in the ten per cent highest priced subjects	Per cent of the total investment that was invested in the ten per cent highest priced subjects.
Central	\$5460.51	4
Manual Training	10540.25	9
Northeast	9015.70	7
Westport	4586.08	3
Lincoln	3656.28	10

These figures show that the per cent of the total investment that Manual Training invested in the highest ten per cent subjects was three times that of Westport and more than twice that of Central, while Lincoln invested the highest per cent of any school.

Attention is directed to these facts for the reason that in an effort to examine into the conditions that were responsible for the high priced subjects in the city and with a purpose to reduce the investment in such subjects the location of the largest investments in such subject is of great importance. For, the first step toward improvement in the

administration of any school, as the writer sees the problem, is to secure definite, detailed and significant knowledge of the actual investment in the different subjects, as made by the different schools of the system. When this information is secured, it remains for the administrators of the schools to express their relative valuations of the different subjects under the given conditions by the percentage of the available funds that they expend for each, just as a housewife controlling a limited family income expresses her valuations of the various necessities and luxuries of life by the proportion of her funds that she devotes to each.

SECTION 3.

SUMMARY OF THE RESULTS OF THE THESIS AS A WHOLE.

In making a detailed study of a problem that involves many factors as does this thesis there is danger in the writer's failure to point out clearly the results of the study. On the other hand, it is quite possible for the reader of such a theme not to recognize the significant results even through the reading of a general summary. Therefore, a concise summary of the important results of the study is given in this final section.

1. Through the study of the 54 subjects common to

the four white schools it was shown that for instruction and for maintenance and operation there was a great variation among the schools. It was found that the variation in the cost of maintenance and operation was due chiefly to two conditions, namely: (1) the average size of the class-rooms of the schools differ considerably, and (2) the use made of the class-rooms differed greatly in the schools. The variation in the cost of instruction was due chiefly to a difference in the average daily attendance of the classes in the different schools. Taking into consideration both instruction, and maintenance and operation two schools were practically the same in cost and the other two schools were considerably higher. For a more complete summary of the study of the 54 subjects see page 24.

2. The study of the total cost of all subjects of the colored school compared with the average of the totals of all subjects of the white schools shows that the median cost per P-R of the colored school was slightly less than the average of that of the white schools. For the 30 subjects common to all schools the average of the median cost per P-R of the white schools was a little less than the median cost per P-R of the colored school. See page 26.

3. Regarding the cost of the four subjects specifically required for graduation in all schools, a wide variation was found, comparing the different

schools as to the cost of these subjects per P-R. The high cost of the most expensive school was found to be due chiefly to high salaried teachers and low average attendance of the classes of these subjects. The low cost of the least expensive school was due principally to low salaried teachers and the teachers having more classes than did the teachers of the other schools. See pages 30-33.

4. The cost of the subjects of the 1st, 2nd, 3rd, and 4th years respectively varied widely, much more in two of the schools, however, than in the other three. The average cost per P-R of the first year subjects was the least in all of the schools. The highest cost for three schools was on the fourth year subjects and for two schools it was on the third year subjects. The variation in the cost of the subjects of the third and fourth year was much greater than was that of the first and second years and the variation was much greater for the maximum priced subjects of the third and fourth year subjects than for the minimum priced subjects of the same years. See pages 48-50.

5. In comparing the cost of solid subjects with that of non-solid subjects it was found that there was a wide difference between the cost per P-R of the two types of studies, the relation between the cost of the same credit in non-solid and solid subjects being \$16 to \$7. It was also found that a little over one-fourth

of the total investment in the high schools was diverted to non-solids and three-fourths of all of the subjects included in the list of 10% most expensive subjects were non-solids. See pages 52-57.

6. Concerning the distribution of the high priced subjects among the different schools it was found that even among the three schools of the same type the distribution was quite unequal, one of the schools having twice as many as did either one of the other two. See pages 61 and 62. The percent that the number of subjects of a school which are among the highest priced 10% subjects of the city is of the total number of subjects of the school varies considerably among the schools. That of one of the three schools of the common type is about three times that of either one of the other two. That of the special school is 11% while that of the highest of the three common schools is 14%. That of the colored school is 12%.

The percent that the amount invested in the subjects of a school which are among the highest priced 10% subjects of the city is of the amount invested in all of the subjects of the school varies greatly among the schools. That of one of the schools of the common type is more than twice that of one of the other of the same type. That of the special white school is larger than that of any of the three schools of the common type.

The percent of the colored school is the greatest of any school in the city. See page 62.

7. The average of the cost per P-R of the four highest priced subjects in the city was 12 times the average of all subjects in the city. The cost per P-R of the highest priced subject in the city was 20 times the median cost of all subjects in the city.

8. The outstanding subject of the first year subjects for high cost was joinery in every school. Turning held the highest place for the second year subjects in every school except one. Forging was the high subject for the third year. The fourth year had no decidedly high subject.

9. The study on the sixth hour special subjects shows that the two highest priced subjects that appear on the list of 5% highest priced subjects in the city also appear on the list of sixth hour special subjects. The relation between the average cost per P-R of the sixth hour special subjects of all white schools and the average cost per P-R of all subjects of all schools is 8 to 1. The main cause of the high cost of the sixth hour special subjects was the small average class attendance. See pages 66 and 67.

10. On the study of the upper and lower quartile subjects of all schools considered as a whole, the cost per P-R of the different subjects of both quartiles were found

to vary greatly, there being only four out of the 80 subjects in the upper quartile list that represented all white schools and only three of these represented the colored school. Of the 80 subjects of the lower quartile there were likewise only four subjects that represented all of the white schools and only two of them represented the colored school. The cause of the variation is discussed on page 70.

11. Toward the elimination of the extremely high costs and the lessening of the variations in the cost of all subjects, the following administrative measures are suggested:

(1). In order to lessen the waste of heat; to lessen the quantity but not the quality of janitor service; and, to use the time of the teachers to a most equitable and more economic advantage, the elimination of small classes will be effective.

(2). Have class-rooms when heated occupied at all periods of the day and those not needed not heated, to lessen the waste of heat and to lessen janitor service.

(3). Have medium sized classes occupy the smaller rooms to lessen the cost of fuel and janitor service.

