

SANITARY SURVEYS OF THE TOWN OF BLACKSBURG ,VIRGINIA  
AND THE VIRGINIA POLYTECHNIC INSTITUTE

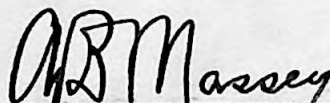
By

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Approved

  
In charge of major ~~work~~ *thesis*

  
Head of Department

  
Dean

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There is one large dining room that accommodates the patrons of the building, members of the University Club, and other persons associated with the college. The dining room is well ventilated and well lighted. There are thirty-eight tables, and floor space enough to accommodate one hundred and fifty persons. The hardwood floor is easily cleaned, and well polished. The walls are clean and painted, and curtains hang over the windows.

The kitchen is large, with tile flooring, and contains two stoves, one refrigerator, and other necessary equipment.

A dietitian supervises the purchase and preparation of all food. All perishable food is carefully stored in a large refrigerator immediately upon arrival. This refrigerator is well lighted, and unusually clean and tidy.

Three toilets for the employees are in the basement. These toilets are clean, well lighted, and ventilated. Daily supervision is given to each toilet.

There are six regular employees in the kitchen, but extra help is obtained when necessary. These employees are furnished white coats and caps in which they do their work. These are changed when they become soiled, and are laundered



by the Virginia Polytechnic Institute laundry.

The employees are required to submit to a medical examination, by the College physician at the beginning of their employment.

#### The Virginia Polytechnic Institute Mess Hall

The college mess hall is a two-story brick building located on the east side of the college campus. It is owned by the Virginia Polytechnic Institute and managed by an employee of the college.

#### The Dining Rooms

The lower room is large, well lighted and well ventilated, and has a floor space of 6600 square feet. The floor is of six-inch tile block with water-tight material between.

The walls are of plaster and painted brown from the floor up to a height of six feet; from there up, including the ceiling, the color is cream. This painting is done once annually.

There are sixty tables, with a seating capacity of ten students to each table. Cotton cloths for each table are changed three times a week.

The dining room on the second floor is a duplicate of the one just described except in size. The floor space here is 5500 square feet and there is also a smaller number of tables, about fifty. Otherwise, the same construction and appearance are presented by both rooms.

#### The Kitchen

The floors of the kitchen, which are of well constructed, six-inch water-tight block-tile are easily cleaned. The walls are of plaster painted brown from the floor up to a height of six feet; above, they are cream colored. These walls are painted once annually and are kept unusually clean throughout the year. There is an abundance of light, both natural and artificial. There is sufficient cross ventilation, but fans are present and are indispensable on account of the odors that occur at meal time. The kitchen is adequately supplied with screens, and flies are never a nuisance in the building.

#### Apparatus and Utensils

The refrigeration is ample in size and efficiency. All perishable foods are stored from the time they are secured until they are used. These refrigerators are kept clean and dry at a temperature of about 38° F.



Large mechanical dish washers are available in the kitchen. During the regular school session over 1200 plates, glasses, cups and saucers are washed after every meal. Hot and cold water is abundant, and the dishes are thoroughly rinsed, after which they are sterilized at 38 pounds of steam pressure. The food utensils are also thoroughly cleaned and sterilized immediately after use.

#### Miscellaneous

Milk for the students is secured from the college dairy at a rate of 260 gallons daily during the regular school session. This milk is pasteurized, and handled in the usual commercial manner except that it is not bottled. It is distributed in the mess hall with seamless dippers and every care is taken to prevent contamination.

Garbage is sorted by some of the employees, and that found suitable for animal consumption is placed in well-covered thirty-gallon cans, and finally fed to the hogs on the college farm. Garbage which is unsuitable for this purpose is burned in a small incinerator outside the mess hall.

There are five toilets and two showers for the employees. These toilets are well-equipped and scrupulously clean, and are conveniently located. No facilities are pro-

vided for the students with regard to toilets. Each employee is required by the steward to wash his hands thoroughly after using the toilet. The employees are supplied with washable garments which are changed three times a week.

Every employee is thoroughly inspected by the college health officer at least twice annually, but no bacteriological inspection for carriers is made.

This mess hall is modern and conforms in every respect to the state requirements in construction and sanitation.

#### College Creamery

The college creamery is located in the dairy Husbandry Building on the southwest end of the campus. Milk is conveyed from the college dairy herd to this creamery where it is prepared for the market. At times when the milk supply from the college herd is insufficient, additional milk is purchased from local dairymen, whose herds are free from tuberculosis and Bang's disease.

