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SANITARY SURVEY

of the City of

KEENE

NEW HAMPSHIRE

by

[illegible]
ROSCOE W. MYERS

June 1924

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INTRODUCTION

Early History

Keene was originally called "Upper Ashuelot". It was set off as a town July 3, 1732 by the legislature of Massachusetts. It was later named "Keene" after Sir Benjamin Keene, the oldest son of the first mayor of King's Lynn. It was settled by English immigrants. In 1747 the settlement was abandoned and burned by the Indians, but was rebuilt two years later. In 1753 a charter of township was granted by the royal governor of New Hampshire. Eleven years later a schoolhouse was erected. In 1776 an epidemic of smallpox occurred, and made necessary a hospital. In 1790 there were 1300 people in the town, and a post office was established. In 1796 the first attempt at a public water supply was made; Deacon Wilder brought water from Beaver Brook into the village.

Nineteenth Century

During the nineteenth century the town grew quite steadily. March 10, 1874 Keene adopted city government. At that time the population was about six thousand. The water-works were completed in 1870, and from time to time after that were improved. During this period all the buildings were of wood. Lumber yards and saw mills were numerous. Woodworking was and still is the chief industry.

Many of the factories made articles of wood as chairs, wooden pails, and even wooden heels are made in Keene. Naturally, fires have been numerous and disastrous. Improvements in the water supply have always been in response to the need for better fire protection, and hygiene has been an incidental consideration. Besides the wood-working industry there were shoe factories and other industries of less importance in the town. A sewage system was constructed in 1883.

During the present century a number of things of sanitary interest have occurred in Keene. There have been two epidemics: one of scarlet fever with twenty-two deaths in 1901, the other the influenza epidemic in 1920.

Board of Health

The year following the influenza epidemic a change was made in the organization of the board of health. A board is elected to serve without pay, and they appoint a health officer whose salary is $1600 a year. Before this time the responsibility was vested in a board rather than in one person, and whenever an epidemic occurred or any health emergency arose the board would resign.

In 1906 the sewage system was extended to include West Keene. In 1914 and 1915 the meter system

for measuring water was installed. In 1916 the incinerator was built. In 1922 the water system was surveyed from the point of view of fire protection, and recommendations were made.

Population

In 1920 the population was 11,210. The people are chiefly of English and Irish descent, there having been relatively little immigration to alter the purity of the "old Stock". There is however a small "foreign quarter" in the southern part of the city, in which there are Italians and other southern Europeans.

Rural Features

Although a city in name, Keene appears decidedly rural to the visitor from Boston. The main street has a double row of trees along its middle, extending nearly up to the square where the stores are. There are very few tenement houses, nearly all the people having their own homes; and this adds to the rural atmosphere. There are no larger cities near Keene, and Keene is the county center; so it certainly could not be called "suburban".

Keene is in the southern part of New Hampshire. It lies in a valley about ten miles east of the

Connecticut river. The center of the town is 483 feet above sea level; but owing to the high hills which surround the town, and their abundant water shed, the town is relatively low and damp. The land on which the town is situated has however been getting dryer and dryer. In 1732 there was a great flood which inundated the township (then called Upper Ashuelot). Until about fifty years ago there used to be a lake where the center of the city now is. A man of sixty-two tells of fishing at a body of water where the largest hotel in the city now stands. Many of the buildings are erected on spiling in what was once a swamp. At present however there are relatively few places about the town which could really be called swampy.

Geographic Position

Geology

The soil all through this part of New Hampshire is sandy and not very fertile. As this is in the region which was covered by the glaciers during the ice age, there are many loose boulders and the ground is in places very stony. New Hampshire is well-known as the "Granite State". Most of the rocks and the boulders and the stone walls in Keene are

of granite, but there is nowhere near as much granite in Keene as there is farther north in the state. The stoniness of the soil does not prevent the growth of trees. All the hills about Keene, and some of them are quite high, are well covered with timber. Within the city limits there are four hills that are over a thousand feet above sea level; there are many lesser elevations.

Climate

The rainfall is fairly constant throughout the year, there usually being a period of relative drouth in the midsummer. Owing to the well-timbered hills the amount of water in the streams remains fairly constant throughout the year, except for the freshets in the spring when the snow melts. Even the small streams keep flowing throughout the summer.

The weather in Keene is like that elsewhere in New England. As Mark Twain said, "God made everything in New England but the weather." There are frequent, sudden changes in temperature and humidity. The humidity is generally fairly high, over 50%. The ground in the winter is generally covered with snow which melts and freezes, so that one day there will be slush and the next day ice.

The temperature varies from perhaps 100 on the hottest day of summer down to below zero in winter. The lowest temperature recorded in Keene is 42 degrees below zero on January 2, 1899. The nights are generally cold, while the days are fairly warm. The difference between the temperature at night and that during the daytime is much greater in Keene than in cities which lie on more level ground.

Through the western part of the town runs the Ashuelot river.* This is a small, rather slow-flowing stream, very muddy and dirty. It takes the sewage of Keene at various points along its course. Some factories are located along its shores, and one obtains water power from it. This factory also pipes the river water for use in case of fire. Since they also use the city water for the same purpose, this constitutes a health menace which will be discussed in more detail later.

Topography

The Ashuelot river is not used for drinking water anywhere along its course. It flows through the towns of Swanzey, Winchester, and Hinsdale, emptying into the Connecticut river at Hinsdale. The course of the river from Keene to the place in Hinsdale where it

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* See map in back of book

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empties into the Connecticut is about eighteen miles long. This is probably sufficient to protect towns using the Connecticut river as a water supply from infection by Keene's sewage; at least no complaints have ever been made to Keene.

About three miles north of the city is Sylvan Lake. This is nested among high hills and has an elevation of 640 feet. It is used as a reservoir. The overflow drains into the Ashuelot river by a small swift-flowing brook.

On the eastern side of the city and roughly parallel to the Ashuelot river runs a small swift-flowing stream in which lurk many wary trout. This is Beaver Brook. In the city proper the stream loses its cleanliness and beauty, and runs through backyards and under side streets; it contains numerous tin cans and other rubbish. It then unites with the Branch, a larger trout stream; this empties into the Ashuelot.

In Swanzey, just south of Keene, is Wilson pond, a body of water about as large as Sylvan Lake. Wilson pond is a pleasure resort for Swanzey and Keene. There is dancing, a small theatre, bathing in summer, and skating in winter. The lake is also used as a source of hydroelectric power.

The city is in a strong financial position, and can well afford any necessary sanitary improvements. The total bonded debt as of December 1, 1923 was $73,000. The total assets were $216,196.24, and total liabilities $163,743,85.

Financial Situation

The balance of assets over liabilities on December 1923 was enough to pay off most of the bonded indebtedness. These assets include only items which the city expects to realize on soon. Keene has a valuation of $16,023,656.00. The public works are valued at $1,000,000. The tax rate is $22.50. Owing to the wide variety of industries in Keene, there has never been a business depression.

There is ample opportunity for growth. At present there are forty manufacturing plants in the city, making twenty-five different lines of goods. The main industry is chair manufacture; there are eight such factories. Freight facilities are excellent; there are three railroads running from the city. Traffic problems are reduced to a minimum by having an unusually wide street in the center of the town. (See first picture.) This is the widest paved street in

the world. Along its two sides and around the triangle which marks its northern limit all the business of Keene is concentrated.

The city has plenty of room, however. There are very few tenements. Houses are not crowded together. Every one lives in a cottage or a farm house. There is ample room for the children to play without getting into the streets. This means fewer accidents, fewer crippled children, and less rickets.

The twenty-three hundred dwellings surround the business district and are in turn surrounded by farms and public parks, of which the city boasts 220 acres. The total area of Keene is thirty-seven square miles.

Main Street from the R.R. Crossing North
Nearly all the Stores are Located along here

Sylvan Lake, Reservoir See page 10

WATER

The waterworks of Keene were established on July 3, 1861. Water was let into the city on November 1869. At that time there were about eight miles of main pipe. The cost of the original system was $82,000. The water system is now valued at $600,000, and is an occasion of some civic pride. They now have about fifty miles of main pipe.

Sylvan Lake

Sylvan Lake (see pictures) was the first reservoir built. It is well-named, as it sets in a hollow in the hills and there is nothing in sight all about it except trees. There is one house on its watershed, and that is kept track of rather closely by the health officer. This house makes use of a septic tank for sewage disposal. The nature of such a tank will be discussed later under the heading of "Sewage". Sylvan Lake, when full, holds about 180,500,000 gallons. It has an area of fifty-one acres, and the area of the watershed is over 1500 acres. When full it is about 155 feet above Central Square and is three miles from it. The main dam is of earth with a central wall or core of stone and cement eighteen inches thick, extending up to about

the height intended for the water in the pond. On the southeast side there is a small earthen dam.

With considerable difficulty I succeeded in surveying the watershed of this lake at first hand. As mentioned before, the edges of the lake are very heavily wooded. There are many brier patches and other difficulties in the way of inspecting this reservoir. There was plenty of evidence of wild life in the wood about it. In many places along its shores there are boulders forming diminutive peninsulas out into the water. Around these there were numerous bait cans and forked sticks. I am indeed sorry for the fishing inspector if he seriously attempt to patrol this reservoir. There is some overflow from the reservoir on the southeast side, where the earthen dam was built, and it is rather swampy. I could not be quite sure whether this swampy land drained into the reservoir or went the other way. The main overflow from the reservoir is by a small stream on the west side. The west side of the reservoir is the one most easily approached from the city. It would be quite easy to patrol this side, as there is a path and the going is fairly smooth.

Beech Hill Reservoir

There is a small reservoir in a ravine on Beech Hill. It has a capacity of fifteen million gallons and a water area of 7¼ acres. It is 110 feet above Central Square. The reservoir was made in 1872 by blocking the ravine with an earthen dam. It is no longer used as a water supply, but might be in an emergency. It is within city limits, and there are houses rather close to it on the east side. These houses are, however, all connected to the sewers. On the eastern side of the reservoir is a park called Robin Hood Forest; this makes a most excellent drainage area for the reservoir, as the forest is fairly well kept and the park is very little used by people. As in the case of Sylvan Lake, evidence of fishing was found. The water in this reservoir is very turbid and would not be desirable for drinking purposes. I ran across a group of boys who had pulled out of the water three mud turtles and a number of small hornpout; it is not the kind of water out of which you would expect to pull a perch.

