

A COURSE IN RURAL SANITATION FOR PRESENTATION IN
TWELFTH GRADE HOME ECONOMICS BASED ON
A PARTIAL INVESTIGATION OF NEEDS IN LYON COUNTY

A THESIS

SUBMITTED TO THE DEPARTMENT OF
EDUCATION AND THE GRADUATE COUNCIL OF THE KANSAS STATE
TEACHERS COLLEGE OF EMPORIA IN PARTIAL FULFILLMENT OF
THE REQUIREMENTS FOR THE DEGREE OF
MASTER OF SCIENCE

By

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THE UNIVERSITY OF CHICAGO
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O. M. M.

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PART I
INTRODUCTION

The purpose of the writer in making this study has been three-fold: (1) to determine the sanitary conditions in the rural communities; (2) to determine the educational needs of the rural communities in regard to sanitation; and (3) to prepare a course in sanitation which will meet the needs of pupils living in country homes. Lyon County, Kansas, was used in part for the basis of the study. The course has been prepared for presentation by the home economics department, and adapted to the twelfth grade.

(Investigation of the sanitary conditions in the rural districts of Lyon County reveals the need for education in sanitation. Improvements are needed in equipment, methods, and knowledge of sanitary conditions.) Country homes, which should offer the best conditions for "right living",¹ fall far below an acceptable standard. Table I substantiates the truth of this statement. The figures for this table were taken from the Lyon County assessor's rolls for the year 1927 which are filed at the Kansas State Agricultural College in Manhattan. An examination of the table will show a total of 2,074 heads of families reporting, which it may be assumed, represent that many dwellings, and a population of 11,554.

¹This phrase is attributed to Ellen H. Richards, a recent authority on sanitation.

ASSESSOR'S ROLLS,
1927
TABLE I

	Agnes Twp.	Amer- icus	Centre	Elem- daro	Empor- ia	Fre- mont	Ivy	Jack- son	Pike	Read- ing	Water- loo	Totals	
Power Washing machines	3	-	-	5	5	33	8	6	28	5	3	96	For the Home
Vacuum cleaners	1	-	-	-	3	1	1	1	2	-	-	9	
Power churns	-	-	-	-	-	-	-	-	-	-	-	-	
Home Plant	5	-	-	-	2	5	4	4	3	2	6	31	Gas Farm
Current Purchased	1	-	-	-	22	2	-	45	-	-	-	70	
Acetylene plant	-	3	-	1	7	-	3	2	-	-	-	16	Elec. Light- ing
Natural gas	-	-	-	1	-	-	-	-	-	-	-	1	
In kit- chen sink	4	-	-	-	29	28	32	8	11	9	1	122	Running Water System
In bath room	3	-	-	-	16	13	7	5	7	9	1	61	
In barn	-	-	-	-	3	3	-	1	-	1	-	8	Home Heat- ing (Fur- nace)
Steam	-	-	-	-	1	1	-	-	-	-	-	2	
Hot water	-	-	-	-	6	1	1	1	1	6	-	16	
Hot air	3	-	1	-	5	19	-	2	1	4	-	35	
Total re- porting improve- ments	20	3	1	7	105	106	56	75	53	36	11	466	
No. heads of reporting families	207	290	288	307	608	264	72	272	202	147	217	2,074	
Popula- tion	824	1189	1311	1356	2235	997	290	1081	790	630	851	11,554	

ASSESSOR'S ROLLS,
1934
TABLE II

Table Showing the Running Water Improvements in Lyon County by Townships in 1934.
Adapted from the Incomplete Assessor's Rolls.

Running Water	Anges	Amer-icus	Centre	Elem-daro	Empor-ia	Fre-mont	Ivy	Jack-son	Pike	Read-ing	Water-loo	Totals
In kitchen	4	6		5			10		6	13	5	49
In bath room	3	5		2			8		6	10	5	39
In barn	-	1		1			2		-	1	-	5
Total re- porting improve- ments	7	21		8			20		13	14	10	93
Popula- tion										599		

(Further examination shows that there are only ninety-six power washers or less than one for every twenty families; nine vacuum cleaners; and no power churns. For lighting purposes there are thirty-one reporting home electric plants, seventy connected with power lines, sixteen have acetylene plants, and one is using natural gas. Homes reporting running water show that one hundred and twenty-one have it in the kitchen sink, sixty-one in the bathroom, and eight in the barn. Only fifty-three families report furnaces, of which two are steam, sixteen hot water and thirty-five hot air. Fremont township on the north of Emporia reports a total of one hundred and six improvements, while Center in the southern part of the county reports only one.) It is the belief of the writer that without these facilities sanitation is very difficult, if not impossible.

No later surveys, which are complete, are procurable at this time. The assessor's rolls for 1934 show only water equipment. The incomplete information is shown in Table II.

This table shows the same figures for Agnes township as for 1927, decided improvements for Americus, Elemendaro, Reading and Waterloo; decreases are found for Ivy and Pike townships.

(The writer surveyed nine homes for sanitary conditions) using as a basis the points shown on page 6. (In eight of them the location of the house was good from a standpoint of distance from the road. In most cases the ground was well-drained and there were trees and shrubbery. All houses had screens, although in one replacement was necessary. One house

was without fence or sidewalks. One home had a hot air furnace, one a heatrola in which coal and wood both were burned. The others had wood stoves. Two homes close to Emporia, were lighted with electricity. Of the other seven, one had an acetylene plant, which was used part of the time for lights, while the others had kerosene lamps. Four had power washing machines, four more had hand power washers, and the other one had a washboard. Five floors were covered with linoleum, two were oiled, while two were plain boards. The cleaning equipment was limited. Brooms were in all homes, dust mops in five, and a vacuum cleaner in just one. Only two modern equipped bathrooms were found. One place provided a heated room for bathing in the winter, but it was without running water or drain. Two-thirds of the houses appeared to be clean, one more fairly clean, while the other two left much to be desired.)

Barns were all located a good distance from the house. There were only two that were not lower than the house, and only one that was located on the south side of the house.

(As to water supply, four had good cisterns, two others had cisterns which were not protected, and three had wells which were not on well-drained ground. Three had water piped into the kitchen.

Garbage disposal in all cases was to chickens or hogs, in most cases it was fairly well taken care of and was not a great menace. In two places rubbish was laying about and

chickens were near the door. There was no fence around this house.

The adequacy of the sewage disposal varied from excellent to very bad. Two had water flush systems. Of the seven having privies, only one was protected against flies, and only two used disinfectant. Four of the privies were very poorly constructed. None made provision for regular disposal of night-soil. Only three had kitchen drains, and two of these were in homes fully equipped with water. The third drained into the garden, and was cared for in a sanitary manner.)

(Apparently much is needed in the way of sanitary improvement in the country.) In most country homes there is very inadequate equipment for making the home healthful. Financial barriers are an excuse, but lack of sanitary knowledge is far more important. The only hope for better conditions lies in educating the younger generation. The boys and girls who make up this generation should want better conveniences and should know how to get them in the country without coming to town.

The points used by the writer in observing rural homes are presented here. The rating of one home is shown.

Sanitary Features Observed in Farm Homes

I	House	<u>Remarks</u>
	A. Location	
	Back from the road...Well-drained ground...Shrubbery, trees.....	Good
	B. Construction	
	Good foundation... Screens.....	

Windows... Fence... Sidewalks..... Fair

C. Interior

Heating and ventilation...(jacket stoves)..Furnaces..... Wood stove, ventilation poor

Lighting...(Electric plant...On power line...Gas...Kerosene lamps)..... Poor quality kerosene lamps

Laundry facilities Easily cleaned surfaces in kitchen... bathroom...Elsewhere..... Washboard and tub

Cleaning equipment...(Vacuum or suction cleaner...Dust mops...Cloths)..... Broom

D. Bathing facilities.....

Modern equipment and bathroom...Convenient room provided with drain...Heat. Used kitchen

E. General cleanliness..... Poor

II Barn.....

Distance from house...On lower ground.... Opposite direction from prevailing winds.. Fair

III Water Supply.....

A. Cistern..... Protected and with filter...On high ground...Impervious walls..... Cistern protected. Filter.

B. Well..... Deep...Protected...On high ground.... above any sewage disposal...Dust proof...Piped into house.....

IV Garbage and Rubbish Disposal.....

Feeding to animals...Burying...Burning or incineration..... Fair

V Sewage Disposal.....

A. Cesspool...Good location.....

B. Septic tank...Sanitary flush toilet.... Good drainage.....

	<u>Remarks</u>
C. Sanitary outdoor toilet.....	
Good location...Protected from flies	
...Provision for removal of night-soil...Use of earth, lime or other disinfectant.....	
	Good location. Poor construction. Disinfectant used.
D. Kitchen drain...Sanitary treatment..	
	Drained into garden

A rather complete survey was made of rural Lyon County in January and February, 1934, as a part of the GWA program. This included valuable and detailed information on sanitary conditions which the writer was very desirous of obtaining. However, the results of this survey have not been released for general inspection at this time. (May, 1934.)

Very few previous studies in regard to sanitation are available. The writer found no course in sanitation designed particularly for rural conditions. An examination of home economics curriculum studies for senior high schools shows sanitation included in the background. It is touched upon mainly in connection with other topics included in the course. A study made in Texas and reported in 1920 by Blanton, Harris, and Peek² includes in its curriculum a one-half unit course in Physiology, Hygiene and Sanitation. Its aim is healthful living and it is offered as a background for home nursing.³ It includes many sanitary and health factors. Sub-topics

²Blanton, Harris, and Peek, Home Economics, Bulletin 114, Texas.

³Ibid., pl. 89.

are found in foods and clothing on cleanliness, care of person, and household equipment. Bacteria, molds, and yeasts are included also in a biology⁴ course. Evidently, biology is considered important in its possible contributions to the home.

The Denver study⁵ of 1925 for home economics in senior high school, with Threlkeld in charge did not recommend a course in sanitation. Principles of food spoilage and preservation are included in the foods course. Foods also deals with other topics, one of which is a discussion of kitchen arrangement which includes the care of utensils, refrigerator, sink, and garbage with a purpose of the knowledge of the effect of improper care of them.⁶ Another topic emphasises cleanliness in feeding the baby. Still another topic emphasises the sanitary care of the sick.

A course in home making and child care⁷ designed for the senior high school in Denver, includes planning a home in which sanitation and health features are considered. This course also deals with the care, cleanliness, and equipment for the house. A course in applied economics for boys is also outlined. Some of the topics deal with sanitation and care of food, and sanitary housing.

The St. Louis study of home economics for senior high schools,⁸ made in 1926, mentions in its objectives, health

⁴Ibid., pp. 81-2.

⁵Home Economics, Course of Study Monograph, No. Thirteen, Denver.

⁶Ibid., pp. 90-1.

⁷Ibid., pp. 110-27.

⁸Home Economics for the High School, Curriculum Bulletin, No. 41, St. Louis.

habits in regard to sanitation. The part treating foods has units on cleanliness in the care and preparation of food. Clothing courses have units on care of household furnishings, laundering, and cleaning. While sanitation is not recommended as a separate course, it is given a great deal of consideration in the St. Louis study.

The Kansas State Home Economics Association prepared a course of study,⁹ which was issued in 1928. It emphasized the principles of right living.¹⁰ Plans for one, two, and three year courses were given. Each of the three courses, foods, clothing, and home and family include units on sanitation. That is, the sanitary features are given consideration in regard to food, its care, preparation and preservation; clothing, its care, hygiene of person and care of the house; home and family, sanitary features of the house, house plans and care of the sick and children.

All of the four studies reviewed were based upon results of investigations made on the needs of the pupils.

One more study may be mentioned, that of the United States Federal Board for Vocational Education¹¹ in 1924. This recommended that the school plant for vocational education include laundry equipment. Sanitation as a subject is not emphasized. It is found only in the background.

While these and many other studies, some of outstanding

⁹Home Economics, Part IX, Course of Study for High Schools, Kansas.

¹⁰Ibid., p. 8.

¹¹Home Economics Education, Vocational, Bulletin No. 28, Washington, D.C.

importance and others of lesser importance have been made, the subject of rural sanitation is given only incidental consideration so far as the writer has been able to ascertain.

In the preparation of this study investigations were made of the sanitary conditions in Lyon County. The county health department and the county home demonstration agent were consulted. Both helped in making contacts with rural conditions, gave suggestions, and aided in locating material. Investigations were made of rural schools, rural homes, and sanitary conditions as revealed by the assessor's rolls. The subject of sanitation was studied in periodicals, bulletins and books, and special applications made of it to rural conditions. Methods and principles of curriculum making were studied in part from the writings of recognized authorities, but also from the course in High School Curriculum under the able direction of Mr. H. G. Lull. The next step was the preparation of the course in sanitation itself. This included the formulation of objectives and assumptions. Next, an outline of units was prepared. After this the units were written around the objectives, and planned and based upon investigations which were made. Wherever possible correlations with other courses were made. Contributions expected of other courses are listed in most of the units. Suggestions are also made for additional units, which may be offered as alternative courses, or offered in other courses. The study was directed by Mr. Lull.

The course has been divided into fifteen units. The first

is an introductory or exploratory unit, the next two are on water; then follow four units on the disposal of waste, and one unit is given to the plan of the farmstead. Following this are five units on the house and its sanitary and health features, and the last two are mainly on the sanitation of food. After the units and closing this study is a summary of findings, including conclusions and recommendations.

It is hoped that the study touches upon the outstanding problems of rural sanitation and that it has been wisely adapted to the age and needs of twelfth grade pupils residing in the rural districts of Lyon County.

PART 2
Course in Rural Sanitation for Twelfth Grade to
be Presented by the Home Economics Department

GENERAL CURRICULUM ASSUMPTIONS

The big problem of educators today is to provide a curriculum which will bear the scrutiny of the social sciences. Much in the traditional school must fall before them. They are demanding educational methods and procedures which will correlate, not divorce, the academic studies from life situations. They demand a type of education which will function in the life of the community. Development of beliefs, convictions, and skills are necessary. They find expression outside of school. Raup¹ makes a rather clear statement of this fact.

Beliefs, convictions, ideals, common consents, and mutual understandings are indispensable to a wholesome society of persons. These find their crucial expression in the intimate and basic life relationships of people, in the family, in adolescent development, in occupation and economic function, in religion, and in art, and in community approval

....

Schools must contribute their share in the formation of the attitudes and beliefs.