The milk is pasteurized in a two-hundred gallon pasteurizer by the Holding Method, at 145°F. for thirty minutes. About one hundred and twenty-five gallons per day are pasteurized in this manner, after which the milk is



bottled and sold as Grade A milk to the college and town.

The ventilation and light are adequate in the creamery. The floors, which are of tile blocks, slant to a central point where waste material is drained. Practically no dust particles exist in the plant. Steam is continuously escaping, and the floors and walls are scrupulously clean.

Workmen are inspected at least once annually by the college health officer. However, if the need arises, the college health officer makes additional examinations.

Toilet facilities are available in connection with other departments of the building. All workmen use every precaution in toilet sanitation.

The creamery is exceptionally clean in every detail, and could be used as a model for the State of Virginia.

#### The College Book Store

The business of the College Book Store is not confined to the selling of books, but includes the sale of numerous other sundries required by the students, especially ice-cream and fountain drinks. The store is large and well arranged and presents a pleasing appearance.

A modern soda fountain has recently been installed

and is maintained in a clean and tidy manner. Drinks are dispensed in glasses which are afterwards cleansed by soap and water, and then rinsed.

The employees, usually two students and three permanent employees, are not required to undergo medical examinations, either clinical or bacteriological, other than that given to the students by the medical authorities upon college entrance. These employees have access to a clean sanitary toilet.

#### The Virginia Polytechnic Institute Barns

There are two Virginia Polytechnic Institute dairy barns. One of these buildings will accommodate seventy-five cows, and the other forty cows. Both buildings are of frame construction with concrete flooring. Ventilation is adequate with plenty of natural and artificial light.

Extreme care is emphasized in the handling of milk. The udders are washed by hand before each milking. Two employees are responsible for the care and operation of the recently installed combine milker. This device milks four cows simultaneously, the milk being drawn by a suction process. The cows are milked three times daily, at a rate of thirty to



fifty cows an hour. The milk is drawn into a glass container and weighed, so that an annual record for each animal can be obtained. The milk is then led to a cooler where it is immediately reduced to a temperature of 50°F., then it is placed in sterilized cans and is ready for pasteurization at the college creamery.

Employees are clothed in white uniforms, with cap and rubber boots. The uniforms and caps are changed three times weekly and laundered by the college laundry. A medical examination is given to each employee once annually. However, a bacteriological examination is not required.

Manure is disposed of immediately after each milking by a conveyance that carries it to a house where it is stored. This house is free from flies, there being no windows. The manure from here is distributed to the farm as it is needed.

Toilets are placed in each barn. There are all necessary accessories including a lavatory, hot water, and soap. Each employee is required to wash his hands after using the toilet.

#### The War Memorial Hall

This building is the recreation center of the

Virginia Polytechnic Institute. It includes the gymnasium, swimming pool, quarters for the visiting teams and for some of the members of the Athletic Association.

The gymnasium is well ventilated and well heated, and is lighted both artificially and naturally. The flooring is of hardwood and tightly placed, thus allowing very little space for the accumulation of dust. The apparatus for the athletes is adequate, but no provision is made for the cleansing of this equipment.

The swimming pool, which was recently constructed, is of modern type. The water is used repeatedly, being purified by filtration and then chlorination by the chlorine-ammonia process. The chlorine dosage ranges from one to four parts per million. Before entering the pool, every individual is required to use the shower bath and foot solution, so that Dermatophytosis (athlete's foot) may be kept at a minimum.

The toilets in the building are sufficient in number and are properly cleaned. Deodorants are used continually. In the lavatories and the shower baths, both hot and cold water are available and towels are provided by the individual.



The Virginia Polytechnic Institute Barracks

There are seven brick buildings included in the barracks group which form the "quadrangle". With the exception of one of these, they are the oldest group of buildings on the campus. Another building, which is of stone, was used as a barracks during the session of 1935-36. This is located near the east side of the drill field.

In these barracks two cadets, sometimes three, are assigned to each room, which is equipped with one lavatory, having hot and cold water. Soap and towels, however, are furnished by the occupants.

The buildings are heated with steam by the college power plant, but no provision is made to increase the air condition in the buildings. At times this lack may be detrimental to the health of the occupants.

Shower baths are located in the basement of each barracks. The floor of each shower bath is scrubbed once a week, but no provision is made to prevent the spread of Dermatophytosis (athlete's foot), by the use of foot bath solutions. The floors of these showers are very slippery when wet and are dangerous. Since the beginning of work on this thesis the college authorities are having the floors

relaid, the surface roughened, and a more gradual slope towards the central drain.