(4). Eliminate unnecessary duplication of special equipment for experimental purposes and limit equipment for demonstration purposes to essentials rather than investing in much desirable equipment that is not necessary.

(5). Change present conditions governing the non-solid subjects to lessen the time required for a credit, or, otherwise lessen the cost of these subjects.

Consideration of any of the first four points will be worth while in the examination of any subject of high cost. The high cost of some of the non-solids probably can be reduced materially only by placing them on the basis of solids.

APPENDIX.

KEY TO TABLES I A, I B, I C, I D AND I E.

The tables are given on the pages immediately following this one. In each of tables, Items I, II, III, IV, V, VI, VII, represent phases of investment (expenditure) as follows:

Item I. Five percent of the cost the site, building, and general equipment.

Item II. Five percent depreciation on value of equipment of departments.

Item III. Overhead expenses.

Item IV. Salaries of principal and vice principal.

Item V. Salaries of teachers.

Item VI. Cost of maintenance and operation.

Item VII. Cost of educational supplies.

Since the cost per P-R is the same for all subjects for Item I in each school respectively, it is given only at the bottom of each table immediately underneath the total investment for the item. The cost per P-R is indicated similarly for Items II and IV of each table.

For detailed explanation of what is included in each item and of the meaning of terms used in the tables, read pages 2 to 9 inclusive, in the text.

How to read the tables and what the tables should mean to the reader are discussed in the text on pages nine and ten.

Table I A. Central

A summary of the investment in and cost per pupil-
recitation of all subjects given at Central.

Items	I		II		III		IV		V		VI		VII		Totals	
Subjects	Invest.	Invest.	P-R		Invest.	Invest.	Invest.		Invest.	P-R	Invest.	P-R	Invest.	P-R	Invest.	P-R
English I	\$ 2024.12	\$	\$		\$ 465.17	\$289.92			\$4444.56	\$.050	\$ 917.27	\$.008	\$	\$	\$ 8114.04	\$.088
II	1190.35				329.59	205.35			2870.40	.043	611.94	.009			5207.63	.082
III	994.30				228.61	142.47			2360.80	.052	403.76	.007			4129.94	.089
IV	479.84				110.35	68.74			1283.50	.045	174.07	.005			2116.50	.080
Algebra I	1958.35				450.39	290.61			5337.80	.056	782.30	.008			8819.45	.094
II	334.65				76.96	47.95			956.80	.063	143.66	.008			1560.02	.101
Geometry Pl.	914.72				210.37	131.07			2182.96	.052	348.71	.008	10.86		3798.69	.090
Sol.	74.97				17.24	10.74			322.40	.091	46.34	.013			471.69	.134
Trigonometry	39.91				9.17	5.71			315.62	.165	48.95	.026			419.36	.221
Analytics	20.50				4.69	2.20			166.65	.175	25.37	.027			219.41	.232
Psychology	30.90				7.10	4.42			161.20	.109	25.75	.018			229.37	.157
Physiography	413.38	4.70			95.07	59.23			644.80	.032	185.40	.009	18.10		1420.68	.072
Physiology	653.93				149.37	93.06			1248.00	.037	556.16	.019	33.26	.001	2733.78	.087
Botany	227.71	33.38	.003		52.37	32.63			483.80	.038	139.05	.013	157.79	.015	1126.73	.106
Zoology	200.25	6.91			46.05	28.69			483.80	.046	139.05	.012	120.80	.013	1025.55	.111
Chem. Gen.	226.84	42.13	.004		52.17	32.50			832.00	.070	304.04	.028	50.47	.004	1540.15	.136
H. H.	451.68	41.72	.004		51.46	32.06			832.00	.073	304.04	.028	49.98	.004	1762.94	.139
Physics	455.69	128.86	.006		104.78	65.28			1466.40	.072	797.20	.039	524.90	.025	3543.11	.172
Ancient Hist.	1127.17				259.23	161.51			2498.60	.044	409.40	.007			4455.91	.071
M. & M.	268.17				61.67	38.42			561.60	.043	103.00	.007			1032.86	.080
American	355.11				81.68	50.89			1112.80	.066	184.90	.010			1785.38	.106
Civics	626.53				144.09	89.77			1703.00	.059	271.85	.008			2835.24	.097
Economics	76.54				17.60	10.96			121.20	.034	25.37	.007			251.67	.071
Latin I	1020.28				234.65	146.99			3078.40	.065	618.61	.012			5098.93	.107
Caesar	401.90				92.43	57.58			1768.80	.063	292.10	.016			2612.81	.109
Cicero	45.37				10.43	6.50			374.40	.086	61.80	.012			498.50	.128
Virgil	33.61				7.73	4.81			322.40	.202	66.74	.043			435.29	.275
Greek	34.39				7.91	5.00			363.60	.241	61.80	.038			472.70	.309
German I	344.45				79.21	49.35			805.85	.050	112.86	.006			1391.72	.086
II	129.48				29.77	18.55			268.66	.043	37.62	.005			484.08	.078
III	83.86				19.28	12.02			268.66	.067	37.62	.009			421.43	.106
IV	12.81				2.94	1.83			268.66	.445	37.62	.064			323.86	.539

Table I B. Manual Training

A summary of the investment in and cost per pupil-
recitation of all subjects given at Manual Training.