Some of our social trends imply greater equality and the need for a new social core for the curriculum. Judd believes tradition should be used as a guide only when it is supported by a "dominant social trend". Civic intelligence would rank high when rated by this criterion. It is social evolution and not individual skills that are of

¹R.B. Raup, "The New Conception of the Profession of Education," The Educational Frontier, p. 75.

importance.² Ideals of democracy imply several factors, one of which is "the performance of duty up to one's ability as a basis for the right of sharing and the opportunities for initiative".³ Lull also gives others.⁴

It is the duty of educators, then, to have first a broad knowledge of the pupils' needs and their place in society. Only with this background can opportunities be planned for as large a development of capacities as is possible. Development of knowledges, appreciations, convictions, attitudes, habits, and skills is the purpose of the educator. These will be developed through curriculum objectives. Curriculum objectives served by this course are: health efficiency, home life efficiency, and citizenship efficiency.⁵

This may be stated in brief outline.

I Concepts of democracy.

- A. Sharing.
- B. Initiative.
- C. Corollaries of these.

II Products of learning.

- A. Knowledges.
- B. Appreciations.

²Charles K. Judd, "The Curriculum in View of the Demands on Schools", SCHOOL REVIEW, January, 1934, pp. 17-25.

³Herbert G. Lull, Secondary Education, pp. 177-8.

⁴Ibid.

⁵Ibid., p. 184.

C. Convictions.

D. Attitudes.

E. Habits.

F. Skills.

III Curriculum objectives.⁶

A. Health efficiency.

B. Homelife efficiency.

C. Citizenship efficiency.

⁶The curriculum objectives are arranged in the order of importance judged by the writer as most applicable to the present study.

OBJECTIVES

I Curriculum Objectives served by this course.

- A. Health efficiency.
- B. Home life efficiency.
- C. Citizenship efficiency.

II Intermediate Objectives.

- A. Sanitation is essential to health and homelife efficiency.
- B. An adequate supply of pure water is essential to health.
- C. The safe disposal of all wastes is essential to health.
- D. The location of buildings, well, and sewage disposal plants bear a direct relation to health.
- E. Proper construction of the house is essential to the health and happiness of the members of the household.
- F. Household pests bear a definite relationship to health and homelife efficiency.
- G. Proper lighting facilities are essential to health and homelife efficiency.
- H. Proper heating and ventilating systems are essential to health efficiency.
- I. Proper methods of interior cleaning are essential to health.

- J. Proper handling of milk and other food supplies are essential to health and citizenship efficiency.

III Specific Objectives.

- A. To learn how sanitation contributes to health.
- B. To learn that an adequate supply of pure water is essential to cleanliness in the home.
- C. To learn how a pure water supply for the home is secured and protected.
- D. To learn the need for the safe disposal of wastes.
- E. To learn how to dispose of garbage in a safe manner.
- F. To learn satisfactory methods of sewage disposal in rural communities.
- G. To learn how to dispose of rubbish in a rural community in a satisfactory manner.
- H. To learn how buildings, wells, and sewage disposal plants should be located to promote the best interests of health.
- I. To learn what features in the structure of the house contribute to the health of the family.
- J. To learn how to control household pests so that they will not be a menace to health.
- K. To learn the most efficient method of lighting the home.
- L. To learn how to properly heat and ventilate a house.

- M. To learn how to clean the inside of the house so that it will be sanitary.
- N. To learn how to handle milk in a sanitary manner.
- O. To learn how to protect the food of the family.

IV Marginal Objectives.

- A. To develop favorable attitudes toward the different phases of sanitation.
- B. To learn the costs involved in the installation and operation of the different sanitary devices.
- C. To learn how to perform the different operations involved in sanitary procedures as they affect the home.
- D. To learn how to be discriminative in the choice of food and equipment for the household.
- E. To learn how to protect oneself against disease.

UNIT I EXPLORATION OF THE SUBJECT

Science type. Applied technique.

I CURRICULUM OBJECTIVE: Health and homelife efficiency.

A. Intermediate objective: Sanitation contributes to physical well-being.

1. Specific objectives:

a. To learn how sanitation contributes to health.

b. To learn what to look for in a sanitary or unsanitary situation.

c. To learn the benefit of cleanliness to the home.

B. Organization of activities and subject matter.

1. The purpose of this unit is exploratory. It should open up for the pupils the subject of sanitation. In doing this they should be prepared for a personal visit to a home where they will observe the sanitary features.

The subject of sanitation and health may be brought up by the reading of current events which concern health, disease, or sanitary conditions. A story may be read. "Willie's Cold", in Hygeia, vol. 5, April, 1927, page 199, will serve nicely to introduce the subject.

The sanitary and health factors appearing in this article should be brought out and others added.

Previous information as to health and sanitation will aid here. Courses in hygiene should make valuable contributions.

Prepare a list of factors contributing to health, and check over for items which are directly influenced by the home surroundings. Announce that a visit is to be made to a home and ask the pupils to decide for what items they should look. The list should include water supply; sewage, garbage and waste disposal; location of house, barn, privy and well; interior cleanliness, heating plant, ventilation, and light; cleaning equipment; bathing facilities; and facilities for care of food.

2. Visit. Make a visit to a rural home. Observe exterior features, examine indoor features as much as possible. The hostess' permission should be secured before the visit is made. She should answer some questions as to water supply, cleaning equipment and her needs for making the home a healthful place in which to live.

3. Discussion of visit and plans for further developments. The significance of the factors observed should be brought out. To the pupil much of this will be impressive, mainly from the standpoint of aesthetics. However, other values must be realized.

4. Gathering information. Books dealing with bacteria should be put on the reading table, a list of references may be put into the hands of the pupils. There should be access to current and bound volumes of some periodicals, especially Hygeia and others pertaining to country life. Slides of living bacteria may be observed through the microscope. Cultures of bacteria may be prepared and counted. Distinction may be made between good and bad bacteria. General science and biology courses should have contributed facts as to the habits of bacteria and their relation to disease.

Vital statistics showing deaths and cases of illness due to different diseases should be examined. The county health department can supply some of this information. The Statistical Bulletin of the Metropolitan Life Insurance Company gives worth while information.

5. **Contrasts.** Contrasting ideas concerning sanitation and cleanliness between different homes, in country and city homes, in different countries such as India, China, and the Philippines should be made. Sanitary conditions in Rome, in the Middle Ages, and the earlier cities, the Black Death and other plagues should be noted and compared with our own ideal of sanitation.
6. The pupils may check the items in the list against their own homes.
7. **Application of the objectives.** Definite relationships between sanitary conditions and health should be understood. Such points as the following should be made clear:
 - a. Much ill health is due to bacteria and unhygienic methods of living.
 - b. Most of the dangers of bacteria may be eliminated by the application of sanitary principles.
 - c. General health aids in combating the effects of harmful bacteria.
8. **Further application of objectives.**
 - a. Members of the home will be more healthful if sanitary modes of living are followed.
 - b. Each member will be better equipped for doing his share of the duties.
 - c. More contentment and satisfaction should result from cleanliness of the home and its surroundings.

9. Test. Give a written lesson testing the pupils' knowledge of sanitary features. They should list those things found in a rural home which affect its sanitation and tell how sanitation affects health and the homelife.

Note: The next unit will deal with one of the main problems of home sanitation. Probably water supply is the logical one. However, it may be wise to use some other problem, such as the location of buildings in relation to sanitation.

C. Contributions of other courses.

1. Hygiene.

- a. Efficient health.
- b. Personal cleanliness.
- c. Community cleanliness.

2. Foods.

- a. Care of foods.
- b. Care of kitchen equipment.
- c. Dishwashing.
- d. Food spoilage.

3. General science or biology.

- a. Microscopic forms of life.
- b. Water.

D. References.

Books

1. Babbitt, Sewerage and Sewage Treatment, Chapter I.
2. Broadhurst, Home and Community Hygiene, Chapter I, 1918.*
3. Buchanan, Household Bacteriology, 232 pp.
4. Jordan, A Textbook of General Bacteriology, 819 pp.
5. Kendall, Civilization and the Microbe, 231 pp.
6. Prudden, Dust and Its Dangers, 113 pp.
7. Prudden, The Story of Bacteria, 232 pp.
8. Smiley and Gould, Community Hygiene, Chapter I.
9. Tobey, Riders of the Plagues, 348 pp.

Periodicals

1. Clark, "Education of Adam Henry", HYGIEA, vol. 5, March, 1927, p. 199.
 2. Cumming, "Sanitation of Swimming Pools, Wading Pools and Bathing Beaches", AMERICAN CITY, vol. 43, September, 1930, pp. 123-4.
 3. Eastwood, "Untreated Ground Water Supplies Are Potential Hazards", AMERICAN CITY, vol. 46, March, 1932, pp. 66-70.
 4. Mayo, "Sanitation at the Sword's Point", FORUM, vol. 79, February, 1928, pp. 222-8.
 5. STATISTICAL BULLETIN, Metropolitan Life Insurance Company, vol. XIII-V.
 6. Tobey, "Police Power, Public Health, and Due Process of Law", AMERICAN CITY, vol. 34, February, 1926, pp. 207-11.
 7. Walsh, "Whole-Family House", PARENT'S MAGAZINE, vol. 4, April, 1929, p. 30.
 8. Wilbur, "Health: A Business Asset", SURVEY, vol. 55, March 15, 1926, pp. 678-9.
 9. "Willie's Cold", HYGIEA, vol. 5, April, 1927, p. 199.
- *Fourth Edition, 1929, 469 pp.

UNIT II WATER SUPPLY

Science type. Applied technique.

I CURRICULUM OBJECTIVE: Health and homelife efficiency.

A. Intermediate objective: Sanitation is essential to health and successful homelife.

1. Specific objectives:

a. To learn that an adequate supply of pure water is essential to cleanliness in the home.

b. To learn the ways in which water is used.

c. To learn what the costs of an inadequate or an impure supply of water are:

B. Organization of activities and subject matter.

1. Uses of water. Man is very dependent upon water. He uses it in many ways. Enumerate the ways, such as: drinking, bathing, preparation and cooking of foods, washing dishes and clothing, cleaning the house, for growing plants, for recreational purposes, such as bathing or boating. Consider for which of these, germ-free water is necessary, for which it is not.

Note: It is assumed that previous studies in foods, clothing, hygiene, and science have offered units on the subject of water and its uses.

2. Discussion and planning of further developments.

Amount of water needed. Consider the ways in which water is used. Find out why it is essential to use a lot of water. Also find estimates of how much water is used in a sewage system per person per day. Find out how much water is needed for laundering and cleaning. Discuss the relation between cleanness and the amount of water used.

3. Finding material on the subject. Books on house-keeping and hygiene should be supplied. The pupils should have free access to current and bound periodicals which deal with water supply and the uses of water. The article on "Sanitation in the Farm Home", by Grace Marion Smith in *HYGIEIA*, vol. 4, November and December, 1926, is especially good. An estimate of the amount of water used in a sewage system per person per day may be found in Housewifery by Balderston on page 39. Lippincott's Manual of Home and Community Hygiene by Broadhurst contains a chapter on water which is very good. Other references are given at the end of the unit.

4. Effects of impure water. Examine textbooks on hygiene to find out how diseases and epidemics are spread. See how often they are due to contaminated water. May the effects of the use of impure water be only ill health without the appearance of a particular disease? Can the

costs be counted in death only? How else may they be counted? Should a municipality supply two grades of water? Why or why not?

5. Costs of the use of impure water or of an inadequate supply. Consider the question of costs. Find as many costs as possible. For instance, impure water will aid in the spread of contamination and infection. Adequate supplies of water aid in satisfactory sewage disposal. If sewage disposal is not satisfactory, contamination, sickness, and ill health are the result. These are real costs. If a physician's services are needed, then financial costs are involved. Suffering and unhappiness may be considered costs also. See Chapter IV in Ellen H. Richard's book, The Cost of Cleanness. This contains an estimate of possible savings to the United States if there was no sickness.
6. Contrasts. Much may be learned by drawing a few contrasts. Compare the death rate in city and rural districts. What facts are found? Seek the causes for this. Are they necessary? To what extent may an inadequate or impure water supply be responsible? Compare the amounts of water used per person in the city with that used

in the country. It may not be an easy task to secure information on the second point. Compare the type of water used by the American city dweller with that of the average rural dweller of India. How about the health of the two groups. Compare the methods of securing water in the different countries.

7. Application of the objectives. Answer these questions:

How is water used? How many of the ways in which water is used contribute to cleanliness? Why is it costly to use impure water? Why costly to use an inadequate supply of water?

8. Test. The unit may be completed with a test which calls for comprehensive reasons for the adequate use of a pure water supply and the cost of cleanness. The essay type is suggested, since attitudes are important here. If desired, current events or other materials collected by the pupils may be presented.

C. Contributions of other courses.

1. Foods.

- a. Water as a food.
- b. Uses of water in the preparation of food.
- c. Water as a cleaning agent.

2. Clothing: Water in laundering.

3. General science.

- a. Sources of water.
- b. Uses of water.

4. Hygiene: How water cleans.

Note: The next unit will be on pure water.

D. References.

Books

1. Balderston, Housewifery, Chapter I.
2. Bigelow and Broadhurst, Health for Every Day, Chapter II.
3. Brewer, Rural Hygiene, pp. 62-88.
4. Broadhurst, Home and Community Hygiene, Chapter V, 1918.
5. Broadhurst and Lerrigo, Health Horizons, Section XXIII.
6. Horwood, Public Health Surveys, Chapter V.
7. Hough, Sedgwick, and Waddell, The Human Mechanism, pp. 563-74.
8. Richards, The Cost of Cleanness, 109 pp.

Periodicals

1. Campbell, "Sanitation of Tourist and Vacation Camps", AMERICAN CITY, vol. 40, June, 1929, pp. 91-3.
2. "How the World Gets Its Drinking Water", HYGEIA, vol. 5, October, 1927, pp. 512-13.
3. Smith, "Sanitation in the Farm Home", HYGEIA, vol. 4, November, and December, 1926, pp. 615-7, 697-8.

UNIT III PURE WATER

Science type. Applied technique.

I CURRICULUM OBJECTIVE: Health and homelife efficiency.

A. Intermediate objective: Pure water is essential to health efficiency.

1. Specific objectives:

- a. To learn how a pure water supply for the home is secured and protected.
- b. To learn how water is contaminated.
- c. To learn the difference between hard and soft water.

B. Organization of activities and subject matter.

Note: Correlate with the unit on water supply.

1. An adequate supply of water is essential to sanitation. This supply must also be pure. There are several sources of water for the home. The problem is to enumerate and examine the possibilities of securing a sanitary supply for rural homes. Open the unit by asking what pure water is and how water is obtained.
2. Sources of water. The following questions or similar ones will arise in this section: What is the original source of water? Where does

water go when it evaporates? What sources does man use for obtaining his water? Are all of these sources dependable as to amount? If one source fails, what may be done to secure water? How do cities secure water? What are the most common methods in the rural sections of this county?