Owing to the fact that the supply from Sylvan Lake and Beech Hill Reservoir was inadequate for fire protection, 862 acres of land were bought in

Echo Lake

Roxbury and Nelson. This land includes Woodward Pond, which has been renamed Echo Lake. The area of the lake is now about 140 acres. The lake is seven miles from Keene and is 844 feet above Central Square. The water is not taken directly from the lake, but what is needed is obtained by two intercepting dams placed along Roaring Brook, the outlet of the reservoir. The capacity of the lake is 530,000,000 gallons, but the greater part of this is necessarily wasted before collection. The upper intercepting dam on Roaring Brook is three miles from the lake. As there is no facility for storage at this point, a pipe line extends from there over the northern part of Beech Hill to a distributing reservoir which has been built in the course of Beaver Brook. The distributing reservoir is on a level with Sylvan Lake, and it connects as directly as possible with the city mains. As the area of the distributing reservoir is only about half that of Sylvan Lake, this amount of storage seemed inadequate for fire protection and another dam of stone and concrete was built across Roaring Brook two miles below the first dam. This dam is 137

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Sources of Polution

There is no reason to suspect contamination from the watershed of Echo Lake. There is one house on its watershed, and this place uses a septic tank. From a sanitary point of view the method of collection from Roaring Brook is probably quite satisfactory. But of course the turbidity of the water is considerably increased by its passage through Roaring Brook. The other inlet to the distributing reservoir to the northwest of Beech Hill is probably excellent drinking water. It drains a relatively uninhabited region in Gilsum and Sullivan. There is however a remote possibility of contamination from a few farmhouses along the upper part of Beaver Brook. Contamination of Sylvan Lake by sewage is very well guarded against.

In all the reservoirs, in Roaring Brook and in the upper part of Beaver Brook, fishing is practically unchecked. It is unlawful to fish in the reservoirs. Fishing is tacitly permitted in

Beech Hill Reservoir, as that is not used as a water supply. This reservoir is so much neglected that if any occasion should arise for using its water, the health of the city would be very definitely jeopardized. It is shut off from the city mains by a check valve, and if the pressure in the mains gets down to forty pounds the water from Beech Hill is automatically turned on. In the spring of 1924 they were testing out the hydrants in Keene, and the State happened to come round to analyze the water as obtained from a faucet near the point where the Beech Hill Reservoir pipe connects to the mains. They found Bacillus coli fairly abundant in this water, and the water was promptly condemned by the railroad. Signs were put up, warning passengers who transferred at the Union Station to avoid drinking the water. The city felt quite indignant about this, and had many analyses made to prove that the condemning analysis was incorrect; all the samples were reported upon from the various laboratories as quite satisfactory. The railroad has accepted the satisfactory reports and is again using Keene's water. It seems probable that in testing the hydrants in the region of the check valve connecting to the Beech Hill Reservoir the flow through the city mains could not be sufficiently

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To add to the scare from which the city suffered this spring the doctors found that a large number of the people were suffering from diarrhea, and the water supply was blamed for this. It was not possible to collect any statistics on this epidemic, if it was an epidemic. There were no deaths, and no one was seriously ill.

Another possibility for the stray finding of Bacillus coli is in one of the factories located along the Ashuelot River. As mentioned in the introduction, the Ashuelot River is a sewer at this point. As an additional means of fire protection in this factory a private system of hydrants and fire pumps has been installed. This system is supplied with water from the Ashuelot River, also with water from the city mains. The water from the city mains is doubly checked so that the river water cannot go the other way. It is claimed that even if the valves leaked the pressure in the city system would be sufficient to prevent any reversal

of flow, and this is probably true. It seems very unlikely that the water supply should be contaminated from this source.

The Keene water supply is not treated in any way; no chemical or other means of purification is employed.

Interpretation Of Water Analysis

The State analysis of the water is made at irregular intervals (recently it has been made about once a month). Specimens are taken at random points, and brought to Concord for analysis. In addition to these analyses the school physician makes frequent tests of the water. The preceding State analysis was copied from the records of the superintendent of the water works. The red ink shows the printed form; the black indicates the result of this particular analysis.

The measure of turbidity and sediment is as follows:

very slight	1
slight	2
considerable	3
heavy	4

Thus the turbidity is slight to considerable. One of

STATE OF NEW HAMPSHIRE

Sanitary Water Analysis

Concord

April 23, 1924

From Keene Water Works, Keene, N. H.

Serial No. 23385

Supply: City, Court Street (faucet)

Turbidity:	2 to 3
Sediment:	2
Odor:	1
Color:	0.15

(parts per 100,000)

Free NH_3 Nitrogen	0.0010
Alb. NH_3 Nitrogen	0.0076
Nitrate Nitrogen	0.003
Nitrite Nitrogen	none
Chlorides	0.09
Hardness	0.7
Lead	---
Zinc	---
Iron	---
B. coli	1 cc negative 10 cc negative (2 tubes)
Bact. per cc at 37 C	---
Alkalinity	---
Residue on evaporation	---

the causes of this turbidity lies in the fact that a large proportion of the water comes through Roaring Brook (see paragraph entitled "Echo Lake", page 11). This also explains the slight sediment.

Odor is measured according to the following table:

very faint	1
faint	2
distinct	3
decided	4
very strong	5

There is therefore a very faint odor to the water, as shown by this analysis. The most likely explanation of the odor is algae. Sylvan Lake and Echo Lake are not treated in any way to prevent the formation of algae. However I may state from personal experience that there is no disagreeable flavor to the water during the summer months. Perhaps in the spring, when this specimen was taken, the water was not so satisfactory, owing to the spring "overturn" - the water being taken from Sylvan lake about three feet below its surface.

The reservoirs are both surrounded by overhanging trees, and part of the margin of Sylvan Lake, at least, is definitely swampy. This probably accounts

for the faint color noted in the analysis.

Both the ammonia determinations show that the amount of organic pollution of the water is relatively low. In interpreting these figures, however, one must remember that the analysis is based on parts per hundred thousand rather than on parts per million; for instance, the albuminoid ammonia determination indicates 0.076 parts per million. There is reason to suspect that a large part of the albuminoid nitrogen is of vegetable origin. The low percentage of nitrate nitrogen also suggests that the water has never contained much organic matter. Nitrite nitrogen is absent, as it should be. The chlorides are low. This is about the usual figure for good water in this region. The hardness of the water is expressed in parts of calcium carbonate per hundred thousand. Thus it will be seen that the water of Keene is fairly soft water.

The bacteriological examination on this specimen consisted only in a search for bacillus coli. The tube containing 1 cc of the water and the two tubes containing 10 cc each of the sample failed to ferment lactose broth. There being no evidence of contamination from this test, further bacteriological study of

manure
carrier

Dairy of C. S. Fisher The cow barn is between the two silos. The large barn to the right has rooms in the rear for handling the milk

See page 37

An Old Well

See page 21

this sample was omitted.

In conclusion one may justly deduce from this analysis that the water was free from contamination and suitable for drinking purposes.

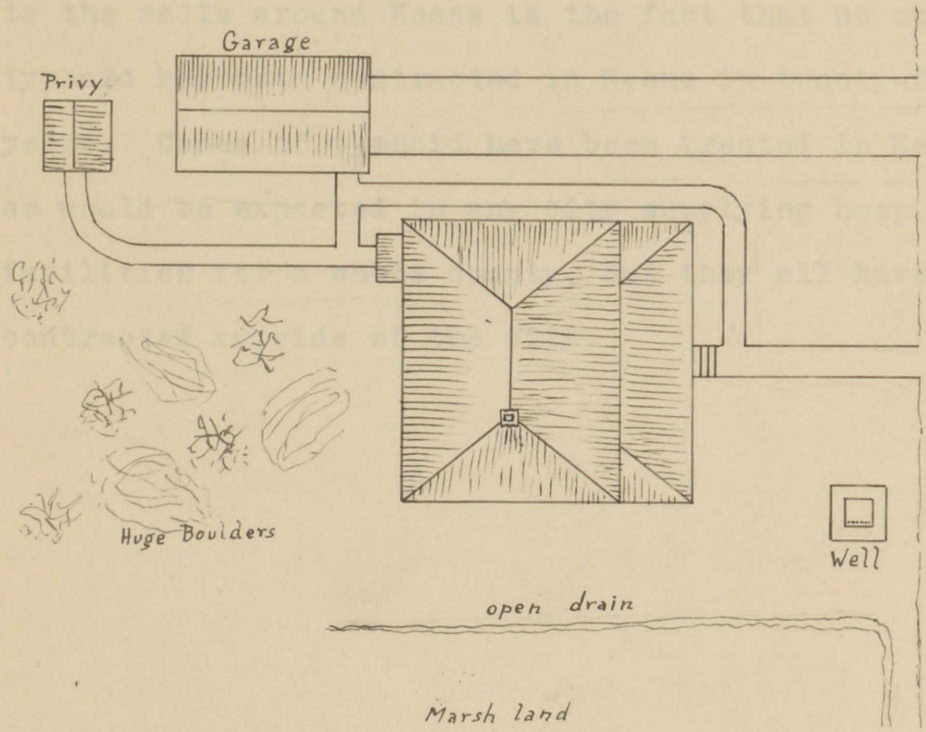
Wells

There are no public and only a few private wells. There are no wells of any kind in the city proper. All the outlying farms are supplied with wells. The nearest wells to the center of the city that I could find were on Rule Street, a little over a mile from the center of the town. Along the east side of this street runs a swamp, and on a margin of this swamp are a number of small, rather shabby wells. (See picture opposite page 20)

Most of the houses along here are on the west side of this street. Nearly all of them have privies; a few have septic tanks. The rock formation is such that although the houses and privies are higher up than the wells there can not be any seepage from one to the other, except by filtration through about fifty to one hundred feet of soil. This would probably be sufficient to keep back any contamination.

As the picture shows, the well is raised up on stones and protected by a wooden box with a hinge cover. Across the cover lies a pole with a hook

lashed to its end. With this they fish for the bucket at the bottom of the well. This picture shows the worst well I could find; and taking that fact into consideration, one must agree that the wells around Keene are not bad.



A well of similar type, but in neater surroundings is shown in the diagram above. This illustrates a rather common arrangement used by the cottagers. The privy is in one extreme corner of the lot at the back of the house, and the well is at the other extreme.

The open drain is evidently designed to prevent seepage from the marsh into the well. There is no danger of seepage from the privy into the drain, owing to the contour of the land.

Perhaps the best compliment that could be given to the wells around Keene is the fact that no case of typhoid has been contracted in Keene in twenty-five years. Cases of typhoid have been treated in Keene, as would be expected in any city supplying hospital facilities for a whole county, but they all have been contracted outside of the city.