Items	I		II		III		IV		V		VI		VII		Totals	
Subjects	Invest.		Invest.	P-R	Invest.		Invest.		Invest.	P-R	Invest.	P-R	Invest.	P-R	Invest.	P-R
English I	\$ 901.07	\$	\$	\$	342.29	\$	264.24	\$	3212.00	\$.051	\$ 391.84	\$.006	\$	\$	\$ 5111.44	\$.081
II	595.53				227.02		714.64		1694.00	.036	290.02	.005			2981.21	.065
III	637.56				243.05		187.07		2634.50	.066	341.50	.007			4043.68	.097
IV	412.54				156.26		120.98		1991.00	.061	189.62	.007			2870.40	.092
Algebra I	911.89				347.62		277.51		4247.82	.060	473.37	.007			6258.21	.091
II	133.64				50.94		39.19		682.00	.074	65.72	.006			971.49	.104
Geom. Pl.	559.98				213.47		164.21		2626.23	.059	266.21	.006			3830.10	.089
Sol.	10.02				3.82		2.93		160.41	.215	12.20	.018			189.38	.257
Trigonometry	59.13				22.54		17.35		523.41	.116	39.04	.011			661.47	.151
Analytics	11.31				4.31		3.31		137.50	.190	15.55	.020			171.98	.234
Psychology	32.17				12.26		9.43		440.00	.136	29.28	.013			523.14	.223
Physiography	116.75				44.50		34.23		649.00	.072	143.47	.015			987.95	.111
Physiology	210.95				80.41		61.86		731.50	.045	199.83	.017			1284.55	.086
Botany	195.61	47.93	.003		74.57		57.36		1452.00	.124	540.64	.031	9.81	.001	2377.92	.183
Zoology	194.22	16.02	.001		74.04		56.95		731.50	.050	285.48	.022	9.74	.001	1367.95	.098
Chem. Mc. A.	101.04	30.99	.004		38.51		29.63		696.65	.093	176.72	.026	47.82	.006	1121.36	.153
Academ.	63.93	19.61	.004		24.37		18.74		348.32	.078	88.36	.020	30.24	.006	593.57	.132
Adv.	3.59	1.11	.004		1.37		1.05		348.32	1.936	88.36	.564	1.40	.006	445.20	2.534
H. H.	133.82	41.05	.004		51.01		39.24		696.65	.068	176.72	.019	63.30	.006	1201.79	.121
Physics	276.42	85.33	.004		105.37		81.06		1540.00	.072	456.76	.023	82.26	.004	2627.20	.127
Ancient Hist.	255.35	1.26			97.34		74.88		1056.00	.055	152.93	.009			1637.76	.088
M. & M.	134.94				51.44		39.57		638.00	.066	95.16	.010			959.11	.100
English	84.17				32.04		24.68		577.50	.109	81.56	.015			799.95	.148
Industrial	56.97				21.72		16.71		418.00	.105	53.33	.014			566.73	.143
Civics	27.88				10.62		8.17		181.50	.087	12.20	.006			240.37	.117
Political Econ.	76.16				29.03		22.33		56.58	.074	62.22	.012			246.32	.110
Political Sci.	71.94				27.42		21.09		418.00	.079	57.77	.011			596.22	.114
Latin I	158.22				60.31		46.40		426.22	.034	46.66	.004			737.81	.062
Caedar	81.17				30.94		23.80		568.30	.094	62.22	.012			766.43	.130
Cicero	43.94				16.75		12.88		284.15	.086	31.11	.010			388.83	.120
Virgil	8.46				3.22		2.48		284.15	.451	31.11	.054			329.42	.529
German I	155.41				59.24		45.57		638.00	.056	46.66	.005	2.59		947.47	.085
II	68.05				25.94		19.95		638.00	.122	60.39	.012	1.12		813.45	.158
III	44.46				16.95		13.03		319.00	.097	32.94	.010			426.38	.131
French I	46.99				17.91		13.78		418.00	.121	27.75	.008			524.43	.153
II	34.09				11.99		10.00		418.00	.165	31.11	.013			505.19	.202
Spanish I	225.10				85.81		66.01		836.00	.050	62.22	.004			1275.14	.078
II	53.66				20.45		17.73		418.00	.104	39.34	.010			549.18	.138

Table I B. Manual Training

(Continued)

Items	I		II		III		IV		V		VI		VII		Totals	
Subjects	Invest.		Invest.	P-R	Invest.		Invest.		Invest.	P-R	Invest.	P-R	Invest.	P-R	Invest.	P-R
Bookkeeping I	\$ 532.81	\$	\$		\$ 202.10	\$	\$ 156.26	\$	\$ 2629.00	\$.066	\$ 397.11	\$.010	\$ 45.50	\$.003	\$ 3962.78	\$.103
Shorthand I	306.19				116.72		89.79		1028.50	.047	184.23	.007	26.11	.003	1751.54	.081
II	95.14				36.27		27.90		506.00	.071	62.22	.009	8.19	.003	735.72	.107
Com. Geog.	48.22				18.38		14.14		209.00	.058	31.11	.009			320.85	.091
Arith.	128.09				48.83		37.57		561.00	.063	46.66	.004			822.15	.091
Law	48.04				18.31		14.09		209.00	.058	57.09	.017			346.53	.099
Non Solids																
Typewriting I	609.83				232.48		178.83		1430.00	.031	153.72	.003	52.09	.003	2656.95	.122
II	192.41				69.50		53.46		506.00	.037	51.24	.004	15.59	.003	888.20	.136
Penmanship	111.05				42.33		32.56		319.00	.038	56.73	.007			561.67	.138
Office Training	13.32				5.07		3.90		104.50	.105	15.55	.017			142.34	.292
Free Hand Draw. I	524.12	6.25			199.80		153.70		1398.56	.036	264.56	.007	24.17	.006	2571.16	.146
II	167.66	1.76			63.91		49.16		612.85	.044	115.02	.009	7.59	.006	1017.95	.166
III	110.81	1.50			42.24		32.49		518.56	.072	104.12	.015	4.83	.006	814.55	.234
Mech. Draw. I	382.97	64.37	.002		145.99		120.49		1459.65	.051	592.39	.023	24.59		2790.45	.202
II	203.28	34.16	.002		77.49		59.61		1193.45	.094	448.78	.037	13.05		2029.82	.316
III	102.46	17.22	.002		39.06		30.04		596.72	.122	233.36	.057	6.57		1025.43	.412
IV	52.78	8.87	.002		20.12		15.48		596.72	.155	215.41	.058	3.33		912.71	.480
Joinery	404.68	100.99	.003		154.27		118.67		1870.00	.061	783.12	.028	503.13	.018	3934.97	.268
Turning I	194.16	85.42	.006		74.01		56.93		1540.00	.094	456.76	.030			2407.28	.308
(P.M.)II	17.64	7.75	.006		6.72		5.17		385.00	.293	114.19	.095			536.47	.836
Forging	149.57	54.66	.005		57.02		43.86		1056.00	.096	783.24	.077	368.89	.036	2513.24	.476
Electricity	55.54	100.00	.018		21.17		16.28		1045.00	.276	67.10	.019	39.66	.010	1344.75	.694
Mch. Shop	109.12	277.63	.037		41.60		32.00		1595.00	.202	571.16	.074			2626.51	.694
Steam	51.63				19.68		15.14		1044.97	.265	67.09	.018			1198.51	.614
Printing	164.41	37.28	.003		62.67		48.21		770.00	.066	307.44	.027	71.39	.006	1461.40	.252
Domes. Sci. I	100.03	2.95			41.98		32.29		440.00	.052	142.74	.018	126.48	.017	886.47	.222
II	65.56	1.75			24.99		1.92		440.00	.092	142.74	.032	75.20	.017	752.16	.330
III	32.69				12.46		9.58		330.00	.135	71.39	.032	37.60	.017	494.72	.416
IV	117.84	3.16			44.92		34.55		660.00	.074	142.74	.017	135.03	.017	1138.24	.264
Domes. Art I	459.75	8.24			175.27		135.64		3000.50	.079	659.70	.020	25.41		4459.51	.246
II	260.21	1.83			99.19		76.31		1597.75	.082	430.81	.022	14.34		2480.44	.256
III	161.07	1.13			61.40		47.51		1064.25	.076	309.65	.023	8.85		1653.86	.246
IV	101.44				38.67		29.74		319.00	.042	107.70	.014	5.57		602.12	.160
Lunch	42.21	7.43	.002		16.11		12.48		330.00	.066	71.37	.025			479.60	.234
Gymnasium I	775.73	24.05			295.72		227.59		2254.91	.042	476.91	.009			4054.91	.150
II	44.21	1.37			16.85		12.96		220.00	.072	43.34	.015			338.73	.222
III	61.22	1.89			23.34		17.95		220.00	.048	43.34	.010			367.74	.164
Elocution I	233.14				88.83		68.33		1193.50	.071	163.84	.008			1747.64	.206