3. Collecting information on sources. Some time will be allowed for this. References may be given by the teacher, but the pupils should not be limited to these. Personal experience and other courses will furnish some answers. The visit made in connection with Unit I should prove valuable here. The course in general science should present a unit on water.
4. Discussion of sources and planning further developments. There are many sources of water. To what extent may those in this county be depended upon for purity? Decide what purity means. Note the difference between water which is chemically pure and that which is bacteriologically pure. What difference does it make as to the use of the water? Is rain water always pure? Why? Examine the entire list of sources as to their probable purity. Can their purity be determined? If so,

how? What is surface water? Is it safe for drinking? Oral reports may be made on the safety of the different sources, such as, surface waters, driven and artesian wells, springs, cisterns, and brooks.

5. Contamination of water. If all water is not pure, then some of it is contaminated or polluted. What are the different kinds of contamination? Organic and mineral bacteria, both pathogenic and harmless, are found in water. Which of these make water unsafe from a sanitary standpoint? Is clear sparkling water always pure? How is water contaminated? Does nature contaminate it? In what way is man responsible for it? What does pollution mean? Discussion should include these topics: Dust, contamination of soil, water sheds, pollution, poor methods of sewage disposal, animals, and campers. Examine the sources of water supply for great cities and note how the water sheds are protected. The same principle applies to the rural home. How are the wells, cisterns, and springs of rural homes contaminated? To what extent is the individual farmer responsible for the impurity of his water? Who else may

be and how? Correlation with Unit II will show how diseases are spread by contaminated water. What diseases are commonly contracted from unsafe water supplies? Why are surface waters particularly unsafe?

6. Location and construction of well, cistern, or spring.

Where is a safe place for it? Upon what principles will its location be determined? What principles of construction should be observed? Why? Of what value are filters? What care should they have? If water is piped into the house, are there any further sanitary principles which should be observed? What are they?

7. Protection against impure water. If water is not pure, then that which is used in the kitchen and for drinking must be purified. (The foods course should have offered a unit on water which would give at least the method of boiling that is most common. General science should give other methods, such as, chlorine and other chemicals and distillation.) Should distilled water be provided for drinking? Why or why not?

8. Application of the objectives. Summarize material.

Such points as the following should be understood.

a. Definite effort and thought are necessary in

providing an adequate supply of pure water for

consumption in the rural home.

- b. A well built with impervious walls, cistern fitted with sanitary pump and filter, which are kept sanitary, a clean roof and open drains, and adequate care exercised in turning water into cistern only after air and roof have been washed will insure a fairly pure supply of water. A large cistern should provide an adequate water supply.
 - c. Driven or artesian wells are safe.
 - d. All surface waters must be jealously guarded and used cautiously.
 - e. A spring by virtue of that fact does not guarantee pure water. Caution in using and protection of the spring are necessary.
 - f. Location of surface well in relation to other buildings and the barn is very important.
 - g. Water from streams should not be considered safe nor water from wells located near them.
 - h. Chemically pure water, which may be desirable for some purposes, is not necessary for sanitary purposes usually.
 - i. Bottled waters are not always pure.
9. Test. The unit may be closed with a written lesson which tests the knowledge of what pure water is, how water is contaminated, the methods of securing

pure water for the rural home, the difference between hard and soft waters, and the importance of this fact to sanitation. Or the pupils may make further contributions to the subject. They may discuss benefits of pure water to health and homelife efficiency.

C. Contributions of other courses.

1. General science.

a. Water, hard and soft.

b. Methods of purifying water.

2. Foods: Purifying water.

3. Civics: Individual responsibility in protecting water supply.

D. Suggested Units.

1. Study of the city water supply. Visit city water works.

2. Filters, their construction and use.

3. Expense of building cisterns, digging wells, and making protective coverings for them. Estimates may be found in literature or from contractors.

4. Designs for wells, cisterns, and filters may be studied.

5. Means of educating for the purpose of securing pure water in rural communities.

6. Soft water, for the farm and how it can be secured.

7. Testing water; how and where is it done? When is purification necessary? How may it be done?

Note: Next unit. The problem of sewage disposal may well follow this one unless it seems advisable to follow one of the leads listed under the heading "Suggested Units".

E. References.

Books

1. Bailey, Textbook of Sanitary and Applied Chemistry, Chapter V.
2. Bigelow and Broadhurst, Health in Home and Neighborhood, Chapter 2.
3. Brewer, Rural Hygiene, Chapter IV.
4. Broadhurst and Lerrigo, Health Horizons, Section XXIII.
5. Dodd, Chemistry of the Household, Part I.
6. Elliot, Household Hygiene, 224 pp.
7. Fuller, Domestic Water Supplies for the Farm, 180 pp.
8. Gerhard, The Sanitation, Water-Supply and Sewage Disposal of Country Homes, 328 pp.
9. Halbert, The Better Homes Manual, Chapter VIII.
10. Hough, Sedgwick, and Waddell, The Human Mechanism, Chapter XXX.
11. Smiley and Gould, Community Hygiene, Chapter VIII.
12. Talbot, House Sanitation, Chapter V.
13. Tobey, Riders of the Plagues, p. 35.
14. Turner, Personal and Community Health, Chapter XII.

Bulletins

1. Walker, Soft Water for the Farm, 11 pp.

Periodicals

1. Bell, "Design and Construction of Small Filtration Plants", AMERICAN CITY, vol. 38, June, 1928, pp. 131-134.
2. Chase, "The Sanitation of Water Sheds", AMERICAN CITY, vol. 40, January, 1929, pp. 103-105.
3. Clark, "The Education of Adam Henry", HYGEIA, vol. 5, March, 1927, pp. 115-117.
4. Eastwood, "Untreated Ground Water Supplies are Potential Hazards", AMERICAN CITY, vol. 46, March, 1932, pp. 66-70.
5. "How Nature Purifies Water", LITERARY DIGEST, vol. 105, April, 1930, p. 35.
6. "How the World Gets Its Drinking Water", HYGEIA, vol. 5, October, 1927, pp. 512-513.
7. "Impure Wells and Springs", LITERARY DIGEST, Vol. 99, November 17, 1928, pp. 49-81.
8. Older, "Whys of Everyday Things, Water Everywhere", GOOD HOUSEKEEPING, vol. 82, March, 1926, p. 87.
9. Smith, "Sanitation in the Farm Home", HYGEIA, vol. 4, November, December, 1926, pp. 615-617, 697-698.
10. Vaughn, "Distilled Water For Drinking Purposes", HYGEIA, vol. 4, March, 1926, p. 162.

UNIT IV DISPOSAL OF WASTES

Science type. Applied technique.

I CURRICULUM OBJECTIVE: Health and homelife efficiency.

A. Intermediate objective: The safe disposal of all wastes is essential to health.

1. Specific objectives:

a. To learn the need for the safe disposal of wastes.

b. To learn what the different wastes are.

c. To develop attitudes of responsibility in the proper disposal of wastes.

B. Organization of activities and subject matter.

Note: It is assumed that the pupils have by this time gained a fair knowledge of what the term unsanitary means.

1. This unit may easily be connected with those on water by bringing out the causes of water contamination. To be sure that the pupils know what unsanitary means, a few questions may be put to the class to bring out their ideas of sanitation. It should be to the effect that unsanitary as opposed to sanitary means the presence of harmful or pathogenic bacteria.

Use a picture, diagram, or other vivid illustration, showing the unsanitary location of a spring

or well used for drinking purposes. This will bring out the idea of the safe disposal of wastes to the class. Former units have presented the occurrence of typhoid and other diseases due to the use of water contaminated by a case of typhoid. The idea of disposing of one's own waste materials in such a way that they will not interfere with others' rights must be emphasized.

2. Contrasts. This unit offers the opportunity for some vivid contrasts. One useful illustration would be that of the early settlers in the west who had no neighbors for miles. Streams were uncontaminated as were other water supplies. As settlements increased the disposal of wastes became a problem. Diseases spread. Compare the manner of treating disease before Pasteur's discovery of the germ theory with the method now used. Others may be found.

3. Kinds of wastes. References for reading for this unit will include some on the city's problems of satisfactory disposal of wastes. The pupils will find wastes divided into about three classes: (1) garbage, consisting of wastes from cooking and eating, (2) excreta, and (3) rubbish, consisting of tin cans and numerous other wastes. The class should discuss the problem of satisfactory disposal for

these. What is objectionable about each of the classes of wastes?

4. How diseases are spread. This topic could very easily be made over into an entire unit. Some information on this subject should have been secured from courses in hygiene and general science. For further study let the pupils choose different topics. A list of diseases may be prepared. Include typhoid fever, dysentery, malaria, colds, and epidemics of measles, diphtheria and others.
5. Oral reports. These will bring out the ways in which diseases are transmitted. A summary containing the main facts should be prepared. It will include such points as the following:
 - a. Typhoid fever is spread by water and food.
 - b. This water and food must first be contaminated by typhoid germs from typhoid cases.
 - c. Some people are capable of giving the disease without themselves being sick. These are known as "carriers".
 - d. Milk is a common means of spreading diseases. Typhoid germs may drop from the cow's udder into the milk pail, having been picked up by the cow when standing in contaminated water.
 - e. Many cases of typhoid have been directly traced to contaminated sources of water. This has led in many instances to the careful patrolling

of water-sheds.

f. Purification of water by different means is practiced by municipalities for the protection of those using it.

g. Careless disposal of wastes provides good breeding places for flies and mosquitoes.

6. Application of the objectives. Discuss each of the objectives and prepare a summary. This should include such points as the following:

a. A safe disposal of human wastes is necessary to prevent the contamination of air, water, soil, and food. These are the agents by which diseases are usually spread.

b. Waste materials consist of three classes: garbage and kitchen wastes, excreta, and rubbish. Each has a sanitary aspect.

c. One's responsibility as a citizen demands that he dispose of his own wastes in such a manner as not to harm anyone else. Responsibility does not end here. One must also encourage others to do the same.

7. Attitudes. Some desirable attitudes toward dirt and cleaning should be developed in the pupils. Dirt will not spread contagious or infectious disease unless pathogenic germs are contained in it. Decide what is a sane attitude to assume.

8. Test. Use an objective, essay, or a combined type test at the close of this unit.

C. Contributions of other courses.

1. Civics.

- a. Citizenship responsibility in proper methods of waste disposal.
- b. The city's problem of waste disposal.
- c. Benefits of cleanness and neatness to a community.

Note: The next unit will take up methods of safe disposal.

D. References.

Books

1. Bailey, A Textbook of Sanitary and Applied Chemistry, Chapter VII.
2. Bigelow, Health in Home and Neighborhood, pp. 226-248.
3. Broadhurst and Lerrigo, Health Horizons, Sections XIV and XXI.
4. Elliot, Household Hygiene, Part I.
5. Horwood, Public Health Surveys, Chapter VII.
6. Hough, Sedgwick, and Waddell, The Human Mechanism, Chapters XXX-XXXVII.
7. Lumsden, Rural Sanitation, 336 pp.
8. Richards, The Cost of Cleanness, 109 pp.
9. Sanderson, The Rural Community, Chapters XII, XVI.
10. Smiley and Gould, Community Hygiene, Chapter II.
11. Talbot, House Sanitation, Chapter IX.

12. Turner, Personal and Community Health, Chapters X, XIII.

Bulletins

1. "Where the Typhoid Fever Deathrate Is Still High", STATISTICAL BULLETIN, Metropolitan Life Insurance Company, vol. XIV, No. 11, November, 1933, pp. 6-8.

Periodicals

1. "Americanization and Street Cleaning", AMERICAN CITY, vol. 42, March, 1930, p. 139.
2. Baker, "Essential Features of an Efficient Street-Cleaning System", AMERICAN CITY, vol. 36, May, 1927, pp. 654-7.
3. "Bathing in Polluted Waters", LITERARY DIGEST, vol. 98, September 22, 1928, p. 27.
4. "Be Careful of Wayside Eating Places", HYGEIA, vol. 8, January, 1930, p. 85.
5. Boyce, "Some Sewage Disposal Problems", AMERICAN CITY, vol. 33, September, 1925, pp. 266-70.
6. Campbell, "Sanitation of Tourist and Vacation Camps", AMERICAN CITY, vol. 40, June, 1929, pp. 91-3.
7. "City's Problem of Garbage Disposal", AMERICAN CITY, vol. 36, March, 1927, pp. 403-5.
8. Douglas, "Profitable Garbage Disposal in a Town of Fourteen Hundred", AMERICAN CITY, vol. 40, February, 1929, pp. 86-7.
9. "Efficiency in Rubbish Disposal", AMERICAN CITY, vol. 33, September, 1925, pp. 265-6.
10. Emerson, "Make Public Health Personal", SURVEY, vol. 55, January, 15, 1926, p. 477.
11. Hollingsworth, "What the Bureau of Hygiene Has Done for the City of Utica, New York", AMERICAN CITY, vol. 40, February, 1929, pp. 161-3.
12. "In Handling Your Garbage", GOOD HOUSEKEEPING, vol. 82, June, 1926, p. 96.

13. Jester, "Why Bother with Bug and Chemical Tests at Small Water-Works Plants?" AMERICAN CITY, vol. 43, September, 1930, p. 167.
14. "Little Towns and Big Cities Accomplish Wonders with Brooms and Paint Brushes, Flower Seeds, Shrubs and Trees", AMERICAN CITY, vol. 40, February, 1929, pp. 147-50.
15. Munson, "The Letter from Home", HYGEIA, vol. 8, May, 1930, pp. 435-9.
16. "Sanitary Districts in Missouri", AMERICAN CITY, vol. 38, April, 1928, p. 125.
17. Sturtevant, "How Doth the Little Germ", HYGEIA, vol. 6, April, May, 1928, pp. 217-18, 285-6.
18. "Swat the Early Fly", HYGEIA, vol. 6, April, 1928, p. 224.
19. Tobey, "Politics and Public Health", SCIENTIFIC MONTHLY, vol. 23, August, 1926, pp. 123-8.
20. Whelan, "Says the Fly", HYGEIA, vol. 5, May, 1927, p. 235.
21. Wilbur, "Health: A Business Asset", SURVEY, vol. 55, March 15, 1926, pp. 678-9.

UNIT V GARBAGE DISPOSAL

Science type. Applied technique.

I CURRICULUM OBJECTIVE: Health and homelife efficiency.

