

1939

# A study to determine emphasis of biological interests in social and industrial groups as basis of biology course in New Bedford High School.

Frank Farley Hutchings  
*University of Massachusetts Amherst*

Follow this and additional works at: <https://scholarworks.umass.edu/theses>

---

Hutchings, Frank Farley, "A study to determine emphasis of biological interests in social and industrial groups as basis of biology course in New Bedford High School." (1939). *Masters Theses 1911 - February 2014*. 2620.  
Retrieved from <https://scholarworks.umass.edu/theses/2620>

This thesis is brought to you for free and open access by ScholarWorks@UMass Amherst. It has been accepted for inclusion in Masters Theses 1911 - February 2014 by an authorized administrator of ScholarWorks@UMass Amherst. For more information, please contact [scholarworks@library.umass.edu](mailto:scholarworks@library.umass.edu).

★ UMASS/AMHERST ★  
  
312066 0306 8609 9

FIVE COLLEGE  
DEPOSITORY

A STUDY TO DETERMINE EMPHASIS OF BIOLOGICAL  
INTERESTS IN SOCIAL AND INDUSTRIAL GROUPS  
AS BASIS OF BIOLOGY COURSE  
IN NEW BEDFORD HIGH SCHOOL

---

NOTCHINGS - 1939

ARCHIVES  
THESIS

M  
1939  
H973

SUBJECT

A Study to Determine Emphasis of Biological Interests  
in Social and Industrial Groups as Basis of  
Biology Course in New Bedford High School

FRANK FARLEY HUTCHINGS

Thesis Submitted for the degree of Master of Science  
Massachusetts State College

AMHERST

1939

## TABLE OF CONTENTS

	Pages
Chapter I. Introduction	
A. Changing objectives in science study	5
1. Reorganization of 1920	6
2. Recent trends	6
B. Survey of present course	7
1. Description of Community	7
2. Outline course of study	8
3. Prediction of changes needed	8
Chapter II. Procedure	
A. Approach to discover subject matter for adjusted course.	10
1. Pupil Survey	11
a. Determination of biological surroundings by biology pupils	12
2. Questionnaire	12
a. Determination as to necessary contents	12
B. Present Biology Outline	13
Chapter III. What pupils found regarding their biological surroundings.	
A. Balanced type of survey	22
1. Home surroundings	23
a. Number in family	23
b. Ownership of home	23
c. Rooms in house	25
d. Method of heating	25
e. Kinds of refrigeration	27
f. Kinds lighting	27
g. Repair of home	27
2. Plant and Animal Surroundings	29
a. The vegetable garden	29
b. Animals and pets	29
c. Lawns and plantings	29
d. Flower gardens	29
e. Flowers in the home	29
3. Recreation and Leisure	31
a. Vacation opportunities	32
b. Favorite sport	32
c. Ability to swim, play, etc.	32
d. Ability to save life	32
4. Food and Health	33
a. Milk consumption	34
b. Absence due to sickness	34
B. Composition of school groups participating	35
1. Classes	36

Chapter IV.	What biological groups though regarding their biological needs and interests.	
	A. Discussion of data	38
	1. Combined group	41
	a. Choice of items	43
	b. Unit grouping	43
	2. Personnel of questionnaire group	44
	a. Professional	47
	b. Trades and Industrial	48
	c. Services	49
	d. Miscellaneous	50
	3. Separate Groups I-IX	
	a. Professional	51
	b. <b>Skilled Professional</b>	55
	c. <b>Executives</b>	59
	d. Office	63
	e. Skilled trades	67
	f. Public service	71
	g. Community service	75
	h. Home service	79
	i. Miscellaneous	83
Chapter V	A Comparison of emphasis placed upon similar units by different groups on a percent value basis.	
	A. Discussion of data	87
	1. Combined Group	88
	2. Separate Groups	89
	a. Professional	
	b. Skilled professional	
	c. Executive	
	d. Office	
	e. Skilled trades	
	f. Public service	
	g. Community service	
	h. Home service	
	i. Miscellaneous	
	3. Evaluation of items	
	a. Percent values	
	4. Comparison of units	
	a. Percent values	93
	b. Numerical order	94
Chapter VI.	Discussion of Units recommended for readjusted course of study.	
	A. Outline of adjusted units	96
	1. Order of Emphasis	96
	B. Use of units	98
	C. Conclusions	101
Chapter VII.		
Appendix	Replies to questionnaire by groups	5
	Pupil Survey of biological surroundings	6
	Selective questionnaire of biological interests	6
Chapter VIII		
Bibliography		8

CHAPTER I

INTRODUCTION

Introduction

As the result of changing trends in education during the opening years of this century, the National Education Society appointed a commission to investigate the present situation and to submit recommendations regarding the reorganization of secondary education to meet the needs of the times. A report was therefore submitted in 1918 on "Cardinal Principles of Secondary Education" and published as a public document in 1919.\*(1) Supplementary reports followed on the reorganization of different subject matter, among them the outstanding report on "The Reorganization of Science in Secondary Education."

The first report of the Commission is worthy of especial consideration in its definite conclusion that the needs of society and the plans of the schools were not in harmony. The following recommendations were submitted: (1) that a continuous and progressive program of education be drawn up from the kindergarten to the University, (2) that greater attention be given to individual differences in intellectual ability and interests, (3) that Educational differentials be formulated, with recognition of the needs of individuals and of society, and (4) that surrent conceptions of general discipline be thoroughly revised.

Having defined these very necessary changes in educational theory the Commission outlined the main objectives of education

\*(1) Cardinal Principles of Secondary Education, Bulletin 19  
Office of Education, Washington, D. C.

to be: (1) Health. (2) Command of fundamental processes. (3) Worthy home membership. (4) Vocational efficiency. (5) Citizenship. (6) Worthy use of leisure and (7) Ethical character. These objectives had been arrived at as the result of a thoroughly conducted scientific study and marked a landmark in the development of educational philosophy.

In the following year (1920), the Committee's report on the "Reorganization of Science in Secondary Education" appeared. In it emphasis was placed upon the value of science instruction in the realization of practically all of the above aims. The essential difference was that it had shifted the emphasis in science study from the mastery of subjects to the mastery of functional values as applied to human relations.

Viewed from the standpoint of problems of today, certain changes of philosophy and method may be noted. In the first place, the emphasis had been placed upon the immediate and applied value, and too little attention devoted to a recognition of the contributions of the past in the determination of the problems of the present. Also no direct reference was made to the influence which this development has had upon thinking and on the mental and social adjustments of the individuals of our society. Referring to the conclusions reached by the Committee on the "Function of Science in General Education" of the Progressive Education Society, it was felt that "the purpose of general education is to meet the needs of individuals in the basic aspects of living in such a way as to promote the fullest possible realization of personal potentialities and the most effective participation in a democratic society."



Thus the emphasis of modern scientific education is laid on the need of individuals of a personal and social nature. For definitiveness these may be outlined in four groups: (1) Personal living, which embraces the bases of good health, the correct food for living needs, esthetic satisfactions, a workable philosophy, etc.; (2) Immediate personal-social relationships, which refer to the adjustments within the family and between the sexes; (3) Civic relationships, which include the effective participation in social and civic affairs so that the most effective biological conditions for successful living may be attained; and (4) Economic relationships which refer to vocational background, the ability to work to the most effective ends and the understanding of economic laws and practices as applied to every day living.

The part which science plays in these relationships is the controlling factor. In particular are the biological relationships affected. The modern philosophy of education calls for the fullest expression of individual capabilities - for direct coordination with human needs in the social, civic, and esthetic fields. Of necessity there is a great deal to be accomplished in determining just what these interests are. A definite study must be made with each particular case to arrive at any full understanding. The procedure will vary in each instance, and the solutions will differ accordingly.

The method of approach to an understanding of the problem must be by personal contact and survey. The form which the contact may take must be systematic so that the ground may be definitely covered. The method of questionnaire by contact would be likely to produce the most satisfactory results.

Therefore, the author has proceeded along this line in determining the differences of biological interests in society. The information sought is definitely stated so as to be clearly understood by the persons from whom it is sought. With this method it is possible to obtain necessary information on which to proceed in the building up of a biological program of work in the local high school.

The main purpose of this study is thus to determine the interests and understanding of the pupils with whom we are concerned, and the desires and interests of their parents (the older people of the city) as they are engaged in the process of earning a living, regarding what experience has shown them would be valuable to have taught to their children in high school.

A guide to the subject matter proposed to be included in a more effective general biology course in the high school is found in the answers to questionnaires that have been circulated in our student group and among the older professional, business and industrial groups through the city.

New Bedford is a textile manufacturing city with rail and sea connections. The population according to the National Census of 1930 was 112,804. It has a cosmopolitan population made up largely of native-born and English, French, Portuguese, Poles, Armenians, Germans and Italians, thus affording an ample supply of skilled and unskilled labor. The city is sixth largest in Massachusetts in population and third in the value of its manufactured goods. In all there are 200 industries employing over 32,000 people. The textile industry is out-

standing and embraces by far the largest number of the workers.

The standard of living conditions in New Bedford has been affected by the depression and conditions peculiar to the textile industry. The standard of wages paid in the textile industry is in general somewhat lower than that in other industries, - that in the metal trades, for example. The character of the laborers has been such that cheap help is available, and the character of work required in mill work has been of such that long training is not necessary. The transfer of many mills to the South has also decreased the valuation of property.

In spite of the handicap of lower standards of living due to the above-mentioned causes it must not be overlooked that the workers and the mill owners have shown an outstanding ability to work together and to adjust any differences through the actions of a joint board. In this way savings have been effected and labor continued on a higher wage plane.

CHAPTER II

PROCEDURE

## PROCEDURE

Before it was possible to proceed to the task of ascertaining what constituted the most important biological needs and interests of the members of the different community groups, and what should be included in the high school general biology course, it was necessary to determine what were the biological surroundings and circumstances under which the members of these groups lived. In order to ascertain what these factors are, a study was made of the biological set-up of the community, through a high school student questionnaire. This was arranged in the form of a biological survey and given to members of each of the ten biology classes in the high school. In all, three hundred returns were obtained. It was felt that more accurate and dependable information could be obtained in such a manner by a representative group of young people, who were more observing as to the character of their surroundings, than if it had been conducted by any older group. On the basis of the information so obtained, it was possible to proceed with the next phase of the study.

The second phase of this study was conducted in the form of a questionnaire submitted to the members of fifty-five different professional, trade, and industrial groups throughout the city so as not only to obtain a cross section of opinion of these different groups as to their biological needs and interests but also so as to be able to obtain a basis for examination of these different community groups as to their comparative needs and interests.

The method by which these groups were selected necessitated considerable study. The census statistics of city occupations furnished a guide along which to work. An examination of the vocations, activities, etc. of the parents of the pupils taking the biology courses afforded very definite information. A third guide was found in analysis of the general character of positions which high school graduates occupy in the community.

In evaluation of data received I have allowed the biological interests of certain groups special weight in influencing the planning of a high school biology course. These groups comprise the professional and clerical, the skilled tradesmen, and store and skilled industrial workers. The members of these groups either have been graduated from the high school themselves or have had children in the school.

The topics treated in each of the surveys were chosen with reference to the units contained in the present general biology course in the high school. It was the purpose to make the statements and the opinions as simple and direct as possible in order that the results obtained be significant.

The method of presentation in each case was by personal contact. The purpose of the paper was carefully explained, the answers given only after thoughtful consideration.

The first survey included the different items of biological information in the surroundings of the pupils. These they were asked to check on and return the following day. A tabulation of the findings follows in the next chapter.

The second survey includes opinions of biological

interest from the older groups. An attempt was made to find out what topics had the greatest frequency. The different members of the groups were asked to check the fifteen items which they considered to be of the most importance. The tabulation of results follows in a later chapter.

PRESENT BIOLOGY OUTLINE

I. BIOLOGY DEALS WITH ALL LIVING THINGS

Unit 1. Some Problems which Living Things must Solve  
in Securing and Using Energy

Introduction and Statement of Major Problems

II. THE STRUGGLE FOR ENERGY

Problems:

How are Living Things Engaged in the Struggle for Energy?  
What Kinds of Enemies must Living Things Fight, and  
How do they Protect Themselves against these Enemies?  
What is Man's Part in the Struggle for Energy?

III. LIFE NECESSITIES

Problems:

How is Life Related to Certain Forms of Energy and to  
Certain Factors and Conditions of the Air?  
How is Life Related to Certain Other Factors of the  
Environment?

IV. LIVING AND NONLIVING THINGS

Problems:

What are some Important Characteristics of Living Matter?  
How does Living Matter Differ from Nonliving Matter?  
What are some Important Chemical and Physical Processes  
which are Related to Living Things?

Unit II. Plants and the World's Food Energy

Introduction and Statement of Major Problems

V. THE PLANT AND SOME OF ITS PROBLEMS

Problems:

How is a Green Plant Equipped to Transform the Sun's  
Radiant Energy into Food Energy?  
How does the Green Plant Manufacture Food?  
What are the Nature and the Importance of Transpiration?

VI. DIFFERENT STRUCTURES FOR DIFFERENT USES

Problems:

What are some of the Structures and Functions of Plant Stems?  
How do Stems Grow?  
What are some of the Structures and Functions of Roots?  
How do Various Plants Solve the Problem of Food Storage?



## VII. COMPETING FOR LIGHT ENERGY

### Problems:

How are Various Kinds of Plants Equipped to Compete for the Sun's Energy?

## Unit III. The Living Things which Compete for Energy

### Introduction and Statement of Major Problems

## VIII. HOW LIVING THINGS ARE GROUPED AND NAMED

### Problem:

How are Living Things Classified?

## IX. THE FOUR GREAT GROUPS OF PLANTS

### Problems:

What are some Adaptations which Enable the Various Great Groups of Plants to compete successfully for Energy--the Simplest Plants, the Mosses and Liverworts, the Ferns and their Relatives, and the Seed-Bearing Plants?

## X. THE SIMPLER ANIMALS

### Problems:

What are some Adaptations which Make the Great Groups of Simpler Animals Successful Organisms--the Protozoa, the Sponges, the Coelenterates, the Flatworms, the Roundworms, the Echinoderms, the Segmented Worms, and the Mollusks?

## XI. THE INSECTS AND THEIR RELATIVES

### Problems:

How are the Arthropods, especially the Crayfish and the Insects, Equipped to Compete successfully for Energy?