Table I B. Manual Training
(Concluded)

Items	I		II		III		IV		V		VI		VII		Totals	
Subjects	Invest.	Invest.	P-R	Invest.	Invest.	Invest.	P-R	Invest.	P-R	Invest.	P-R	Invest.	P-R	Invest.	P-R	
Elocution II	\$ 8.43	\$		\$ 3.21	\$ 2.47	\$ 170.50	\$.027	\$ 21.50	\$.037	\$		\$ 206.11	\$.174			
Public Speak. I	13.69			5.22	4.06	170.50	.160	21.50	.023			214.97	.414			
II	23.83			9.08	6.99	170.50	.096	21.50	.013			231.90	.264			
Music, Vocal	149.96	72.32	.007	57.16	43.97	1278.75	.113	120.01	.012			1731.17	.312			
Piano	47.44	22.72	.007	18.08	13.91	426.25	.127	43.00	.013			571.40	.342			
Totals	\$14662.51	\$1185.00		\$5585.07	\$4304.02	\$71607.10		\$14479.66		\$1891.44		\$113714.80				
	P-R= \$.015			P-R= \$.005	P-R = \$.004											

Table I C. Northeast

A summary of the investment in and cost per pupil-
recitation of all subjects given at Northeast.

Items	I	II	III	IV	V	VI	VII	Totals
Subjects	Invest.	Invest. P-R	Invest.	Invest.	Invest. P-R	Invest. P-R	Invest. P-R	Invest. P-R
English I	\$ 2099.28	\$	\$423.47	\$ 266.36	\$4872.90	\$.060	\$ 679.85	\$.008
II	2041.50		411.83	259.03	3984.90	.047	705.83	.008
III	1275.57		257.32	161.84	2985.90	.058	410.06	.008
IV	291.73		58.85	37.01	976.80	.078	81.59	.006
Algebra I	2439.34		492.09	309.51	3774.00	.051	819.11	.007
II	142.66		28.78	19.05	482.85	.105	76.01	.015
Geometry Pl.	1134.60		228.88	143.96	2630.70	.057	525.41	.009
Sol.	39.73		8.01	5.04	160.95	.107	25.34	.015
Trigonometry	53.65		10.82	6.80	177.60	.087	23.09	.010
Psychology	176.98		35.70	22.45	444.00	.066	56.32	.007
Physiography	394.46	13.51 .001	79.57	50.05	555.00	.035	277.17	.016
Physiology	864.22	1.98	174.34	109.65	1920.30	.057	443.85	.015
Botany	512.45	7.90	103.37	65.02	1132.20	.058	348.12	.017
Zoology	319.91	2.16	64.53	40.59	754.80	.061	232.08	.017
Chem. Gen.	310.26	41.30 .003	62.59	39.36	999.00	.085	212.94	.017
H.H.	110.35	13.76 .003	22.26	14.00	499.50	.124	106.47	.025
Physics	378.24	150.21 .011	76.30	47.09	1387.50	.100	389.96	.026
Ancient Hist.	1166.97		235.41	148.06	2020.20	.046	318.15	.007
M. & M.	426.74		86.09	54.14	976.80	.059	171.26	.009
American	444.94		89.76	56.45	1154.40	.070	185.91	.010
Civics	1071.03		216.05	135.89	1920.30	.048	337.03	.006
Economics	100.95		20.36	12.81	377.40	.099	68.72	.017
Industrial H.	144.40		29.13	18.32	377.40	.073	68.72	.012
Latin I	897.82		181.12	113.82	2000.22	.057	279.70	.007
Caesar	525.95		106.10	66.73	1356.42	.070	193.42	.009
Cicero	231.28		46.65	29.34	677.10	.078	93.85	.010
Virgil	118.56		23.92	15.04	324.12	.071	48.81	.010
Greek I	88.63		17.88	11.24	324.12	.096	48.81	.013
II	16.72		3.37	2.12	324.12	.511	48.81	.072
German I	460.21		92.84	58.39	1212.12	.082	168.46	.010
II	233.62		47.13	29.64	666.00	.076	72.99	.007
III	117.69		23.74	14.93	333.00	.074	36.59	.007
IV	28.76		5.80	3.64	333.00	.306	36.59	.031