A. Intermediate objective: Proper methods of garbage disposal are essential to health.

1. Specific objectives:

- a. To learn how to dispose of garbage in a safe manner.
- b. To learn that methods of disposal will differ in rural districts from those in cities.
- c. To learn how proper disposal of garbage contributes to homelife efficiency.

B. Organization of activities and subject matter.

1. After the presentation of the unit on the need for safe disposal of garbage, questions will naturally arise as to what are safe methods. In the first place, make a list of the methods of garbage disposal known to the pupils. Consider the sanitation of these methods.
2. Examination of methods. a. Garbage can and collection of trucks or wagons, b. feeding to chickens or other animals, c. burial, and d. burning or incineration.
 - a. Garbage can. What is the ordinary procedure

with the use of garbage cans? This question will be quickly answered by the pupils from experience. Consider the sanitation of this in relation to health. Does the character of the garbage make any difference? If so, what? What other factors may enter in? What method or methods are used in this community? Are they safe? If so, why? What factors enter into the proper disposal of garbage?

3. Discussion and planning further developments. Let some pupils find out from the proper officials what disposal of garbage is made in the community. Take a trip down the alley to observe garbage cans. See what type of container is used? Is it covered securely? Are there flies about? Are dogs and cats getting scraps out of the can? What objection can you see to this? What is the character of the contents of the can? Is there any relation between this and sanitation?

Examine references to find what is unsanitary about the different methods of garbage disposal. Review the definition of unsanitary, which is the presence of pathogenic bacteria. Are there any pathogenic bacteria in garbage? If so, what precautions are necessary? Will the bacteria multiply here? What

are the conditions for the growth of bacteria?
What is nature's purpose in bacterial growth?
How can the problem of bacterial growth be met
so that it will not be harmful to man?

4. Collecting information. Look in bacteriology books and other references to get answers for these problems. Oral reports may be planned.
5. Oral reports and discussion. Let several give reports on the information found. Attitudes should be given free expression. Keep before the pupils the idea of safe disposal. Facts such as the following should be brought out:
 - a. Garbage cans are left uncovered, are untidy, are not air-tight, and are not clean.
 - b. Flies are congregated about them, dogs and cats are taking scraps out, and the contents are very moist.
 - c. Some cans are air-tight, securely covered, are less moist than others, and are lined with paper.
 - d. The conditions found in "a" and "b" promote the growth and spread of bacteria.
 - e. Bacterial growth is for the destruction of matter. Were it not for this, the earth would be cluttered up with wastes. Nature takes out of

them their elements and returns them to the soil where they can be used again.

6. With these facts in mind, proceed to the other three methods of garbage disposal and examine them--
- b. feeding to chickens or other animals, c. burial, and d. burning or incineration. What advantages or disadvantages are found in these methods? Is there any danger of contamination from any of them? If so, what? How can the four methods of garbage disposal studied be applied effectively on the farm? Find an answer to the following question-- How can garbage cans be used in a sanitary manner? Apply the question of sanitation to each of the methods. Guide the discussion so that the main facts of safe disposal will be found. These should include most of the following facts. Others may be added.
 - a. To prevent the growth of bacteria it is necessary to prevent conditions conducive to their growth. Kitchen wastes should be well-drained. Keep garbage in an air-tight container in a cool place and dispose of it as soon as possible. A paper in the can will make the can easier to clean. Wash the can with soap and water. Disinfectant will be necessary if there are contagious diseases.

- b. For feeding to animals, kitchen wastes should be well-drained, and portions, such as, orange or grapefruit skins, should be burned or buried. What is left over after being out several hours should be raked up and buried or burned.
- c. Burying is very satisfactory if the wastes are well-drained and are buried at least a foot deep, where they will not be dug up by dogs. If buried in the garden or field, they will act as fertilizer. Not too much should be put in the same place. They should not be near a well used for drinking purposes.
- d. Burning or incineration. This is very satisfactory. If the content is small and well-drained, it may be burned in the kitchen range, heating stove, or furnace. Incinerators for their special purpose are made of two kinds for indoor use. One requires other fuel, while the other requires only the waste. In one the waste is dried before burning. An incinerator may be constructed for outdoor use. The objection to burning is that valuable fertilizer is wasted.
- e. All garbage wastes should be disposed of while fresh, as there is nothing objectionable about them then.

7. Application of the objectives. Which of these methods is used most commonly on the farm? Are any of them used in a sanitary manner? Will there be danger of contamination if any of the methods are used as they should be? Why is the problem different in the country than in town or city? How will home life be made more efficient by the right disposal of garbage? What attitude should be taken toward garbage disposal? Such conclusions as the following should be reached:

- a. If sanitation is the aim and is correctly applied, any of the four methods may be used.
- b. People live much closer together in cities and there is more garbage than in the country for the space which is available for its disposal.
- c. Cleanliness, neatness, and care in the matter of garbage disposal will make the home more attractive. The members of the household should be stronger and happier as the result of sanitary conditions.
- d. The attitude should be assumed that proper precautions are necessary, but that undue worry is uncalled for, especially when one is fairly well assured of the healthful conditions of the home and its members. Other factors of health brought about by wholesome food, personal cleanliness,

air, and exercise will do much to prevent sickness.

C. Contributions of other courses.

1. General science: Bacteria and germs, favorable conditions for their growth.
2. Foods: Care of kitchen wastes.

D. Suggested units.

1. Types and cost of garbage cans.
2. Types and cost of incinerators.
3. Public regulations in regard to garbage disposal.

E. References.

Books

1. Brewer, Rural Hygiene, Chapter VI.
2. Broadhurst, Home and Community Hygiene, Chapters VIII, IX, XVI.
3. Elliot, Household Hygiene, pp. 115-20.
4. Turner, Personal and Community Health, Chapter XIII.

Periodicals

1. Boniface, "Problem of Waste Disposal in a Small City", AMERICAN CITY, vol. 37, October, 1927, pp. 466-8.
2. Cook, "Kitchen-Sink Complex", LADIES HOME JOURNAL, vol. 48, September, 1931, p. 12.
3. Henderson, "Incinerator for Home Use", GOOD HOUSEKEEPING, vol. 86, April, 1926, p. 89.

4. "In Handling Your Garbage", GOOD HOUSEKEEPING, vol. 82, June, 1926, p. 96.

Note: See references for unit on "Waste Disposal". The next unit will take up the disposal of excreta on the farm.

UNIT VI. SEWAGE DISPOSAL

Science Type. Applied technique.

I CURRICULUM OBJECTIVE: Health and citizenship, efficiency.

A. Intermediate objective: Proper disposal of sewage is essential to health.

1. Specific objectives.

- a. To learn satisfactory methods of sewage disposal in rural communities.
- b. To learn which method is the most satisfactory.
- c. To learn how to operate the different methods efficiently.
- d. To learn that efficient sewage disposal has an aesthetic as well as a health value.

B. Organization of Activities and Subject Matter.

Note: The problem of the disposal of sewage should prove one of great interest to twelfth grade pupils. They are interested in appearances. The particular phase of sewage disposal which will be studied in this unit, that of excreta, should prove the most interesting of the problems on the disposal of wastes.

1. In this unit the problem of the disposal of excreta, or nightsoil, as it is termed, is attacked with the idea of finding satisfactory means for its disposal in rural communities.

The visit to the rural home made in an earlier unit should be reviewed to see what method was used

there. Find others. Let pupils criticise these methods, then suggest that they go to different sources to find out about them. They may also learn other methods which will prove more efficient than those listed. Study methods used in cities and criticise them. Include: activated sludge, cesspools, septic tanks, aeration, disposal into streams or lakes, sewage farming, or combinations of some of these. Oral reports may be given.

2. Searching for facts. Open several avenues for getting facts. One of these should be the farm bureau office. The home demonstration agent can give information on the efficiency of methods that are being used. She will also have bulletins on the subject of disposal of sewage on farms. Another avenue is that of the county health department. Some of the pupils probably came from country homes; if not, they have friends living there who will be able to get some first-hand information. A fourth way will be that of bulletins, periodicals, and books in the class laboratory and school library. Different pupils may be assigned to collect information from the different sources.

3. Discussion and making further plans. The pupils should come back with several ideas which should be discussed. Their list of methods should include by

this time: the open and unprotected privy with provision for the removal of nightsoil, the earth and chemical toilets, water disposal systems with cesspool or septic tank. Encourage free discussion of the methods. Several questions should arise. The teacher may suggest others. Find out which of the methods the pupils believe most satisfactory for use in rural communities. Suggest that a definite and critical study be made of the methods. If the question of cost arises, as it should, make it a part of the study.

4. Further study and preparation for oral reports. From this point it may be wise to have different groups of the class working on different units. The problem divides itself nicely into three parts: (1) the privy, (2) the earth or chemical toilet, and (3) the water disposal system with cesspool or septic tank.

Rather definite units should be worked out here on each of the three topics. Let three different groups make a careful study of one of the problems. They should prepare oral reports on their studies. In this manner the entire class will have the benefit of all the information. All should be held responsible for this.

5. Oral reports. Each group will give reports before the class as to what they have found. The reports should include facts as to how the method is operated, how it should be operated, its efficiency, location, cost, the individual's responsibility in having an adequate sewage disposal system, and what can be done to make it the least unattractive possible.

6. Application of the objectives. After studying the problem, the class should come back to the specific objectives. A summary should be prepared which will include some of the following conclusions:
 - a. That some way should be provided for spreading the sewage out on the ground for proper aeration. This must not be near the house and should be on a downward slope from the well from which drinking water is secured.
 - b. The purpose of all sewage disposal is to prevent further contamination by it.
 - c. A disinfectant, such as lime, should be used in the dry earth closet or privy.
 - d. Privies should be provided with screens, windows, covered seats, and should be closed in around the sides and back.
 - e. Privies should be provided with means for removing nightsoil, or else for removing the

superstructure to another location.

- f. Earth and chemical toilets may provide satisfactory sewage disposal if carefully operated.
 - g. The indoor water disposal system is the most satisfactory if a good septic tank is provided to receive the sewage.
 - h. A septic tank is far more satisfactory than cesspools from a health as well as an aesthetic standpoint.
 - i. Any method must be carefully and correctly operated to be efficient.
 - j. Cost should be considered of minor importance where the health of the family is concerned.
 - k. Individual farm homes are responsible for the disposal of their sewage in such a manner that it will be neither offensive nor harmful to the neighbors near or distant.
7. Tests. After the completion of this unit, or after the completion of this and some related ones, the pupils should be tested on their knowledge of the principles of satisfactory sewage disposal for country homes and communities. The test may be objective, but an essay type will give more freedom of expression. The test may take the form of application of the principles; that is, let the

pupils select a definite situation and tell what could be done to make it sanitary and efficient.

C. Suggested Units.

1. Construction, cost, and operation of the sanitary outdoor privy.
2. Construction, cost, and operation of dry earth or chemical toilets.
3. Construction, cost, and operation of a water system.

Note: Topic 3 may include indoor construction and furnishings of bathroom, provisions for getting water into the house, and necessary outdoor constructions, such as the septic tank and cesspool; or it may be broken up into the separate units suggested in topics 4 and 5.

4. Construction, cost, and operation of bathroom including the provisions for water supply.
5. Cesspools and septic tanks, their construction, cost, and operation.
6. Plumbing for the house.

D. References.

Books

1. Bailey, A Textbook of Sanitary and Applied Chemistry, Chapter VII.
2. Balderston, Housewifery, Chapter II.
3. Bigelow and Broadhurst, Health in Home and Neighborhood.
4. Brewer, Rural Hygiene, Chapter V.

5. Broadhurst, Home and Community Hygiene, Chapters VII, XIV, XV, XVI, XXIII.
6. Broadhurst and Lerrigo, Health Horizons, Section XXI.
7. Elliot, Household Hygiene, Part III.
8. Hough, Sedgwick, and Waddell, The Human Mechanism, Chapter XXXV.
9. Smiley and Gould, Community Hygiene, Chapter 7.

Bulletins

1. Driftmier, Sewage Disposal for Kansas Homes, 8 pp.
2. Warren, Sewage and Sewerage of Farm Homes, 55 pp.

Periodicals

1. Dare and Collings, "Mechanical Aeration for Domestic Sewage, AMERICAN CITY, vol. 45, November, 1931, pp. 88-90.
2. Foster, "Solving the Farmer's Sanitation Problem", HYGEIA, vol. 5, May, 1927, pp. 245-247.
3. Harrington, "Guarding the Camper's Health", HYGEIA, vol. 5, July, 1927, pp. 337-339.
4. Jones, "House to House Canvass of Sewer Connections on a Separate System", AMERICAN CITY, vol. 39, September, 1928, pp. 135-137.
5. McDonnell, "Solving the Sewage Disposal Problem of a Small Community", AMERICAN CITY, vol. 45, July, 1931, p. 11.
6. Olin, "Sanitation of Resorts and Tourist Camps", AMERICAN CITY, vol. 32, June, 1925, p. 758.
7. "The Old Swimmn' Hole as a Danger Spot", LITERARY DIGEST, vol. 90, September 4, 1926, p. 22.
8. Whitefield, "Septic Tank for Farm and Cottage", POPULAR MECHANICS, vol. 55, June, 1931, pp. 1045-1047.

UNIT VII RUBBISH DISPOSAL

Science type. Applied technique.

I CURRICULUM OBJECTIVE: Health and citizenship efficiency.

A. Intermediate objective: The proper disposal of rubbish is essential to health and homelife efficiency.

1. Specific objectives:

- a. To learn how to dispose of rubbish in a rural community in a satisfactory manner.
- b. To learn what method is the most satisfactory.
- c. To learn that efficient rubbish disposal has an aesthetic as well as a health value.
- d. To develop attitudes of cleanliness and neatness.

B. Organization of activities and subject matter.

Note: Not much time need be allowed for this unit since much of the material has been covered in other units. It is to be used at the discretion of the teacher. She may consider that the subject has already been given adequate attention.

1. Relate this unit to the three former ones. Point out that this one is needed to complete the subject of waste disposal. If the city has an incinerator or dumping ground, the class may be taken for a visit. On the way observe the roadsides, vacant lots, or creeks for rubbish.

2. The visit. Observe the conditions in the dump.

What is the character of the refuse? Could any of it have been satisfactorily burned? Are there any conditions here which are detrimental to health? How do the conditions check with facts concerning the growth, development, and opportunity for spread of bacteria and diseases? How about the conditions for breeding mosquitoes? Is there anything to attract or harbor rats, cats, or dogs? Is there a relation between these animals and health? Observe it from an aesthetic standpoint aside from health. What may be properly classed as rubbish?