SEWAGE

Sewage Disposal

Keene is very fortunately located from the point of view of sewage disposal. Through the western part of the city runs the Ashuelot river. The volume and the velocity of flow of this river, although not great, are ample for the sewage of Keene. As mentioned in the introduction, the water from this river is not used for drinking purposes. The nearest water supply that it could contaminate is that of towns situated along the Connecticut river, more than eighteen miles from Keene. There are five mains and a number of small outlets distributed along the river between West Street and the junction of the Ashuelot river with the "branch." Where the railroad bridges the river there is a distinct odor of sewage due to the fact that the largest main empties just above this point. Except at this one place the dilution is sufficiently prompt to prevent any disagreeable odor.

There are no intercepting sewers along the margin of the river. Perhaps Keene will find it

Suggested Improvement

desirable to build one at the point above mentioned, and carry it down stream as far as Winchester Street. As will be seen from the map, part of the water of the Ashuelot river is diverted by the mills of the Faulkner and Colony Company in such a way that the Ashuelot river is divided into two unequal parts which join about two thousand feet farther down stream. It is into the smaller of these two parts that the largest sewer main of the city empties, and it is only here that the dilution factor is inadequate. An intercepting sewer running to a point just beyond the junction of these two parts of the river could carry away the sewage from the large main.

Method Of Collection

The method of sewage collection used is the separate one, the storm water being carried in relatively large drains, at least in the central part of the city. In the outlying parts of the city there is no need of collecting the street wash. Houses within a hundred feet of the sewer pipes are required to connect with the system. The system is being constantly extended, but has by no means reached its growth as yet. Practically all buildings within a mile of the center of the city use

the public sewage system. December 1, 1923 there were thirty-four miles of mains and laterals in use.

The trade sewage offers no particular problems. Woodworking is the chief industry, and there is no waste from this trade that is carried off by the sewers.

Other Methods Of Disposal

In Keene, and throughout New Hampshire for that matter, a large proportion of the people live in scattered farmhouses which it is not practicable to connect with the sewers. There are two main methods for disposing of this sewage. Those houses which lie beyond the reach of the water supply usually depend upon the dry disposal method, the common privy. The policy of the Board of Health in Keene is to require that any farmer or any citizen whose privy constitutes a sanitary nuisance shall install a septic tank.

The State Board of Health in a special bulletin defines the septic tank as follows: "A plain rectangular tight box, preferable made of concrete, five to six feet deep and with a length at least one and a half times the breadth, receiving only domestic sewage, which enters by an inlet pipe submerged about 24 inches below the surface of the tank contents, and the public sewage system. December 1, 1922 there were thirty-four miles of mains and laterals in use.

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Septic Tanks

which has a slow and regular flow to the outlet pipe, which is also submerged about 24 inches. The effluent from a tank in proper action is but little discolored, carries no solid matter and has scarcely any odor. A discharge underground, where there is good drainage, is to be preferred. The cover of such a tank must be at least one foot above the scum which forms, and must be tight enough to exclude light, and so that the gas pressure from within will exclude the air. At least one opening, or manhole, should be made in the cover so as to give access to the inside when necessary, but this must be closed and no vent in the cover allowed."

Efficiency

The Board of Health requires that these tanks be suitably constructed to allow of anaerobic digestion of the sewage without stagnation. During the year 1923 fifteen privies caused complaint, and the health officer ordered that nine of them be replaced by septic tanks.

The efficiency of Keene's sewage is excellent for the community which it serves, but it does not serve as much of Keene as it should. Of course this feature is being constantly remedied. There

have been no complaints about the sewage disposal from towns situated along the course of the Ashuelot river below Keene; nor has Keene experienced any serious difficulties in making the system work. The grades can be made sufficient to prevent blocking.

Summary And Criticism

In general it may be said that Keene's system of public sewage disposal is a very satisfactory one as far as it goes. The system of dilution employed is quite successful, with the one exception noted in regard to the large outlet near the railroad bridge. The vigilance of the health officer gives assurance that the best possible provision will be made for the sewage disposal of those who cannot connect with the system. The use of septic tanks draining into the loose sand, which is so abundant in New Hampshire, is a very satisfactory way out of the problem of private sewage disposal.

GARBAGE, REFUSE, AND ASHES

Disposal Of Garbage And Refuse

In 1916 the Jarvis Engineering Company installed a destructor furnace for the disposal of waste materials, an incinerator plant being erected by the city at the city pasture at an expense of $4,200. The city pasture is a little over a mile to the south of the center of the city.

The capacity of the incinerator is one cord an hour. It consists of a large brick furnace which has openings on one side for removing ashes. This furnace is set into the basement of a small building. The trucks carrying the rubbish can be driven into the building, where the rubbish is dumped onto a cement floor. From this point the rubbish is shoveled through a large, round opening into the furnace below. Enough wood is included in the rubbish to secure a hot fire. Most of the time the hole in the floor is closed, but even when it is open there is no disagreeable odor. The fire is sufficiently hot to cause complete combustion. The upper picture opposite page 31 shows the appearance of the incinerator room about fifteen minutes after a load of

garbage has been dumped. The boxes around the side of the room are put into the furnace a few at a time together with the less combustible material, and at this particular time several had accumulated. It is evident from the picture that the incinerator, as it is run here, furnishes a very satisfactory method of taking care of garbage.

The one difficulty about this system at present lies in the method of collection. Each person from whom garbage is collected has to pay for the service.

Method Of Collection

The garbage is collected twice a week by a private truckman. The collection of burnable refuse is by no means complete, but in a rural community of this type there is adequate and satisfactory means of disposing of such rubbish on the premises.

Ashes are left by the dwellers along the edge of the highway and are collected free of charge by the Highway Department, and used for construction purposes. The ashes from the incinerator are sold for fertilizer.

Although the method of collection is such that people cannot be compelled to dispose of the rubbish through the incinerator, the method works out very garbage has been dumped. The boxes around the side of the room are put into the furnace a few at a time together with the less combustible material, and at this particular time several had accumulated. It is evident from the picture that the incinerator, as it is run here, furnishes a very satisfactory method of taking care of garbage.

The one difficulty about this system at present lies in the method of collection. Each person from whom garbage is collected has to pay for the service.

Method Of Collection

The garbage is collected twice a week by a private truckman. The collection of burnable refuse is by no means complete, but in a rural community of this type there is adequate and satisfactory means of disposing of such rubbish on the premises.

Ashes are left by the dwellers along the edge of the highway and are collected free of charge by the Highway Department, and used for construction purposes. The ashes from the incinerator are sold for fertilizer.

Although the method of collection is such that people cannot be compelled to dispose of the rubbish through the incinerator, the method works out very

Criticism

well in practice. Under the present conditions it seems to me that Keene has handled the problem better than most small cities. Of course in a small community of more or less scattered dwellings it would be surprising if the problem of garbage disposal were difficult to handle.

Interior of Incinerator Plant See page 29

Factories of the Norwood Calef Company See pages 47 to 53

6784

State of New Hampshire

CERTIFICATE OF BIRTH

Child's Name..

Date of Birth..

Place of Birth..

Sex,.......Color,........Living or Stillborn,........

No. of Child, 1st, 2d, etc..............................

Father's Name..

" Birthplace..................................

" Color................ Age................

" Residence..................................

" Occupation..................................

Mother's Maiden Name..............................

" Birthplace..................................

" Color................ Age................

" Occupation..................................

Signature and address of Physician (or other person) reporting said Birth.

....

....

Date.................................... (Over)

CERTIFICATE OF BIRTH

Child's Name ....

Date of Birth ....

Place of Birth ....

Sex, ...Color, ...Living, or Stillborn ....

No. of child, 1st, 2d, etc. ....

Father's Name ....

" Birthplace ....

" Color .... Age ....

" Residence ....

" Occupation ....

Mother's Maiden Name ....

" Birthplace ....

" Color .... Age ....

" Occupation ....

Reported by ....

STATE OF NEW HAMPSHIRE

I hereby certify that the above birth record has been recorded according to law.

....

Clerk of ....

Date .... [OVER]

This certificate assures both child and parents legal proof of the age and nationality of the child as often becomes necessary.

The record of a birth is required by many corporations before employment is given; is necessary to allow school children of a certain age to be employed during vacation periods; is required in civil service examinations, appointment to certain civil and military positions, to establish property, pension, insurance, citizenship and various other rights.

If there are any omissions or errors in this certificate, take it back to the clerk for correction.

Be sure the child's name is correctly given in full.

5621

EXTRACTS FROM THE PUBLIC STATUTES.
Chapter 173.

Section 1. * * *

1. The record of a birth shall state its date and place of occurrence, full Christian and surname (if named), color and sex of child, whether living or stillborn, and the full Christian and surnames, color, occupation, residence, and birthplace of parents.

Sect. 2. **The attending physician, accoucheur, mid-wife, or other person in charge, who shall attend, assist, or advise at the birth of any child, living or stillborn, within the limits of a town or city in this state, shall report to the clerk of such town within six days thereafter all the facts required by section one of this chapter regarding the birth.**

SECT. 8. The clerk of every town shall . . . . transmit the names, residences, and official stations of all persons who have neglected to make to him the returns required by law relating to the subject-matter of such records.

Sect. 11. Any person who shall **neglect** or refuse to perform a duty imposed upon him by the provisions of this chapter, shall be fined not exceeding fifty dollars for each offense, for the use of the town in which the offense was committed, and it shall be the duty of the registrar of vital statistics to enforce this section.

NOTE—It is expected that town and city clerks will keep on hand a supply of these blanks; but should any physician prefer, they may be obtained by addressing the Department of Vital Statistics, Concord, N. H., stating number required, etc.

(Over)

Keene, ______________________

Mr. ______________________________________

Dear Sir:

Please insert the name of your ______________________ child, born on the ______________ day of ______________________, omitted by the physician reporting the birth, and return this slip to the city clerk, to complete the record.

Respectfully,

FRANK H. WHITCOMB, City Clerk.

Name of Child in full: ______________________________________

Groom..

Bride..

Residence of Groom..

" Bride..

Age of Groom..

" Bride..

Color of Groom..

" Bride..

Occupation of Groom..

" Bride..

Birthplace of Groom..

" Bride..

No. of Marriage of Groom..

" Bride..

Groom Widowed or Divorced..

Bride " " "..

Intention Filed..

By whom Married *..

Residence..

Official Station..

Date of Marriage..

Place..

*Clergyman or Justice of the Peace.

[Record continued over]

6500

Undertaker.

1874

PERMIT FOR BURIAL.

OFFICE OF THE BOARD OF HEALTH

Keene, N. H., ... *1924.*

Permission is hereby given for the burial of the remains of

...., *age* .... *years,* .... *months,*

.... *days, who died at* ...., ... *1924,*

of .... *in* .... *Cemetery,* ....

By Direction of the Board of Health,

This permit must accompany the body to its destination.

.... *Agent.*

[Record continued.]

GROOM'S FATHER AND MOTHER.

Father's Name ....

" Residence ....

" Age*........................Color................................

" Occupation ....