Table I C. Northeast

(Continued)

Items	I	II	III	IV	V	VI	VII	Totals
Subjects	Invest.	Invest.	Invest.	Invest.	Invest.	Invest.	Invest.	Invest.
		P-R			P-R	P-R	P-R	P-R
French I	\$ 156.87	\$	\$ 31.64	\$ 19.90	\$ 555.00	\$.072	\$ 82.60	\$.01
II	107.90		21.76	13.68	277.50	.068	41.30	.009
III	39.47		7.96	5.00	277.50	.185	41.30	.025
Spanish I	456.39		92.07	57.90	666.00	.036	155.42	.007
II	163.41		32.38	20.37	444.00	.082	103.61	.018
III	76.30		15.39	9.68	222.00	.077	51.80	.016
Bookkeeping I	605.23		122.09	76.79	804.75	.033	288.13	.011
II	269.81		54.43	34.23	536.13	.050	192.09	.017
Shorthand I	466.67		94.14	59.21	666.00	.036	126.71	.006
II	121.79		24.57	15.45	222.00	.048	42.23	.052
Com. Geog.	152.32		30.72	19.34	222.00	.038	110.66	.016
Arith.	549.29		110.81	69.69	1237.65	.056	193.79	.007
Law	90.16		18.18	11.44	388.50	.127	58.59	.018
Non Solids								
Typewriting I	632.32		127.54	80.23	702.63	.029	168.94	.006
II	275.00		55.47	34.79	444.00	.041	84.47	.007
Penmanship	426.25		85.98	54.08	485.07	.029	128.12	.006
Free Hd. Draw.	1934.34	3.46	188.28	118.42	2575.20	.071	829.20	.022
II	66.62		13.44	8.45	377.40	.145	105.90	.032
Mech. I	397.55	11.17	80.19	50.44	1378.62	.096	341.73	.017
II	309.05	8.94	62.34	39.21	915.75	.074	144.43	.011
III	75.13		15.15	9.43	230.88	.082	97.64	.025
Joinery	280.00	100.00	56.48	35.52	725.94	.067	649.03	.057
Turning	302.60	150.00	61.04	38.39	888.00	.072	663.39	.056
Arts & Crafts								
4 yr. Mc.Dr.	57.50		11.60	7.29	414.03	.164	196.16	.059
Forging	100.08	100.00	20.19	12.68	591.63	.173	590.52	.163
Domes. Sci. I	424.11	24.54	85.55	53.81	1154.40	.076	360.57	.021
II	63.39	3.50	12.78	8.04	488.40	.204	144.67	.057
Art I	286.48		57.34	27.75	765.90	.069	354.89	.030
II	406.85		82.05	51.61	1015.65	.064	482.99	.029
H. H. Manag.	19.95		4.02	2.53	111.00	.147	32.85	.041
Millinery	143.45		28.94	18.20	499.50	.093	253.46	.045
Gym. I	1825.18	122.28	368.19	231.54	2521.92	.034	1857.96	.029
II	384.39	20.38	77.54	48.76	399.60	.029	252.67	.004
Elocution I	561.37		113.26	71.24	888.00	.039	232.78	.009
II	46.65		9.41	5.92	222.00	.125	58.19	.030
Publ. Speak	40.50		8.17	5.13	222.00	.154	58.19	.037
Music I	460.20	2.10	92.84	58.39	899.10	.051	260.23	.014
II	121.51		24.51	15.41	299.70	.064	86.74	.017
Orchestra	183.14		36.94	23.23	299.70	.043	86.74	.011
Totals	\$30738.42	\$777.19	\$6199.44	\$3890.54	\$68150.67		\$17601.71	\$1303.54
	P-R=\$.029		P-R=\$.006	P-R=\$.003				\$128661.51

Table I D. Westport

A summary of the investment in and cost per pupil-
recitation of all subjects given at Westport.

Items	I		II		III		IV		V		VI		VII		Totals	
Subjects	Invest.		Invest.	P-R	Invest.		Invest.		Invest.	P-R	Invest.	P-R	Invest.	P-R	Invest.	P-R
English I	\$ 1543.91	\$	\$		\$ 409.81	\$	\$ 271.97	\$	\$ 4879.73	\$.048	\$ 642.45	\$.006	\$	\$	\$ 7747.87	\$.078
II	1425.16				378.29		251.05		4681.67	.057	553.89	.007			7290.06	.088
III	1176.43				312.27		207.24		4146.57	.055	453.41	.006			6295.92	.085
IV	742.87				197.54		131.10		2761.34	.058	264.36	.005			4097.21	.087
Algebra I	1674.49				444.47		294.97		6120.72	.057	871.71	.008			9406.36	.089
II	254.39				67.52		44.81		1263.02	.075	139.31	.010			1769.05	.109
Geom. Pl.	1220.68				324.01		215.03		5320.36	.067	594.25	.008			7674.33	.099
SpI.	90.34				23.99		15.92		492.62	.088	63.02	.012			685.89	.124
Trigonometry	79.99				21.23		14.09		513.81	.098	51.63	.011			680.75	.133
Analytics	14.72				3.91		2.59		165.95	.178	13.41	.015			200.58	.217
Psychology	46.61				11.34		7.95		214.42	.072	19.47	.007			299.79	.103
Physiography	209.29	24.98		.002	55.55		36.86		620.92	.046	168.08	.013			1115.68	.085
Physiology	599.74	13.21			159.37		105.77		2263.47	.063	541.86	.014			3683.42	.102
Botany	340.93	40.46		.002	90.49		60.05		1086.26	.051	268.87	.013	27.62	.001	1914.68	.091
Zoology	205.50	62.31		.005	54.54		36.20		588.60	.043	223.65	.017	23.50	.001	1194.30	.136
Chemistry	888.51	68.18		.001	235.84		156.52		3884.31	.067	653.36	.012	284.08	.005	6170.80	.109
H. H.	166.08	12.98		.001	43.89		29.24		738.51	.069	117.12	.011	53.20	.005	1161.02	.110
Physics	297.24	93.41		.005	78.98		52.37		1412.72	.072	270.64	.014	194.16	.011	2399.52	.082
Ancient Hist.	1040.93	4.21			276.15		183.27		3079.78	.044	389.79	.005			4974.13	.073
M. & M.	609.75	2.46			161.85		106.93		2087.24	.050	216.23	.005			3184.46	.079
American	714.32	2.81			189.62		125.05		2450.62	.047	312.77	.006			3795.19	.077
Civics	604.54				160.46		106.49		2477.69	.064	318.08	.009			3667.26	.097
Economics	107.82				28.62		18.99		578.33	.074	59.66	.014			793.42	.112
Latin I	975.24				258.86		171.79		3370.82	.056	433.34	.008			5210.03	.289
Caesar	510.13				135.41		89.86		2333.02	.074	273.70	.009			3342.12	.107
Cicero	225.38				59.82		39.70		995.31	.070	131.68	.009			1451.89	.103
Virgil	114.51				30.39		20.17		663.72	.093	70.12	.009			898.91	.126
German I	415.17				110.20		73.13		1348.30	.055	183.38	.007			2130.18	.086
II	264.38				70.17		46.56		861.45	.053	123.91	.006			1366.47	.083
III	124.73				33.04		21.97		610.11	.078	69.34	.009			859.19	.111
IV	84.89				22.53		14.95		374.60	.063	34.67	.006			531.64	.093
French I	216.51				57.47		38.14		658.58	.046	84.16	.006			1054.86	.076
II	126.92				33.95		22.53		517.24	.052	68.38	.008			769.02	.084
III	39.50				10.48		6.95		257.12	.099	34.19	.014			348.24	.137
Spanish I	368.96				97.90		64.86		1706.75	.069	280.66	.010			2519.13	.103
II	104.39				27.70		18.38		517.02	.083	168.08	.028			835.57	.135
III	33.53				8.90		5.11		259.04	.124	84.04	.042			390.62	.190