3. Such questions as the ones suggested in paragraph 2 should arise mainly amongst the pupils. Some searching for facts will be made after the visit. Further discussion and reporting of facts found will answer most of the questions. Rubbish will be found to consist of papers, boxes, and other combustible materials, tin cans, bottles, broken china and glassware, bits of iron, old umbrella frames, children's toys, dead animals, and numerous other objects. Besides this there will be ashes.
4. Methods used by towns and cities. An examination of different methods used by cities should reveal the

principles of the disposal of rubbish. Have a report on the article "Efficiency in Rubbish Disposal" found in the American City, September, 1925. Other methods than the ones given here will be found in reading. List and discuss these.

- a. Mixing of all wastes, other than garbage, and collection by the city.
- b. Separation of different kinds of rubbish and collection by trucks.
- c. Salvaging systems.
- d. Dumping grounds.
- e. Burying.
- f. Burning or incineration.
- g. Disinfecting.
- h. Individual care of rubbish with dumping by roadsides and in creeks.
- i. Filling in ground--or made land.

5. Application of the objectives. What are the advantages and disadvantages of these methods? What are the principles involved? How can these principles be applied to the country home? Formulate a set of principles for rural use.

- a. Uprturned bottles and cans collect water and make excellent breeding places for mosquitoes.
- b. Rats harbor about dumping grounds. Since rats

are known to spread certain diseases, dumping grounds as a source of contamination should be discouraged.

- c. All cans and other food receptacles should be well rinsed before discarding.
- d. Cats and dogs may act as a medium for the spread of disease from dumping grounds.
- e. Small animals catch their heads in old cans.
- f. Children are wont to play about old rubbish where there is danger of injury from sharp edges as well as possibility of infection.
- g. Separate rubbish into combustible and incombustible matter.
- h. Burn in an outdoor incinerator all combustible waste.
- i. Waste iron has a monetary value; it may be sold to junk dealers.
- j. Tin cans and other incombustible wastes should be buried several inches or a foot or more deep.
- k. Rubbish improperly cared for is unsightly. It encourages slothful habits and promotes disease and ill-health.
- l. Many uses for ashes will be found about the farm.

6. Test. An objective test may be used for this unit.

Note: It would be well at this point to have a fairly comprehensive review covering the units on sewage and waste disposal. A test over these units should test attitudes as well as facts. For the former the essay type is preferable, while an objective may prove more satisfactory for the latter.

Note: The next unit takes up location of house and other buildings.

C. Suggested units.

1. Public incinerators, their operation, cost, and efficiency.
2. The use of streams for the disposal of sewage.

D. References.

Books

1. Broadhurst, Home and Community Hygiene, Chapters VIII, XIII.
2. Elliot, Household Hygiene, pp. 120-51.
3. Richards, The Cost of Cleanliness, pp, 7-12.

Periodicals

1. "Efficiency in Rubbish Disposal", AMERICAN CITY, vol. 33, September, 1925, pp. 265-6.
2. Peyser, "Incinerators for the Home," HOUSE AND GARDEN, vol. 50, November, 1926, p. 86.
3. Warnecke, "Economy and Efficiency in Refuse Collection", AMERICAN CITY, vol. 37, November, 1927, pp. 601-2.

Note: See references for Unit IV.

UNIT VIII LOCATION OF BUILDINGS,
WELL, AND SEWAGE DISPOSAL PLANT

Science type. Applied technique.

I CURRICULUM OBJECTIVE: Health and homelife efficiency.

A. Intermediate objective: The proper location of buildings, well and sewage disposal plants bear a direct relation to health.

1. Specific objectives:

- a. To learn how buildings, well, and sewage disposal plants should be located to promote the best interests of health.
- b. To learn how this arrangement may also serve an aesthetic purpose.
- c. To emphasize the fact that the source of water supply for drinking purposes should be located on well-drained ground.
- d. To develop attitudes of attractiveness and sanitation.

B. Organization of activities and subject matter.

Note: It is assumed that the pupils now understand the principles of sewage disposal. There are, however, other factors entering into the proper location of buildings, wells, and sewage disposal plants.

1. The teacher may open this unit by suggesting that some house with which the pupils are familiar (it may be the one visited is poorly located in regard to health). The reasons for the truth of this

statement may be obvious or they may have to be sought. Such factors as the relation of the house to the well or the sewage disposal plant should be quickly recognized. If some of the girls live close to a dusty highway or field, they will see the need for being back from the road. Many other factors should be brought up.

2. Proceeding from the proper location of the house to that of other buildings should follow logically. It makes little difference in what order these are considered. When any rules for location are given, the reason should be given also. The rule aside from reasons for its usefulness is not very valuable. The list of topics to consider should include:

- a. The house in relation to the road and other buildings of the farm.
- b. The barn in relation to the house, other buildings, and well.
- c. Various outbuildings, as storage cellars, sheds, and privy, in relation to house, well, and other buildings.

3. Gathering facts. In finding reasons for rules for the location of different buildings on the farm the pupils should be encouraged to examine various

sources. The county farm bureau office can give some information. From there may be secured a Kansas State Agricultural College Bulletin called Designs for Kansas Farm Homes by H. E. Wichers, of the Division of Engineering, Manhattan, Kansas, Bulletin 23, Volume XIII, Number 10, November 1, 1929. If it is not available there, it may be secured directly from Manhattan. It contains plans for farm homes, including location of buildings and other features. The bulletin on Sewage and Sewerage of Farm Homes, referred to in a previous unit, will provide some helpful suggestions. The first bulletin includes good references. Other books, bulletins, and periodicals should be included in the references for reading. Conferences with people living on farms, if they can be arranged, will give helpful suggestions.

4. Discussion and planning further developments. After sufficient time has been allowed for collecting information, a period for free discussion should be allowed. Each one should contribute some facts to this. Some may be able to give current events relating to the subject. Consider each of the three topics separately. Further subdivision of topics may be made if desired. At the end of the

discussion period each pupil should have a fairly comprehensive idea of the subject. Plan a chart showing the scheme for a farmstead.

5. Application of the objectives. Near the close of the unit a summary should be prepared. Let this include the main factors as found with their application to objectives.
 - a. The farmstead plan will differ according to the side of the road it is located.
 - b. Ordinarily less dust will come to the house if it is on the south side of the road.
 - c. If the house is placed well back from the road, there will be less dust.
 - d. A house placed on a slope or high place is better drained than one on low or level ground.
 - e. The barn should be some distance from the house and ordinarily placed in the opposite direction from that of the prevailing winds.
 - f. The barn should be lower than the house for drainage purposes.
 - g. The barn should be separated from the house by a fence, of course, but also, a screen of trees, vines, or shrubbery for aesthetic purposes.
 - h. Milk sheds, storage sheds, and other sheds should

be located on the same side of the house as the barn for purposes of drainage and convenience.

- i. Feeding lots should be a good distance from the house and on ground that drains well.
- j. The privy should be some distance from the house, and below it on a downward slope. A trellis or shrubbery should screen it from view.
- k. The septic tank should be below the house although danger of contamination from it is not very serious.
- l. Locate cesspools quite a distance from the house, where drainage is good and there is no danger of contaminating drinking water or soil.
- m. The kitchen sink can be drained into a barrel outside of the house, which can be moved and emptied. Pipes leading from sink to the garden where there is shrubbery growing is a satisfactory method for disposing of wastes from the kitchen sink.
- n. Put the well above the house and other buildings where the drainage is known to be good.
- o. A sanitary survey should be made before the well is located.

- p. The garage may be located in a convenient place as there is little danger of contamination from it.
- q. Curved drives are more attractive although straight ones are more economical.
- r. Shrubbery, grass, and flowers well placed add much to the attractiveness of the farm home.

6. Test. A test of the combined type of essay and objective may be used. Or, if desired, the scheme for a farmstead made by each pupil may serve in place of test.

C. Contributions of other courses.

1. General science.

- a. The soil as a scavenger.
- b. the use of shrubbery and other plants to beautify the home.

2. Hygiene.

- a. The dangers of dust.
- b. How the body protects itself against dust.

D. Suggested units: Construction of septic tanks.

Note: The construction of the house follows this unit very logically.

E. References.

Books

1. Bashore, Overcrowding and Defective Housing in the Rural Community, 92 pp.
2. Brewer, Rural Hygiene, Chapter II.
3. Elliot, Household Hygiene, Part I.
4. Gray, House and Home, Chapters I, II, XIII, XVI.
5. Halbert, The Better Homes Manual, Chapter II.
6. Smiley and Gould, Community Hygiene, Chapter 7.
7. Talbot, House Sanitation, Chapter III.

Bulletins

1. Wichers, Designs for Kansas Homes, 105 pp.

Periodicals

1. "Little towns and Big Cities Accomplish Wonders with Brooms, Brushes, Flower Seeds, Shrubs, and Trees", AMERICAN CITY, vol. 40, February, 1929, pp. 147-50.
2. Smith, "Sanitation in the Farm Home", HYGEIA, vol. 4, November December, 1926, pp. 615-7, 697-8.

UNIT IX CONSTRUCTION OF HOUSE

Science type. Applied technique

I CURRICULUM OBJECTIVE: Health and homelife efficiency.

A. Intermediate objective: Proper construction of the house is essential to the health and happiness of the members of the household.

1. Specific objectives:

- a. To learn what features in the structure of the house contribute to the health of the family.
- b. To learn what features contribute to the happiness of the family.
- c. To learn how to incorporate these features in a house plan.

B. Organization of activities and subject matter.

Note: It is assumed that high school pupils are interested in appearances, and while the problem may be attacked from the standpoint of attractiveness, it is the duty of the teacher to see that the class sees beyond this and realizes the importance of strength and other built-in features which are the foundation of attractiveness.

1. Bring before the class a picture of an attractive, well-built house, either by going to see it, showing pictures, or using, for example, a house with which all are familiar. Ask the pupils what they like about this house. Use

another example of a house less attractive and well-built. Ask for points of comparison. Beauty of design and attractiveness of setting will make the strongest appeal.

2. Application of principles of health and sanitation.

Is the location good? Is it on sloping ground? What is expected of a healthful house? This question cannot be satisfactorily answered without knowing the importance of light, ventilation, good foundation, good materials, plumbing, good workmanship, and good planning. Therefore, materials and methods for finding these out should be provided. Some of them should be answered in part by courses in hygiene and general science.

Note: Units should have been presented.

a. Hygiene

- 1). The body's need for an ample supply of fresh, pure air.
- 2). The influence of humidity on the body
- 3). Methods of ventilation.
- 4). The value of a good heating system.
- 5). The health value of cleanliness.

b. General science should present the following units.

- 1). Air, its composition and how it circulates.
 - 2). Principles of heating a house.
 - 3). Household pests, their habits and life history.
- c. Clothing should present the following units.
- 1). How to keep the body clean.
 - 2). How to keep the clothing clean.
- d. Foods should present the following units.
- 1). Uses of water and how it cleans.
 - 2). Methods of keeping and storing foods.
3. Collecting material. Other sources of information will include textbooks on hygiene, house architecture, house sanitation, and insects; pamphlets on the same subjects, which may be secured from the State Agricultural College or the United States Department of Agriculture; and periodicals. Some definite references should be given.
4. Class discussion. Allow free discussion. Many questions may arise as the result of the study or discussion. Give as much consideration to these as seems wise. Go back to the discussion of the healthful features of the two houses used in the opening discussion of the unit. Apply the principles which have been found by studying the problem. Emphasize the fact also

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that healthful or attractive features may exist independently of each other. See the article entitled "Dirt and the Tourist", appearing in the Outlook for May 28, 1930, by T. R. Ybarra. This will show that the picturesque is not always sanitary. Show also that the most satisfaction results when cleanliness and attractiveness are combined.

5. Arrangement of rooms. Study different house plans for good arrangement of rooms. Discuss the plans. Decide what factors enter into the problem. Approve two or three plans.
6. Value of planning. If the class does not realize the importance of this factor, have someone report on the incident related in the bulletin Designs for Kansas Homes by H. E. Wichers, issued by the Kansas State Agricultural College, which gives the experience of two men building houses.
7. Application of the objectives. Summarize the principles found. Further application should be made by having each one draw a sketch of a house in which the desirable features are incorporated. The list of features should include points such as the ones given here. Exhibit and criticize the sketches. If fairly elaborate sketches are

made, it may be possible to correlate this unit with one in the art department. List the desirable features:

- a. Good location according to principles discovered in the unit on the plan for the farmstead.
- b. A deep foundation, which is strong and impervious. No cracks or openings to allow the entrance of insects and pests.
- c. Plenty of well-constructed windows to admit light and air in ventilation.
- d. Tight-fitting windows to keep out dust and soot.
- e. Inlet for fresh air to furnace.
- f. Pipes and other equipment for heating.
- g. Artificial systems of ventilation are not satisfactory unless constructed and operated in the proper manner.
Too often stale, used air is reheated and circulated several times. Fresh, clean outdoor air should be provided.
- h. Open fireplaces are valuable for ventilation and add a great deal of cheer to

th the home. They do not provide much heat, but if constructed in the right manner, will throw more heat into the room than they ordinarily do.

- i. Built-in bathrooms and sinks with running water and sewage facilities are conducive to cleanliness and happiness.
- j. Strong supports and beams make the house more durable.
- k. A sleeping porch will be conducive to well-ventilated sleeping quarters.
- l. Large porches are conducive to rest and sociability.
- m. A cool storage-room for fruits and vegetables should be provided in the farm home.
- n. Housework may be lightened by having heating plants, storage-rooms, and laundry on the main floor, thus eliminating a basement and stairs.
- o. A basement should have impervious walls, have plenty of windows for light and ventilation, and be divided by partitions into rooms for different purposes. The storage-room for vegetables should be unheated.
- p. A separate washroom for the men entering the house from the field or barn should

be placed so that the dust from their clothing will be brought into the kitchen.

- q. A separate room for the care of milk is desirable, unless there is a separate building for this purpose.
- r. A good lighting system.
- s. Attractive color schemes and easily cleaned surfaces, particularly in kitchen and bathroom.
- t. A separate room for each member of the family is desirable.

C. Suggested units. A wealth of topics may arise out of this topic. Units for some of those listed here are included in this course.

1. Color and its use in the home.
2. How to heat a home.
3. How to light a home.
4. The fireplace, cost, and construction.
5. Household pests--how to combat them.
6. How to ventilate a house.
7. Plan for a home laundry.
8. Cost of building a home.
9. Kinds of materials used in construction of houses.
10. Different types of houses found in different countries and climates.

Note: Since the purpose for many factors in the construction of houses is protection against insects and other pests, they will be studied in the next unit.