Toilets are located in the basement of each building, with the exception of the newest ones, which have a toilet located on each floor. These toilets are properly cleaned and deodorants are used continually. The military department insists that the cadets take individual care for the cleanliness of these toilets.

The Academic and Research Buildings of the Virginia Polytechnic Institute

With two exceptions the classroom buildings are adequate in sanitary facilities.

Davidson Hall, although carefully planned for the disposal of chemical gases, does not function satisfactorily in this respect. Otherwise this building is in a satisfactory condition.

The Agricultural Hall was erected in 1905, and shows much evidence of out-dated construction. The plumbing in this building is very crude. Pipes are found exposed in many places and the leaks in them are frequent. There is one bubbling fountain in the building located on the main floor.



This fountain is not sanitary since the column of water is vertical and may allow mouth washings to drop back on the bubbler. As a result of severe wear the flooring, which is of hard pine, has developed large cracks where quantities of dust have accumulated. The ventilation on the whole is apparently sufficient, but the windows are so arranged that an inadequate amount of light reaches the center of the building. A portion of the third floor is occupied by the Department of Agricultural Chemistry. The laboratory in this department is inadequately ventilated to the point of possibly being detrimental to the health of the workers and a discomfort to others in the building, especially those on the same floor.

#### The Transient Camp

Recently a transient camp has been located adjacent to the college farm on the Prices Fork Road west of Blacksburg. The camp is a W. P. A. project, and its function is to provide shelter for the men engaged in erecting public buildings for the state and federal governments.

There are four main buildings in the camp. These include a hospital, office quarters, a mess hall, and a

storage room. The laboring men of the unit are housed in tents. These tents are twelve feet square, have a plank floor six inches from the ground and contain five bunks. These quarters seem to be comfortable, especially in the warmer months.

The mess hall is a long narrow frame building constructed on the army mess hall style. It is well screened against flies and is well ventilated. The odor from the kitchen is well cared for by electric fans.

Thirty gallons of raw milk are purchased daily from a local dairyman, R. W. Brown, at the rate of twenty-five cents per gallon. Water and lights are furnished by the Virginia Polytechnic Institute.

The hospital is a two-room building containing two beds, with medicine and equipment sufficient for rudimentary treatment. The hospital is well ventilated and well lighted. One of the local doctors makes daily visits to the camp. A dentist that is associated with the other eleven camps of this type makes about one visit a month.

The garbage is collected and stored in a well screened shanty. It is hauled daily to a nearby farm and fed to hogs.

Toilet facilities for the laborers are provided by



two large privies, both located near their quarters, and are built to meet the state requirements. On the other hand, toilet facilities for the officials are connected to a septic tank located one hundred feet from the mess hall. The flow into it is by gravity. This tank is of the gravel type and sewage flows about twenty feet through the sand beds. The capacity of the tank is far beyond the present needs.

## SUMMARY

A survey of the Town of Blacksburg and the Virginia Polytechnic Institute was made from a standpoint of sanitation. The results of this inspection, which have been discussed in detail in the foregoing pages of this thesis, may be summarized under the following points:

1. An inspection of the drug stores of Blacksburg revealed the following:
  - a. Employees are not required to undergo a clinical or bacteriological examination, nor are they required to dress uniformly. .
  - b. The ventilation in the stores is inadequate.
  - c. The fountain in Store Number 18 is exceptionally clean, while that of Number 88 is dirty.  
Neither place of business has proper means of washing glassware.
  - d. The general cleanliness of the stores is not exceptionally good.
2. The survey of the boarding houses and hotels of the town revealed:  
~~revealed:~~
  - a. Employees are not required to undergo a medical



examination, either clinical or bacteriological.

- b. The houses are very well ventilated, and no offensive odors could be detected.
- c. Toilet facilities are only moderately adequate.
- d. The general sanitation of these houses is very good.

3. An inspection of the restaurants of the town showed the following:

- a. The employees are not required to take a medical examination.
- b. The ventilation is very poor in Building Number 15, but very good in the other restaurants.
- c. The toilet facilities are not adequate, and are neither clean nor sanitary.

4. An inspection of the grocery stores of the town revealed:

- a. There is inadequate ventilation in the stores.
- b. The refrigeration in all of the stores is good.
- c. The toilets in these stores are poorly ventilated, unsanitary, and inadequate.
- d. The general appearance of the stores is neat, but crowded.