" Birthplace..

Mother's Name ....

" Residence ....

" Age*........................Color................................

" Occupation..

" Birthplace ....

BRIDE'S FATHER AND MOTHER.

Father's Name..

" Residence..

" Age*........................Color................................

" Occupation..

" Birthplace..

Mother's Name ....

" Residence ....

" Age*........................Color................................

" Occupation ....

" Birthplace ....

THE STATE OF NEW HAMPSHIRE

I hereby certify that the above marriage record is correct to the best of my knowledge and belief.

....

Clerk of..

Date..

---

*If deceased, give age at death.

APPLICATION for the Disinterment

Of the body of..

....

now lying in.......................................Cemetery

Town of...N. H.

Date of Death: Year,.........Month,.........Day,.........

Age: Years,...........Months,...........Days,...........

Place of Birth,...

Date of Birth: Year,.........Month,.........Day,.........

Sex,............Color,.......... Married, Single, Widowed or Divorced. ....

Occupation,...

Cause of Death,...

Place of Death,...

The body is to be removed by

....

(State whether by railroad or by private conveyance.)

To..Cemetery

Town of...

State of..

To whom shall permit be sent?

....

P. O. Address,..

....

Applicant.

P. O. Address,..

....

Date............................19....

(OVER)

INSTRUCTIONS

This application must be sent in a long envelope (*not* folded), as it is to be preserved among the permanent records of the state.

The penalty for digging up, disinterring, removing or carrying away any human body without lawful authority, is imprisonment not exceeding one year, or a fine not exceeding two thousand dollars, or both.

A separate application must be made for each body.

Names of persons and places must be written so plainly that no mistakes can be made in the permit.

A body deposited in a receiving tomb may be removed therefrom for interment in any cemetery in the same, or adjacent, town or city upon a permit issued by the proper local authorities (the town clerk in towns, the board of health in cities), provided the removal is by *private conveyance*.

RULE 8. Every disinterred body, dead from any disease or cause, shall be treated as infectious or dangerous to the public health, and shall not be accepted for transportation unless said removal has been approved by the state or provincial health authorities having jurisdiction where such body is disinterred, and the consent of the health authorities of the locality to which the corpse is consigned has first been obtained; and all such disinterred remains, or the coffin or casket containing the same, must be wrapped in a woolen blanket thoroughly saturated with a 1-1000 solution of corrosive sublimate and enclosed in a hermetically soldered zinc, tin, or copper-lined box. But bodies deposited in receiving vaults shall not be treated and considered the same as buried bodies, when originally prepared by a licensed embalmer as defined in Rule 2, and as directed in Rule 2 or 3 (according to the nature of the disease causing death), provided shipment takes place within thirty days from the time of death. The shipment of bodies prepared in the manner directed by licensed embalmers from receiving vaults may be made within thirty days from the time of death without having to obtain permission from the health authorities of the locality to which the body is consigned. After thirty days the casket or coffin box containing said body must be enclosed in a hermetically soldered box.

Bodies dead of scarlet fever, diphtheria, or other dangerous communicable disease, must not be placed in a receiving tomb unless they have been previously prepared by a licensed embalmer in accordance with the requirements of Rule 2 of the "Official Order Concerning the Transportation of the Dead."

Bodies that have been buried must not be disinterred except in accordance with a permit issued by the State Board of Health, and also by the proper local authority.

Address:
STATE BOARD OF HEALTH,
Concord, N. H.

2655

Sample

6051

Certificate of Death

Name, Jones, John Henry

Place of Death, Elliot City Hospital

No. 301 Main Street

Ward, 1 Village, Keene, N.H.

How long a resident, Four months

Previous residence, Swanzey, N.H.

If death occurred at an institution give name of same

Elliot City Hospital

How long an inmate, Four months

Where from, 217 Graves Rd., Swanzey N.H.

Date of Death: Year, 1924 Month July Day, 12

Age: Years, 52 Months, 4 Days, 5

Place of Birth, Swanzey, N.H.

Date of Birth: Year, 1872 Month March Day, 7

Sex, Male Color, White Divorced, Widowed or Married, Single, Married

Occupation, Farmer

Cause of Death, Diabetes Mellitus

Duration, five years

Contribution Cause, Carbuncle of neck

Duration, One month

(Record continued over)

Name of Father Henry Samuel Jones

Maiden Name of Mother Mary Ida Smith

Birthplace of Father Swanzey N. H.

Birthplace of Mother, Swanzey N. H.

Occupation of Father Farmer

Deceased was ~~wife of~~ Husband of

Mary Jane (Taylor) Jones

~~Widow of~~

Roscoe W. Myers M. D.

P. O. Address, Harvard Medical School
Boston, Mass

Place of Interment, Lot No. 287

Date of Interment, July 16, 1924

Name of Cemetery, Woodlawn Cemetery

John J. Brown, Undertaker

P. O. Address Keene, N. H.

The State of New Hampshire

Report to the STATE BOARD OF HEALTH, CONCORD, N. H., of diseases named below in

....

for week ending Saturday, ...

Signed, ...

Names of Diseases	Sick at last report	During the Week			Sick at close of week	Infected houses
		Taken Sick	Recovered	Died		
Anterior poliomyelitis (INFANTILE PARALYSIS)						
Cerebro-spinal meningitis						
Chancroid						
Chicken pox						
Diphtheria						
German measles						
Gonococcus infections						
Infectious diseases of the eye						
Ophthalmia neonatorum						
Trachoma						
Influenza						
Measles						
Mumps						
Pneumonia, acute, lobar						
Scarlet fever						
Septic sore throat						
Smallpox						
Syphilis						
Tuberculosis all forms						
Typhoid fever, and paratyphoid fever						
Whooping cough						

(OVER)

The following diseases are also reportable and should be reported upon the space below:

Actinomycosis, Acute infectious conjunctivitis, Anthrax, Asiatic cholera, Dengue, Dysentery (amebic), Dysentery (bacillary), Favus, Glanders, Hookworm disease, Leprosy, Malaria, Pellagra, Plague, Rabies (dog bite), Rocky Mountain Spotted Fever, Tetanus, Trichinosis, Typhus Fever, Yellow Fever, Continued Fever lasting seven days.

PULMONARY CONSUMPTION, DEATHS REPORTED

REMOVALS

6955

TABLE No 1

Date	Population	Living Births	Birth Rate (per 1000 estimated population)	Deaths under one year	Infant Mortality Rate	Deaths	Death Rate
1880	6,786						
1881	6,852						
1882	6,918	143	20.81			136	19.64
1883	6,984	107				68	
1884	7,050	159	22.63			125	17.62
1885	7,116	152	21.40			114	15.80
1886	7,182	129	17.81			125	17.22
1887	7,248	131	17.91			132	18.05
1888	7,314	147	20.06			95	12.40
1889	7,380	130	15.62			135	16.29
1890	7,446	158	21.22			156	21.08
1891	7,618	162	21.35			126	16.62
1892	7,790	150	19.34			138	17.81
1893	7,962	151	19.08			159	20.15
1894	8,134	114	13.71			116	14.18
1895	8,306	148	17.87			126	15.22
1896	8,478	131	15.19			111	12.81
1897	8,650	144	16.54			133	16.26
1898	8,822	142	15.87			152	14.73
1899	8,994	168	18,83			133	14.60
1900	9,165	158	17.23			131	14.29
1901	9,255	162	17.47			169	18.28
1902	9,345	203	21.75			126	12.71
1903	9,435	166	17.51			132	13.84
1904	9,525	174	18.18			150	15.62
1905	9,615	165	17.00			168	17.38
1906	9,705	154	15.60			166	16.97
1907	9,795	203	20.74			180	18.48
1908	9,885	201	20.33			159	15.79
1909	9,975	197	19.69			145	14.13
1910	10,065	204	20.27	22	107.86	178	17.67
1911	10,180	207	20.30	17	82.12	181	17.81
1912	10,294	248	24.13	26	104.83	187	18.15
1913	10,409	253	24,42	21	83.00	192	18.46
1914	10,523	250	23.83	18	72.00	156	14.86
1915	10,638	249	23.48	23	91.96	157	14.81
1916	10,752	226	20.94	16	70.79	170	15.74
1917	10,867	227	20.79	21	92.50	195	18.78
1918	10,981	229	19.91	19	82.53	275	25.00
1919	11,096	185	16.12	12	70.27	170	15.32
1920	11,210	244	21.77	24	98.41	227	20.27
1921	11,350	248	21.94	13	52.41	193	17.00
1922	11,500	257	22.50	21	81.71	181	15.73
1923	11,700	255	22.10	13	50.98	171	14.62

Analysis of Table 1

Table 1 includes some of the vital statistics of Keene from the year 1880 to 1923. From 1884 on, each year includes from December first of the preceding year to December first of the year indicated under the heading "date." The year 1883 includes only nine months, owing to a change in the time of year on which statistics were calculated.

The population figures are taken from the census on the census years. The population for the other years was estimated by the arithmetical method. All rates are calculated from the estimated population for the year, not on the preceding census.

Only the living births are charted; the still births and miscarriages are not sufficiently well reported to be of any statistical value. A glance at the next column headed "birth rate" will show that on the whole the birth rate has been definitely higher since 1907. The explanation for this fact probably lies far more in the reporting of births than in any increase in the birth rate. The city clerk of Keene considers that the births in the city are rather poorly reported. There is a fine of from ten to fifty dollars for a failure to report

a birth; this probably is not enforced as often as it should be.

I had great difficulty in collecting statistics on infant mortality. I could not find any separate list of deaths under one year, and it was necessary to pore through the list of all deaths as published in the annual reports. I carried this back as far as 1910 and then stopped, feeling that the births before this date were too poorly reported to permit of any accurate statistics on infant mortality. The infant mortality rate is based on deaths under one year per thousand living births.

Deaths are better reported than births. It will be noted that the largest number of deaths in any one year occurred in 1918, the year of the influenza epidemic. The death rate for that year is decidedly higher than that for any other year. It will be noted also that the death rate is decidedly lower than the birth rate, especially in recent years when the births have been more thoroughly reported. This fact indicates that a large part of Keene's growth in population is natural growth; that is, it is not due to immigration.