D. References.

Books

1. Balderston, Housewifery, Chapters I, II, III, VII, VIII.
2. Bigelow and Broadhurst, Health in Home and Neighborhood, Chapters III, IV, V.
3. Broadhurst and Lerrigo, Health Horizons, Section I.
4. Dodd, The Healthful Farmhouse, 69 pp.
5. Elliot, Household Hygiene, Parts I, II.
6. Gray, House and Home, 356 pp.
7. Halbert, The Better Homes Manual, Part I.
8. Horwood, Public Health Survey, Chapter X.
9. Hough, Sedgwick, and Waddell, The Human Mechanism, Chapters XXVII-XXIX.
10. Smiley and Gould, Community Hygiene, Chapter X.
11. Talbot, House Sanitation, Chapter IX.
12. Turner, Personal and Community Hygiene, Chapter XVII.

Bulletins

1. Bainer and Jorgenson, Electrical Cooking in the Farm Home, 16 pp.
2. Gannon, Finishes and Furnishings for the Kitchen, 16 pp.
3. Gray, Convenient Kitchens, 29 pp.
4. Pew, The Step-Saving Kitchen, 16 pp.

Periodicals

1. "Adequate Ventilation Provides for Sound Sleep",
HYGEIA, vol. 5, January, 1927, p. 24.
2. Alder, "Plumbing the New House", GOOD HOUSEKEEPING,
vol. 86, April, 1928.
3. "Food Poisoning by Rats", HYGEIA, vol. 5, June,
1927.
4. Hoover, "The Shrine of Cleanliness", HOUSE
BEAUTIFUL, vol. 58, October, 1925, pp. 422-6.
5. Laird, "Air; Good Air and Bad, Good and Bad Ventilating
Systems", SCIENTIFIC AMERICAN, vol. 142,
January, 1930.
6. MacDonald, "The Business of Housekeeping", HOUSE
BEAUTIFUL, vol. 59, June, 1926, p. 810.
7. O'Kane, "Invaders of the Pantry", GOOD HOUSEKEEP-
ING, vol. 92, April, 1931, pp. 96-7.
8. Smith, "Sanitation in the Farm Home", HYGEIA,
vol. 4, November, December, 1926, pp. 615-7.

UNIT X HOUSEHOLD PESTS

Science type. Applied technique.

I CURRICULUM OBJECTIVE: Health and homelife efficiency.

A. Intermediate objective: Household pests bear a definite relationship to health and homelife efficiency.

1. Specific objectives.

a. To learn how to control household pests so that they will not be a menace to health.

b. To learn the habits of the ordinary household pests.

c. To learn how household pests spread diseases.

d. To learn that community cooperation is necessary in combating some pests.

B. Organization of activities and subject matter.

Note: The subject of household pests was touched upon in the unit on house construction. The contributions expected of other courses in that unit dealing with household pests will also be helpful in this one.

1. This topic may be introduced in different ways. One would be to ask the reasons for screens on windows. Another would be pictures of flies or other insects. Another might be, for instance, observing the tearing up of sidewalks to reenforce foundations against termites. Whichever is used, a list of insects and other pests should be prepared and put

on the board. (The ditty by Walt Mason may be used. It is given here.)

Typhoid Fly

The early fly's the one to swat,
It comes before the weather's hot.
It sits around and cleans its legs
And lays almost a million eggs.
And every egg will hatch a fly
To drive us crazy by and by.

2. Find out with which of these pests the pupils are most familiar. Books, pamphlets, pictures, and clippings concerning these pests should be laid out on the reading table. Let the pupils look at these and see if they can add any more to the list on the board. Questions should arise as to why there should be concern over these pests. Some may say that moths destroy clothing, others that mice consume food intended for human consumption. Flies are not desirable, because they awaken you in the morning by tickling your nose. Mosquitoes are an annoyance, because it is no pleasure to be bitten by them, and to hear them singing around is an exasperation.
3. Such answers as the above should be encouraged. Many more points may arise which are valuable. Then the pupils should be led to see something of the relation of these pests to health. Bring in a microscope and let the pupils see the leg of a fly through it. This may not be a new experience for them, but it will

be impressive.

After viewing the fly's leg, a review of the life history and habits of the fly should be made. The point concerning the origin of the fly and its willingness to crawl on the food or the baby's face will also be impressive. Find out how many bacteria are on one fly. From this it will be readily seen why there is a relation between the fly and health. See what diseases are spread by flies.

4. Follow a similar procedure with other household pests. Get the life history and habits for the other household pests in the list. See which ones are connected with the spread of certain diseases. The list should include: flies, mosquitoes, cockroaches, ants, silver fish, fleas, crickets, bed-bugs, clothesmoths, book lice, house centipedes, carpet beetles, grain beetles, cheese skipper, rats, and mice. Possibly, cats and dogs should be included as a means of spreading disease.
5. Reports may be prepared on the different topics. If they are, include in them methods of combating the pest. Allow time for looking into the material provided on the subject of pests.
6. Reports and discussion. By this time most of the information should be collected. Reports may be

given with discussion following. The discussion should be grouped about the following points:

- a. Habits of insect or animal.
- b. Methods by which they spread disease.
- c. With what particular disease any are connected.
- d. How they gain entrance into the house.
- e. Methods of keeping them out of the house.
- f. Methods of destroying them or rendering them harmless after they do get into the house.
- g. Methods of combating them which require community effort.

Discuss each topic except in instances where there are logical groupings of topics.

7. Historical interest in pests. Find historical events showing the relation of the progress of civilization to insects and animals which infest the house. Ravages of bubonic plague, as spread by the rats; malaria and yellow fever as spread by the mosquito. The building of the Panama Canal and the work of Sir William Gorgas are interesting. Another topic which may be considered here is how these diseases or animal carriers first gained entrance into the United States.

8. Application of the objectives and summary. Apply the objectives to the discoveries which have been made. This may be done in the form of a summary. In the summary include the main facts, such as those given here:

- a. Prevention rather than cure is most effective in combating all household pests.
- b. Breeding places for flies should be destroyed or protected. This means proper care of manure, garbage, and other wastes.
- c. Drain small collections of water and dispose of rubbish, for upturned cans make excellent breeding places for mosquitoes after a rain. Rubbish piles harbor rats.
- d. A good foundation without cracks or crevices is effective in keeping insects and animals out of the house.
- e. A screen over the inlet for fresh air to the furnace is necessary for keeping out insects and small animals.
- f. Keep basement, kitchen, and pantry dry, as the moisture, attracts some insects.
- g. See that there are no cracks or crevices for roaches and other insects to hide in.
- h. There should be screens on all windows to keep out flies and other insects; cellar or basement

windows must be covered to keep out rats and mice.

- i. Swat the flies which enter the house, sweep them up and burn them. Early flies are the breeders of millions more.
- j. Scrupulous cleanliness, covering of all food, and storing in insect-proof containers are effective methods of combating flies and other insects.
- k. Destruction of pests may be necessary. For this there are various poisons, and fumigants. It is wise to have the expert make use of these. Sodium flouride is effective for roaches. It should be sprinkled about freely near crevices and cracks so that the insects cannot miss it.
- l. Find out how the insects or animals gain entrance to the house and prevent this if possible.
- m. Strict rules should be observed about the slaughtering lot. Some worms are a parasite to the hog. Rats and dogs can spread these to man.
- n. Thorough cooking of all pork is necessary in order to destroy trichinae.
- o. Buying inspected meat is safer than slaughtering at home.

C. Contributions of other courses.

1. General science--Units on life-history, and habits of ordinary pests, such as flies, mosquitoes, and rats.
2. Foods. Units on care and protection of food from household pests.
3. Clothing. Prevention of clothesmoth; extermination of bedbugs, and some other insects.
4. History or social science. Units which show how civilization has been affected by pests and animal carriers of disease.

D. Suggested units. Several topics for units have already been suggested and others will suggest themselves to the class during reading or discussion periods.

1. The rat and bubonic plague.
2. Making the Panama Canal region healthful.
3. The tapeworm and other parasites.
4. Community cooperation in preventing breeding places for flies and mosquitoes.
5. Care of hogs and methods of slaughtering in relation to health.
6. The control of malaria and yellow fever.
7. Tuberculosis in milk cattle.

Note: There are several problems of making the house comfortable, convenient, and sanitary. Lighting is considered in the succeeding unit.

E. References.

Books

1. Bigelow and Broadhurst, Health in Home and Neighborhood.
2. Brewer, Rural Hygiene.
3. Broadhurst and Lerrigo, Health Horizons, Section XIII.
4. Howard, The House Fly, Disease Carrier.
5. Smiley and Gould, Community Hygiene, Chapters III, IV.
6. Talbot, House Sanitation, Chapter X.
7. Tobey, Riders of the Plagues, pp. 13-8, 163-90, 238.

Bulletins

1. Meat and Meat Cookery, pp. 5-8.

Periodicals

1. "Foiling the Moth", GOOD HOUSEKEEPING, vol. 88, May, 1929, p. 94.
2. Jones, "Controlling Insects", PICTORIAL REVIEW, vol. 32, June, 1931, p. 54.
3. Mayer, "On Packing Away Your Winter Clothes", GOOD HOUSEKEEPING, vol. 80, May, 1925, p. 86.
4. O'Kane, "Invaders of the Pantry", GOOD HOUSEKEEPING, vol. 92, April, 1931, pp. 96-7.
5. "Swat the Early Fly", HYGEIA, vol. 6, April, 1928, p. 224.
6. Whelan, "Says the Fly", HYGEIA, vol. 5, May, 1927, p. 235.
7. Torrance, "Manhandling the Mosquito", HYGEIA, vol. 8, August, 1930, pp. 723-6.

UNIT XI LIGHTING

Science type. Applied technique.

I CURRICULUM OBJECTIVE: Health and homelife efficiency.

A. Intermediate objective: Proper lighting facilities are essential to health efficiency.

1. Specific objectives:

a. To learn the most efficient method of lighting the house.

b. To learn the advantages and disadvantages of different methods of lighting.

c. To learn why rural homes are poorly lighted.

d. To learn the cost of efficiently lighting the rural home.

e. To learn how cost compares with the lighting of the city home and why the difference.

B. Organization of activities and subject matter.

Note: It is assumed that some of the pupils live in modern homes. All will be familiar with the advantages of modern conveniences.

1. Start the discussion of the unit by getting reasons for people preferring to live in the town or city. Several factors should be mentioned, Many of them will not be directly concerned with lighting. But it is well to bring in these other factors. Modern conveniences in the home will

surely be one. The answers will suggest other units which may be studied. List the preferences on the blackboard. Check those which the pupils consider most important, then choose those which may logically be studied in this course. Some of the others may be incorporated in other courses or departments.

Note: It is assumed that lighting will be included in the list and will be the one that is chosen for study.

2. Relation of lighting to sanitation or health.

Note: See section C, Contributions of other courses. List the reasons for good light. These will include such factors as the following. Others may be added.

- a. Good lighting is necessary for the protection and care of the eyes.
- b. It is important that the housewife be able to see what she is doing when preparing food.
- c. Better sanitary conditions should result when one can see well, otherwise many spots will be neglected.
- d. Good lights are necessary near the medicine chest to see that one is getting the right bottle and avoid getting the wrong one,

3. Comparing methods of lighting. From personal experience and examination of reference materials, a list of methods of lighting should be made.

This done, the next step is to compare the advantages and disadvantages of these. In order to complete this, it will be necessary also to find out what the essentials of good lighting are. Questions as to the satisfaction of lighting facilities in the school and the different homes of the pupils should be considered. Also, discuss the cost and method of operating different systems of lighting. Some consideration should be given to the kind of light most used and why. Is this method the best? Why?

4. Seeking information. Some books, pamphlets, and periodicals should be provided on the subject of satisfactory lighting systems in rural homes. Use other sources. Send some of the pupils to the electric light company to find out the different kinds of equipment, the kind of lighting effects found most satisfactory, and the cost of using electricity in the country. Perhaps a plan or map showing the location of power lines in the county can be secured. Others may go to architects or hardware stores to find out about other methods of lighting, such as individual electric plants or gas plants. Also, examine styles and costs of different kinds of lamps. Let each pupil find what facts she can on what good lighting is. This

will involve considerations of direct, semi-direct, indirect, and diffused lighting. Find advantages and disadvantages of each.

5. Discussion. The class should now be ready to discuss intelligently the problems suggested in section 4. Summarize the main points.
6. History or development of lighting. This offers an interesting study which correlates nicely with history and, somewhat, with general science. Consider different topics for which further information will be needed. Fires, torches, candles, the use of oil in producing light, lamps of various kinds, gas of different kinds, electricity, and others are interesting topics. Different pupils may prepare reports on these. Compare methods of lighting at different periods of history with other periods and, particularly, of our own day.
7. Application of the objectives. Consider each of the objectives and prepare answers for them in the light of the information presented in class. Such facts as the following should be made clear.
 - a. Electricity is most convenient, but because of its cost, most rural homes consider it prohibitive. It is preferred because it is clean,

- requires little care, furnishes power for household appliances, and by it efficient lighting is secured.
- b. Gas has many advantages. It gives good light. It is difficult to secure gas in rural communities from the gas lines. Individual gas plants can be operated with some degree of satisfaction at a cost that is not prohibitive. Certain household appliances may be used with these, such as the iron.
 - c. Kerosene lamps are much used because the initial cost is small. If proper care is exercised in their selection and operation, they furnish pleasing and soft lights. They require much care.
 - d. The cost of securing good lights in rural communities seems much greater than that in cities. The difference is more apparent than real. Taxes, rent, and other expenses of the city home go in part to pay for electricity. If those who move into the city for the conveniences there would spend the extra money on the farm, they would probably be much happier.

8. Test. An objective test is suggested for this unit.

C. Contributions of other courses.

1. Hygiene

- a. Hygiene and care of the eyes.
- b. Well-lighted medicine chest.

2. Foods.

a. Light kitchen for food preparation.

3. Clothing: Good light for sewing.

D. Suggested units. Several topics used in this unit could be expanded into units. These and other which might be offered are:

1. History of lighting.
2. Planning, constructing and operating the individual electric plant.
3. Planning, constructing, and operating the individual gas plant.
4. Electrical fixtures and appliances for the rural home.
5. Comparison of total cost of operating different systems.

Note: The next unit will take up heat and ventilation.

E. References.

Books

1. Bailey, A Textbook of Sanitary and Applied Chemistry, Chapter IV.
2. Balderston, Housewifery, pp. 79-83.
3. Bigelow and Broadhurst, Health in Home and Neighborhood, Chapter V.
4. Broadhurst and Lerrigo, Health Horizons, Section XV.
5. Elliot, Household Hygiene, pp. 74-90.
6. Gray, House and Home, Chapter VIII.