## XII. THE ANIMALS WITH SPINAL CORDS

### Problems:

What are some Adaptations of the Higher Animals which Make them Successful in the Competition for Energy--the Fish, the Frogs and their Relatives, the Snakes and their Relatives, the Birds, and the Mammals?

Unit IV. Structures and Processes Concerned with  
Securing and Using Food Energy

Introduction and Statement of Major Problems

XIII. HOW PLANTS AND ANIMALS MEET THE FOOD PROBLEMS

Problems:

- How are Typical Plants and some of the Simpler  
Animals Equipped to Secure the Food they Need?
- How are the Highest Invertebrates and the Chordates  
Equipped to Secure Food?
- What are some Problems of Man in Relation to Food?
- What are some Important Facts about the Energy Foods?
- What are some Important Facts which one should know  
about the Non-energy Foods and the Substances  
they Contain?

XIV. PREPARING FOOD ENERGY FOR USE BY PROTOPLASM (DIGESTION)

Problems:

- What is the Nature of Digestion?
- How do the Digestive Systems of the Lower Organisms  
Differ from those of the Higher Organisms?
- What are some Important Factors in Relation to  
Digestion in the Human Mouth?
- How is Digestion Carried on after the Food Leaves the  
Mouth?

XV. TRANSPORTATION AND USE OF ENERGY AND NECESSARY MATERIALS  
WITHIN AN ORGANISM (CIRCULATION AND ASSIMILATION)

Problems:

- What are some Important General Facts about Circulation  
in Plants and Animals?
- What are the Important Structures of Plant and Animal  
Circulation and What are their Functions?
- What are the Structures of Human Circulation and What  
are their Functions?
- What is the Nature of Human Blood and How does it  
Perform its Functions?

XVI. THE PROCESS OF SECURING OXYGEN AND ELIMINATING CARBON  
DIOXIDE (RESPIRATION)

Problems:

- How is Respiration Carried On in Plants?
- How is Respiration Carried On by those Animals which  
obtain Oxygen Dissolved in Water?
- How is Respiration Carried On by Animals which Get  
Oxygen directly from the Air?
- How is Respiration Carried On by Man?

XVII. GETTING RID OF WASTE PRODUCTS (EXCRETION)

Problems:

- What is the Nature of Excretion?
- How is Excretion Carried On in Plants and Typical Animals?
- How is Excretion Carried On in Man?

XVIII. GLAND SECRETIONS AS AIDS IN THE USE OF ENERGY

Problem:

- What are some Characteristics and Functions of the Various Glands in Man?

Unit V. The Responses of Living Things to Energy and Other Factors in the Environment

Introduction and Statement of Major Problems

XIX. UNLEARNED RESPONSES

Problems:

- What Responses can be Made by Plants and by Protozoa?
- How do Organisms with Nervous Systems React to Stimuli?
- What Responses can Insects Make?
- What Responses can Chordates Make?

XX. LEARNED RESPONSES

Problems:

- What are Some Factors in Animal Learning?
- What are Some Characteristics of High Learning?

XXI. THE SPECIAL SENSE ORGANS

Problems:

- What is the Nature of the Senses of Touch, Taste, and Smell?
- What is the Nature of the Sense of Sight in Various Animals?
- What is the Nature of the Senses of Hearing and Balance?

Unit VI. Man's Efforts to Conserve his Energy through Control of Disease and Improvement of Health

Introduction and Statement of Major Problems

XXII. USE AND CONTROL OF INVISIBLE LIVING THINGS

Problems:

How do Various Microorganisms Help and How do they Injure Man?

How are Communicable Diseases Spread?

How may we Guard against Attacks by Disease Germs?

How may the Body be Helped to Resist Attacks of Disease Germs?

XXIII. HOW SCIENCE COMBATS CERTAIN GERM DISEASES

Problems:

How does Science Combat Diphtheria, Smallpox, and Typhoid Fever?

How does Science Combat Tuberculosis?

How does Science Combat some of the Most Serious Diseases Caused by Protozoa?

XXIV. IMPROVING HEALTH THROUGH APPLICATIONS OF BIOLOGY

Problems:

How are Hygiene and Health Related to Food Habits?

What are some Important Considerations concerning the Hygiene of the Mouth?

How are Hygiene and Health Related to Respiration?

What are some Further Considerations in Relation to Hygiene and Health?

Unit VII. Improving Methods of Using and Conserving Energy

Introduction and Statement of Major Problems

XXV. CONTROL AND CONSERVATION OF CULTIVATED PLANTS AND DOMESTIC ANIMALS

Problems:

How do Men Use and Conserve Soil Values?

How does Man Protect his Crops against Insect Pests?

How can Man Control Pests that Attack Domestic Animals?

How can Man Control Certain Fungous Diseases of Plants?

XXVI. THE CONSERVATION OF NATURAL RESOURCES AND WILD LIFE

Problems:

What are Important Problems of Forest Conservation?

What are the Most Serious Enemies of Forests?

By What Means are Forests Conserved?

Of What Importance to Man are Birds, and How can they be Protected?

In What Ways are Wild Mammals Important to Man?

How can Man Make Rivers, Lakes, and Oceans More Productive?

XXVII. CONSERVATION AND THE NATIONAL PARKS

Problems:

- What and How are National Parks Provided?
- What are some of the Special Features of the Yellowstone National Park?
- What are some of the Features of the Great Smoky Mountains National Park?

Unit VIII. The Struggle for Energy through Succeeding Generations

Introduction and Statement of Major Problems

XXVIII. THE SIMPLEST KINDS OF REPRODUCTION

Problems:

- Can Life Start from Dead Material?
- What are the Ways in which Simple Plants and Animals Reproduce?
- How do Plants and Animals Reproduce by Fission and by Budding?
- How do Plants and Animals Reproduce by Means of Spores?
- How do Plants and Animals Reproduce Vegetatively?

XXIX. REPRODUCTION WITH SEX

Problems:

- How is Sexual Reproduction Effected in the Simplest Plants and Animals?
- How is Sexual Reproduction Effected in Plants and Animals which Have Sex Organs?
- What are the Special Conditions Associated with Sexual Reproduction?

XXX. OTHER IMPORTANT FEATURES OF REPRODUCTION

Problems:

- How is Alternation of Generations Illustrated in the Life Histories of Moss and Fern?
- What are the Important Aspects of Fertilization and Incubation?
- What are Some Unique Behaviors Related to Reproduction?
- What are Some Behaviors Related to Care of Offspring?

XXXI. THE FACTORS OF INHERITANCE

Problems:

How do Plants and Animals Change?

In What Respects is the Cell the Basis of Inheritance?

What are the Laws of Inheritance?

How do Men Apply the Laws of Inheritance?

XXXII. THE RECORDS OF THE AGES

Problem:

What Causes Scientists to Believe that Life on the  
Earth is Descended from Ancient Life?

Unit IX. Biology for Leisure Time

Introduction and Statement of Major Problems

XXXIII. BIOLOGY FOR LEISURE TIME

Problems:

How can Biological Knowledge be Used in Out-of-Door  
Pastimes?

How can Biological Knowledge be Used in Indoor Pastimes?

From experience obtained in the presentation of the present course in general biology it has been found that too much material has often been presented and the emphasis has been misplaced. For this reason much that has been of value had to be sacrificed and much that ought to have been taken up has been omitted. Possibly the reason for this has been that the course follows too closely along the lines laid down in the college entrance requirements. The problem of better arrangement of material so that it will function for the non-college student is one that needs attention.

For example: Considerable time is devoted to a classification of plants and animals as well as to the development of the functions in animals. This may have been replaced on a more thorough study of such units as Health, Food, Disease, Narcotics etc., which are considered necessary to better living.

A rearrangement of the foregoing course for the non-college student was made by finding out what were the surroundings of the pupil and then by determining what the interests of the older occupational groups were and comparing them with the units of the present course so that proportionate emphasis might be made in the arrangement of the revised course.

It is to be expected that the regular course for the college entrance student will be continued and may be done by arranging the material so that the emphasis shall be placed properly.

The determination of this is the function of the later chapters of this thesis.

CHAPTER III

WHAT THE PUPILS FOUND REGARDING THEIR BIOLOGICAL  
SURROUNDINGS AS GIVEN IN SURVEY SHEET I



## CHAPTER III

### WHAT THE PUPILS FOUND REGARDING THEIR BIOLOGICAL SURROUNDINGS

#### AS GIVEN IN SURVEY SHEET I

##### In General:-

This study of the biological needs and interests of the community has been conducted from two different angles. The first phase had to do with the securing of information as to the character of these surroundings as determined by a survey conducted by the pupils of the biology classes of the New Bedford High School. The second phase was concerned with the opinions of the older employed group as to what they felt were their most important needs and interests. This chapter will concern itself with a tabulation of the information obtained from the first survey along with a discussion of that data.

The results gained from the survey were interesting and significant inasmuch as this information was obtained by the pupils themselves in a close check-up of their own surroundings and activities.

##### In Particular:-

The first group of particular items had to do with home conditions. These related to general living conditions and contained information as to the size of family, the ownership of the house (whether privately owned or rented), the number of rooms in the house, and conveniences available, such as the type of heating used, the character of lighting, kind of refrigeration, and general repair of the house. Details of each are found

in pages following.

Number of Persons in family:-

The most important item in this group related to the number of persons in the family. In some cases the family included relatives or roomers, though this was not the rule. The number ranged from two to twelve in a family. Those families numbering from three to seven embraced the larger number. The average family comprised mother, father, and three children. The large family groups, containing from eight to twelve, were few in number.

Ownership of house:-

The inquiry relative to home ownership showed forty percent owning. The other sixty percent occupied rented quarters. The percent of persons owning homes in the city is only \_\_\_\_\_ indicating that the high school pupil comes from homes of above the average circumstances.

Number of rooms in house:-

The number of rooms in a house varied from four to fourteen, with an average of seven and six-tenths rooms per family, and with the following distribution: twelve with four rooms, fifty-one with seven rooms, twenty-one with ten rooms, and seven with fourteen rooms. These figures would seem to indicate that practically all high school families were adequately and comfortably housed.

TABLE I

CHARACTER OF HOME SURROUNDINGS

<u>Number in Family</u>	<u>Number of Families</u>
Two in family	3
Three in family	39
Four in family	73
Five in family	58
Six in family	34
Seven in family	20
Eight in family	8
Nine in family	6
Ten in family	1
Eleven in family	2
Twelve in family	2
	<u>246</u>

HOUSE PRIVATELY OWNED OR RENTED?

Privately owned	100
Rented	<u>146</u>
	246

Method of heating:-

The heating systems embraced the four common types of coal stove, hot air, hot water and oil heating. Of these it was found that sixty-six percent were of the furnace type, and the remaining homes were heated either by wood or coal stoves. It may be considered that the heating conveniences are satisfactory although in one-third of these cases we found that wood and coal stoves were being used. This would indicate more crowded living quarters during the winter and a possible inconvenience in the ability to perform home work.

Kinds of refrigeration used:-

The systems of refrigeration were three in number and consisted of ice, electric, and gas refrigeration. One-half of these were of the old ice-box type and the remainder of the electric type with the exception of six gas refrigerators. An increasing use of electric refrigerators may be noted in this relation. The old type ice-box was found to be still in use in the majority of cases with the resulting low efficiency.

Kind of lighting used:-

Electric lighting was reported in one hundred percent of the houses surveyed.

Repair of home:-

General good repair of the houses was also noted.

TABLE II

NUMBER OF ROOMS IN HOUSE

<u>Number of rooms</u>	<u>Number of families</u>
Four rooms	12
Five rooms	46
Six rooms	35
Seven rooms	51
Eight rooms	36
Nine rooms	23
Ten rooms	21
Eleven rooms	5
Twelve rooms	5
Thirteen rooms	4
Fourteen rooms	7
	<u>246</u>

METHOD OF HEATING HOUSE

<u>Method of Heating</u>	<u>Number of families</u>
Coal	48
Stove	33
Oil	74
Hot air	54
Hot water	37
	<u>246</u>

In reviewing the above facts, it can be stated that the percent of home ownership was high, and that living conditions in these homes rated better than average in space accommodation and modern conveniences.

TABLE III

KIND OF REFRIGERATION USED

<u>Kind of refrigeration</u>	<u>Number of families</u>
Ice refrigerator	123
Electric refrigerator	117
Gas refrigerator	<u>6</u>
	246

HOW IS HOUSE LIGHTED?

Electricity	246
-------------	-----

IS HOUSE KEPT IN GOOD REPAIR?

Good repair	246
-------------	-----

Plant and Animal Interests

The next important factor has to do with the character of the plant and animal interests. The extent of participation in the activities of this field is a measure of the degree of interest existing, as well as of the amount of instruction and guidance needed along these lines.

An index of the degree of interest which people have in animal life was shown by the fact that fifty-four percent of the homes surveyed had domestic animals. The kind of animals included varied from the ownership of a horse, hens, or cows which contribute to the livelihood of the family, to the possession of pigeons, dogs, cats, birds and other household pets.

The opportunity to have and to care for a garden is valued by the city dweller. It not only affords him an opportunity to obtain fresh vegetables and to decrease the cost of living, but it also enables him to obtain exercise that he would not be able to get in any other way. In all, one hundred forty-six persons, or sixty percent of the group were able to have their own gardens. This represents an unusually large number for any city group.

A still greater number of people cultivated flower gardens. One hundred eighty-three homes, representing a total of seventy-four percent of the number surveyed, had interest in the growing of flowers. Of this number it will be recalled that one-half of the homes were rentals.



TABLE IV

PLANT AND ANIMAL INTERESTS

HAVE YOU A GARDEN?

Those having gardens	146
Those not having gardens	<u>100</u>
	246

HAVE YOU ANIMALS OR PETS?

Those having animals or pets	132
Those not having animals or pets	<u>114</u>
	246

ARE THERE GOOD LAWNS AROUND HOUSE?

Good lawns around house	187
No lawns around house	<u>59</u>
	246

HAVE YOU A FLOWER GARDEN?

Those having flower gardens	186
Those not having flower gardens	<u>60</u>
	246

HAVE YOU FLOWERS IN THE HOUSE?

Those having flowers	203
Those not having flowers	<u>43</u>
	246

The practice of having flowers in the home was carried out in a still greater number of cases. Eighty-three percent had flowers throughout the year. The keeping of plants in the house is not subject to the limitations that are met with in the care of a garden or out-of-door flower plots and is an indication of the natural love which people have for flower culture.