- e. There is no systematic method for the disposal of rubbish.

5. An inspection of the public schools in the town revealed the following:

- a. The amount of natural light was found to be adequate.
- b. The heating units are efficient.
- c. The drinking fountains are sufficient in number and sanitary in operation.
- d. The toilet facilities are ample and these toilets are well cared for.

6. An inspection of the Norfolk and Western Railroad Station revealed:

- a. There are three improper drinking fountains.
- b. Ashes are allowed to accumulate for several months.
- c. The toilets are dirty and poorly ventilated.
- d. The general appearance of the interior of the building is only fair.

7. An inspection of the Faculty Apartments revealed the following:

- a. The refrigeration in this building is good.



- b. The dining room and kitchen are exceptionally clean and well kept.
  - c. The ventilation in the dining room and the kitchen is unusually efficient.
  - d. No offensive odors are noted in the kitchen.
  - e. Toilet and shower facilities for the employees are adequate.
  - f. No medical examination is required for the employees other than at the beginning of employment.
  - g. The garbage disposal for this building is not as adequate as should be.
8. The inspection of the college dining hall revealed:
- a. Offensive odors arise especially at meal time.
  - b. Employees are given a medical examination twice annually, but no clinical or bacteriological examination is required.
  - c. The building is well ventilated and well lighted.
  - d. The garbage is disposed of efficiently.
  - e. Toilet facilities are adequate and proper care is taken to have these toilets kept clean.
9. The inspection of the college creamery showed:

- a. This creamery is clean and sanitary.
  - b. The employees undergo a medical examination only once a year, but no clinical or bacteriological examination is required.
  - c. Both artificial and natural lighting are good.
  - d. The toilet facilities in this creamery are good.
10. A survey of the College Book Store showed:
- a. The ventilation in this store is good.
  - b. This room has sufficient light and ample heat.
  - c. All food is displayed in cellophane or show cases.
  - d. The glassware is improperly washed.
  - e. No medical examination is required for employment in this store.
11. an inspection of the college barns revealed:
- a. The employees are examined by the College Health Officer once a year.
  - b. These buildings have good ventilation and plenty of light.
  - c. The floors of these barns are washed three times daily.
  - d. There are no offensive odors from these barns at any time.



e. The toilets are clean and well cared for.

12. The inspection of the War Memorial Hall revealed:

a. The entire building is well lighted and well ventilated.

b. There are sufficient number of shower baths in this building, but these baths are unsafe because of a slick film found on the concrete floors.

c. The toilet facilities are clean and adequate.

13. The inspection of the Virginia Polytechnic Institute Barracks showed:

a. These barracks are well lighted and heated.

b. Some of the rooms are too small to accommodate the number of students assigned to them.

c. The ventilation of these buildings is generally good, but no air conditioning system is installed.

d. The toilets in these barracks are exceptionally clean.

14. an inspection of the academic buildings of the campus revealed:

a. All the buildings on the campus are kept clean.

b. The ventilation in all the buildings except in

Davidson Hall and Agricultural Hall is good.

- c. The one fountain in Agricultural Hall is of the bubbling type and delivers a vertical stream of water.
- d. The toilet facilities are excellent except in Agricultural Hall.

15. The inspection of the transient camp revealed:

- a. The sleeping quarters for these men are clean and well kept.
- b. The tents and houses are spaced well apart.
- c. Sanitary shower baths are available to the men.
- d. The mess hall is clean and well ventilated.
- e. A small hospital is available for rudimentary treatment.
- f. The pit privy type of toilet is used by the workmen.



TABLE I

## CLIMATOLOGICAL DATA FOR BLACKSBURG, VIRGINIA

U. S. Weather Bureau

1900 -1930

	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Annual
Mean Temperature	32.9	32.7	42.7	50.4	60.3	67.6	70.7	62.9	64.0	53.3	42.2	34.0	51.1
Highest Temperature	75	79	85	89	91	99	95	96	96	86	79	73	99
Mean Precipitation	3.23	3.17	3.72	3.14	3.90	4.61	5.30	3.99	3.14	2.97	2.25	3.04	42.46
Driest Year	1.69	3.40	1.00	1.17	2.87	2.00	3.52	2.00	1.84	2.92	.63	2.81	25.95
Wettest Year	7.31	1.38	3.66	6.38	3.90	9.71	8.26	8.10	2.90	5.95	2.07	5.94	65.56
Average Snowfall	6.6	5.2	4.1	0.8	trace	0	0	0	0	0.1	1.0	4.5	22.3
Average No. of Days With .01 inch or More Precipitation	9	8	10	10	10	11	12	11	7	7	6	8	109