7. Halbert, The Better Homes Manual, pp. 287-308, 525, 577, 617-9, 683.
8. Hough, Sedgwick, Waddell, The Human Mechanism, pp. 548-51. 472-82.
9. Luckiesh, Lighting the Home.
10. Talbot, House Sanitation, Chapter VII.
11. Van Rensselaer, Rose, and Canon, A Manual of Home-Making, pp. 200-6.

UNIT XII HEAT AND VENTILATION

Science type. Applied technique.

I CURRICULUM OBJECTIVE: Health and homelife efficiency.

A. Intermediate objective: Proper heat and ventilation are essential to health and homelife efficiency.

1. Specific objectives.

a. To learn how to properly heat and ventilate a house.

b. To learn the comparative efficiency of different systems of heating and ventilating.

c. To learn how to secure an adequate supply of warm air.

d. To learn what temperature and degree of humidity are the most healthful.

B. Organization of activities and subject matter.

Note: If the season of the year when this unit is offered is one when artificial heat must be provided, it is suggested that the unit be opened with the subject of heat. At another season ventilation may be more suitable.

1. Open this unit by presenting the problem of what makes indoor air in the winter comfortable. Consider the air in the classroom at the time. What factors contribute to its comfort or discomfort? The subjects of heat, purity, and humidity should be considered.

Note: It is assumed that the class have had units in hygiene on the body's need for fresh-heated air; and in general, science on air currents and the composition of air.

2. Several problems should arise as to the amount of heat that is needed, the proper temperature and humidity that is most healthful, also the value of pure air. What impurities are in the air? How may the air be freed of them? It may be observed that there are many foreign particles in the air of houses when a ray of sunshine enters in the morning. What are the effects of an adequate supply of pure, warm air on the health? What is "elephant air"? How is air of the right kind and amount to be provided? How often is air changed in the house? How often should it be?

3. Let the pupils set out to find answers to these problems. They should find how much fresh air is needed. Have someone report on the article "Air", by Laird in the SCIENTIFIC AMERICAN, vol. 142, January, 1930. Other references will give the proper temperature and humidity. Some pupils may tell how to secure pure air. If a public structure is being put up, it can be examined for built-in heating and ventilating systems. Stoves and furnaces may be priced at

hardware stores. Various methods will be found. These should be considered. Pupils can work on different topics for which the entire class will be responsible.

Note: It is suggested that the class be divided into two groups, one of which will work on the methods of heating and fuels and the other on methods of ventilating.

Topics which may be considered are stoves and fireplaces, hot air furnaces, steam heat, fuels, natural and mechanical ventilation, and humidity. Oral reports may be presented. They should contain a description of the method and a criticism of the method and a criticism of its advantages or disadvantages. Costs may be included.

Note: The next paragraph may be omitted at the discretion of the teacher.

4. Heating and ventilating public buildings and factories.

What are the problems in the heating and ventilating of public buildings and factories? What facts have been found as the result of experiments and surveys of the condition of air in these places? What is the effect on the inhabitants? What methods of ventilation are used? Is there anything here that can be applied to the individual home?

5. Contrasts. Some interesting lessons may result from

the studying of contrasts in heating and ventilating. Draw these contrasts from different periods of history. Be sure to include the "Black Hole of Calcutta" and the Londonberry ship. They may be drawn between different types of civilization and different climates at the present time. Compare these with our methods. Correlations may be made with history.

6. Effects of inadequate supplies of warm and, particularly, pure air on health. The purpose of this is to show crowded conditions and breathing and re-breathing of impure air spread colds and other diseases. Recall the story of "Willie's Cold", Find out what the combustion products of different fuels are. What effect if any, do these have on health? Review the Dartmouth case of carbon monoxide poisoning which occurred in the winter of 1934 or a similar case. This will lead to further investigations on the subject of carbon monoxide gas and other gases. What is "ground air", and is its effect on the health? What is the effect on health of a damp, poorly ventilated cellar? What is the effect of outdoor air on health?

7. Application of the objectives. After studying the subject of heating and ventilation, come back to the application of the principles discovered and

apply them to rural homes. What methods can be used in rural homes? Are people there getting lots of pure fresh air? If not, why not? What difficulties stand in the way of adequate heating and ventilating devices in the country home? What kind of fuel is most available in the country? Which system of heating and of ventilating can be most satisfactorily operated? Should the cost be prohibitive? Discuss these problems.

8. Application of objectives. After discussing the different objectives, prepare a summary of the unit. This should include the principle factors.

- a. An adequate supply of fresh air is needed at all times. Air should be kept in circulation, heated in the winter, and, perhaps, cooled in the summer.
- b. There are several artificial methods of providing ventilation. These must receive proper care and attention to be effective.
- c. A ventilating system which admits fresh air at a low level and exhausts it at a high level will provide better air than one which works in the reverse order.
- d. Proper precautions are necessary to care for the combustion products of burning fuel.
- e. Air of about 68 degrees Fahrenheit and 40 to 60

- degrees in humidity, is best. Most air in houses is warmer and much dryer than this.
- f. If natural means of ventilating are depended upon, see that there are windows open on opposite sides of the house for better circulation.
 - g. The same air should not be returned to the furnace, reheated and sent through the house again. Let it out and get fresh air.
 - h. Special attention must be given to the humidity of the air. A wet bulb should be kept in the house in order to determine the amount of moisture in the air. The warmer the air the more moisture it will hold.
 - i. Wood is often burned in the country because of its availability. Some kinds yield more heat than others. It should be very dry. Oil or coal may be used. Gas is available in some small towns.
 - j. Stoves, furnaces and connecting pipes and registers must be kept clean if the air is to circulate properly and be dust free.
 - k. Fireplaces are cheerful and are a great aid in ventilation but are hardly dependable as a source of heat in really cold weather.
 - l. With willingness to plan and make the necessary

expenditures, the heating and ventilation of rural homes can be even more efficient than that of city homes.

C. Contributions of other courses.

1. Social science or history.

- a. Man's changing mode of living through the ages.
- b. Effect of housing upon Indians and other outdoor peoples.
- c. The incidents of the "Black Hole of Calcutta" and the Londonberry ship.

D. Suggested units.

1. Fuels.
2. Fireplaces.
3. Furnaces.
4. Relation between ventilation and tuberculosis or other respiratory diseases.
5. Cost of installation and operation of different systems.

Note: The next unit takes up the cleaning of the interior of the house.

E. References.

Books

expenditures, the heating and ventilation of rural homes can be even more efficient than that of city homes.

C. Contributions of other courses.

1. Social science or history.

- a. Man's changing mode of living through the ages.
- b. Effect of housing upon Indians and other outdoor peoples.
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D. Suggested units.

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2. Fireplaces.
3. Furnaces.
4. Relation between ventilation and tuberculosis or other respiratory diseases.
5. Cost of installation and operation of different systems.

Note: The next unit takes up the cleaning of the interior of the house.

E. References.

Books

1. Bailey, A Textbook of Sanitary and Applied Chemistry, Chapters I-III.
2. Balderston, Housewifery, pp. 52-79.
3. Bashore, Overcrowding and Defective Housing in the Rural Districts, 92 pp.
4. Bigelow and Broadhurst, Health in Home and Neighborhood, Chapters III, IV.
5. Brewer, Rural Hygiene, Chapters II, III.
6. Broadhurst and Lerrigo, Health Horizons, Section I.
7. Elliot, Household Hygiene, Part I.
8. Gray, House and Home, Chapter VII.
9. Halbert, The Better Homes Manual, Chapter VIII;
10. Horwood, Public Health Survey, pp. 250, 270, 291.
11. Hough, Sedgwick, and Waddell, The Human Mechanism, Chapters XXVIII, XXIX.
12. Prudden, Dust and Its Dangers, 113 pp.
13. Smiley and Gould, Community Hygiene, Chapters I, V, VI.
14. Talbot, House and Sanitation, Chapters V, VI.
15. Turner, Personal and Community Health, Chapter XVII.

Periodicals

1. "Adequate Ventilation Provides for Sound Sleep", HYGEIA, vol. 5, January, 1927, p. 24.
2. "It Pays to Ventilate", REVIEW OF REVIEWS, vol. 82, July, 1930, p. 108.
3. Laird, "Air; Good Air and Bad, Good and Bad Ventilating Systems", SCIENTIFIC AMERICAN, vol. 142, January, 1930, pp. 14-6.
4. Lyon, "How to Put Humidity in Your House", HYGEIA, vol. 4, January, 1926, pp. 11-5.
5. MacLaurin, "Abating Black Smoke Will Not Solve the

Problem of Atmospheric Pollution", AMERICAN CITY, vol. 40, May, 1929, pp. 135-7.

6. Peyser, "Concerning the Air in the House", HOUSE AND GARDEN, Vol. 51, April, 1927, p. 119.
7. Peyser, "Indoor Comfort from Ventilation", HOUSE AND GARDEN, vol. 51, May, 1927, p. 126.
8. Wood and Hendriksen, "Carbon Monoxide Menaces Life and Health", AMERICAN CITY, vol. 37, September, 1927, pp. 357-9.

UNIT XIII INTERIOR CLEANING

Science type. Applied technique.

I CURRICULUM OBJECTIVE: Health and homelife efficiency.

A. Intermediate objective: Proper methods of interior cleaning are essential to health.

1. Specific objectives.

- a. To learn how to clean the inside of the house so that it will be sanitary.
- b. To learn the best methods of cleaning.
- c. To learn the relation between the care of the household furnishings and the service which they will give.
- d. To learn the relation between sanitation and appearance.

B. Organization of activities and subject matter.

1. This unit may be opened by a suggestion from the teacher that the classroom needs dusting or that the blackboards or windows need washing. Cloths and necessary materials may be supplied for the cleaning. From this, questions should arise as to the pupil's responsibility at home in cleaning and care of the house and its furnishings. Questions of the proper methods of cleaning should arise.

As the problem is rather extensive, it will be wise to break it up into parts. Let different groups work on these separately. After careful study of the problem, reports may be made to the class. In this way the entire class may be held responsible for all of the material. It is suggested that a division be made on the basis of different rooms. Some special problems, such as the laundry and certain types of cleaning in the kitchen, should be left for separate units. For the purposes of the unit, the following topics may be used.

- a. Living room, dining-room, and halls.
- b. Bathroom, kitchen, and plumbing fixtures.
- c. Proper basement and heating plant.

2. Working plan for each topic. The class may work together in making a working plan for the topics as all three may logically proceed in a similar manner.

a. Consideration of problem as a whole and its division into sub-topics:

- 1). List of units or fixtures to be cleaned.
- 2). List of units or fixtures requiring special care.
- 3). The methods of cleaning.
- 4). Necessary equipment for cleaning; choice, care, and storage of equipment.

5). Working schedules for cleaning.

Note: From this point the three groups will be working separately. The unit on the living room, dining-room, and halls is given here.

3. Units or fixtures to be considered. A list may be prepared and revised after some study of the problem. It will include walls, floors, floor-coverings and draperies, upholstered furniture, polished surfaces, bric-a-brac, books, electrical fixtures, windows, curtains, shades, pictures, and heating element.

4. Units or fixtures requiring special care. The prepared list will include piano, leather, and others.

5. Methods of cleaning and equipment. This information may be found in abundance in different books on housekeeping, in bulletins, and in the women's magazines. It will be interesting to consider the history of the problem of housekeeping.

It will also be interesting to contrast methods used in various civilizations and environments today. After various methods of cleaning are found, the group should come together for the purpose of discussing and organizing them.

6. Oral reports and discussion. Each group will make oral reports of the information they have found.

There will be overlapping points in some of the units. Where different methods of doing the same things are presented, allow free discussion as to the value of the methods and as to the circumstances when they should or should not be used. Free criticism of older or existing methods should be encouraged. Let it be made sure that health and sanitation are the principal goals of cleaning. A comparison between sanitation and appearance may be drawn. Discuss cleaning schedules.

7. Attitudes. Ask the class how they feel about seeing dust in the house, of seeing an unwashed sink, or of seeing various articles such as papers strewn about. The reaction to this will probably be positive. The discussion should be led to the problem of how the housekeeper is to get everything done. She has many duties and probably little help. To what extent should she or the family be disturbed by these factors? If some things must be left undone, what things should come first? What degree of order is necessary for successful homelife? What are desirable attitudes to cultivate? What is the value of good attitudes?

8. Application of the objectives. This may be done in the form of a summary after the discussion outlined in paragraph 6. It should include a list of principles.

- a. In order to keep a house sanitary and healthful, regular and proper methods of cleaning are necessary.
 - b. The aim of cleaning should be to eliminate dust and dirt rather than just displace it.
 - c. Cleaning equipment should be chosen with care to facilitate cleaning. Cleaning equipment and agents require proper care and storage if the greatest satisfaction is to result from their use.
 - d. Proper care increases the service of household furnishing.
 - e. A clean, shining, or unsoiled appearance is not a guarantee of bacteriological cleanness.
9. Test. The test completing this unit may be a combined objective and essay type since it is desired to test for both facts and attitudes. Or, if desired, the test may be made practical by having the pupils clean a classroom or office in the school. If there are practice rooms for the home economics classes, these may be cleaned and checked by the teacher.

C. Contributions of other courses.

1. General science.

a. Dust, its source, composition, and movements.

b. The action of soap and other cleaning agents.

2. Clothing: Methods of cleaning and renovating curtains, draperies, and linens.

D. Suggested units.

1. Daily, weekly, and seasonal working schedules for housekeepers, both with and without outside help.

2. Furnishing the living-rooms from a sanitary standpoint.

3. Laundering.

4. Disinfectants, germicides, deodorants, and fumigants.

5. Family cooperation in the care of the house.

6. Special care in cases of sickness and contagious diseases.

Note: The care of milk will be considered in the next unit.

E. References.

Books

1. Bailey, A Textbook of Sanitary and Applied Chemistry, Chapter IX.

2. Balderston, Housewifery, Chapters I, IV, VI, IX, X, XI.

3. Bigelow and Broadhurst, Health in Home and Neighborhood,

Chapter VI.

4. Broadhurst, Home and Community, Chapter XXI.
5. Broadhurst and Lerrigo, Compilers, Health Horizons, Section XI.
6. Dodd, Chemistry of the Household, Part II.
7. Elliot, Household Hygiene, Part I.
8. Hough, Sedgwick, and Waddell, The Human Mechanism, Chapter XXVII.
9. Matthews, The House and Its Care.
10. Richards, The Chemistry of Cooking and Cleaning, Part II.
11. Van Rensselaer, Rose, and Canon, A Manual of Home-Making, Part II.