Relative to the care and maintenance of lawns about the house, results indicated that sixty percent of the houses had lawns, the same proportion as those having gardens.

In all, these figures of the degree of participation of this group in nature activities are unusually high in comparison with other city groups. They are indicative, however, of the surroundings of a group of students with which we are most intimately concerned in school.

Recreation and Leisure

The third group of factors has to do with sports and the use of leisure time. Since these activities are taking up an increasing amount of time in the life of an individual, they become an outstanding problem of society.

The opportunity to have a vacation during the summer that would result in a definite change of environment and bring about a new set of experiences, was open to seventy-two percent of the pupils reporting. The remainder indicated that they had been able to enjoy shorter periods of change. A condition unusually favorable seems to be reflected.

The ability to take part in some sport and thereby be in a position to make better use of leisure time, was enjoyed by practically all the pupils. This condition was brought about by the maintenance of good gymnasium instruction and by the supervision of sports which included all boys and girls. However, there was a fairly large group which indicated no opportunity to play ball or tennis.

The ability to resuscitate a person from drowning or from gas effects was unfavorably reported. In this group it was shown that sixty percent would not know what to do. It would seem that first aid instruction should receive more attention.

In conclusion, with this exception, reports from the pupils as to sports and use of leisure time were particularly favorable.

TABLE V

Recreation and Leisure

HAVE YOU OPPORTUNITY TO GO AWAY ON A VACATION EACH YEAR?

Those having vacation opportunity	178
Those not having vacation opportunity	68
	<u>246</u>

FAVORITE SPORT

Baseball

CAN YOU SWIM - PLAY TENNIS - PLAY BALL?

Those not able to swim	35
Those not able to play tennis	73
Those not able to play ball	49
	<u>246</u>

CAN YOU RESUSCITATE A PERSON FROM DROWNING, ETC.?

Those able to do so	100
Those not able to do so	146
	<u>246</u>

FOOD AND HEALTH CONDITIONS

Two factors were reported upon in this phase: milk consumption by individuals and families and school absence on account of sickness.

The amount of milk consumed has a great deal to do with the health of the family. The availability of good milk and the family's purchasing power are the controlling factors. The milk supply of New Bedford is abundant and conditions surrounding production are most sanitary, and the survey showed that all families reported a fair consumption of milk, the average per person amounting to one pint per day. No families indicated a much lower average.

The necessity of remaining out of school on account of sickness at some time during the year was reported by thirty-three percent of the pupils. The time varied from a few days to over a month. The result of this loss of time results in a loss of instruction and a lower standard of work, often necessitating the pupil's leaving school.

The problem of pupil absence involves other causes than absence due to sickness. The need of helping at home in a family unable to pay for assistance in emergencies plays an important part. The inability to understand the school work and the resulting lack of interest also makes for irregular attendance.

Both these above factors affect general good health.

TABLE VI, FOOD AND HEALTH CONDITIONS, on the following page furnish information on the above.

TABLE VI

FOOD AND HEALTH CONDITIONS

HOW MUCH MILK DOES FAMILY USE DURING WEEK?

About a pint per person per day	246
---------------------------------	-----

HAVE YOU BEEN OUT OF SCHOOL ON ACCOUNT OF SICKNESS THIS YEAR?

Those out for sickness	80
------------------------	----

Those not out for sickness	166
	<u>246</u>

COMPOSITION OF SCHOOL GROUPS COOPERATING IN THE  
BIOLOGICAL SURROUNDINGS SURVEY

The composition of the pupil group that participated in the survey of biological surroundings was such as to include the entire membership of the Biology classes in the New Bedford High School. September - January 1938-9.

Ten classes embracing those in the Scientific, Normal, and General Courses were included. Of these, three classes were from the College Scientific Course, five from the Normal Course, and two from the General Course. These classes were all second year grade, and were equally divided between first and second half years.

Many of the pupils taking biology in these classes, however, had elected it as upper classmen in order to obtain necessary credits for college entrance.

This particular group was taken as the most logical selection for such a survey. Its subject matter had to do with biologic surroundings, and the groups most interested were those who had elected to take up this line of study. It was also of help to the teachers of the course in the effective arrangement of their study objectives.

The composition of this group is shown in TABLE VI on the following page.

TABLE VI

COMPOSITION OF SCHOOL GROUPS ANSWERING  
BIOLOGICAL SURROUNDINGS SURVEY

<u>Class and Course</u>	<u>Number in Class</u>
1 Class 2B Scientific Course	23
1 Class 3C Normal Course	27
1 Class 4E General Course	24
1 Class 3B Normal Course	26
1 Class 4C Normal Course	26
1 Class 4B Scientific Course	26
1 Class 4E General Course	29
1 Class 4C Normal Course	25
1 Class 4B Scientific Course	22
1 Class 3B Normal Course	<u>18</u>
TOTAL 10 CLASSES	246



CHAPTER IV

WHAT OCCUPATIONAL GROUPS THOUGHT REGARDING THEIR  
BIOLOGICAL NEEDS AND INTERESTS

WHAT OCCUPATIONAL GROUPS THOUGHT REGARDING THEIR  
BIOLOGICAL NEEDS AND INTERESTS  
ORGANIZATION OF INFORMATION.

In reviewing the second questionnaire it has been shown that the range of occupations included make it a representative group. The persons consulted had such education and training as highly skilled or professional occupation required - enough to make their opinions worthy of consideration. This varied from that received through vocational training, through school courses, through regular apprenticeships or industrial training to the highly specialized education of those in the professional groups.

The range of items is inclusive of those considered in the regular high school course in Biology. They indicated opinions as to what had been found to be of the most value to successful living. Responses from the entire number were obtained and the results tabulated in the order of their frequencies. In this way it was possible to obtain a comparative set of values for each item. This was done also in each of the nine social and industrial groups. In this way, it was possible to compare the interests and opinions of each of the nine groups.

The compilation of the returns from all of the nine groups as well as the numerical position attained by each item is found in TABLE VIII.

In order to simplify the list of items and to obtain a better grouping, it was found possible to consolidate items

of like nature: Functions of the Human Body, which embraced four items, and referred to each of four functions, and Development of Animal Functions, which embraced four items and similarly referred to four functions of Animals, were each considered as one item under the heading of The Human Body and its Functions, and The Development of Animal Functions. In this way, the list of items were reduced to thirty-one.

The items were then arranged in order of frequencies in the total number of choices given each item. These results are found in TABLE VIII.

A further grouping of items corresponding to units of study was found to be practicable. Many of the items were closely associated under such headings as Health, Disease, etc. It was found possible to consolidate these items into ten units. Each unit may be treated as a subject in the school course, and the comparison of the treatment and the value given each unit by the nine groups would be more significant than comparing that given to each of the several items.

The following arrangement of units was found to be convenient:

1. The Human Body and its Functions
2. Health Considerations
3. Foods
4. Heredity and Evolution
5. Disease
6. Reproduction
7. Plants
8. Animals
9. Narcotics
10. Miscellaneous

The last unit is considered as a miscellaneous one as little value was given the items in it and it was not considered significant except in two cases.

The arrangement of the units with their associated items is found in TABLE IX.

The contents of the table include the number of choices per item, the average choice per unit and the percent value of the unit based on number of choices. A discussion of the choices obtained from the combined group as compared to those from the separate groups is taken up later.

OPINION OF COMBINED GROUP

The review of the results obtained from the returns of the entire number of choices made, show the following arrangement of units on the basis of percentage of votes cast.

The first choice of units was, "The Human Body and its Functions, with a percent value of 85.1. All items relating to Functions of the Human Body were considered of equal importance, followed by Glands of the Body with a less number of choices.

Second choice is given to Health Considerations, with a percent value of 73.1. The leading item in this unit is, "The Necessity of Keeping Fit," followed by Good Health in the Home, Value of Appearance, and The Value of Posture, in order named.

Third choice was given Narcotics with a percent value of 53.2. Emphasis is placed on this unit in the minds of all groups even to a greater degree than on Disease and Foods.

Fourth choice is given Disease with a percent value of 54, which is only slightly less than that given Narcotics. The arrangement of items in the order of their importance are as follows: "Health Check-up," "Transmission of Disease," "Bacteria," and "Nature of Disease."

Fifth position is awarded "Foods" with a percent value of 48. The arrangement of items in the order of their choice are as follows: "Vitamins," "Care of Milk, Food and Water," "Food Preservation," "Uses of Food," "Food Spoilage," and "Sources of Food."

Sixth choice is given "Heredity and Evolution" with a percent of 33. Heredity was considered twice as necessary for study as Evolution.

Seventh choice was given the unit "Reproduction of Plants and Animals" with a percent value of 26.

Eighth choice is given the unit "Animals" with a percent value of 17.1. The principal emphasis is placed on the item, "The Economic Uses of Animals" followed by "Animal Breeding" and "Classification of Animals," each with low percent values.

Ninth choice is given to "Plants" with a percent value of 17. The emphasis is placed on the item "What are the Economic Uses of Plants" followed by the items in order: "The Vegetable Garden," "The Flower Garden," "Classification of Plants," "Functions of Plants" and "Weeds."

Tenth place is given to "Miscellaneous" with a percent value of 8. There are eight items in this unit and the only one considered very important is "Our Surroundings." The other items receive very low percent values and are not considered significant.

The following pages have to do with choices made by each group separately.

TABLE VIII

CHOICES OF COMBINED GROUP

	Total Frequencies	Rating in Units
1. The Influence of Surroundings on Plants and Animals	48	21
2. Sources of Food for Living Things	13	16
3. Uses of Food by Living Things	88	12
4. Vitamins, Their Sources and Uses	120	6
5. Food Spoiling. Its Causes	84	14
6. Methods of Food Preservation	108	10
7. The Care of Food, Milk, Water and Air	118	7
8. Good Health. How to Keep Fit.	178	1
9. Good Health in the Home.	126	4
10. What is the Nature of Disease?	63	19
11. Disease. How is it transmitted.	114	8
12. Disease. How Can We Check Up on Ourselves	140	3
13. Bacteria. Their Extent, Benefit and Danger	85	13
14. Our Appearance. How Can We Look Right?	122	5
15. Our Posture. Of What Use is it?	118	7
16. The Glands of the Body. Their Great Uses	99	11
17. Narcotics and Their Great Danger	109	9
18. Reproduction of Plants and Animals	49	20
19. Evolution. How did Man Develop	42	23
20. Heredity. What Are the Laws of Heredity?	80	15
21. Plants. How are they classified?	15	26
22. Plants. Their economic use to mankind	64	18
23. Plants. What are the functions of a Plant	13	28
24. Plants. Weeds their nature, extent, and ways of control	10	30
25. Plants. The Vegetable Garden	46	22
26. Plants. The care of Flowers and the Flower Garden	40	24
27. Animals. How are they classified?	11	29
28. Animals. Their economic use to mankind.	70	17
29. Animals. How are they improved by Breeding	14	27
30. The Human Body. The digestion of foods.	173	2
31. The Human Body. Circulation of the Blood	173	2
32. The Human Body. Action of the Respiratory System	173	2
33. The Human Body. The Nervous System	173	2
34. Insects. Their Importance and Action	16	25
35. How to Observe Plants and Animals. Aquaria, etc.	12	28
36. How Old is the Earth?	16	25
37. The Development of Digestion in the Animals.	13	28
38. The Development of Circulation in Animals	9	31
39. The Development of Respiration in Animals	9	31
40. The Development of Locomotion in Animals	3	32

TABLE IX  
COMBINED GROUP (I - IX)

ORDER	RESULTS OF QUESTIONNAIRE BY GROUPS	Choices per item	Average per unit	Percent Value
1	<u>UNIT 1 THE HUMAN BODY AND ITS FUNCTIONS</u>			
	Item 16 The Glands of the Body	99		
	30 Functions of the Body-Digestion	173		
	31 " Circulation	173		
	32 " Respiration	173		
	33 " Nervous System	173	791	158.4 85.1
2	<u>UNIT 2 HEALTH CONSIDERATIONS</u>			
	Item 8 The Necessity of Keeping Fit	178		
	9 Good Health in the Home	126		
	14 The Value of Good Appearance	122		
	15 The Value of Posture	118	644	136 73.1
5	<u>UNIT 3. FOODS</u>			
	Item 2 Sources of Food	13		
	3 Uses of Food	88		
	4 Value of Vitamins	120		
	5 Food Spoilage	84		
	6 Food Preservation	108		
	7 Care of Food, Milk and Water	118	531	88.5 48
6	<u>UNIT 4 HEREDITY AND EVOLUTION</u>			
	Item 19 Evolution How did Man Develop	42		
	20 Heredity What are its Laws?	80	122	61 33
4	<u>UNIT 5 DISEASE</u>			
	Item 10 What is the Nature of Disease?	63		
	11 How if Disease transmitted?	114		
	12 The Health Check up	140		
	13 Bacteria	85	402	100.5 54
7	<u>UNIT 6 REPRODUCTION OF PLANTS AND ANIMALS</u>			
	Item 18 Reproduction of Plants & Animals	49	49	49 26
9	<u>UNIT 7 PLANTS</u>			
	Item 21 How are Plants Classified	15		
	22 What are their economic uses	64		
	23 What are the functions of Plants	13		
	24 The Vegetable Garden Weeds	10		
	25 The Vegetable Garden	46		
	26 The Flower Garden	40	118	31.3 7
8	<u>UNIT 8 ANIMALS</u>			
	Item 27 Classification of Animals	11		
	28 The Economic Uses of Animals	70		
		14	95	31.6 17 1/2
3	<u>UNIT 9 NARCOTICS</u>			
	Item 17 Narcotics	109	109	109 54.2
10	<u>UNIT 10 MISC.</u> 48+ 16+ 12+ 16+ 13+ 9+9+ 3+			
	1- 34- 35- 36- 37-38-39-40		126	15.6 8
	Insects, Age of Earth, Nature Observa- tion, Study of Digestion, Circulation Respiration and Locomotion in Animals			



COMPOSITION AND OPINION OF GROUPS

The main object of this study was to find out what units the members of the various social and industrial groups considered to be the most necessary to their biological needs and interests. What pupils had found out as to the character of their surroundings has been discussed in a previous chapter.

The first step in this phase of the study is to know the composition of the industrial groups cooperating in answering the questionnaire. The individuals were selected after consulting the city census returns to ascertain the occupations of the parents of the pupils attending High School.