TABLE II  
CLIMATOLOGICAL DATA FOR BLACKSBURG, VIRGINIA  
1930 - 1934

Temperature in Fahrenheit		Precipitation in Inches					Sky								
Mean	Highest	Date	Lowest	Date	Total	Total Snow	Greatest Monthly	Monthly	Least Monthly	Month	Clear	Partly Cloudy	Cloudy	Prevailing Wind	Number Rainy Days
1930 53.4	99	7/28	-6	2/25	21.09	32.0	3.95	12	.93	7	203	41	121	N.W.	104
1931 54.7	95	7/1	3	2/2	39.49	3.2	7.28	8	.47	11	185	40	140	S.W.	117
1932 54.4	98	6/31	-4	12/19	47.50	24.9	6.29	6	1.82	8	188	33	145	S.W.	122
1933 55.0	93	6/8	0	2/9	33.66	11.5	6.52	7	.30	9	178	80	107	S.W.	108
1934 54.1	99	7/26	-10	2/28	38.45	28.1	6.26	3	1.09	1	176	75	114	S.W.	114

Killing Frosts  
Last in Spring April 13      First in Fall October 6





Table IV

MILK EXAMINATIONS

Source	Bacterial Count	Number of Examinations Made	Quantity Sold Daily in Blacksburg
College Creamery	10,000	6	50 gallons per day
Slusser's Dairy	210,000	3	11 gallons per day
Clover Creamery	28,000	2	24 gallons per day
Brown's Dairy	58,000	2	50 gallons per day
Atkin's Dairy	125,000	5	10 gallons per day
Strickler's Farm	15,000	2	4-5 gallons per day
			Total 150 gallons per day



Table V

WATER EXAMINATIONS

Potability of Town Tap Water

Date	Lactose Broth	Plate Count
June 16	No gas	15 per cc.
June 23	No gas	12 per cc.
June 29	No gas	18 per cc.
July 2	No gas	5 per cc.
July 7	No gas	12 per cc.
July 11	No gas	11 per cc.
July 13	No gas	6 per cc.
July 17	No gas	4 per cc.
July 20	No gas	15 per cc.
July 24	No gas	21 per cc.
July 27	No gas	25 per cc.
July 31	No gas	9 per cc.
Aug. 3	No gas	7 per cc.
Aug. 6	No gas	14 per cc.
Aug. 18	No gas	18 per cc.
Aug. 21	No gas	12 per cc.
Aug. 24	No gas	14 per cc.

Potability of College Tap Water

June 11	No gas	10 per cc.
June 17	No gas	8 per cc.
June 24	No gas	15 per cc.
June 29	No gas	7 per cc.
July 3	No gas	6 per cc.
July 7	No gas	12 per cc.
July 11	No gas	8 per cc.
July 13	No gas	12 per cc.
July 17	No gas	15 per cc.
July 21	No gas	12 per cc.
July 24	No gas	18 per cc.
July 28	No gas	9 per cc.
July 31	No gas	12 per cc.
Aug. 3	No gas	11 per cc.
Aug. 7	No gas	6 per cc.
Aug. 17	No gas	5 per cc.
Aug. 21	No gas	12 per cc.
Aug. 24	No gas	14 per cc.

WATER EXAMINATIONS

Potability of College Spring Water

Date	Lactose Broth	Plate Count
June 11	No gas	12 per cc.
June 13	No gas	13 per cc.
June 24	No gas	15 per cc.
July 1	No gas	15 per cc.
July 3	No gas	13 per cc.
July 13	No gas	20 per cc.
July 20	No gas	22 per cc.
July 27	No gas	16 per cc.
Aug. 3	No gas	15 per cc.
Aug. 17	No gas	10 per cc.
Aug. 24	No gas	12 per cc.

Potability of Town Spring Water

June 8	No gas	12 per cc.
June 20	No gas	15 per cc.

Potability of College Swimming Pool

June 16	No gas	23 per cc.
June 23	No gas	32 per cc.
June 29	No gas	40 per cc.
July 2	No gas	19 per cc.
July 3	No gas	49 per cc.
July 15	No gas	57 per cc.
July 22	No gas	36 per cc.
July 29	No gas	31 per cc.
Aug. 6	No gas	39 per cc.
Aug. 20	No gas	36 per cc.
Aug. 24	No gas	42 per cc.