Table I D. Westport
(Continued)

Items	I		II		III		IV		V		VI		VII		Totals	
Subjects	Invest.		Invest.	P-R	Invest.		Invest.		Invest.	P-R	Invest.	P-R	Invest.	P-R	Invest.	P-R
Bookkeeping I	\$ 301.47	\$		\$	\$ 80.02	\$	\$ 53.10	\$	\$ 936.25	\$.050	\$ 278.88	\$.014	\$ 5.35	\$.	\$ 1655.07	\$.088
II	159.71				42.39		281.13		575.98	.050	185.92	.021	2.67		994.80	.095
Shorthand I	108.54				28.81		19.11		446.06	.063	75.76	.012	1.78		680.06	.099
II	54.37				13.04		9.57		222.56	.065	37.88	.011	.89		338.31	.100
Gom. Geog.	47.85				12.70		8.42		160.71	.053	15.33	.005			245.01	.082
Arith.	28.95				7.68		5.10		144.66	.079	16.57	.009			202.96	.112
Law	94.91				25.19		16.71		323.67	.055	92.96	.016			553.44	
Non Solids																
Typewriting I	151.50				40.21		26.68		445.76	.045	75.76	.007	2.67		742.58	.154
II	32.66				8.67		5.75		222.88	.110	37.88	.022	.59		308.43	.312
Penmanship	21.36				5.67		3.76		147.12	.109	46.48	.036			224.39	.338
Freehand Draw. I	738.00	36.10			195.79	129.94			2006.25	.041	338.80	.014			3444.88	.160
II	187.94	9.24			49.88	33.10			846.91	.081	348.64	.034			1475.71	.280
III	73.47	3.60			19.50	12.94			401.25	.091	159.20	.039			669.96	.310
IV	90.31	3.60			23.97	15.91			521.30	.121	254.00	.052			909.09	.396
Mech. Draw. I	508.58	7.01			134.99	89.59			1578.25	.043	429.36	.012	40.74	.001	2788.52	.160
II	204.30	2.80			54.23	35.99			792.51	.064	214.68	.017	16.30	.001	1320.81	.212
III	109.92	1.40			29.17	19.35			526.01	.071	143.12	.020	8.83	.001	837.80	.234
IV	64.63	.93			17.15	11.38			258.51	.063	71.56	.018	5.16	.001	429.32	.214
Joinery	317.02	82.19	.004		84.21	55.05			1926.32	.094	732.38	.038	235.06	.012	3432.23	.344
Turning	140.76	125.00	.015		37.36	24.79			882.96	.089	549.36	.059			1760.23	.374
Forging	47.85	125.00	.044		12.70	8.42			588.60	.205	599.92	.224	37.66	.013	1420.15	1.020
Mech. Art (4 yr.)	13.06				3.46	2.30			294.67	.384	183.12	.255			496.61	1.326
Domes. Sci. I	290.02	13.31			76.98	51.08			1034.26	.052	331.50	.018	285.12	.016	2082.27	.220
II	180.58	8.22			47.92	31.81			642.00	.051	198.90	.017	178.20	.016	1287.63	.218
Domes. Art I	455.25	7.39			121.46	80.19			1813.65	.055	451.00	.016	20.72		2949.66	.192
II	254.77	4.17			67.62	44.80			909.39	.057	254.36	.016	12.19		1547.30	.196
Gymnasium I	576.98	34.39	.001		153.08	101.63			2033.10	.064	1690.78	.051			4589.96	.280
II	387.27	22.29	.001		102.80	68.22			998.31	.063	1207.70	.050			2786.59	.276
III	203.67	12.15	.001		53.99	35.87			567.32	.050	483.08	.045			1356.08	.240
Elocution I	188.48				50.03	33.20			663.82	.053	155.16	.013			1090.60	.180
II	56.66				15.06	9.99			331.91	.093	77.58	.024			491.20	.282
Public Speak.	135.22				35.53	23.57			663.72	.077	155.16	.019			1013.20	.240
Music I	295.44				78.42	51.25			578.12	.031	155.16	.008			1158.39	.126
II	71.76				19.04	12.64			289.11	.064	77.58	.018			470.13	.212
Glee Club	184.84				48.79	32.38			289.11	.024	77.58	.007			632.70	.110
Orchestra	57.04				15.14	9.99			289.11	.057	77.58	.022			448.86	.206
Totals	\$24493.62	\$823.80			\$6499.21	\$4310.27			\$91653.86		\$19527.35		\$1456.49		\$148744.60	
	P-R=\$.017				P-R=\$.004	P-R=\$.003										

Table I E. Lincoln

A summary of the investment in and cost per pupil-recitation of all subjects given at Lincoln.