It was found that these could be conveniently arranged in four general classifications:

Professional

Trades and Industrial

Public, Community and Home Services

Miscellaneous

These in turn were divided into nine groups and subdivided into fifty-five occupational activities, as shown in TABLE \_\_\_\_\_, embracing one hundred eighty-six individuals.

These groups were selected with the purpose of having a representative group that would be interested in the High School through educational contacts and dependent on the occupation for their livelihood. All members of the groups consulted have had or may have, in the future, children in the High School. In many cases they themselves were graduates of the school. No effort is made to

weight the responses of these groups. It might appear, for example, that the preferences expressed by the professional group might be more valuable than some other, but in tabulation that angle has been disregarded.

The items were then arranged in order of their frequencies. These results are found in TABLE VIII.

A further grouping of items into units of study was found to be practicable. Many of these items were associated under such headings as The Human Body and its Functions, Health Considerations, Foods, Disease, etc.. In this way it was possible to form ten units of study. Each unit may be treated as a subject in the school course and a comparison of the units is more significant than a comparison of items.

The following arrangement of units was found practicable:

1. The Human Body and its Functions
2. Health Considerations
3. Foods
4. Heredity and Evolution
5. Diseases.
6. Reproduction
7. Plants
8. Animals
9. Narcotics
10. Miscellaneous

The last unit is considered as a miscellaneous one as little value was given the items in the unit and they were not considered significant except in two cases.

TABLE X

OCCUPATIONS OF CITIZEN GROUPS

Professions

1. Community Leaders

Doctors	4
Lawyers	4
Ministers	2
Engineers	6
Accountants	2
Total	20

2. Skilled Labor

Artists	2
Bankers	2
Draughtsmen	6
Optometrists	1
Law Students	4
Technicians	4
X Ray Men	1
Undertaker	1
Engineers	2
Total	24

TRADE AND INDUSTRIAL GROUP

1. Executive

Executives	10
Merchants	4
Buyers	2
Office Managers	5
Construction Engrs.	2
Director of Educ.	1
Sec. C of C	1
Total	25

2. Skilled Office

Clerks	6
Newspaper	4
Secretaries	5
Stenographers	6
Salesmen	4
Total	25

3. Skilled Trades

Electricians	2
Engineers	2
Glass Blower	1
Jeweler	1
Machinists	4
Painters	3
Plumbers	3
Photoengravers	1

3. Skilled Trades (continued)

Pharmacist	1
Sheet Metal Worker	1
Sign Painter	1
Sterotypist	1
Watchmaker	1

Total	25
-------	----

4. Public Service

Police	12
Firemen	4
P O Clerks	4

Total	20
-------	----

5. Community Service

Y M C A	3
Boy Scouts	2
Girl Scouts	2
Boys Club	1
R X	2

Total	10
-------	----

6. Home Service

Housewives	20
------------	----

7. Miscellaneous

Farmers	3
Foresters	4
Milk Inspectors	2
Dairyman	1
Ships Officers	3
Engineers	2
Help	2
Total	17

PROFESSIONAL GROUP I

The Professional Group, composed of twenty community leaders in their several lines, as doctors, lawyers, ministers, engineers, etc., represents the highest type of intelligence and training. Their education has been the most complete and their contact with community activities is extensive. The opinions advanced by this group should therefore receive our special attention.

The following arrangement of units in the order of their importance was selected by this group:

1. The Human Body and its Functions.
2. Health Considerations.
3. Heredity and Evolution.
4. Disease.
5. Food.
6. Narcotics.
7. Reproduction.
8. Animals.
9. Plants.
10. Miscellaneous.

The first choice of this group had to do with unit of "Human Body and its Functions." The necessity of a knowledge of the body and the functions was recognized. This was the first choice by all groups. A special unit of study under the head of Physiology and Anatomy is recommended. The relation of the functions of the body to other biological units should also be considered in the regular biology course.

The second choice had to do with the unit of "Health Considerations," with an average of fifteen votes per item. The

arrangement of items in this group was as follows: "The necessity of Keeping Fit" (18); "Personal Appearances," (15); "Importance of Looking Right," (14); "Good Health in the Home," (13); and "The Value of Posture," (12).

A special unit of Health Education is recommended. Fundamental principles showing the relation between health to other biological conditions should be included in the general biology course.

"Heredity and Evolution" were chosen for third place with a total of fourteen out of a possible twenty votes. The placing of these two items so high in the scale of choices by this group indicates that with a greater understanding of the appreciation of these items by other groups the appreciation would be greater. They were given a sixth and seventh place in all other groups.

"Disease Considerations" was considered fourth in order of choice, with an average of thirteen and five-tenths. The items in this group in the order of their importance were "Health Check-up" "Bacteria" and "The Nature and Transmission of Disease." These can be efficiently taught in the general biology. Some of the other groups place this unit in third place and others in fifth place.

"Food Considerations," followed in fifth place very closely after "Disease," with an average of thirteen and three-tenths votes. The items were all very closely grouped, in the following order: "Vitamins" (15); "Food Preservation" (14) "The Use of Foods" (13), and "Food Sources" (12). All were considered of practically the same value.



The choice of the Narcotics unit for sixth place with an average of thirteen votes indicated it to be of almost equal weight with the preceding three groups.

Reproduction of Plants and Animals was chosen in seventh place with an average of twelve votes. This indicates that it is important, although the relative place given to it by other groups is higher.

The "Study of Animals" was awarded eighth place with a total of eleven. In this group all items received practically the same number of choices: Animals, Their Economic Use, Classification, and Animal Breeding.

Plant Study with an average of ten and eight-tenths per item followed closely after Animal Study. All items were considered equally important. The Vegetable Garden held a slight lead of choices followed by Plant Classification, Plant Uses, Functions of Plants, Weeds and Flowers.

The Age of the Earth received no choices and the Development of the Various Animal Functions was also omitted.

TABLE XI

RESULTS OF QUESTIONNAIREGROUP I. (20)

UNIT	<u>THE HUMAN BODY AND ITS FUNCTIONS</u>	Item Choices	Unit Average	Percent value
	The Glands of the Body	16		
	Functions of the Body. Digestion	19		
	Circulation	19		
	Respiration	18		
	Nervous System	18	90	16.6
				83
UNIT 2	<u>HEALTH CONSIDERATIONS</u>			
	The Necessity of Keeping Fit	18		
	Good Health in the Home	14		
	Value of Appearances	15		
	Value of Posture	13	60	15
				75
UNIT 3	<u>FOODS</u>			
	Sources of Foods	12		
	Uses of Food	13		
	Value of Vitamins	15		
	Food Spoilage	11		
	Food Preservation	14		
	Care of Food, Milks and Water	15	80	133
				67
UNIT 4	<u>HEREDITY AND EVOLUTION</u>			
	Evolution. How did Man Develop?	13		
	Heredity. What are its Laws?	15	28	14
				70
UNIT 5	<u>DISEASE</u>			
	What is the Nature of Disease?	10		
	How is disease Transmitted	15		
	The Health Check-up	15		
	Bacteria	14	55	13.6
				68
UNIT 6	<u>REPRODUCTION OF PLANTS &amp; ANIMALS</u>	12	12	12
				60
UNIT 7	<u>PLANTS</u>			
	How are Plants Classified?	10		
	What are Their Economic Uses?	12		
	What are Their Functions?	10		
	The Vegetable Garden	10		
	Weeds	12		
	The Flower Garden	11	65	10.8
				54
UNIT 8	<u>ANIMALS</u>			
	Classification of Animals	10		
	Economic Uses of Animals	10		
	Animal Breeding	12	32	1.
				55
UNIT 9	<u>NARCOTICS</u>	13	13	13
				65
UNIT 10	<u>MISCELLANEOUS</u>		32	4
	Insects, Age of Earth, Environment, Nature Observation, Animal Functions, Development of Animals.			20

SKILLED PROFESSIONAL GROUP

The second group, consisting of the twenty skilled professional technicians, is one that is well trained along technical lines, but does not represent the broad viewpoint in the previous group. All are good observers, however, and their opinions should receive careful attention.

The following arrangement of units, in their order of importance, was selected by this group:

1. The Human Body and Its Functions.
2. Health Considerations
3. Disease
4. Food
5. Reproduction
6. Narcotics
7. Heredity and Evolution
8. Plants
9. Animals
10. Miscellaneous

First choice was given to the unit "The Human Body and its Functions," with an average of seventeen and six-tenths per item. The same consideration was given this unit as in the first group and the similar treatment is recommended.

Second choice was given to "Health Considerations" with an average of seventeen per item. The following order of choices was made: "Keeping Fit" (20); "Posture" (14); "Health in the Home," (13); and "Importance of Appearance," (11). The importance given this choice was the same as in the other groups and the same treatment is recommended.

The unit "Disease" was given third choice with an average of

fourteen per item. The arrangement of items in the order of their selection was "The importance of Health Check-up" (18); "Bacteria" (15); and "Nature of Disease" (11). Three other groups give "Disease" the same relative rating - one drops it to fourth place and four to fifth place.

The unit "Food" comes next with an average of twelve and two-tenths per item. This is slightly lower than the average of the Professional Group, which gave thirteen and three-tenths and allotted fifth place of this unit. The leading item "Vitamins" received nineteen votes while the others received practically the same values for each item, although "The Uses of Food" and "Food Preservation" ruled slight favorites.

The unit "Reproduction of Plants and Animals" was selected for fifth place with twelve votes. The relative importance of this unit is high as the average of all groups is sixth place.

"Narcotics" was selected for sixth place with an average choice per item of ten. The place accorded this unit is four and seven-tenths, which indicates that the value placed is low.

"Heredity and Evolution" were chosen for seventh position with an average count of nine per item. "Heredity" was considered more important received twelve, and "Evolution" six. The position given this unit is six, which indicates that it is considered of a lower value by this group.

"Animal Study" was given eight choices with an average of five and six-tenths. The Classification of Animals received nine votes followed by The Economic Uses of Animals and Animal Breeding, each of which had a total of four. The average place given to this unit was seven and seven-tenths, which indicated that the value placed by

this group was lower than the average.

The last place in the order of unit choices was allotted "Plant Study", with an average per unit of five. The Economic Uses of Plants followed by The Vegetable Garden were the two outstanding items. The average position of this unit is eight and four-tenths, which indicates that this group choice is lower than the average.

TABLE XII

RESULTS OF QUESTIONNAIRE GROUPS I (20)

	Item Choices	Unit Average	Percent value
UNIT 1 <u>THE HUMAN BODY AND ITS FUNCTIONS</u>			
The Glands of the Body	14		
Functions of the Body. Digestion	20		
" " " " Circulation	18		
" " " " Respiration	18		
" " " " Nervous System	18	88	17.6
			88
UNIT 2 <u>HEALTH CONSIDERATIONS</u>			
The Necessity of Keeping Fit	20		
Good Health in the Home	13		
Value of Appearances	11		
Value of Posture	14	68	17
			85
UNIT 3 <u>FOODS</u>			
Sources of Foods	12		
Uses of Food	9		
Value of Vitamins	19		
Food Spoilage	9		
Food Preservation	12		
Care of Food, Milk and Water	11	73	12.2
			61
UNIT 4 <u>HEREDITY AND EVOLUTION</u>			
Evolution. How did Man Develop?	6		
Heredity. What are its Laws?	12	18	9
			45
UNIT 5 <u>DISEASE</u>			
What is the Nature of Disease?	9		
How is Disease Transmitted	12		
The Health Check-up	18		
Bacteria	15	54	13.6
			68
UNIT 6 <u>REPRODUCTION OF PLANTS &amp; ANIMALS</u>	12	12	12
			60
UNIT 7 <u>PLANTS</u>			
How are Plants Classified?	4		
What are Their Economic Uses?	6		
What are Their Functions?	3		
The Vegetable Garden	4		
Weeds	5		
The Flower Garden	7	29	4.9
			24
UNIT 8 <u>ANIMALS</u>			
Classification of Animals	9		
Economic Uses of Animals	9		
Animal Breeding	4	17	5.6
			28
UNIT 9 <u>NARCOTICS</u>	10	10	10
			50
UNIT 10 <u>MISCELLANEOUS</u>		28	3.5
Insects, Age of Earth, Environment, Nature Observation, Animal Functions. Development of Animals.			22

THE EXECUTIVE GROUP    III

The Executive Group, composed of twenty-five leaders in industrial activities, represents those who have received higher education than the average.

The following arrangement of units in the order of their importance was selected by this group:

1. The Human Body and its Functions
2. Health Considerations
3. Narcotics
4. Foods
5. Disease
6. Heredity and Evolution
7. Animals
8. Reproduction
9. Plants
10. Miscellaneous

The greatest emphasis was placed on the "Study of the Human Body and **its** Functions." This was in line with similar choices made by other groups. The conclusions and recommendations are the same as for the Professional Group.

Second choice was given to the unit, "Health Considerations" with an average item value of eighteen. The arrangement of items varies somewhat from those in the Professional Groups. Items were arranged in the order of their importance. The "Importance of Keeping Fit" (25) followed by "The Value of Good Posture" (17), "Good Health in the Home" (16), and "The Importance of Appearances" (14). The recommendations for this study are the same as for the

Professional Group.

Third choice was given to the unit on "Narcotics," which received fourteen votes. The average position given this unit was four and eight-tenths, which indicated that this group place special emphasis on it.

The opinions are those of a trained observer.

Fourth choice was awarded to the unit "Foods" with an average item value of twelve and three-tenths. The arrangement of items in the order of their choices is as follows: "The Care of Milk, etc." (17), "Vitamins" (16); "Food Preservation" (14); "Food Sources" (11); "Food Uses" (9), and "Food Spoilage" (17). The average position of this unit is four and one-tenth. The selection of the item referring to "The Care of Milk, Food and Water," as the most important one, indicating the executive viewpoint of placing emphasis on the things that can be done to make the most effective use of material.

"Disease Considerations" were the fifth choice with an average item value of ten. The outstanding choice in this group related to the item, "The Importance of a Health Check-up" (17). The other two items received six and seven votes each. The "Health Check-up" is emphasized in industrial establishments and by the government services to obtain greater efficiency. "The Nature of Disease" and "Bacteria" were considered of minor relative importance. The average position of this unit is four, which indicates this group did not consider it important.

"Evolution and Heredity" were given sixth place in the order of choices with an average of unit value of seven and five-tenths. First choice was given to "Heredity," with a vote of ten, while "Evolution" received only five votes. The average position of this



unit is six, which is similar to position given by this group.