TABLE No 2

Date	Population	Deaths	Typhoid Fever		Tuberculosis (all forms)			Measles	
			Deaths	Rate	Deaths	Rate	Case Fatality	Deaths	Rate
1900	9,165	131	0		14	152.75	11.46	0	
1901	9,255	169	2	21.61	17	183.60	10.65	0	
1902	9,345	126	1	10.70	5	53.50	4.16	1	10.70
1903	9,435	132	0		7	74.19	6.06	0	
1904	9,525	150	0		14	146.87	9.33	0	
1905	9,615	168	3	31.20	13	125.20	8.92	2	20.80
1906	9,705	166	1	10.30	9	92.74	5.42	0	
1907	9,795	180	1	10.21	9	91.89	5.00	0	
1908	9,885	156	0		7	70.81	4.40	1	10.12
1909	9,975	145	0		12	120.20	8.27	0	
1910	10,065	178	3	27.12	9	64.27	5.05	0	
1911	10,180	181	2	19.02	5	49.05	2.76	0	
1912	10,290	187	2	19.44	9	87.48	4.81	1	9.72
1913	10,409	192	4	38.20	7	66.85	3.64	0	
1914	10,523	156	1	9.50	12	114.00	7.69	0	
1915	10,638	157	1	9.40	9	21.60	5.73	0	
1916	10,752	170	1	9.30	7	65.10	4.11	0	
1917	10,867	195	2	18.40	8	73.60	4.10	2	18.40
1918	10,981	275	1	9.10	5	45.50	2.18	0	
1919	11,096	170	0		2	18.02	1.17	0	
1920	11,210	227	0		8	71.26	3.52	0	
1921	11,350	193	0		11	96.91	5.73	0	
1922	11,500	181	0		8	69.56	4.42	0	
1923	11,700	171	1	8.54	7	59.78	4.09	0	

Analysis of Table 2

The specific mortality rate for typhoid, tuberculosis and measles are included under "Table 2," along with the statistics from which these rates were calculated. As in the other table, the population is estimated by the arithmetical method, except for the census years. It will be noticed that there are a number of deaths from typhoid. All of these cases are explained by the fact that Keene has the only hospital in the county, the Eliott City Hospital. A few of these cases occurred in residents of Keene who had contracted the disease outside. As stated on page 23, no cases of typhoid have been contracted in Keene for twenty-five years.

It will be seen at a glance that tuberculosis is a far more frequent cause of death in Keene than are both typhoid and measles put together. It is difficult to drawn any conclusion from the fluctuations in the specific mortality rate of tuberculosis, but it does seem that the rates have averaged somewhat lower in the last ten years than in the preceding ten years

Measles is not very frequently a cause of death, as the long row of ciphers indicates. Since 1900 there have been only seven deaths from measles in Keene.

Analysis of Table 2

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CITY OF KEENE

APPLICATION FOR MILK LICENSE

ALL LICENSES EXPIRE ON THE THIRTY-FIRST DAY OF MAY OF EACH YEAR

Application No.................. License No..................

Application made by...

Street and Number ....

Application received... ....192...

License issued...192...

Number of cows under local test...

Number of cows under Federal test..

Date of last test..

Number of reactors in last test ....

Daily production of milk...

Amount of milk sold to dealers..

Amount of milk sold to retail trade..

Complete list of dealers from whom milk is purchased for purposes of sale

NAMES	ADDRESSES

Complete list of dealers to whom milk is sold

NAMES	ADDRESSES

Place at or from which milk is to be sold...

Raw.. Pasteurized...

Does applicant desire to sell as principal or agent.....................................

If as agent, give name of principal ....

Signature of Applicant...

Date...

A certificate signed by a registered veterinary showing the result of the tuberculin test on any cow, the milk from which is to be sold in Keene, must be filed with the Board of Health.

A certificate signed by a registered veterinary showing the result of the tuberculin test on any cow, the milk from which is to be brought into Keene from any source to be sold in Keene, must be filed with the Board of Health.

Such certificate shall, in all cases, include a chart showing in full detail the reaction of each cow subjected to the tuberculin test.

Each cow tuberculin tested and found free from disease shall be marked with a numbered ear tag, furnished by the Board of Health, and a list of the numbers on such tags shall be filed with the Board of Health.

BOARD OF HEALTH

Per FRED C. NIMS, Health Officer.

1874

CITY OF KEENE

MILK LICENSE

BOARD OF HEALTH **KEENE, N. H.**

Application No.__________ Date__________

This Certifies that__________

Address__________

License No.__________

is hereby licensed to engage in the business of selling and distributing milk and cream (raw or pasteurized) in the City of Keene from store or wagons for a period of one year from the date hereof, unless this license shall sooner be revoked.

This license is issued upon condition that it may at any time be revoked at the pleasure of the Board of Health and upon the further condition that the licensee personally, or by his agents, servants or employees, shall in all respects comply with the ordinances and regulations now in force, or which may hereafter be adopted, and that he will comply with all the orders which may from time to time be made by the Board of Health pertaining to such business.

Dated at Keene, N. H., this__________day of__________192__

BOARD OF HEALTH

Per__________

Health Officer

BOARD OF HEALTH

SANITARY INSPECTION OF DAIRY FARMS.

SCORE CARD.

Indorsed by the Official Dairy Instructors' Association.

Owner or lessee of farm C. S. Fisher

P. O. address 332 Winchester St. State Keene, N. H.

Total number of cows Thirty-nine Number milking Twenty-nine

Gallons of milk produced daily About 100 gallons

Product is sold by producer in families, ~~hotels~~, ~~restaurants~~, one store~~s~~,

to no dealer.

For milk supply of Keene, N. H.

Permit No. 40 Date of inspection June 18, 1924

REMARKS: no minors employed. All milk sold "raw." Delivered twice a day.

(*Signed*) Roscoe W. Myers

Inspector.

HOBBS & WARREN PUBLISHERS BOSTON FORM 440-2

EQUIPMENT.	SCORE.	
	Perfect.	Allowed.
COWS.		
Health	6	6
Apparently in good health.... 1		
If tested with tuberculin within a year and no tuberculosis is found, or if tested within six months and all reacting animals removed.... 5		
(If tested within a year and reacting animals are found and removed, 3.)		
Food (clean and wholesome)	1	1
Water (clean and fresh)	1	1
STABLES.		
Location of stable	2	2
Well drained ✓ 1		
Free from contaminating surroundings ✓ 1		
Construction of stable	4	3½
Tight, sound floor and proper gutter ✓ 2		
Smooth, tight walls and ceiling ✓ 1		
Proper stall, tie and manger ½ 1		
Provision for light: Four sq. ft. of glass per cow 120/30 = 4	4	4
(Three sq. ft., 3; 2 sq. ft., 2; 1 sq. ft., 1. Deduct for uneven distribution.)		
Bedding	1	1
Ventilation,	7	4½
Provision for fresh air, controllable flue system 1½ 3		
(Windows hinged at bottom, ✓ 1.5; sliding windows, 1; other openings, 0.5.)		
Cubic feet of space per cow, 500 ft 597 feet ✓ 3		
(Less than 500 ft., 2; less than 400 ft., 1; less than 300 ft., 0.)		
Provision for controlling temperature 0 1		
UTENSILS.		
Construction and condition of utensils very good	1	1
Water for cleaning	1	1
(Clean, convenient, and abundant.)		
Small-top milking pail mostly mechanical	5	4
Milk cooler	1	1
Clean milking suits	1	3/4
MILK ROOM OR MILK HOUSE.		
Location: Free from contaminating surroundings	1	1
Construction of milk room	2	2
Floor, walls, and ceiling 1		
Light, ventilation, screens 1		
Separate rooms for washing utensils and handling milk	1	1
Facilities for steam	1	1
(Hot water, 0.5.)		
Total	40	35¼

METHODS.	SCORE.	
	Perfect.	Allowed.
COWS.		
Clean	8	3
(Free from visible dirt, 6.)		
STABLES.		
Cleanliness of stables	6	5
Floor ✓ 2		
Walls ✓ 1		
Ceiling and ledges ✓ 1		
Mangers and partitions ½ 1		
Windows ½ 1		
Stable air at milking time	5	5
Freedom from dust ✓ 3		
Freedom from odors ✓ 2		
Cleanliness of bedding	1	1
Barnyard	2	1½
Clean 1		
Well drained 1		
Removal of manure daily to 50 feet from stable not 50 feet	2	1
MILK ROOM OR MILK HOUSE.		
Cleanliness of milk room	3	3
UTENSILS AND MILKING.		
Care and cleanliness of utensils	8	7
Thoroughly washed ✓ 2		
Sterilized in steam for 15 minutes 3		
(Placed over steam jet, or scalded with boiling water, 2.) ✓		
Protected from contamination ✓ 3		
Cleanliness of milking	9	3½
Clean, dry hands ✓ 3		
Udders washed and wiped ½ 6		
(Udders cleaned with moist cloth, 4; cleaned with dry cloth or brush at least fifteen minutes before milking, 1.)		
HANDLING THE MILK.		
Cleanliness of attendants in milk room	2	2
Milk removed immediately from stable without pouring from pail	2	1
Cooled immediately after milking each cow	2	2
Cooled below 50° F	5	5
(51° to 55°, 4; 56° to 60°, 2.)		
Stored below 50° F	3	3
(51° to 55°, 2; 56° to 60°, 1.)		
Transportation below 50° F	2	2
(51° to 55°, 1.5; 56° to 60°, 1.)		
(If delivered twice a day, allow perfect score for storage and transportation.) ✓		45
Man in charge worked on test dairy producing certified milk		6
Total	60	51

Equipment 35¼ + Methods 51 = 86¼ **Final Score.**

NOTE 1.—If any exceptionally filthy condition is found, particularly dirty utensils, the total score may be further limited.

NOTE 2.—If the water is exposed to dangerous contamination, or there is evidence of the presence of a dangerous disease in animals or attendants, the score shall be 0.

BOARD OF HEALTH

SANITARY INSPECTION OF DAIRY FARMS.

SCORE CARD.

Indorsed by the Official Dairy Instructors' Association.

Owner or lessee of farm C. C. Worcester

P. O. address 37 Leverett St. State Keene, N. H.

Total number of cows Twenty Number milking Fifteen

Gallons of milk produced daily Forty-five

Product is sold by producer in families, ~~hotels~~, restaurants, ~~stores~~, to no dealer.

For milk supply of Keene, N. H.

Permit No. 100 Date of inspection June 17, 1924

REMARKS: About ten cans a day are purchased. Some of this and all that produced at this dairy is sold whole. The remainder of the purchased milk is separated.

The score has been marked down rather harshly because a boy with apparently no sense of cleanliness is employed to handle the milk.

(Signed) Roscoe W. Myers.
Inspector.