Items	I	II	III	IV	V	VI	VII	Totals
Subjects	Invest.	Invest. P-R	Invest.	Invest.	Invest. P-R	Invest. P-R	Invest. P-R	Invest. P-R
English I	\$ 440.90	\$	\$ 241.65	\$ 27.78	\$ 1027.47	\$.034	\$ 357.32	\$.011
II	274.36		147.29	129.29	550.82	.029	212.89	.012
III	180.57		98.97	85.09	375.83	.031	140.55	.010
IV	121.43		66.55	57.22	220.00	.029	76.22	.009
Algebra I	487.31		267.09	229.65	1685.81	.054	472.11	.015
Geom. Pl.	194.85		106.79	91.82	746.98	.058	202.88	.026
Arith. Gen.	229.88		125.99	108.33	608.32	.040	163.30	.011
Psychology	57.49		31.51	27.09	293.33	.075	64.33	.017
Physiography	73.20	7.31 .001	40.12	34.49	220.83	.051	77.28	.017
Physiology	226.48		124.13	106.73	666.65	.041	229.72	.015
Botany	51.77	5.15 .001	28.37	24.40	120.83	.038	41.58	.012
Astronomy	17.01		9.31	8.00	120.83	.116	41.58	.038
Chem. Gen.	116.45	5.65	63.82	54.88	483.32	.067	128.66	.017
H. H.	11.92	.57	6.53	5.61	241.66	.341	64.33	.088
Physics	187.66	35.57 .003	102.85	88.44	440.00	.036	128.66	.010
Ancient Hist.	114.33		62.66	53.88	373.33	.049	138.58	.018
M. & M.	105.34		57.74	49.64	533.33	.049	152.39	.023
American	89.73		49.18	42.28	200.00	.036	64.33	.011
English	63.53		34.82	29.94	120.00	.025	51.97	.012
Civics	224.20		122.88	105.65	540.00	.033	199.46	.012
Economics	56.67		31.06	26.70	241.66	.072	69.27	.019
Latin I	347.23		190.31	163.64	1283.32	.060	367.21	.017
Caesar	151.57		83.07	71.42	500.00	.057	152.44	.016
Cicero	37.89		20.76	17.85	266.66	.117	69.27	.029
Virgil	35.11		19.24	16.54	266.66	.123	69.27	.030
German	101.59		55.68	47.87	240.83	.039	98.97	.018
Com. Arith.	10.54		5.72	4.92	104.16	.162	42.64	.064
Non Solids								
Joinery	304.77	25.00 .001	167.04	143.62	750.00	.044	485.00	.028
Turning	222.94	15.00 .001	122.19	105.06	750.00	.053	485.00	.033
Gas Engine	65.82	15.98 .003	36.07	31.01	375.00	.099	191.88	.049
Domes. Sci. I	75.94	9.09 .001	41.62	35.79	733.32	.282	646.71	.241
Domes. Sci. II	43.94	4.54 .001	24.08	20.70	366.66	.138	323.35	.118
Domes. Art I	350.01	8.36	191.84	164.95	742.80	.034	237.55	.010
Domes. Art II	191.09	4.18	104.73	90.05	557.10	.044	178.16	.013
Elocution	41.32		22.64	19.47	125.00	.049	34.63	.013
Totals	\$5304.84	\$136.40	\$2904.30	\$2499.80	\$16872.51		\$6459.49	\$689.12
	P-R=\$.015		P-R=\$.008	P-R=\$.007				\$34866.46

Table II

Showing investment in and cost per P.-R. of each subject of each school and the total investment in all subjects and median cost per P.-R. of all subjects of each school

	Central		Manual Training		Northeast		Westport		Lincoln	
	Invest.	P.R.	Invest.	P.R.	Invest.	P.R.	Invest.	P.R.	Invest.	P.R.
English I	\$ 8114.04	\$.088	\$ 5111.44	\$.081	\$ 8341.86	\$.106	\$ 7747.87	\$.078	\$ 2275.12	\$.075
II	5207.63	.082	2981.21	.065	7403.09	.093	7290.06	.088	1314.65	.071
III	4129.94	.089	4043.68	.097	5090.60	.104	6295.92	.085	881.01	.071
IV	2116.50	.080	2870.40	.092	1445.98	.122	4097.21	.087	541.42	.068
Algebra I	8819.45	.094	6258.21	.091	7834.05	.096	9406.36	.089	3141.97	.099
II	1560.02	.101	971.49	.104	749.35	.158	1769.05	.109		
Geom. Pl.	3798.69	.090	3830.10	.089	4663.55	.104	7674.33	.099	1343.32	.114
Sol.	471.69	.134	189.38	.257	239.07	.160	685.89	.124		
Trigonometry	419.36	.221	661.47	.151	271.96	.135	680.75	.133		
Analytics	219.41	.232	171.98	.234			200.58	.217		
Arith. Gen.									1235.82	.081
Psychology	229.37	.157	523.14	.223	735.45	.111	299.79	.103	473.75	.122
Physiography	1420.68	.072	997.95	.111	1428.62	.094	1115.68	.085	453.23	.130
Physiology	2733.78	.087	1284.55	.086	3520.04	.110	3683.42	.102	1370.05	.087
Botany	1126.73	.106	2377.92	.183	2209.22	.141	1914.68	.091	272.10	.112
Zoology	1025.55	.111	1367.95	.098	1452.56	.152	1194.30	.136		
Chem. Gen.	1540.15	.136	593.57	.132	1756.31	.152	6170.80	.109	852.78	.114
H. H.	1762.94	.139	1201.79	.121	798.68	.199	1161.02	.110	358.70	.498
Adv.			445.20	.2534						
M. A.			1121.36	.153						
Astronomy									196.73	.184
Physics	3543.11	.172	2627.20	.127	2633.72	.191	2399.52	.082	1005.81	.138
Hist. Anc.	4455.91	.071	1637.76	.088	3888.79	.091	4974.13	.073	742.78	.097
M. & M.	1032.86	.080	959.11	.100	1715.03	.106	3184.46	.079	898.44	.102
Amer.	1785.38	.106			1931.46	.118	3795.19	.077	445.52	.077
Eng.			799.95	.148					300.26	.067
Indus.			566.73	.143	637.97	.123				
Civics	2835.24	.097	240.37	.117	3680.30	.092	3667.26	.097	1192.19	.075
Pol. Econ.	251.67	.071	246.32	.110	580.24	.154	793.42	.112	425.36	.121
Sci.			596.22	.114						
Latin I	5098.93	.107	737.81	.062	3472.68	.102	5210.05	.089	2351.71	.107
Caesar	2612.81	.109	766.43	.130	2248.62	.117	3342.12	.107	958.50	.103
Cicero	498.50	.128	388.83	.120	1078.22	.126	1451.89	.103	412.43	.176
Virgil	435.29	.275	329.42	.529	530.45	.119	898.91	.126	406.82	.183
Greek I	472.70	.309			490.68	.148				
II					395.14	.621				
German I	1391.72	.086	947.47	.085	1992.02	.130	2130.18	.086	544.94	.087
II	484.08	.078	813.45	.158	1049.38	.122	1866.47	.083		
III	421.43	.106	426.38	.131	525.95	.120	859.19	.111		
IV	323.86	.539			407.79	.375	531.64	.093		
French I	1176.34	.130	524.43	.153	846.01	.120	1054.86	.076		
II	395.17	.180	505.19	.202	462.14	.115	769.02	.084		
III	384.11	.402			371.23	.248	348.24	.137		