Seventh choice was given to unit on "Animals" with an average value of five. The item on "Economic Uses of Animals" considered important and was given a vote of twelve. The other two items were not considered significant, only three votes being given to each. The average position of this unit is seven and seven-tenths.

Eighth choice was allotted to the unit on "Reproduction" with a value of five. The average position of this unit is six. The position given by this group to the unit indicates that it is not considered important. It may be considered that members of this group were inclined to consider the particular problems of their own business and to neglect others.

The final and last choice had to do with the unit "Plants." Only one item received much attention, in this unit, and that was on "Plants, their Economic Use" which received eleven votes. The Vegetable Garden received five votes, and the remaining choices were scattering. The average position of this unit is eight and two-tenths, indicating that this group do not consider it as of average importance.

TABLE XIII

RESULTS OF QUESTIONNAIRE GROUPS III (25)

	Item	Unit	Percent
	Choices	Average	Value
UNIT 1	<u>THE HUMAN BODY AND ITS FUNCTIONS</u>		
	The Glands of the Body		
	Functions of the Body. Digestion		
	" Circulation		
	" Respiration		
	" Nervous System	25	112
		22.4	91
UNIT 2	<u>HEALTH CONSIDERATIONS</u>		
	The Necessity of Keeping Fit	25	
	Good Health in the Home	16	
	Value of Appearances	14	
	Value of Posture	17	72
		18	72
UNIT 3	<u>FOODS</u>		
	Sources of Foods	11	
	Uses of Food	9	
	Value of Vitamins	16	
	Food Spoilage	7	
	Food Preservation	14	
	Care of Food, Milk and Water	16	63
		10.5	42
UNIT 4	<u>HEREDITY AND EVOLUTION</u>		
	Evolution. How did Man Develop?	5	
	Heredity. What are its Laws?	10	15
		7.5	30
UNIT 5	<u>DISEASE</u>		
	What is the Nature of Disease?	6	
	How is Disease Transmitted?	13	
	The Health Check-up	17	
	Bacteria	7	43
		10.7	43
UNIT 6	<u>REPRODUCTION OF PLANTS &amp; ANIMALS</u>	5	5
		5	20
UNIT 7	<u>PLANTS</u>		
	How are Plants Classified?	1	
	What are Their Economic Uses?	11	
	What are Their Functions?	2	
	The Vegetable Garden	5	
	Weeds	2	
	The Flower Garden	3	24
		4	16
UNIT 8	<u>ANIMALS</u>		
	Classification of Animals	1	
	Economic Uses of Animals	12	
	Animal Breeding	2	15
		5	20
UNIT 9	<u>NARCOTICS</u>	14	14
		14	54
UNIT 10	<u>MISCELLANEOUS</u>		
	Insects, Age of Earth, Environments, Nature Observation, Animal Functions, Development of Animals.	6	0.75
			3

OFFICE GROUP IV

The Office Group is composed of twenty-five clerks and others who attend to the detail of office routine. Their work is restricted to specific operations and their point of view is personal. They are concerned with the factors which have to do with keeping the position and doing the work satisfactorily. The education of this group is clerical and the view point taken is personal work.

The following arrangement of units in the order of their importance was selected by this group:

1. The Human Body and its Functions.
2. Health Considerations
3. Disease.
4. Food
5. Animals
6. Heredity and Evolution
7. Reproduction
8. Narcotics
9. Plants
10. Miscellaneous

The unit selected for first place in their opinion was the same as that chosen by other groups, that of "The Human Body and its Functions." Conclusions reached and recommendations made regarding the treatment of this unit are outlined in Group I.

The second choice was the unit on "Health Considerations" with an average item value of twenty. The arrangement of item choices within the unit were as follows: "The Importance of Keeping Fit," (24); "Good Health in the Home" and "Bacteria" each received twenty votes, followed by "The Value of Posture" with

sixteen votes. The emphasis was placed upon the "Importance of Keeping Fit" with "Health in the Home" and "The Knowledge of Bacteria" receiving second attention. The recommendations regarding the teaching of this unit are the same as in Group I.

Third selection was awarded the unit "Disease" with an average value per item of twelve and three-tenths. The outstanding item was "The Value of a Health Check-up" with a vote of twenty-one. The items "Bacteria" and "The Nature and Treatment of Disease" followed with choices of nine and seven respectively. The votes given "Health Check-up" indicated that this was a purposeful selection. This group placed more emphasis on this item than the average.

Fourth position was selected for the unit "Animals" with an average value per item of five. The outstanding choice was "The Economic value of Plants," with second place given to "Vegetable Garden." Other items received few choices.

Fifth choice was "Heredity and Evolution" with an average value of six and five-tenths. The average position of this unit is six, indicating that the order of choice of this group was the same as the others. "Heredity" was given preference with a choice of nine votes, followed by "Evolution" with four. The emphasis was placed on heredity while the study of evolution was not considered as significant.

The sixth choice was for "Narcotics" with a value of six. The average emphasis in placement of this item is four and eight-tenths, indicating that the office workers did not consider this as important.

Seventh position was given "Reproduction of Plants and Animals" with a value of six. The average of this unit is six, showing that the interest is slightly less in this group.

The eighth unit chosen was "Plants" with an average value of five and eight-tenths. The outstanding item was "The Economic Value of Plants" with a value of eleven. The second choice was awarded to "The Care of Flowers with a vote of six., followed by "The Vegetable Garden" with a choice of five. The other items received two and three votes respectively.

The last choice was accorded "Animals," with an average per item of five. "The Economic Uses of Animals" was considered most important with a value of six, followed by "Classification of Animals" with a choice of five. No votes were given "Animal Breeding." The interest in and the care of animals did not interest office workers who are more concerned with the immediate problems of body, and health.

TABLE XIV

RESULTS OF QUESTIONNAIRE GROUPS IV (25)

	Item Choices	Unit Averages	Percent value
<b>UNIT 1</b> <u>THE HUMAN BODY AND ITS FUNCTIONS</u>			
The Glands of the Body	16		
Functions of the Body. Digestion	24		
"                                  Circulation	22		
"                                  Respiration	23		
"                                  Nervous System	24	109	21.8
			87
<b>UNIT 2</b> <u>HEALTH CONSIDERATIONS</u>			
The Necessity of Keeping Fit	24		
Good Health in the Home	20		
Value of Appearances	20		
Value of Posture	16	80	20
			80
<b>UNIT 3</b> <u>FOODS</u>			
Sources of Foods	9		
Uses of Food	11		
Value of Vitamins	16		
Food Spoilage	9		
Food Preservation	11		
Care of Food, Milk and Water	12	59	9.8
			38
<b>UNIT 4</b> <u>HEREDITY AND EVOLUTION</u>			
Evolution. How did Man Develop?	4		
Heredity. What are its Laws?	9	13	65
			26
<b>UNIT 5</b> <u>DISEASE</u>			
What is the Nature of Disease?	7		
How is Disease Transmitted	19		
The Health Check-up	21		
Bacteria	9	56	14
			54
<b>UNIT 6</b> <u>REPRODUCTION OF PLANTS &amp; ANIMALS</u>	6	6	6
			24
<b>UNIT 7</b> <u>PLANTS</u>			
How are Plants Classified?	3		
What are Their Economic Uses?	11		
What are Their Functions?	3		
The Vegetable Garden	6		
Weeds	2		
The Flower Garden	9	34	57
			23
<b>UNIT 8</b> <u>ANIMALS</u>			
Classification of Animals	6		
Economic Uses of Animals	9		
Animal Breeding	0	15	5
			20
<b>UNIT IX</b> <u>NARCOTICS</u>	6	6	6
			24
<b>UNIT 10</b> <u>MISCELLANEOUS</u>		14	1.8
Insects, Age of Earth, Environment, Nature Observation, Animal Functions. Development of Animals.			7

SKILLED TRADES GROUP V

The Skilled Trades Group is composed of twenty-five persons who are trained to perform the operations in the mechanical trades connected with trade and industry. In it are machinists, electricians, plumbers, carpenters, and others who comprise the largest group of independent workers in the community. Their point of view represents that of the best section of our population and is not governed by any group interests, but by the interests of the community at large. Its opinions should carry weight.

The following arrangements in the order of their importance were selected by this group:

1. The Human Body and its Functions
2. Narcotics
3. Health Considerations
4. Food
5. Disease
6. Evolution and Heredity
7. Reproduction
8. Plants
9. Animals

The first choice was "The Human Body and its Functions," with the highest average number of votes for each item as compared with any other group. All items referring to functions of the Human Body received unanimous choice, and that referring to a special study of "Glands" received a high average of seventeen. The recommendations made for Group One govern for this group.

"Narcotics" was the second choice of units and contained the high average of twenty-three, almost equalling the leading unit. It is singular that this group consider this unit so important, as the average of choices was only four and eighth-tenths for this unit.

With this decreasing emphasis placed on a study of narcotic action, it is indicative that there is a real demand for its inclusion in our outlines.

The third choice was "Health Considerations," which had an average value of fifteen per item. The highest single item was "How to Keep Fit" (23) followed by "Good Health in the Home" (14), "The Value of Posture" (12) and "The Value of Appearance" (11).

Fourth choice was indicated for "Foods," which averaged fourteen and eight-tenths votes per item. The high single item "The Care of Food, Milk, etc." (21), followed by a tie vote of fifteen as between "The Uses of Food," "Food Spoilage" and "Food Preservation," "Vitamins", (12) and "Sources of Food," (11). The selection of this unit for fourth place was the same as the average selection (four and one-tenth), and indicates that the position of this choice is quite well established.

Fifth choice was given "Disease" with an average of thirteen and eight-tenths. The order of unit selections were as follows: "The Value of a Health Check-up" (18), "The Nature and Transmission of Disease" (12) and "Bacteria" (11). The outstanding choice of eighteen for the "Health Check-up" indicates the demand for health study. The average position given this unit is four with a slightly lower choice by the group.

Sixth choice was given "Heredity" and "Evolution" with an average item value of eight. The arrangement of choices was "Heredity" (9) and "Evolution" (8). The average choice given this item (six) was the same as that assigned by the group.

Seventh choice went to "Reproduction of Plants and Animals" with a vote of five. The average of the choices for this item was



five and eight-tenths. Less emphasis is placed upon this unit by the group than in the general average.

Eighth choice was given "Plants" with an average item value of four and eight-tenths. The leading choice in the items was "The Economic Uses of Plants" with a vote of eight, followed by "The Vegetable Garden" (seven), "The Care of Flowers and Weeds," each tied with five votes each, "Classification of Plants" (3), and "Functions of Plants (1). The position given this unit was similar to that given in the general average (8.2). The emphasis in this unit was similar to that in most other Plant units which indicated the economic uses are considered most important.

The ninth and last choice was assigned to "Animals" with an average item vote of three and three-tenths. The highest vote was "The Economic Uses of Animals" (8), followed by "Classification of Animals" and "Animal Breeding," with one vote each. The average position was seven and seven-tenths, indication that this group places less value on it.

TABLE XV

RESULTS OF QUESTIONNAIRE GROUP V (25)

	Item Choices		Unit Averages	Percent Value
<b>UNIT 1. <u>THE HUMAN BODY AND ITS FUNCTIONS</u></b>				
The Glands of the Body	17			
Functions of the Body. Digestion	25			
" " Circulation	25			
" " Respiration	25			
" " Nervous system	25	117	23.4	94
<b>UNIT 2. <u>HEALTH CONSIDERATIONS</u></b>				
The Necessity of Keeping Fit	23			
Good Health in the Home	14			
Value of Appearances	11			
Value of Posture	12	60	1.5	60
<b>UNIT 3. <u>FOODS</u></b>				
Sources of Foods	11			
Uses of Foods	15			
Value of Vitamins	12			
Food Spoilage	15			
Food Preservation	15			
Care of Food, Milk and Water	21	89	12.7	51
<b>UNIT 4. <u>HEREDITY AND EVOLUTION</u></b>				
Evolution. How Did Man Develop?	7			
Heredity. What are its Laws?	9	16	8	32
<b>UNIT 5. <u>DISEASE</u></b>				
What is the Nature of Disease?	12			
How is Disease Transmitted?	16			
The Health Check-up	18			
Bacteria	11	57	14.2	57
<b>UNIT 6. <u>REPRODUCTION OF PLANTS &amp; ANIMALS</u></b>	5	5	5	20
<b>UNIT 7. <u>PLANTS</u></b>				
How are Plants Classified?	3			
What are Their Economic Uses?	8			
What are their Functions?	1			
Weeds	5			
The Vegetable Garden	7			
The Flower Garden	5	29	4.8	19
<b>UNIT 8. <u>ANIMALS</u></b>				
Classification of Animals	1			
Economic Uses of Animals	8			
Animal Breeding	1	10	3.3	13
<b>UNIT 9 <u>NARCOTICS</u></b>	23	23	23	92
<b>UNIT 10. <u>MISCELLANEOUS</u></b>		11	1.7	7
Insects, Age of Earth, Environment, Nature Observation, Animal Functions, Development of Animal Functions				

PUBLIC SERVICE GROUP VI

The Public Service Group is composed of twenty persons occupying Civil Service positions. They have had a good public school education and hold positions which are insured by regulations. Their viewpoint may be considered the same as the Clerical group and the character of their work is similar.

The following arrangement of units in the order of their importance were selected by this group:

1. The Human Body and its Functions
2. Health Considerations
3. Reproduction
4. Food
5. Disease
6. Narcotics
7. Heredity and Evolution
8. Animals
9. Plants

The first choice was "The Human Body and its Functions" with an average per unit of eighteen and four-tenths. This choice is similar to that of other units. The conclusions drawn and recommendations made are similar to those made for Group I.

Second choice was given "Health Considerations" with an average per unit of seventeen and two-tenths (17.2). This is the same as that given by other units. The conclusions drawn and recommendations made are the same for Group I.

Third choice was given "Reproduction of Plants and Animals" with a vote of sixteen. This is the highest relative position

given this unit by any group, the average being six. The choice is possibly due to their interests in developing a garden or in the keeping of animals for use or for pets.

Fourth choice was given to "Food", with an average of twelve and two-tenths per item. This is similar to the average (four and one-tenth). The emphasis placed on nearly all the items in the unit were the same. The order of arrangement in the order of their choice was as follows: "The Care of Milk, Food, Etc." (17), "Methods of Food Preservation" (16), "Vitamins," (13) "Uses of Food" (11) "Food Spoilage" (10), and "Food Sources" (6). The emphasis was placed upon "Care of Food and Milk and Water."