HOBBS & WARREN PUBLISHERS BOSTON FORM 440-2

EQUIPMENT.	SCORE.	
	Perfect.	Allowed.
COWS.		
Health	6	6
Apparently in good health ✓ 1		
If tested with tuberculin within a year and no tuberculosis is found, or if tested within six months and all reacting animals removed ✓ 5		
(If tested within a year and reacting animals are found and removed, 3.)		
Food (clean and wholesome)	1	1
Water (clean and fresh)	1	1
STABLES.		
Location of stable	2	1/2
Well drained 1		
Free from contaminating surroundings 1		
Construction of stable	4	2
Tight, sound floor and proper gutter 2		
Smooth, tight walls and ceiling 1		
Proper stall, tie and manger 1		
Provision for light: Four sq. ft. of glass per cow	4	1/2
(Three sq. ft., 3; 2 sq. ft., 2; 1 sq. ft., ✓ 1. Deduct for uneven distribution.)		
Bedding shavings not liberal	1	1/2
Ventilation,	7	3
Provision for fresh air, controllable flue system 3		
(Windows hinged at bottom, 1.5; sliding windows, ✓ 1; other openings, 0.5.)		
Cubic feet of space per cow, 500 ft 3		
(Less than 500 ft., ✓ 2; less than 400 ft., 1; less than 300 ft., 0.)		
Provision for controlling temperature 0 1		
UTENSILS.		
Construction and condition of utensils hard to keep clean	1	1/2
Water for cleaning	1	1
(Clean, convenient, and abundant.)		
Small-top milking pail mechanical	5	5
Milk cooler separate sink, ice water	1	1
Clean milking suits	1	
MILK ROOM OR MILK HOUSE.		
Location: Free from contaminating surroundings stable over	1	0
Construction of milk room	2	1
Floor, walls, and ceiling 3/4 1		
Light, ventilation, screens 1/4 1		
Separate rooms for washing utensils and handling milk	1	1
Facilities for steam	1	1/4
(Hot water, 0.5.)		
Total	40	24 1/4

METHODS.	SCORE.	
	Perfect.	Allowed.
COWS.		
Clean	8	0
(Free from visible dirt, 6.)		
STABLES.		
Cleanliness of stables	6	1
Floor foul 2		
Walls dirty 1		
Ceiling and ledges dirty 1		
Mangers and partitions foul 1		
Windows dirty 1		
Stable air at milking time	5	3
Freedom from dust 3 3		
Freedom from odors 0 2		
Cleanliness of bedding dirty	1	0
Barnyard	2	1/2
Clean 0 1		
Well drained 1/2 1		
Removal of manure ~~daily~~ to 50 feet from stable	2	1/2
MILK ROOM OR MILK HOUSE.		
Cleanliness of milk room boy employed dirty	3	0
UTENSILS AND MILKING.		
Care and cleanliness of utensils	8	3
Thoroughly washed ✓ 2		
Sterilized in steam for 15 minutes 0 3		
(Placed over steam jet, or scalded with boiling water, 2.) 0		
Protected from contamination ? 3		
Cleanliness of milking	9	3
Clean, dry hands ? 2 3		
Udders washed and wiped ~~6~~		
(Udders cleaned with moist cloth, 4; cleaned with dry cloth or brush at least fifteen minutes before milking, 1.) 1.		
HANDLING THE MILK.		
Cleanliness of attendants in milk room boy 0	2	0
Milk removed immediately from stable without pouring from pail	2	2
Cooled immediately after milking each cow	2	2
Cooled below 50° F.	5	5
(51° to 55°, 4; 56° to 60°, 2.)		
Stored below 50° F.	3	3
(51° to 55°, 2; 56° to 60°, 1.)		
Transportation below 50° F.	2	1
(51° to 55°, 1.5; 56° to 60°, 1.)		
(If delivered twice a day, allow perfect score for storage and transportation.)		
Total	60	24

Equipment 24 1/4 + Methods 24 = 48 1/4 **Final Score.**

NOTE 1.—If any exceptionally filthy condition is found, particularly dirty utensils, the total score may be further limited.

NOTE 2.—If the water is exposed to dangerous contamination, or there is evidence of the presence of a dangerous disease in animals or attendants, the score shall be 0.

MILK

Dairy Inspection

Two dairy farms supplying milk for the city of Keene have been inspected and scored. The score of the dairy run by C. C. Worcester indicated a poor dairy. This man could have an excellent equipment, but due to carelessness or ignorance of sanitation his dairy scores as low as 48.25%. The other dairy is owned and run by an intelligent, practical dairyman, C. S. Fisher. This dairy scores 86.25%. The upper picture opposite page 20 shows the windows -- which are just barely enough for proper light requirement --, the carrier for manure -- which should have been extended farther from the stable to meet the requirements of the score card --, and also the sound construction of roofs and walls employed on this farm. In spite of the score which I have given these two dairies, Keene is fairly well off as far as milk is concerned. The dairy of C. C. Worcester I inspected after inquiring of a number of disinterested citizens what milkman had the worst milk. The other dairy farm I inspected at the suggestion of the health officer.

Keene does not ship out any milk, nor do they

Regulations Adopted by the Board of Health January 13, 1922, in Addition to Chapter Thirty-seven of the City Ordinances, Pertaining to the Production, Care and Sale of Milk in the City of Keene.

(1) Any person desiring to engage in the sale or distribution of milk, skim-milk, or cream, within the City of Keene, must make application to the Board of Health. Upon blanks to be furnished by the board, setting forth the locality from which such persons procure the milk, skim-milk or cream, and also a full and complete list of the names and addresses of those from whom he purchases said milk, skim-milk or cream. Said application shall state the place at or from which the milk, skim-milk, or cream is to be sold, and shall also state whether the applicant desires to sell or distribute as principal or as agent, and, if as agent, give the name of his principal. It shall be signed by the applicant, and if granted by the Board of Health, a license shall be issued to him.

(2) Applications for license must be filed not later than the 15th day of May of each year, provided, however, that persons desiring to commence the business of selling milk, skim-milk, or cream, may make application for license at any time, but, in every case, new applications must be filed not later than the 15th day of May of each year.

(3) No person licensed by the Board of Health to sell or distribute milk, skim-milk, or cream shall add any dairy to his source of supply without the written permission of the Board or its agent. Any such persons shall immediately withdraw from the city, any supply, upon notification by the Board or its agent that the producer of such supply has failed or refused to comply with any of the requirements made of milk producers.

(4) No milk, skim-milk, or cream shall be sold, or offered for sale in the City of Keene unless the cow from which said milk or cream was drawn and every cow belonging to the same herd, shall have been, within one year, subjected to the tuberculin test by a registered veterinary and a certificate signed by said veterinary shall have been filed with the Board of Health, stating the number of cows tested in each herd, the number found free from disease, and the number of reactors. Said certificate shall include a chart showing the reaction of each individual cow.

The foregoing requirements shall also apply to all cattle stabled or pastured with the milk producing herd, except those which, in the judgment of the attending veterinary, should not be subjected to the tuberculin test.

Any of the above mentioned animals, reacting to the tuberculin test shall be removed from the premises at once if the sale of milk is to continue, provided, however, that registered pure bred cattle, reacting to the tuberculin test but showing no marked physical indication of tuberculosis may be retained on the premises, but such cattle shall be strictly separated from the milk producing herd, and their milk shall not be sold or offered for sale.

If any animal, to which the foregoing applies, shall, when subjected to the tuberculin test, give a doubtful reaction, and a retest is recommended by the attending veterinary, said animal shall not be tagged, but shall be retested at the expiration of sixty days. If said animal is then found to be free from tuberculosis it shall be tagged in the required manner, and if it reacts, it shall be removed from the premises, except as above provided.

The State standard quality for milk is fixed at 11.85% solids and 3.35% fat, and not to contain more than 500.000 bacteria per cubic centimeter, at the time it is delivered to the consumer. In order to legally sell pasteurized milk, skim-milk, or cream, in this State at retail the dealer must label each bottle or container (pasteurized milk, skim-milk or cream) and this information must go to the final purchaser in every instance.

take in milk from outside. No pasteurized milk is sold in the city; the only pasteurizing that is done is by Tait Bros. for their ice cream. The milk supply of Keene is such that every man, woman and child can have o.7 of a pint. All the milk is obtained from tuberculin tested cows; some of them State tested, others local tested.

Bottles of milk are taken from the distributing teams of the various dealers every month and tested. As the dealer does not know what day a bottle will be taken or what bottle in his cart is likely to be taken, he will attempt to keep them all good.

There is no milk store or separate distributing agency. All the milk sold at stores is in bottles; there is no bulk milk.

Before a dealer can sell milk his dairy must have been inspected, all his cows must have been tuberculin tested and all re-acting animals removed, and he must have taken out a milk license. The license, as will be noted by reading it over, puts the dealer at the mercy of the Board of Health. To obtain the license the appended application must be filled out.

There is one certified milk plant in Keene. This was personally inspected, and when scored according to the outline used for the other dairies it was found to deserve about 99%. One point was taken off for not having provision for controlling temperature. Except for this one point the dairy scored perfectly. The total output of this dairy varies considerably. They can put out forty-five gallons a day, but at the time I was there the output averaged about thirty gallons a day.

Certified Milk

SANITARY NUISANCES

One must hunt long and patiently to find any nuisances in Keene. All nuisances, or nearly all, seemed to be complained of quite promptly, and the health officer seems to be efficient in remedying the conditions causing the complaint.

Trade odors do not have to be contended with, except in one case, the gas works. The odor about the gasometer is as bad as one usually finds about such structures. However there are few people living near it. There is a baseball field about four or five hundred feet from the gasometer, and I imagine the people find the odor somewhat disagreeable when they are here to watch the games. This is, of course, of no real sanitary importance; for even if there were a considerable leak from the gasometer, the dilution would be so great that poisoning from carbon monoxide would be practically impossible.

Sources Of Odors

The main sources of odors which are complained of to the health officer are improper disposal of garbage, unsanitary privies, dead animals, improper disposal of manure, and pig pens. The last mentioned is the least frequently complained of.

From the standpoint of health the improper disposal of garbage is quite important. Trouble from this source has been materially lessened since the present system of collecting garbage has been established: that is, the hiring of a private truckman to carry the garbage from the homes to the incinerator. The system was not run efficiently until 1923.

Unsanitary privies causing nuisance are dealt with in three ways. If it is impracticable to get sufficient water supply, the health officer orders that the privy be put in a sanitary condition. If sufficient water supply is available, a septic tank may be ordered installed. In 1922 three septic tanks were ordered installed; in 1923 nine were ordered installed; many others were installed without order from the health officer. If practicable, those having privies causing nuisance are required to connect with the public sewer. No privies are allowed within one hundred feet of a sewer.

Improper manure disposal and the leaving of dead animals where they will cause a disagreeable odor are complained of chiefly for aesthetic reasons. The people of Keene like to have their

premises neat and sweet-smelling.

No piggeries are allowed in the city proper.

Dust

The chief source of dust is from the roads. The only other important source is the dust from a mica factory. Ordinarily this causes no nuisance, because of their efficient blower system; but, at the time I happened to be there, one of the pipes had sprung a leak and the evidence of this dusty factory was plainly visible over all objects within about a hundred feet of the building.