Bulletins

1. Cookenham, House Cleaning Up-to-Date, 12 pp.

Periodicals

1. "Bacteria in the Wash", LITERARY DIGEST, vol. 92, January 8, 1927, p. 24.
2. Balderston, "Cleaning Our Furniture", LADIES HOME JOURNAL, vol. 44, September, 1927, p. 150.
3. Bohn, "Care of Fine Furniture", HOUSE AND GARDEN, vol. 52, October, 1927, p. 96.
4. "Bristling with Brushes", GOOD HOUSEKEEPING, vol. 84, March, 1927, p. 88.
5. Brown, "Away with Daily Grime", THE AMERICAN HOME, vol. 9, February, 1934, pp. 148-9.
6. Brown, "Equipping the Labor-Saving Laundry", HOUSE BEAUTIFUL, vol. 71, January, 1932, pp. 50-1.
7. "Cleaning Prevents Wear", GOOD HOUSEKEEPING, vol. 79, December, 1924, pp. 84-5.

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9. "Efficient Cleaning-Up Tools", LADIES HOME JOURNAL, vol. 43, May, 1926, p. 169.
10. Fisher, "Dustless Dusting", GOOD HOUSEKEEPING, vol. 85, November, 1927, p. 87.
11. Fisher, "Dustless Sweeping", GOOD HOUSEKEEPING, vol. 85, December, 1927, pp. 86-7.
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13. Fisher, "Your Household Equipment", GOOD HOUSEKEEPING, vol. 87, October, 1928, pp. 84-5.
14. "For A Small Wash", DELINEATOR, vol. 115, November, 1929, p. 44.
15. Glass, "Perfectly Splendid Housekeeping", SATURDAY EVENING POST, vol. 204, September 19, 1931, pp. 12-3.
16. Hoover, "Shrine of Cleanliness", HOUSE BEAUTIFUL, vol. 58, October, 1928, pp. 422-6.
17. Jones, "Handy Woman About the House", HOUSE BEAUTIFUL, vol. 59, February, 1926, p. 172.
18. Kendall, "The Way We Wash", GOOD HOUSEKEEPING, vol. 91, November, 1930, pp. 86-7.
19. Lynde, "Dirt-Lifting Efficiency and Wear Produced by Different Types of Vacuum Sweepers", JOURNAL OF HOME ECONOMICS, vol. 24, March, 1932, pp. 257-61.
20. MacDonald, "The Business of Housekeeping; Air and Sunlight Plus", HOUSE BEAUTIFUL, vol. 59, June, 1926, p. 810.
21. Nichols, "In Apple-Pie Order", WOMAN'S HOME COMPANION, vol. 59, February, 1932, p. 44.
22. Nichols, "Keeping the House Clean", WOMAN'S HOME COMPANION, vol. 55, April, 1928, p. 80.
23. Nichols, "Keeping Posted on Mid-Winter Housecleaning Methods", WOMAN'S HOME COMPANION, vol. 58, February, 1931, p. 92.

24. Nichols, "On Carefully Tested Points About Laundering", WOMAN'S HOME COMPANION, vol. 56, March, 1929, p. 110.
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30. Post, "One Servant in the House, An Efficient Schedule for the Day's Work", THE AMERICAN HOME, vol. 6, May, 1931, pp. 113-4.
31. Power, "Housecleaning Yesterday and Today", HOUSE BEAUTIFUL, vol. 74, October, 1933, pp. 161-2.
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33. Smith, "Sanitary Cleaning", HYGEIA, vol. 6, March, 1928, pp. 150-2.
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UNIT XIV MILK

Science type. Applied technique.

I CURRICULUM OBJECTIVE; Health and citizenship efficiency.

A. Intermediate objective: The proper handling of milk is essential to health and citizenship efficiency.

1. Specific objectives:

a. To learn how to handle milk in a sanitary manner.

b. To develop favorable attitudes toward the responsibility of citizens in providing a clean milk supply.

B. Organization of activities and subject matter.

Note: It is assumed that other courses in the curriculum will contribute information on the subject of milk.

1. A bottle of milk should be brought to class and questions asked concerning its source and uses. Among the uses will be included its value as a food for children and invalids. Since this is true, it is most important that the milk be very clean. This will involve several factors, which may be listed. Plan a visit to a local dairy to see how the milk is handled. If possible, the visit should be to a dairy which produces its own milk. Decide for what factors to look.

2. The visit. See how cows are cared for, how they are fed, how they are tested for health, the care of the barns, methods and cleanliness of milking, the health and cleanliness of the milkers and other workmen about the dairy; kind of pails used, care of milk after milking, cooling, aerating, and bottling; and care and equipment of milk house. Find out if it is pasteurized. If so, how? Is it certified? What are the requirements for certification?
3. Discussion and planning further developments. Free discussion should be encouraged in regard to the facts observed on the visit. Several problems may arise which will need further investigation. For example, find out what are acceptable standards of milk production. By whom are these determined? How does the county health department function in regard to securing clean milk? How does the state department function? What is certified milk? Why does pasteurized milk sour? What is the duty of the consumer in protecting the milk supply? From what kind of places should milk be purchased? What care should it have in the home? What methods can be employed in the home to make it safe for use? How does milk supply affect health? What diseases are spread by milk? What determines the cost of milk? What is the duty of the individual

producer of milk? These and many other problems may arise for consideration. Discuss sources and methods of getting answers to these problems.

4. Collecting information. An abundance of material on this subject should be provided. Books, bulletins, periodicals and other sources may be used. Milk cultures may be prepared and examined. If possible, a visit to a laboratory where milk is tested should be arranged. The farm bureau office and the county health department may be consulted.
5. Presenting information to the class for discussion. Oral reports may be arranged or different topics may be discussed. Be sure that all of the problems are solved as nearly as possible.
6. Application of the objectives. Formulate a set of principles and rules for the sanitary handling of milk. Discuss the citizenship responsibility both in securing a sanitary milk supply and the farmer's part in producing it. Prepare a summary of the unit.

The summary should include the principles for the sanitary production, handling, retailing, and consumption of milk. It should be one's responsibility as a citizen to do his share to protect the milk supply.

C. Contributions of other courses.

1. Foods.

- a. Uses and care of milk in the home.
- b. Methods of purifying milk.
- c. The baby's milk.
- d. Care of milk cans and other equipment.

2. Civics: Civic and community cooperation in protecting the milk supply.

3. Hygiene: Relation of milk to health.

4. General science.

- a. Why milk sours.
- b. Why low temperatures protect milk.
- c. Method of testing milk.

5. Art: Make milk posters.

D. Suggested Units:

- 1. Equipping the milk room on the farm.
- 2. Choosing your food when eating away from home.
- 3. Undulant fever and other diseases transmitted by milk.

Note: The last unit takes up kitchen sanitation which involves the care of food.

E. References.

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UNIT XV KITCHEN SANITATION

Science type. Applied Technique.

CURRICULUM OBJECTIVE: Health and homelife efficiency.

A. Intermediate objective: Sanitation in the kitchen is of prime importance to health.

1. Specific objectives.

a. To learn how to care for the food of the household in a sanitary manner.

b. To learn what equipment is necessary for the proper sanitation of food.

c. To develop favorable attitudes toward cleanliness in the kitchen.

B. Organization of activities and subject matter.

Note: It is assumed that much of the material with which the unit will be concerned has already been touched upon either in other units or other courses. This unit is very important, but has been put near the end because of its dependence upon other units. The individual teacher may find it wise to use it near the first and have the other units follow.

1. Bring in pictures advertising electric refrigerators.

Let the girls comment upon them. If the General Electric Model Kitchen makes a visit to the city any time during the time in which the course is presented, it will serve as an opening factor to this unit. Discuss the different features of the

refrigerators, find out their desirable qualities. Present the question of what their purpose is. This will lead to the care of food.

2. Factors involved in the care of foods. Review previous information on this topic. Divide the unit into topics for study. Some of these may be familiar enough that no further study will be required. The topics will include: production, marketing, preparation, storage, preservation, refrigeration, kitchen equipment, and general cleanliness in the handling of food.
3. Investigation of topics. Observation is one method of studying. Visit the packing house, cheese factory, bakery, or any other places where food is produced. Note the sanitation of the building, equipment, workers, and methods of handling food.

Visit markets where food is retailed, also kitchens where food is prepared. There may be a school cafeteria which can be visited. Check on the same points as for places of production. When in the kitchen observe how food is stored, methods of refrigeration, and the equipment. Study the food's laboratory. Let the girls also

study their own home kitchens. Cost of different equipment may be secured from the proper retail stores. Supplement visits with reading from materials in the school library.

4. Discussion. Allow free discussion on all topics. Additional points may need to be cleared up by further study. Emphasize the need for absolute cleanliness in connection with the care and preparation of food. Review methods by which diseases are spread. Trace the ideal handling of vegetables from the producer to the table. Have a report on early methods of refrigeration. Give special consideration to home slaughtering. Milk production has already been discussed.

5. Application of the objectives. Formulate a set of principles for the care of food. These should emphasize cleanliness and care of food from production to serving.

6. Test. An objective test can be used to test points of knowledge. Use an essay test for the expression of attitudes.

C. Contributions of other courses.

1. Foods.

- a. Cleanliness in food preparation.
 - b. Principles of preservation.
 - c. Principles of refrigeration.
 - d. Kitchen equipment.
2. Civics: Individual and community responsibility in regard to sanitary production and handling of food.
 3. Mathematics.
 - a. Cost of equipping the kitchen.
 - b. Cost of food for the family.
 4. Bookkeeping: A plan for household accounts.

D. Suggested Units.

1. Plan for kitchen and its equipment.
2. Home production of meat.

E. References.

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6. Dodd, Chemistry of the Household, Part II.
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8. Elliot, Household Hygiene, pp.157-9.
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11. Smiley and Gould, Community Hygiene, Chapter 11.
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PART 3

SUMMARY

The course in Rural Sanitation, as given in Part 2, is planned as a separate course to be offered in either the first or second half of twelfth year home economics. It is an elective and could very well be open to boys as well as girls. One course of study examined by the writer included a course in applied economics for boys which had some of the same material offered in this one.¹ If this is done, a different choice of units will be made by the teacher and class than if offered to girls only. Units XIII and XIV may be omitted and put into another home economics course. The first into clothing and the other into foods.

Interests of classes will vary due to differences in environment and educational advantages. If the teacher wishes to make the course of the most value to the pupils, then she must take these into consideration. For this purpose alternative units should be provided. In most of the units, therefore, other units are suggested. No rigid course can be planned for any, and certainly not, varied situations. The circumstances are sure to differ, for there is no set formula for the development of any boy's

¹Home Economics, Course of Study Monograph, No. Thirteen, Denver, pp. 128-39.

or girl's interests. For example, Unit VIII, on the location of different buildings on the farm in relation to the sewage plant and well, could be replaced with one on planning beauty spots or an outdoor living room. Should the pupils want to know about what kind of shrubbery or trees to plant in certain spots, then the course should be flexible enough to allow for it. The teacher should also be prepared to attack a new unit from any angle, or in any order which the pupils' interests dictate.

A background of science, both natural and social, will greatly enrich the course. For girls, other home economics courses will also lend enrichment to the course. For boys, vocational studies will do the same thing. Whenever possible, correlations should be planned between the courses. Definite contributions of one subject to others should be expected. The field for the different subjects must be outlined for this purpose. An outline is offered by the writer.

I. Physical education or hygiene. This will confine itself mainly to the healthful aspects of the following topics.

A. Personal hygiene

1. Cleanliness.
2. Recreation.
3. Sleep.
4. Other health habits.
5. How to keep well.

B. Community hygiene.

II General science. This is a course in science.

A. Air.

1. Movements of air.
2. Purification of air.

B. Ventilation.

C. Heat.

D. Water.

E. Soil.

F. Cleaning agents.

G. Dust.

III Biology. This is a course in science also. It should include units on the following topics.

A. Microorganisms.

1. Kinds.
2. Habits.
3. Purpose or uses of microorganisms.

B. Insects as they affect the health of man.

C. Animals as they affect the health of man.

IV Social science. This will treat the citizenship aspects of sanitation.

A. Citizenship responsibility and cooperation.

B. Sanitary legislation.

C. Sanitary statistics.

D. Illustrative historical events which deal with sanitary matters.

E. The organization of social agencies for health services.

F. The health inspectional function of citizens.

V Foods. This is a study of food, its care and preparation.

A. Sanitation of foods.

1. Producing.

2. Marketing.

3. Care.

4. Preparing.

5. Serving

B. Study different foods.

1. Water.

2. Milk.

3. Other foods.

C. Food preservation.

1. Principles.

2. Methods.

D. Refrigeration.

E. Disposal of kitchen wastes.

F. Care of kitchen equipment.

G. Personal cleanliness in kitchen.

VI Clothing. This course is concerned with appearance, grooming, and economics of clothing. Some problems as affecting the care of the house and its cleaning may be included.

A. Care of clothing.

1. Laundering.

a. Equipment.

b. Water.

c. Use of soaps and water softeners.

2. Dry cleaning.

3. Storage.

B. Care of house: Methods of cleaning.

VII Family relations.

A. House planning.

1. Location.

2. Construction.

3. Sanitation.

a. Plumbing.

4. Heating.

5. Ventilating.

6. Lighting.

B. Costs of different equipment.

C. Care of the house.

1. Schedules.

2. Cooperation.

D. Overcoming obstacles preventing sanitary treatment of farm home.

Proper correlations between courses will be a great aid in orientation and integration of the curriculum. Without them the same confusion that exists in the traditional school will remain.

One additional activity which may be suggested here is that of giving more definite study to sanitary legislation. If this has been considered in other courses, then little time need be given to it in this course.

Another activity, which the writer wishes to suggest, is that of giving laboratory work where possible in connection with the different units. If there^{are} home-practice rooms or cottages, these will afford good facilities for laboratory work in connection with some of the units.

It is not expected that the teacher will be able to use all of the units given in this study. She will adapt it to special conditions. Some of the units will be omitted entirely as interests and needs dictate. It may be wise to present other units which are suggested but not planned. If units are to be omitted, it is suggested that either Unit II or Unit III be omitted, also Units V, VI, or VII according to the conditions. Unit XIII may be satisfactorily presented in the clothing course, family relations, or home management. Unit XV can be presented in the foods course.

It is the hope of the writer that this course will meet the needs of pupils in regard to rural sanitation.

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