DESCRIPTION OF PLATES

Plate I

Figure 1. This photograph is an aerial view of the Town of Blacksburg, Virginia and the Campus of the Virginia Polytechnic Institute. (Reduced from a print taken by Capt. Frank Platz, U. S. Army).

Plate II

Figure 2. This view shows a portion of one of the reflecting lakes located on the west side of the campus. In the background is seen a part of the Teaching and Administration Building and also a portion of the Power Plant.

Figure 3. This picture shows a portion of the collecting basin for the college spring. The water flows in this basin and then is chlorinated before being pumped to a sixty thousand-gallon tank near the college barns.

Plate III

Figure 4. This view shows a portion of the interior of the college creamery.

Plate IV

Figure 5. This is also a view of the interior of the college creamery, showing a portion of the milk bottling

machine and cooling apparatus.

Plate V

Figure 6. This is a photograph of the sewage disposal plant of the Town of Blacksburg and the Virginia Polytechnic Institute, showing the contact beds, distributing pipes, control house and greenhouse.

Figure 7. This is a photograph of the interior of one of the college dairy barns. It shows the stances, feeding troughs, and a well lighted room.



Plate I



Figure 1



Figure 2



Figure 3





Figure 4

Plate IV

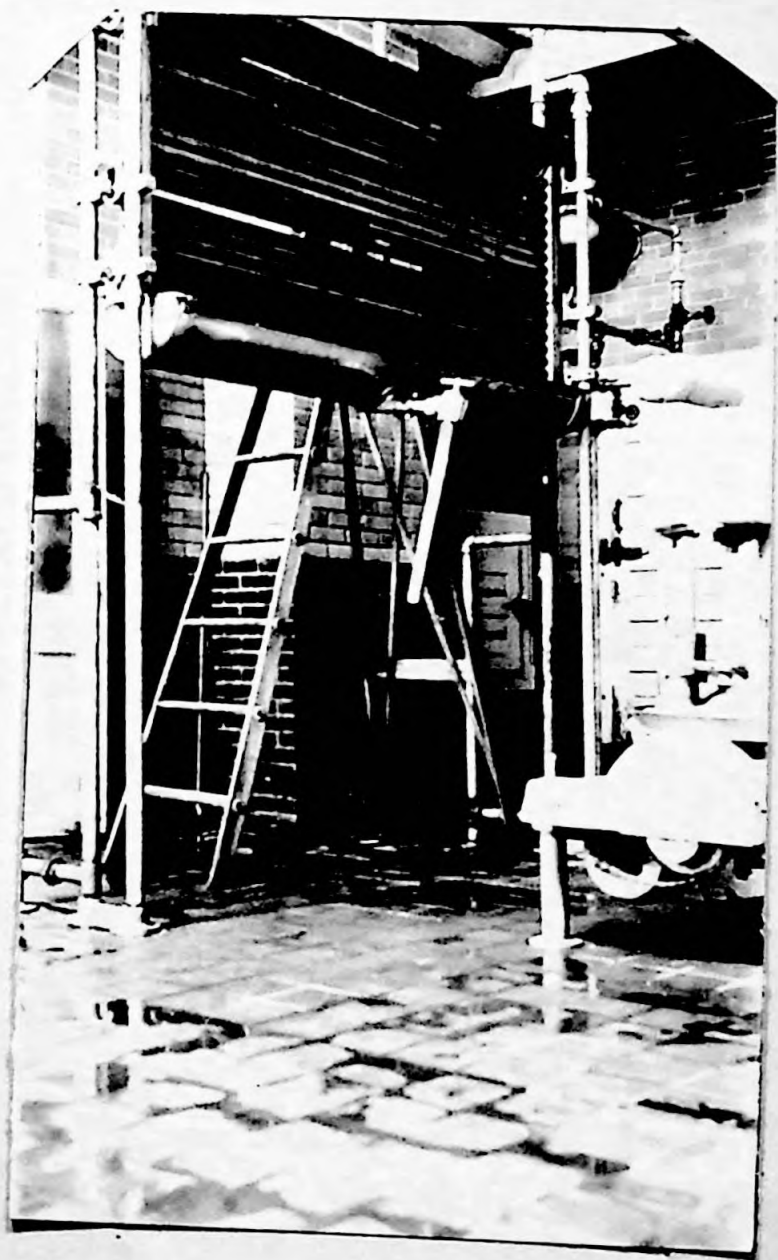


Figure 5





Figure 6



Figure 7