Sawdust is never any nuisance. The various woodworking factories find it advisable for economic reasons to protect by blower systems all their woodworking machinery.

The method of treating the street dust, which is -- as has been previously stated -- the main problem, is to oil as many streets as possible and to use street sprinklers. They have one electric street sprinkler, which is of course limited to the three streets on which there are car tracks: Marlboro Street, Main Street, and West Street. They also have two wagon sprinklers, which cover the streets of the more thickly settled residential districts. In general the dust problem is fairly well handled.

Rats And Vermin

Keene is really a very clean city. Along near the railroad there are some junk piles and rubbish heaps, but none of them seem to be located near enough to buildings to be especially inviting to rats or other vermin. One building, however, appears to be rather favorable for the breeding of vermin. Sometime ago a fire partly destroyed the structure; and the holes into the cellar, left by the fire, were loosely boarded over to keep out prowlers and tramps. This would make an excellent refuge for rats. It is probable, however, that this is only a temporary arrangement, and that the building will soon be repaired.

General Cleanliness

Of course there are a great many empty lots, but these offer no sanitary problem except when they are situated on rather low land and form marshy patches. Dumps such as one finds in a large city are not to be found in Keene. There seems to be a tendency on the part of the people, however, to consider all open drains as dumps. The lower part of Beaver Brook really constitutes a large open drain in which are numerous tin cans

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During the summer when rains are infrequent such a place is a prolific mother of mosquitoes. Half-filled tin cans lying in the water, old kegs, bottles, sticks, and old tires furnish many quiet nooks where the larvae of the mosquito can develop undisturbed.

Flies And Mosquitoes

None of these drains are oiled; in fact no effort at all is made to check the mosquitoes. Flies are not so abundant, there being relatively little putrefying material exposed for the maggots to develop in.

The mosquito problem at Keene, however, should receive some attention. Mosquitoes are very numerous at night, and drive the people into the houses early in the evening throughout the summer. The many marshy places and the many stagnant open drains are probably the chief causes for the prevalence of mosquitoes. An energetic mosquito campaign would be decidedly worth while; perhaps it would even benefit the hotels to do this work at their own expense, because dodging the mosquito is one of the problems of the summer tourist.

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Where Mosquitoes Breed

There are a number of nuisances which Keene is practically free from: such as smoke, unnecessary noises, rats and vermin. In the city proper, at least, piggeries, stables, and manure are rarely causes of complaint. There is no legal definition of nuisance; the health officer has authority to define in the specific case whether or not a certain condition complained of constitutes a nuisance.

INDUSTRIAL HYGIENE

As was mentioned in the introduction, woodworking always has been the chief industry of Keene. The woodworking industry at present includes many branches: wooden heels, wooden pails, and chairs are perhaps the most important branches of the industry in Keene.

Chair manufacture in particular is important. It is really the city's industry, a larger proportion of the people being employed in this work than in any one other trade.

Chair manufacturing extends outside the factory, some of the work being done at home. In wandering about the outskirts of the city I saw a number of places where cane seats and backs were being woven onto the framework of chairs. This outside work is not very profitable. Of course the pay for weaving the seats or backs depends upon the size and upon the ease with which the factories can find people to do this work. The rates average about eighteen cents for a seat and a trifle more for a back. It would not be possible to earn a living at this work. Those taking it to do are usually small farmers and their families, who make

this a slight additional source of revenue by spending their spare time on it.

For further information about this industry I have visited Norwood Calef & Co. chair manufacturers. Most of their factory is given over to the manufacture of porch chairs, but they also do some work on the more expensive chairs. Very little upholstering is done, however.

The minimum wage for doing the work is eighteen dollars a week. It is difficult to estimate the wage on any piece work, as some of the men will come in the afternoon and work two or three hours and call it a "day". The regular number of hours for day work is fifty a week. No women or children are employed except in the office, and their hours are short.

Manufacturing Processes

The raw wood, chiefly birch, consists of slabs two inches thick, with the bark left on usually. The slabs are ten to fourteen feet long. These are stacked in the lumber yard. From here the slabs are gradually removed and sawn by a circular saw into convenient lengths for handling in the factory. These lengths depend on the work for which the slabs are intended. For chairs and backs the slabs

would be a little over three feet long, for rounds they would be eighteen inches long, and so forth.

Then the slabs are passed through a machine which saws them into slats or square rods as the case may require. The square rods are dumped into large wheeled baskets and carried to the second floor of the building to be turned. Special lathes are used for turning. The chisel has over three feet of cutting edge, and in one single operation, taking about a minute and a half, the square rod is converted into one of the main braces of the back of the chair. Since there has been no sorting out of defective rods as yet, the sorting must be done here. If, when the rod comes out of the turning mill, all the bark has not been turned off, it is discarded.

The suitable turned rods are then shipped downstairs again and packed in the steam presses. These huge affairs stand about six feet high, and are so located as to guard the entrance to the factory and very effectively scare away any curious boys. The hissing steam appears quite dangerous, but there is no trouble from burns on account of it; and the presses are much more harmless than they appear.

When the rod comes out of the press it is of suitable shape for the back of the chair. It then goes to a drilling machine which simultaneously makes all the holes necessary in that particular piece of the chair. These include the slats that go across the back, the rungs that brace the bottom, the arm, the seat, and the rungs that form the seat. This operation takes about two minutes. Then the end of this piece of wood is thrust into another machine, which tapers it down to fit the drilled hole in the rocker. Then this piece of wood is shipped to another part of the factory where the rough spots are finished off on emery belts.

Other parts of the chair go through similar but less complicated processes, and all the pieces collect in the assembling room. Here the backs and seats are knocked together and sent out to be caned. When these come back the assembling of the chair is completed with the aid of glue, hammers, and a few special little devices for holding the parts.

Finally the chair goes to the shellacker's department. In this particular factory the shellac is put on with a brush. It takes considerable

skill to do this work rapidly and well. After the shellac has dried, all that is left to do is to crate the chair and ship it.

The large pieces of waste wood that have accumulated during the process of manufacture of this and other chairs are dumped into a bin on the second floor. From the bottom of this bin extends a chute which emerges from the side of the building over a roadway. There is usually a very well trained horse hitched to a cart under the bin. This horse usually knows enough not to run away when the clatter of wood comes down into the cart. These scraps are sold for kindling wood.

Health Hazards and How They Are Met

Cuts And Accidents

It is apparent that the greatest hazard in such a factory is cuts. The workers are all the time having little cuts. Very little attention is paid to this. The danger of infection in these cuts is smaller than it would be in most industries. It is therefore ignored. First aid kits are available in the buildings, but would not be used except in cases of rather extensive laceration

probably. The factory is not large enough to afford a physician. The machinery is as well protected as one would expect to find, all cutting edges being shielded wherever possible. Belts, however, are not so well shielded. Geers are protected to keep out wood dust.

Wood dust is not a health hazard. All lathes, planes, finishing mills, and saws are well hooded and connected to the efficient "blower system." Drills are not attached to the "blower system" directly, the drillings being swept up from the floor and taken care of by special blower attachments in the corners of the rooms.

There are several elevators in the buildings, and the manager took particular pride in stating that they passed the accident insurance inspection one hundred percent. As an elevator leaves one floor, the elevator pit is automatically floored over and fenced off.

Fire

Fire is the bugaboo of the wood manufactories. There is abundant fire protection here. They have a sprinkler system, a special hose house, and an abundance of chemical extinguishers hanging on the walls. There are no fire escapes however. The top of the building is used for probably. The factory is not large enough to afford a physician. The machinery is as well protected as one would expect to find, all cutting edges being shielded wherever possible. Belts, however, are not so well shielded. Gears are protected to keep out wood dust.

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Ventilation

In the woodworking part of the factory the ventilation is excellent. The windows are kept wide open in summer, and in the winter adequate ventilation is maintained indirectly by the "blower system." The painting and shellacking rooms, however, have no blower connections; and here, where the ventilation is of the most importance, no provision has been made for it. In the summer of course there are windows which can be opened; but they are not opened any more than absolutely necessary, because it interferes with the work,-- it causes the shellac to be stringy and to dry on the brush.

Poisoning

The shellac used on the chairs is made from denatured alcohol and gum shellac. The denatured alcohol contains a variable percentage of wood alcohol. As previously stated, the job of shellacking requires a certain amount of skill in order that it be done

rapidly and well. Therefore one man who acquires a knack at it keeps at this job all the time. I talked to one man who had been doing it for several years. Fortunately they do not get enough shellacking to do to keep them busy all the time. Frequently it happens that a new man, when being broken in, will get sick and stop. The worker who gave me this information did not believe there was any poisoning, but merely that the man did not like the work. It is doubtful whether serious poisoning could occur from the fumes of what little wood alcohol there is in the shellac. In addition to being shellacked, some of the chairs are painted. There has been no trouble in the painting department, although it is as poorly ventilated as the shellacking department. The explanation of this probably lies in the fact that very little painting is done.

Summary

In general the chair making industry does not seem to offer any serious health problems. Cuts are frequent but not serious. The lower picture following page 31 shows the largest building of the factory; two of the blowers may be seen; in the foreground are the piles of birch slabs. The other seven chair manufacturing companies are quite similar.

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HOUSING

There are twenty-three hundred dwellings in Keene, and very few tenements. The largest tenement building I could find was on Marlboro Street; I visited this because it had the reputation of being the worst one. The lower picture on the following page shows the backyard and the general layout of the building. The building was divided into ten apartments: five on the upper story, and five on the lower story. The backyards were not at all neat; but there was plenty of room, sunshine, and fresh air.

Tenements

The tenants were mostly Italians, and their being very suspicious of me interfered to a large extent with the inspection of the building. The rooms were between ten and fifteen feet square; and in four rooms on the upper story (in the nearer end of the building, as it appears in the picture) lived three adults and three children. Below these rooms was a kitchen, and in front of this a small store selling ice cream, groceries, and soft drinks. The rooms were dirty, and -- as the picture shows -- there was nothing neat about the place. The

Ventilator on Colonial Theatre See page 55

Back yard of the worst Tenement in Keene See page 54

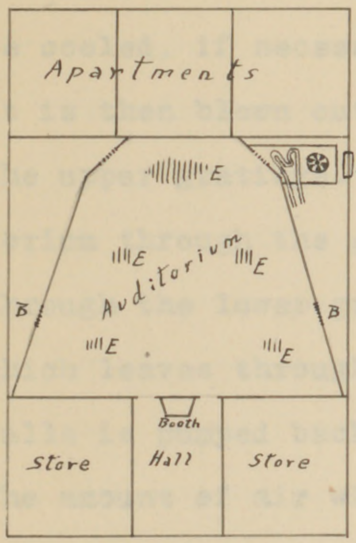
plumbing at the time I inspected the building was in a fairly satisfactory condition.