Fifth choice was given "Disease," which had an average of ten and six-tenths. The average position of this unit is four which shows that the group interest in this unit is less. The order of choice of items were as follows: "The Value of a Health Check-up" (16), while "Nature and Transmission of Disease" and "Bacteria" were with a vote of eight.

The sixth place was given "Narcotics," with a value of eight. The position given this unit is lower than the average (six). Whether the group have had no opportunity to observe what the effects of "Narcotics" were or whether they are in no position to know may account for the low rating.

Seventh choice was given "Heredity and Evolution" with an average vote of four. A vote of eight was given to the item on "Heredity" and no choices were made for "Evolution." This follows the main pattern of choices. The average position given this unit was six indicating that the group interest in this unit is less.

In the eighth position, "Plants" was given a vote of four. "The Economic Uses of Plants" and "The Vegetable Garden" re-

ceived three votes each followed by two votes to "The Care of Flowers."

The ninth and last position was awarded "Animals" with an average vote of one and three-tenths. The only item considered in this unit was that on "Economic Uses of Animals." The "Classification of Animals" and "Animal Breeding" were not considered significant. The average position given this unit is seven and seven-tenths indicating interest by this group to be much less.

TABLE XVI

RESULTS OF QUESTIONNAIRE GROUP V (20)

UNIT		Item Choices	Unit Average	Percent Value
UNIT 1.	<u>THE HUMAN BODY AND ITS FUNCTIONS</u>			
	The Glands of the Body	12		
	Functions of the Body. Digestion	20		
	" Circulation	20		
	" Respiration	20		
	" Nervous System	20	92	18.4
				92
UNIT 2.	<u>HEALTH CONSIDERATIONS</u>			
	The Necessity of Keeping Fit	20		
	Good Health in the Home	18		
	Value of Appearances	15		
	Value of Posture	16	69	17.2
				86
UNIT 3.	<u>FOODS</u>			
	Sources of Foods	6		
	Uses of Foods	11		
	Value of Vitamins	13		
	Food Spoilage	10		
	Food Preservation	16		
	Care of Food, Milk and Water	17	73	12.2
				61
UNIT 4.	<u>HEREDITY AND EVOLUTION</u>			
	Evolution. How Did Man Develop?	0		
	Heredity. What are its Laws?	8	8	8
				20
UNIT 5.	<u>DISEASE</u>			
	What is the Nature of Disease?	3		
	How is Disease Transmitted	11		
	The Health Check-up	16		
	Bacteria	8	38	9.5
				48
UNIT 6.	<u>REPRODUCTION OF PLANTS AND ANIMALS</u>	16	16	16
				80
UNIT 7.	<u>PLANTS</u>			
	How are Plants Classified?	0		
	What are Their Economic Uses?	3		
	What are their Functions	0		
	Weeds	0		
	The Vegetable Garden	3		
	The Flower Garden	2	8	1.33
				6.7
UNIT 8	<u>ANIMALS</u>			
	Classification of Animals	0		
	Economic Uses of Animals	4		
	Animal Breeding	0	4	1.33
				6.7
UNIT 9.	<u>NARCOTICS</u>	13	13	13
				65.
UNIT 10.	<u>MISCELLANEOUS</u>		15	1.8
	Insects, Age of the Earth, Environ- ment, Nature Observation, Animal Functions, Development of Animal Functions.			9.

COMMUNITY SERVICE GROUP VII

The Community Service Group is composed of ten persons occupying positions of directorship, of youth activities, as the YMCA, Girl Scouts, Boy Scouts, and Boys' Club. Their viewpoint is one of public welfare service as reflected from character of work of their organizations. The Health emphasis is prominent in each of these groups.

The following arrangement of units in the order of their importance were selected:

1. The Human Body and its Functions
2. Health Considerations
3. Disease
4. Food
5. Heredity and Evolution
6. Narcotics
7. Reproduction of Plants and Animals
8. Plants
9. Animals

The first choice was given "The Human Body and its Functions." This is the same as that given by other units. The recommendations made and conclusions reached are the same as those in Group I.

Second choice was given "Health Considerations" with an average vote of seven and two-tenths. First place was given to the two items "The Value of Keeping Fit" and "Health in the Home," each received nine votes. "The Value of Posture" followed with six votes, and "Appearance" was last with five votes. The conclusion reached and recommendations made are the same as in Group I.

Third choice was awarded "Disease" with an average vote of

six. The most important item was considered "Value of a Health Check-up" with a vote of eight. "The Nature and Transmission of Disease" and "Bacteria" each received a vote of five. The average position given this unit is four, which indicated that it is given especial emphasis by this group.

Fourth choice was given to "Food" which received an average vote of four and two-tenths. The position given this unit by the group and that found to be the average position was the same (4). The order of choices given to items are as follows: "The Care of Milk, Food and Water" (8), "Vitamins" (5), "Food Spoilage" and "Food Preservation" each receiving four, "Food Courses" (3), and "Uses of Food" (1).

Fifth position was given "Evolution and Heredity" with an average vote of four. The emphasis was placed on the item on "Heredity and its Laws" which received six votes compared to two for "Evolution" and the "Development of Animals." The position given this unit by the group is higher than the average (6).

The two units "Narcotics" and "Reproduction of Plants and Animals" each were tied with a vote of four. Considering the unit of "Narcotics" to be given sixth position, we find that it is lower than the average index of four and eight-tenths.

If we consider the unit on "Reproduction of Plants and Animals" to be in seventh place, it is noted that the position given it by the group is lower than the average index figure of six.

The eighth choice was given "Plants" with an average vote per item of one and five-tenths. Only three items were considered significant: "Plants and their Economic Uses" received five votes,



"The Vegetable Garden" received three and the "Flower Garden" one. The Classification of "Plants", "The Functions of Plants," and "Weeds" received no vote. The position given this unit is practically the same as that obtained from the average index which is eight and two-tenths.

The ninth and last choice was given "Animals" with an average vote per item of one. The item on "Economic Uses of Animals" received three votes and the ones on "Classification" and "Animal Breeding" received no mention. The place given this unit by the group is lower than the index average of seven and seven-tenths.

TABLE XVII

RESULTS OF QUESTIONNAIRE GROUP VII (10)

UNIT		Item Choices	Unit Average	Percent value
UNIT 1.	<u>THE HUMAN BODY AND ITS FUNCTIONS</u>			
	The Glands of the Body	6		
	Functions of the Body. Digestion	10		
	Circulation	10		
	Respiration	10		
	Nervous System	10	46	9.2
				92
UNIT 2.	<u>HEALTH CONSIDERATIONS</u>			
	The Necessity of Keeping Fit	9		
	Good Health in the Home	9		
	Value of Appearances	5		
	Value of Posture	6	29	7.2
				72
UNIT 3.	<u>FOODS</u>			
	Sources of Foods	3		
	Uses of Foods	1		
	Value of Vitamins	5		
	Food Spoilage	4		
	Food Preservation	4		
	Care of Food, Milk and Water	8	25	4.2
				42
UNIT 4.	<u>HEREDITY AND EVOLUTION</u>			
	Evolution. How Did Man Develop?	2		
	Heredity. What are its Laws?	6	8	4
				40
UNIT 5.	<u>DISEASE</u>			
	What is the Nature of Disease?	5		
	How is Disease Transmitted?	8		
	The Health Check-up	8		
	Bacteria	5	26	4.5
				45
UNIT 6.	<u>REPRODUCTION OF PLANTS &amp; ANIMALS</u>	4	4	4
				40
UNIT 7.	<u>PLANTS</u>			
	How are Plants Classified?	0		
	What are Their Economic Uses?	5		
	What are Their Functions?	0		
	Weeds	0		
	The Vegetable Garden	3		
	The Flower Garden	1	9	1.5
				15
UNIT 8.	<u>ANIMALS</u>			
	Classification of Animals	0		
	Economic Uses of Animals	2		
	Animal Breeding	0	2	0.6
				6
UNIT 9.	<u>NARCOTICS</u>	4	4	4
				40
UNIT 10.	<u>MISCELLANEOUS</u>		3	0.4
	Insects, Age of the Earth, Environ- ment, Nature of Observation, Animal Functions, Development of Animal Functions			4

HOME SERVICE GROUP VIII

The Home Service Group is composed of housewives and is the only women's group. The character of their work and objectives are different from that of any other group. Their main consideration is the welfare of the family and especially of the children of the family. Considerations of public welfare would come first, only as they represent conditions conducive to child welfare.

The following arrangement of units in the order of their importance were selected by the group:

1. The Human Body and its Functions.
2. Health Considerations
3. Disease
4. Food
5. Narcotics
6. Reproduction
7. Evolution and Heredity
8. Plants
9. Animals

The first choice was given "Human Body and its Functions." This is the same emphasis as placed on it by all other groups. The same conclusions and recommendations are made as in Group I.

Second choice was awarded to "Health Considerations" with an average vote of sixteen and two-tenths. The order of arrangement of item choices is as follows: "The Necessity of Keeping Fit" (19), "The Necessity of Good Posture" (15), "Good Health in the Home" (13), and "The Value of a Good Appearance" (9). The emphasis in this unit was on the item "How to Keep Fit."

Third choice was given on "Disease" with an average vote per

item of six. The order of choice is as follows: "The Necessity of a Health Check-up" (8), "Bacteria" (5), and "The Nature and Transmission of Disease" (5). The position given this unit by the group was higher than the average position.

Fourth choice was ascribed to "Foods" with a value per item of eleven and two-tenths. The order of arrangement of items in the unit as to the choices is: "The Care of Milk, Food and Water" (14), "Vitamins" and "Food Preservation" each had a value of twelve votes, "Food Spoilage" received eleven, "Uses of Food" had nine and "Sources of Food" had seven votes. The position given the unit by this group is identical with the average position of four.

Fifth choice was given to the unit on "Narcotics" with a vote of nine. The relative position given this unit by the group is practically same as the average position of four and eight-tenths, and indicates that the "Narcotics" unit is important following "Health" and "Foods."

The sixth position is given to the unit "Reproduction of Plants and Animals" with a choice of eight votes. This relative position is practically the same as the average position - five and eight-tenths.

Seventh choice of position is given "Evolution and Heredity" with an average vote of six and five-tenths. "Evolution" received seven ballots and the "Laws of Heredity" six, indicating that each should receive equal emphasis. The position given this unit by the group is lower than the average - five and eight-tenths, which indicates that it is not considered of importance.

Eighth choice is given to "Plants" with an average vote of

three. The order of preference is as follows: "The Vegetable Garden" (5); "The Economic Uses of Plants" (4), "The Functions of Plants" (3), and the "Classification of Plants and Weeds" received one vote each. The emphasis is placed on "Care and Operation of the Vegetable Garden" and the economic phases of plants rather than on their classification. The position given this unit by the group corresponds to the average position - eight and three-tenths.

The ninth and last choice was allocated to "Animals" with an average of three votes. Of these choices, "The Economic Uses of Animals," received six votes, "Animal Breeding" two, and "Animal Classification" one. The position given to this unit by the group is lower than the average index which is seven and seven-tenths.

TABLE XVIII

RESULTS OF QUESTIONNAIRE BY GROUP VIII (20)

UNIT		Item Choices	Unit Average	Percent value
UNIT 1.	<u>THE HUMAN BODY AND ITS FUNCTIONS</u>			
	The Glands of the Body	7		
	Functions of the Body. Digestion	19		
	" " Circulation	18		
	" " Respiration	20		
	" " Nervous System	20	84	16.7
				83
UNIT 2.	<u>HEALTH CONSIDERATIONS</u>			
	The Necessity of Keeping Fit	19		
	Good Health in the Home	13		
	Value of Appearances	9		
	Value of Posture	15	56	14
				70
UNIT 3.	<u>FOODS</u>			
	Sources of Foods	7		
	Uses of Foods	9		
	Value of Vitamins	12		
	Food Spoilage	11		
	Food Preservation	12		
	Care of Food, Milk and Water	14	65	10.7
				53
UNIT 4.	<u>HEREDITY AND EVOLUTION</u>			
	Evolution. How Did Man Develop?	7		
	Heredity. What are the Laws?	6	13	65
				32
UNIT 5.	<u>DISEASE</u>			
	What is the Nature of Disease?	3		
	How is Disease Transmitted?	11		
	The Health Check-up	16		
	Bacteria	18	48	12
				60
UNIT 6.	<u>REPRODUCTION OF PLANTS &amp; ANIMALS</u>	8	8	8
				40
UNIT 7.	<u>PLANTS</u>			
	How are Plants Classified?	1		
	What are Their Economic Uses?	4		
	What are their Functions	3		
	Weeds.	1		
	The Vegetable Garden	5		
	The Flower Garden	4	18	3
				15
UNIT 8.	<u>ANIMALS</u>			
	Classification of Animals	1		
	Economic Uses of Animals	8		
	Animal Breeding	2	11	3.7
				18
UNIT 9.	<u>NARCOTICS</u>	9	9	9
				45
UNIT 10.	<u>MISCELLANEOUS</u>		24	3
	Insects, Age of the Earth, Environ- ment, Nature of Observation, Animal Functions, Development of Animal Functions			15

MISCELLANEOUS GROUP IX

This group is composed of seventeen persons of varied interests. The majority belong to the agricultural group and the others to transportation. Their education is above the average and the character of their work is such that they may be considered as of the independent type. They are all skilled workers.

The following arrangement of units in order of their importance was selected:

1. The Human Body and its Functions
2. Health Considerations
3. Narcotics
4. Food
5. Disease
6. Reproduction
7. Evolution and Heredity
8. Plants
9. Animals

The first choice was given to "The Human Body and its Functions" which is the same as in other groups. The conclusions drawn and recommendations made are the same as in Group I.

Second choice is given to "Health Considerations" with an average vote of sixteen and two-tenths. The order of choices given the different items is as follows: "The Necessity of Keeping Fit" (17); "The Value of Posture" (14), "Good Health in the Home" (12), "The Value of Appearance" (7). The conclusions reached and recommendations made regarding the unit are in Group I.

Third choice was given "Narcotics" with a vote of twelve. The rank given this unit by the group is on a par with that given by the Executive Group, and is much higher than the average of four and seven-tenths. Farmers and transportation men from the nature of their work recognize the importance of a knowledge of narcotics and its effects.