Table II-- (Continued)

	Central		Manual Training		Northeast		Westport		Lincoln	
	Invest.	P.R.	Invest.	P.R.	Invest.	P.R.	Invest.	P.R.	Invest.	P.R.
Spanish I	\$ 1529.26	\$.056	\$ 1275.14	\$.078	\$ 1427.78	\$.081	\$ 2519.13	\$.103		
II	306.72	.074	549.18	.138	763.77	.138	835.57	.138		
III	254.15	.103			375.17	.132	390.62	.190		
Bookkeeping I	2296.72	.082	3962.78	.103	1900.99	.071	1655.07	.088		
II	542.63	.098			1088.49	.105	994.80	.095		
Shorthand I	742.08	.107	1751.54	.081	1416.73	.080	680.06	.099		
II	960.54	.098	735.72	.107	427.04	.138	338.31	.100		
Com. Geog.	255.61	.067	320.85	.091	535.04	.092	245.01	.082		
Arith.	736.11	.069	822.15	.091	2161.23	.101	202.96	.112	167.98	.256
Law	266.13	.066	346.53	.099	566.87	.181	553.44	.095		
Typewriting I	2356.18	.100	2656.95	.122	1715.76	.141	742.58	.154		
II			888.20	.136	895.63	.172	308.43	.312		
Penmanship	2022.03	.106	561.67	.138	1179.50	.146	224.39	.338		
Salesmanship	454.64	.160								
Office Tr.			142.34	.292						
Draw. F. H. I	4487.07	.210	2571.16	.146	4663.05	.302	3444.88	.160		
II	402.95	.224	1017.95	.166	572.91	.446	1475.71	.280		
III			814.55	.234			669.96	.310		
IV							909.09	.396		
Mch. I	4783.95	.246	2790.45	.202	2239.78	.308	2788.52	.160		
II			2029.82	.316	1502.86	.242	1320.81	.212		
III			1025.43	.412	432.86	.296	837.80	.234		
IV			912.71	.480	686.58	.522	429.32	.214		
Joinery	2364.30	.420	3934.97	.268	2049.71	.386	3432.23	.344	2060.56	.234
Turning I	1883.78	.338	2407.28	.308	2103.42	.360	1760.23	.374	1833.89	.262
(P.M.) II			536.47	.836						
Forging	978.21	.992	2513.24	.476	1578.61	.894	1420.15	1.020		
Mch. Art. (4 yr.)							496.61	1.326		
Electricity			1344.75	.694						
Mch. Shop			2626.51	.694						
Steam			1198.51	.614						
Gas Engine									921.41	.616
Printing			1461.40	.252						
Domes. Sci. I	1451.50	.242	886.47	.222	2380.94	.312	2082.27	.220	1576.09	1.122
II	1410.03	.510	752.16	.330	771.97	.640	1287.63	.218	800.08	.648
III			493.72	.416						
IV			1138.24	.264						
Domes. Art I	2877.53	.220	4459.51	.246	1512.08	.278	2949.66	.192	1726.95	.164
II	1334.98	.238	2480.44	.256	2067.14	.266	1547.30	.196	1141.03	.190
III			1653.86	.246						
IV			602.12	.160						
H. H.Man.					170.35	.452				
Millinery					943.55	.352				
Lunch			479.60	.234						
Gym. I	8506.53	.176	4054.91	.150	6927.07	.206	4589.96	.280		
II			338.73	.222	1183.34	.146	2786.59	.276		
III			567.74	.162			1356.08	.240		

Table II-- (Concluded)

	Central		Manual Training		Northeast		Westport		Lincoln	
	Invest.	P.R.	Invest.	P.R.	Invest.	P.R.	Invest.	P.R.	Invest.	P.R.
Elocution I	\$ 2329.12	\$.152	\$ 1747.64	\$.206	\$ 1866.65	\$.172	\$ 1090.60	\$.180	\$ 243.06	\$.184
II			206.11	.174	342.17	.386	491.20	.282		
Public Speak I	541.60	.182	314.97	.414	333.99	.458	1013.20	.240		
II			231.90	.264	1772.86	.208				
Music V. I	2936.01	.158	1731.17	.312	1772.86	.208	1158.39	.126		
II					547.87	.238	470.13	.212		
Glee Club							632.70	.110		
Piano			571.40	.342						
Orchestra					629.75	.198	448.86	.206		
	\$121332.04		\$113714.80		\$128661.51		\$148744.60		\$34866.46	
	M.=\$.107		M.=\$.151		M.=\$.140		M.=\$.112		M.=\$.114

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