Fourth choice was awarded to "Foods" with an average vote of ten and seven-tenths. The order of arrangement of item choices was as follows: "Methods of Food Preservation" (13), "The Care of Milk, Food and Water" (12), "Food Spoilage" (11), "Vitamins" (10), "Uses of Food" (7), and "The Sources of Food" (6). The position given by the group is the same as the average position. The emphasis on "Food Preservations" reflects the farmer interest and the even distribution of votes over the several items suggests a balanced appreciation.

The fifth choice is given to "Disease" with an average value of eight and seven-tenths. The items in order of their relative choices are: "The Necessity of a Health Check-up" (16), "Bacteria" (8), and "Disease, its Nature and Transmission" (2). The emphasis on "Health Check-up" and the neglect of emphasis on "Disease and its Effects" indicate that it is felt that this is a function of the doctor and any little knowledge that one may obtain is superficial. The average rating given this unit is four which indicates that the interest of this group is not great.

Sixth place is given to "Reproductions of Plants and Animals" with a vote of six per unit. This rating is the same as the average - five and eight-tenths.

Seventh place is allotted to "Evolution and Heredity" with an



average vote of five and five-tenths. The unit on "Evolution" received five votes and that on "Heredity" six. The position given this unit is lower than the average - five and eight-tenths.

Eighth place is given to "Plants" with an average vote of one and six-tenths. Definite values given to items in the order of choice are: "The Flower Garden" and "The Vegetable Garden" each received three votes, "Weeds", two, and "Animal Breeding" one. The position given this unit is practically the same as the average position of eight and two-tenths.

The ninth and last choice is given "Animals" with an average vote of one. The "Economic Use of Animals" received two votes and "Animal Breeding" one vote. The unit does not have much emphasis placed on it by this group, although they are farmers for the most part. It may be explained that possibly that is considered the unit is taken up too meagerly to give it any value. The position given this unit is lower than that given in the general average, in fact, it receives the least emphasis.

TABLE XIX

RESULTS OF QUESTIONNAIRE BY GROUP IX (17)

	Item Choices	Unit Average	Percent value
UNIT 1. <u>THE HUMAN BODY AND ITS FUNCTIONS</u>			
The Glands of the Body	10		
Functions of the Body. Digestion	17		
" Circulation	17		
" Respiration	17		
" Nervous System	17	78	15.6
			92
UNIT 2. <u>HEALTH CONSIDERATIONS</u>			
The Necessity of Keeping Fit	17		
Good Health in the Home	12		
Value of Appearances	8		
Value of Posture	14	51	12.7
			80
UNIT 3. <u>FOODS</u>			
Sources of Foods	6		
Uses of Foods	9		
Value of Vitamins	10		
Food Spoilage	11		
Food Preservation	13		
Care of Food, Milk and Water	12	61	10.7
			63
UNIT 4. <u>HEREDITY AND EVOLUTION</u>			
Evolution. How did Man Develop?	5		
Heredity. What are its Laws?	6	11	5.5
			32
UNIT 5. <u>DISEASE</u>			
What is the Nature of Disease?	2		
How is Disease Transmitted?	9		
The Health Check-up	6		
Bacteria	8	35	8.8
			52
UNIT 6. <u>REPRODUCTION OF PLANTS AND ANIMALS</u>	6	6	6
			35
UNIT 7. <u>PLANTS</u>			
How are Plants Classified?	0		
What are Their Economic Uses?	1		
What are Their Functions?	2		
Weeds	3		
The Vegetable Garden	3		
The Flower Garden	1	10	1.6
			10
UNIT 8. <u>ANIMALS</u>			
Classification of Animals	2		
Economic Uses of Animals	1		
Animal Breeding	0	3	1
			6
UNIT 9. <u>NARCOTICS</u>		12	12
			71
UNIT 10. <u>MISCELLANEOUS</u>		10	1.3
			8
Insects, Age of the Earth, Environ- ment, Nature of Observation, Animal Functions, Development of Animal Functions			

CHAPTER V

A COMPARISON OF EMPHASIS PLACED UPON SIMILAR UNITS  
BY DIFFERENT GROUPS ON THE BASIS OF PERCENT VALUE

A COMPARISON OF THE EMPHASIS PLACED ON SIMILAR UNITS  
BY DIFFERENT GROUPS ON THE BASIS OF PERCENT VALUE.

The arrangement of unit selections by each of the nine groups and by the combined group has already been done. The emphasis placed on items in each unit has been indicated.

Choice of factor.

It is impossible to compare similar units in different groups on the basis of numerical count, as the size of the group is not the same in all cases. For this reason a percentage value must be obtained by dividing the actual by the total possible choices in any unit and multiplying by one hundred. The number obtained is a percentage figure and is the percent factor or percent value. The percent value of each item, or unit, may then be obtained. Comparison with other units can then be made on an equality basis.

An evaluation of units of the Combined Group was made and they were found to be in the following sequence of percent values.

For percent values and numerical positions see TABLES XX and XXI.

<u>Unit</u>	<u>Percent value</u>
1. The Human Body and its Functions	85.1
2. Health Considerations	73.1
3. Narcotics	54.2
4. Disease	54
5. Foods	48
6. Heredity and Evolution	33
7. Reproduction	26
8. Animals	17.1
9. Plants	17
10. Miscellaneous	8

An evaluation of items was not attempted except in finding the number of choices and arranging them in the order of frequencies. It is more essential to consider units. A combination of items in a unit gives a better idea to work with, as items can not be considered except in association with others.

From a teaching stand point as well as from the interest manifested, it is better to make use of the unit idea. Similar units can be compared as between the different groups, as well as between different units in the same group. In this way group differences in unit interest are determined as well as the percent of interests by each group. A discussion of the ten different units follows.

#### The Human Body and its Functions

This unit received a percent value of eighty-one and one-tenth, from the Combined Group and was in first place. The valuation given it by the different groups varied from eighty-three, by the Professional Group, to ninety-four by the Skilled Trades Group. Groups VI, City Services, and Group IX, Miscellaneous followed in second place, with a percent value of ninety-two. Group III, Executives, followed with a valuation of ninety-one. In the valuation of items those referring to "Functions of the Body" were almost unanimously chosen, while the item "The Glands of the Body" received a much lower valuation.

#### Health Considerations

This unit occupied second place, in percent values, although it was almost tied with "The Human Body and its Functions" for first place, receiving a percent value of eighty-five. This unit occupied second place in all group evaluations with the exception

of "The Skilled Trades," where it was given a rating of sixty, and occupied third place. The range of percent values given varied from a low of sixty by "The Skilled Trades," to a high of eighty-six by the "City Service Group." The Professional Group was in second place with a percent valuation of eighty-five. The value of this unit in the other groups was below eighty.

#### Narcotics

This unit was given third place in the Combined Group with a percent value of fifty-four and two-tenths. Among the groups the percent value ranged from a low of twenty-four by the Office Group to a high of ninety-two by the Skilled Trades Group. Second place in valuation was given this unit by Miscellaneous Group with a rating of seventy-one. Third position was a tie between Professional Group and City Service Group, each of which had a percent value of sixty-five.

#### Disease

This unit was given fourth place in the Combined Group with a percent value of fifty-four. The range of values in the groups varied from a low of forty-five from the Community Service Group to a high percent value of sixty-eight from the Professional Group, and the Professional Skilled Group, each of which were tied for the position. Second valuation was given by the Home Services, with percentage value of sixty.

#### Foods.

This unit received fifth place in unit valuations in the Combined Group with a percentage of forty-eight. The group preferences varied from a low of forty-two percent by the Community Services

Group to a high value of sixty-seven by the Professional Group.

### Heredity and Evolution

Sixth place was given this unit with a percent value of thirty-three by the Combined Group. The range of percentage values given by the groups varied from a low of twenty from the City Service Group to a high value of seventy from the Professional Group. Second valuation was given by the Skilled Professional Group with a percentage of forty-five.

### Reproduction of Plants and Animals

This unit was given seventh place in the Combined Group with a valuation of twenty-six. The range of percentage valuations varied from a low of twenty by the Executive Group and the Skilled Trades Group to a high figure of eighty from the City Service Group. Second place was held by the Professional and the Skilled Professional Groups, each being tied with a valuation of sixty. The range of percent valuations given this unit by the different groups was the greatest for any of the units.

### Animals

Eighth place was given this unit in the Combined Group with a percent value of seventeen plus. This was only slightly higher than that given "Plants" and it might be fairly considered that these two units were tied for seventh place. The percent values as among the groups varied from a low of six by the Community Services Group to a high of fifty-five by the Professional Group. Second position was taken by the Skilled Professional Group, with a percent value of twenty-eight. Except for the high value given by the Professional Group all the other percentages were fairly low.

### Plants

Ninth place was given this unit by the Combined Group, with a percent value of seventeen. The range of percent values given this unit by the groups varied from a low of ten from the Miscellaneous Group to a high of sixty-four by the City Services Group. The second position was taken in the Professional Group with a percent value of fifty-four. The next position was much lower, being that of the Skilled Professional Group with a percentage value of twenty-eight.

### Miscellaneous

The tenth and last place was given this unit with a percent value of eight. The range of percent values varied from a low value of three from the Executive Group to a high percent value of twenty-two from the Skilled Professional Group. Second place was given by the Professional Group with a percent value of twenty. Third place was given by the Home Services Group with a percent value of fifteen. The remaining percent values were below ten.

### Outstanding Items

The outstanding item in the Combined Group was that of "Good Health, How May We Keep Fit," with a percent value of ninety-six. The next items in percent value were the one relating to the "Functions of the Human Body" each of which received ninety-three percent value. Third place was taken by the item, "The Health Check-up" with a percent value of seventy-five. The number of items receiving percent values of over fifty percent were fifteen. Those receiving less than ten percent were thirteen.

It is not significant to indicate any further percent values, as the numerical values of items is available and the associated items are grouped in each unit.



TABLE XX

ARRANGEMENT OF UNIT SELECTIONS BY EACH GROUP IN TERMS OF PERCENTAGE CHOICES AS RELATED TO THE MAXIMUM CHOICE.

UNITS	C.G.	I*	II*	III*	IV*	V*	VI*	VII*	VIII*	IX*
1. The Human Body and its Functions	85.1	83	88	91	87	94	92	92	83	92
2. Health Considerations	73.1	75	85	72	80	60	86	72	70	80
3. Foods	48	67	61	42	38	51	61	42	53	63
4. Heredity and Evolution	33	70	45	30	26	32	20	40	32	32
5. Disease	54	68	68	43	54	57	48	45	60	52
6. Reproduction	26	60	60	20	24	20	80	40	40	35
7. Plants	17+	54	24	16	23	19	64	15	15	10
8. Animals	17+	55	28	20	20	13	67	6	18	6
9. Narcotics	54.2	65	50	54	24	92	65	40	45	71
10. Miscellaneous	8	20	22	3	7	7	9	4	15	8

\*Groups

- I Professional Leader
- II Professional Skilled
- III Executive
- IV Office Clerical
- V Skilled Trades
- VI City Service
- VII Community Service
- VIII Home Service
- IX Miscellaneous
- C.G. Combined Group

TABLE XXI

ARRANGEMENT OF UNIT SELECTIONS BY EACH GROUP IN TERMS OF THE NUMERICAL POSITION OF THEIR PERCENTAGE CHOICES.

UNITS	C.G.	I	II	III	IV	V	VI	VII	VIII	IX
1. The Human Body and its Functions	.1	1	.1	1	1	1	1	1	1	1
2. Health Considerations	2	2	2	2	2	3	2	2	2	2
3. Foods	5	5	4	5	4	5	6	4	4	4
4. Heredity and Evolution	6	3	7	6	5	6	8	6	7	7
5. Disease	4	4	3	4	3	4	7	3	3	5
6. Reproduction	7	7	5	7	7	7	3	7	6	6
7. Plants	9	9	9	9	8	8	5	8	9	8
8. Animals	8	8	8	8	9	9	10	9	8	10
9. Narcotics	3	6	6	3	6	2	4	5	5	3
10. Miscellaneous	10	10	10	10	10	10	9	10	10	9

CHAPTER VI

DISCUSSION OF UNITS RECOMMENDED FOR AN ADJUSTED

COURSE OF STUDY

OUTLINE OF ADJUSTED UNITS OF STUDY IN ORDER OF EMPHASIS.

Unit I

THE HUMAN BODY AND ITS FUNCTIONS

- A. Preparing Food for Use: Digestion.
- B. Transporting Energy and Materials: Circulation.
- C. Uses of Energy in the Body. Assimilation.
- D. Use of Oxygen and Carbon Dioxide. Respiration.
- E. Getting Rid of Waste Products. Excretion.
- F. The Responses of the Body. Nervous System.
- G. Kinds and Uses of the Glands.

Unit II

HEALTH CONSIDERATIONS

- A. The Elements of Keeping Fit.
- B. Health in the Home, School, Business, etc.
- C. Value of Appearance. Hygiene.
- D. Nature and Value of Posture. Body Control.

Unit III

NARCOTICS

- A. Nature.
- B. Effects.

Unit IV

DISEASE

- A. Elements of a Health Check-up.
- B. Nature of Disease.
- C. Transmission of Disease.
- D. Prevention of Disease.
- E. Nature and Effects of Bacteria.

Unit V

FOODS

- A. Sources of Foods.
- B. Uses of Foods.
- C. Food Preservation.
- D. Causes of Food Spoilage.
- E. Care of Milk, Food, and Water.
- F. The Nature and Uses of Vitamins.

Unit VI            HEREDITY AND EVOLUTION

- A. The Laws of Inheritance.
- B. How Did Man Develop?
- C. Factors in Evolution.
- D. Animal and Plant Development.

Unit VII           REPRODUCTION OF PLANTS AND ANIMALS

- A. How are Plants Reproduced?
- B. Simplest Kinds of Reproduction.
- C. How are Animals and Plants Improved?

Unit VIII          ANIMALS

- A. Kinds of Animal Life.
- B. Economic Uses of Animals.
- C. Feeding and Care of Animals.

Unit IX.           PLANTS

- A. Kinds.
- B. Care.
- C. Functions.
- D. The Vegetable Garden. Weeds.
- E. The Flower Garden.
- F. Economic Uses.

Unit X             MISCELLANEOUS

- A. Our Environment.
- B. Insects.
- C. Age of the Earth.
- D. Development of Functions in Animals.

DISCUSSION OF UNITS IN ADJUSTED COURSE OF STUDY

In the selection of units for the adjusted course those having the greatest percent value of choices were considered. This selection was made after the relative positions of the units in each group was determined.

The arrangement of units in a biology course must logically begin with a study of environment and of fundamental principles that may be used in the development of other units. The items included in the introductory chapter are not in the questionnaire as those items were the objectives for which the preliminary work was arranged.

The organization of the course consists of a series of large embrasive units, which are related to each other. They may be taken up in the order in which they appear in the outline or they may be considered separately. The time at which a unit may be taken up is often determined by the season in which materials are available. In a school like the New Bedford High School, classes in Biology start in both September and January. It is wise to arrange it so that work relating to plants and flowers is taken up during the season when material is abundant.

In schools having a regular course in Physiology, as in the New Bedford High School, the unit "The Human Body and its Functions" need not be taken up as thoroughly. However, it is most necessary to consider the application of biologic principles albeit leaving the physiological and anatomical phases to be taken up in the regular physiology course. The unit cannot be omitted, however. The course in Physiology is given for the Normal Course pupils only, and is not taken up till the fourth year. The College Course

does not include this subject nor does the General Course, so that in these courses it is necessary to take up the biologic phases of "The Human Body and its Functions" quite thoroughly.

In considering the unit "Health Considerations" the work in general health may be somewhat abbreviated for the General Course pupils as it is carried as a separate subject in the third year. The biologic phases of the unit must be dealt with in the regular work. The College Course and the Normal Course do not include Health as a third year subject. Therefore, the unit "Health Considerations" must needs be emphasized more thoroughly for them than for the General Course pupils. The emphasis in the College and Normal Units cannot be placed on the choices as made in the questionnaire, as the objective of these courses is admission to College or Normal School (or to a Hospital).

The consideration of Narcotics as a unit may be emphasized by the College and Normal Groups to the extent as indicated in the table of choices. The General Course group may well defer consideration of this to the time when they are taking it up in the subject of Health in their third year. The biologic bearings of the unit cannot be overlooked and emphasis must be placed on this phase.

The emphasis on Disease as a unit can be carried out in the regular course for the College and Normal Groups. The General Group can defer an extended consideration of this unit till it is taken up in the Health Course. The biologic bearing of the unit again makes it necessary to consider this phase, however.

The unit "Foods" should receive the same type of treatment as "Health Considerations", insomuch as the General Course includes this in the third year subject, Health. The courses given in the

Junior High Schools on Foods and Dietetics do not emphasize biologic considerations although they do improve skill and technique.

It is advisable to build these topics into ten units of study and adapt them to the conditions that will render them most effective.

The purpose of this course is to develop a set of units that will make the teaching of biology more practical and have it meet the needs of the majority of people.

Adjustments can readily be made in the General Course and emphasis can be placed on outstanding items. The College and Normal Course have a definite amount of ground to cover and very little can be done to change their subject matter content.

This part of our study thus indicates the following changes as advisable: (1) elimination of classification studies in plants and animals, and (2) reduction of course time allotted to Animals, Plants and their Environment.



CONCLUSIONS

CONCLUSIONS

In the use of the survey and questionnaire methods it has been possible to obtain valuable data which serves as a background upon which revision of the biology course might be made. The problem now is to use the information obtained from the survey of surroundings interpreting the choices made in the questionnaire in the formation of a readjusted course of study.

The use of the survey method in ascertaining character of surroundings was valuable from the standpoint of the information obtained and the effect upon the observers who felt they were cooperating in a valuable project.

The number of individuals participating insured a wide range of observation. Close contact with the persons contributing to the survey and a full knowledge of the conditions observed by these same persons tended to make the observations more reliable.

The units preferred (I-X) by all the persons reached through the questionnaire and which are the materials to be considered in the revised course are:

- Unit I. The Human Body and its Functions.
- Unit II. Health Considerations.
- Unit III. Narcotics.
- Unit IV. Disease.
- Unit V. Foods.
- Unit VI. Heredity and Evolution.
- Unit VII. Reproduction of Plants and Animals.
- Unit VIII. Animals
- Unit IX. Plants
- Unit X. Miscellaneous

APPENDIX

TABLE

RESULTS OF QUESTIONNAIRE 2

PROFESSIONAL RETURNS

QUESTION	<u>LEADERS</u>		<u>SKILLED</u>	
	No.	Wgt.	No.	Wgt.
1	13	5	9	11
2	12	6	12	8
3	13	5	9	11
4	15	3	19	2
5	11	7	9	4
6	14	4	12	8
7	15	3	11	9
8	18	1	20	1
9	14	4	13	7
10	11	7	9	11
11	15	3	12	8
12	15	3	18	4
13	14	4	15	5
14	15	3	11	9
15	13	5	14	6
16	16	2	14	6
17	13	5	10	10
18	12	6	7	12
19	13	5	6	13
20	15	3	12	8
21	10	8	4	15
22	12	6	6	13
23	10	8	3	16
24	10	8	4	15
25	12	6	5	14
26	11	7	7	12
27	10	8	6	13
28	12	6	9	11
29	10	8	4	15
30	19	1	20	3
31	19	1	18	3
32	18	1	18	3
33	18	1	18	3
34			4	15
35	9	9	2	18
36	10	8	4	15

QUESTIONNAIRE 2

INDUSTRY AND TRADE

Question	<u>EXECUTIVE</u> <u>25</u>		<u>OFFICE</u> <u>25</u>		<u>SKILLED</u> <u>25</u>	
	No.	Wgt.	No.	Wgt.	No.	Wgt.
1	1	15	6	11	4	15
2	11	7	9	9	11	10
3	9	9	11	8	15	7
4	16	3	16	5	12	9
5	7	10	9	9	15	7
6	14	4	11	8	15	7
7	16	3	12	7	21	3
8	25	1	24	1	23	2
9	16	3	20	3	14	8
10	6	11	7	10	12	9
11	13	5	19	4	16	6
12	17	2	21	2	18	4
13	7	10	9	9	11	10
14	14	4	20	3	11	10
15	17	2	16	5	12	9
16	12	6	16	5	17	5
17	14	4	15	6	23	2
18	5	12	6	11	5	14
19	5	12	4	12	7	13
20	10	8	9	9	9	11
21	1	15	3	12	3	16
22	11	7	11	8	8	12
23	2	14	3	12	1	18
24	2	14	2	13	5	14
25	5	12	6	11	7	13
26	3	13	9	9	5	14
27	1	15	6	11	1	18
28	12	6	9	9	8	12
29	2	14			1	18
30	25	1	24	1	25	1
31	25	1	22	1	25	1
32	25	1	23	1	25	1
33	2	14	24	1	25	1
34	2	14	1	14	1	
35			1	14		
36	1	15	2	13	3	16
37	1	15	2	13	1	18
38	1	15	1	14	1	18
39			1	14	2	17

QUESTIONNAIRE 2

PUBLIC SERVICES    20  
CITY

COMMUNITY SERVICE    10

WOMEN  
HOUSEWIVES    20

Question	No.	Wgt.	No.	Wgt.	No.	Wgt.
1	3	13	3	7	8	10
2	6	11	3	7	7	11
3	11	8	1	9	9	9
4	13	6	5	5	12	7
5	10	9	4	6	11	8
6	16	4	4	6	12	7
7	17	3	8	3	14	5
8	20	1	9	2	19	1
9	18	2	9	2	13	6
10	8	10	5	5	3	14
11	18	2	8	3	11	8
12	16	4	8	3	16	3
13	8	10	5	5	8	10
14	15	5	5	5	9	9
15	16	4	6	4	15	4
16	12	7	5	5	7	11
17	15	5	4	6	9	9
18	4	12	4	6	8	10
19			2	8	7	11
20	8	10	6	4	6	11
21					1	
22	3	13	5	5	4	13
23					3	14
24					1	16
25	3	13	3	7	5	12
26	2		1	9	4	13
27					1	16
28	4	12	2	8	8	10
29					2	15
30	20	1	10	1	19	2
31	20	1	10	1	19	2
32	20	1	10	1	18	2
33	20	1	10	1	20	2
34	2				1	
35					0	
36					4	13
37					4	13
38					3	14
39					3	14
40					1	16

QUESTIONNAIRE 2

MISCELLANEOUS 17

<u>Question</u>	<u>No.</u>	<u>Wgts.</u>
1	5	11
2	6	10
3	9	8
4	10	7
5	11	6
6	12	4
7	12	4
8	17	1
9	12	4
10	2	13
11	9	8
12	16	2
13	8	9
14	8	9
15	14	3
16	6	
17	12	4
18	5	11
19	5	11
20	6	10
21		
22	1	14
23	2	13
24	3	12
25	3	12
26	1	14
27	2	13
28	1	14
29		
30	17	1
31	17	1
32	17	1
33	17	1
34		
35		
36	1	
37	2	
38		
39	2	
40		

PUPIL SURVEY OF BIOLOGICAL SURROUNDINGS

1. Pupil's name.
2. Home address.
3. Number in family.
4. Do parents own home?
5. Number of rooms in house.
6. Method of heating house.
7. Kind of refrigeration used.
8. How is the house lighted?
9. Is the house kept in good repair?
10. Have you a garden?
11. Have you animals or pets?
12. Is there a good lawn about the house?
13. Have you a flower garden?                      Flower in the house?
14. Are the sidewalks and streets well kept in your vicinity?
15. Is the garbage cared for and collected in a sanitary way?
16. Are there untidy and unsanitary places nearby?
17. Are there places where rats, flies and mosquitoes breed?
18. Are there smoke nuisances in the vicinity?
19. Have you had the opportunity to go on a vacation each year?
20. What is your favorite recreation or sport?
21. Can you swim?                      Play Tennis?                      Play ball?
22. Could you resuscitate a person from drowning? Gas? Electricity?
23. How much milk does the family use in a week?
24. Have you been out of school on account of sickness this year?

The above questions have to do with SUCCESSFUL LIVING, which your Biology will assist you in answering and realizing the meaning.



SELECTIVE BIOLOGY QUESTIONNAIRE NO. II

Directions: Please place a check mark in front of fifteen items which you consider to be the most important.

1. The Influence of Surroundings on Plants and Animals.
2. Sources of Food for Living Things.
3. Uses of Food by Living Things.
4. Vitamins, Their Sources and Uses.
5. Food Spoiling. Its Causes.
6. Methods of Food Preservation.
7. The Care of Food, Milk, Water and Air.
8. Good Health. How to Keep Fit.
9. Good Health in the Home.
10. What is the Nature of Disease?
11. Disease. How is it Transmitted?
12. Disease. How Can We Check Up on Ourselves?
13. Bacteria. Their Extent, Benefit and Danger.
14. Our Appearance. How Can We Look Right?
15. Our Posture. Of What Use Is It?
16. The Glands of the Body. Their Great Uses.
17. Narcotics and Their Great Danger.
18. Reproduction of Plants and Animals.
19. Evolution. How did Man Develop.
20. Heredity. What Are the Laws of Heredity?
21. Plants. How Are They Classified?
22. Plants. Their Economic Use to Mankind.
23. Plants. What are the Functions of a Plant?
24. Plants. Weeds Their Nature, Extent, and Ways of Control.
25. Plants. The Vegetable Garden.
26. Plants. The Care of Flowers and the Flower Garden.
27. Animals. How are They Classified?
28. Animals. Their Economic Use to Mankind.
29. Animals. How Are they Improved by Breeding?
30. The Human Body. The Digestion of the Foods.
31. The Human Body. Circulation of the Blood.
32. The Human Body. Action of the Respiratory System.
33. The Human Body. The Nervous System. How do we Behave?
34. Insects. Their Importance and Action.
35. How to Observe Plants and Animals. Aquaria, etc.
36. How Old is the Earth?
37. The Development of Digestion in the Animals.
38. The Development of Circulation in the Animals.
39. The Development of Respiration in the Animals.
40. The Development of Locomotion in the Animals.

Name. \_\_\_\_\_

Address \_\_\_\_\_

Occupation \_\_\_\_\_

BIBLIOGRAPHY

TEACHING OF SECONDARY SCHOOL SCIENCE

- 1 National Society for the Study of Education. A Program  
for Teaching Science.  
Thirty-First Yearbook, Part 1. 1932.
- 2 National Society for the Study of Education. Educational  
Diagnosis.  
Thirty-Fourth Yearbook, 1935.
- 3 National Society for the Study of Education. The Scientific  
Movement in Education.  
Thirty-Seventh Yearbook, Part II. 1938.
- 4 Curtis. - - - - - Investigations in the teaching of Science.  
MacMillian.
- 5 Frank. - - - - - How to Teach General Science.  
Blakiston.
- 6 Finney. - - - - - A Sociological Philosophy of Education.  
MacMillian.
- 7 Miller and Blaydes. - Methods and Materials for Teaching  
Biological Sciences.  
McGraw Hill.
- 8 Paul V. Beck. - - - - - The Organization of High School Biology  
on the Problem Basis.  
School Science and Mathematics.  
June 1936. Vol. XXXVI, No. 6.
- 9 John Joe Coe. - - - - - A Problem for Socialization for Biology.  
School Science and Mathematics.  
October 1937. Vol. No. 7.

- 10 O. D. Frank. - - - - Utilizing the Natural Interests of Pupils in Teaching Biology.  
School Science and Mathematics.  
January 1930. Vol. XXX, No. 1.  
February 1930. Vol. XXX, No. 2.  
March 1930. Vol. XXX, No. 3.  
April 1930. Vol. XXX, No. 4.
- 11 Jacobs Edwin E. - - - - Scientific Nomenclature in High School Biology  
School Science and Mathematics.  
April 1936. Vol. XXXVI, No. 4.
- 12 Arch D. Lang. - - - - Biology Objectives Valuable for Social Understanding  
Science Education.  
January 1938. Vol. 22, No. 1.
- 13 George E. Nelson. - - - - History of the Biological Sciences in Secondary Schools of the United States.  
School Science and Mathematics.  
January 1928. Vol. XXVIII, No. 1.  
February 1928. Vol. XXVIII, No. 2.
- 14 Fred T. Ullrich. - - - - Individualized and Vitalized Instruction in Biology in Teachers College.  
Science Education.  
December 1936. Vol. 20, No. 4.
- 15 F. A. Varrelman. - - - - Teaching Living Biology  
School Science and Mathematics.  
March 1931. Vol. XXXI, No. 3.

Approved by:

Z. Jewelles  
C. E. Gordon  
H. C. Moore

Thesis Committee

Date June 3, 1939