The upper picture on the preceding page was taken from the roof of the Colonial theater. This building contains some apartments, but the main reason for my inspecting it was the very interesting system of ventilation employed. The cupola, shown in the picture, houses a five horsepower motor which drives a double fan; the fan blows the air out through the shutters shown in the picture and through similar shutters on the other side of the cupola. The construction of the building will be briefly referred to. There is a hallway leading from the street to the auditorium, and in it stands the ticket office. The auditorium has a cement floor, and forms the lowest part of the building. Around the edges of the room are brass gratings; on the upper part of the walls near the stage are more brass gratings; in the ceiling are six ventilators (E,E); back of the stage are a few apartments. The whole building is four stories high.

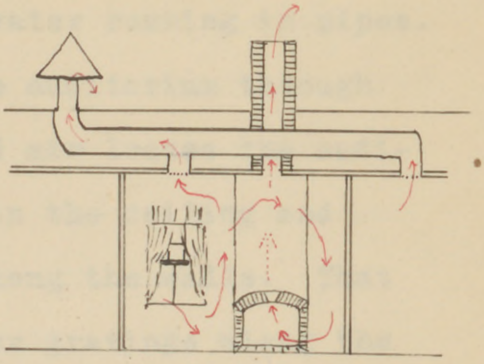
Ventilation

The system of ventilation for the auditorium is shown in the diagrams. There are two different ways of running this ventilation: one for summer

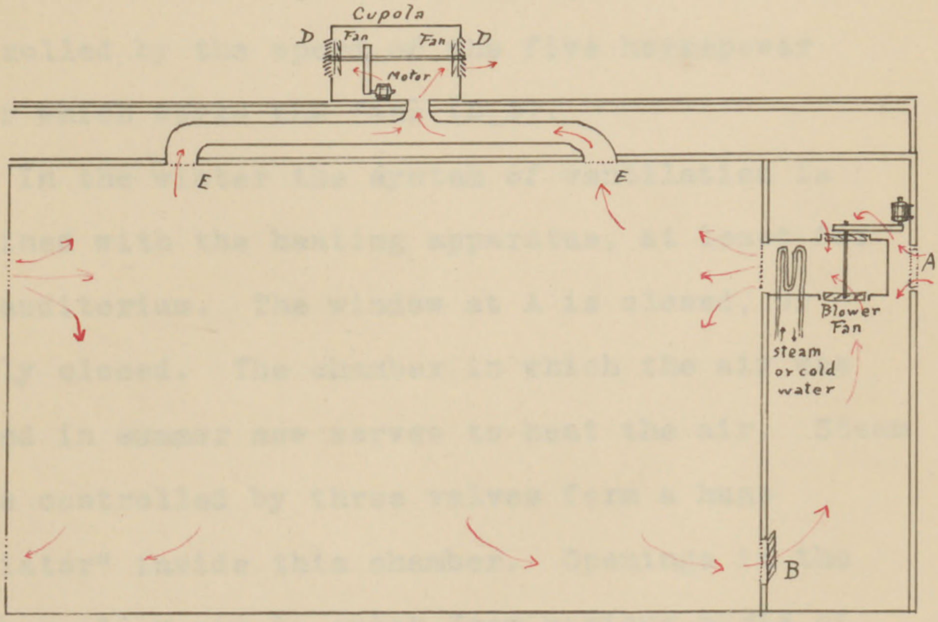
Ventilation of the Colonial Theatre



Floor Plan



How the Apartments are ventilated



Ventilation of the auditorium

and one for winter. In the summer the removable window (A) is taken out, and the outdoor air is drawn by two big fans into a chamber where it can be cooled, if necessary, by water running in pipes. It is then blown out into the auditorium through the upper gratings. The dead air leaves the auditorium through the gratings in the ceiling and through the lower gratings along the walls. That which leaves through the lower gratings along the walls is pumped back through the auditorium again. The amount of air which is thus kept in and circulating can be controlled by the shutter (B). The amount of air that goes out through the ceiling is controlled by the speed of the five horsepower motor which works the fans (D,D).

In the winter the system of ventilation is combined with the heating apparatus, at least for the auditorium. The window at A is closed, or nearly closed. The chamber in which the air was cooled in summer now serves to heat the air. Steam pipes controlled by three valves form a huge "radiator" inside this chamber. Openings in the chamber allow air to enter from various parts of the building that connect with this false partition containing the chamber. The two suction fans blow

the air from the chamber into the auditorium through the upper gratings along the walls. The air then circulates about the room, and most of it passes through the gratings near the floor (B) and passes up again through the false partition to the heating chamber, from which it is sent again into the auditorium. The air can be changed as often as necessary by allowing the escape of the heated air through the gratings in the ceiling (E,E), and by allowing new air to enter the system at A.

This theater is designed for moving pictures only. The projection room is entirely fire proof, and has a separate blower to blow air out onto the roof. Air from the auditorium is used to supply the projection room.

The apartments in the back of the building have the old-fashioned but excellent window and chimney system of ventilation. In addition to this they have a system similar to that used in the projection room (see diagram), but without any blower.

INFECTIOUS DISEASES

The following diseases are reportable to the State Board of Health, Concord, New Hampshire:

- Anterior poliomyelitis (Infantile Paralysis)
- Cerebro-spinal meningitis
- Chancroid
- Chicken pox
- Diphtheria
- German measles
- Gonococcus infections
- Infectious diseases of the eye
  - Ophthalmia neonatorum
  - Trachoma
- Influenza
- Measles
- Mumps
- Pneumonia, acute, lobar
- Scarlet fever
- Septic sore throat
- Smallpox
- Syphilis
- Tuberculosis all forms
- Typhoid fever, and paratyphoid fever
- Whooping cough

The following less frequently occurring diseases are also reportable to the State Board of Health:

Actinomycosis
Acute infectious conjunctivitis
Anthrax
Asiatic cholera
Dengue
Dysentery (amebic)
Dysentery (bacillary)
Favus
Glanders
Hookworm disease
Leprosy
Malaria
Pellagra
Plague
Rabies (dog bite)
Rocky Mountain Spotted Fever
Tetanus
Trichinosis
Typhus Fever
Yellow Fever
Continued Fever lasting seven days

In the matter of quarantine the health officer at Keene merely follows the rules laid down by the State Board of Health. The special bulletin of the State Board of Health entitled "What To Do When Diphtheria, Scarlet Fever, Measles, Whooping Cough, Smallpox and Bad Colds Occur In Schools" indicates the general principles along which the health officer works.

Quarantine Regulations

The following diseases are quarantined: scarlet fever, diphtheria, measles, chicken pox, German measles, mumps, typhoid fever, smallpox, cerebrospinal meningitis, other meningitis, influenza, and syphilis in the first and second stages. The period of quarantine for scarlet fever is four weeks from the appearance of the rash and until the "cessation of all peeling and discharge from ears, eyes and nose." Diphtheria is quarantinable for ten days and thereafter until negative bacteriological cultures are obtained. Measles is quarantined until two weeks from the appearance of the rash and "until all discharge from eyes, ears and nose has ceased." Smallpox is quarantined "until the whole of the skin is free from pustules and from the

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Whooping Cough

General information for those who have to deal with Whooping Cough cases or contacts

1784

Issued by the New Hampshire State Board of Health, and when presented by the Health Officer shall constitute a part of his instructions.

Everyone Should Know

That Whooping Cough is a dangerous disease, particularly for young children.

That there were more deaths in 1921 from Whooping Cough than from any other disease of childhood except Diphtheria. Whooping Cough caused one third more deaths than did Scarlet Fever, and more than four times as many as did measles in New Hampshire during 1921.

That a child with Whooping Cough should have the best of care and attention to avoid getting Pneumonia or other serious complications.

That the parents of children suffering with Whooping Cough should make every effort to prevent ill children from coming in contact with well children.

That failure to keep a child sick with Whooping Cough separated from well children may make one responsible for a death in the family or in the family of a friend.

That the safest course to pursue when a child is thought to have Whooping Cough is to consult the doctor and health officer.

Symptoms of Whooping Cough

Whooping Cough usually starts with a slight cold, hacking cough, and with a little fever. The catarrhal symptoms and cough gradually become more severe; there is a running from the nose and the eyes are reddened. From seven to fourteen days after the exposure of the child to Whooping Cough, the cough has become pronounced and occurs in ''spells'' or paroxysms. The child coughs in ''spells,'' the cough getting more severe, and finally develops what is commonly known as the ''whoop.'' The cough is so severe at times that the child is frantic, and when the cough ceases, it lies exhausted or vomits. The coughing spells re-occur at intervals throughout the day and night, these intervals lessening as the disease progresses. The severe coughing often lasts for three or four weeks.

As a result of the strain of these paroxysms of coughing, the bronchial tubes and lungs of the child are congested, the digestive organs are upset and at times the eyes, heart and kidneys suffer. The most frequent complication is Pneumonia from the congestion of the lungs. Whooping Cough so weakens its victims that it is often many months before they recover their normal strength and during this time, Tuberculosis or other serious disease may develop.

Advice to Parents

The best advice that can be given to parents is to make every effort to keep their children away from those ill with Whooping Cough.

A vaccine is sometimes given to prevent Whooping Cough. It is given in three doses, and in some instances prevents the disease, while in others it fails to prevent, but does seem to make the cough much lighter and lessens the likelihood to Pneumonia and other complications.

When a child becomes infected, a doctor should be called early and his directions followed absolutely.

A child with a particularly severe or persistent cough occurring at a time when Whooping Cough is prevalent in the community should from the first be cared for as Whooping Cough. This means that the child should be kept away from other children, particularly the baby, until it is known whether or not the illness is Whooping Cough.

Children with Whooping Cough should be warmly dressed, carefully fed, and given plenty of fresh air. While it is not necessary for a doctor to see the ordinary Whooping Cough case every day, he should be consulted from time to time and his advice carefully followed.

Isolation and Disinfection.

Whooping Cough can be more easily given to other children during the early stages of the disease than in the latter. The most dangerous time and the time when most children are infected is before it has definitely been determined that a child really has Whooping Cough, that is, before the characteristic "whoop" appears.

When Whooping Cough is present in a community and a child is ill with a cough and cold, parents should separate the ill child from the well children without waiting for the doctor to decide or for the health officer to appear. If this course was followed by all parents, very few cases of Whooping Cough would occur and the toll of deaths would be much less.

It is the duty of the health officer to make such regulations as will so far as possible prevent well children from coming in contact with those ill with Whooping Cough. He will endeavor to secure this result with as little inconvenience as possible to the family and to the patient. The law may require the house to be placarded and the acutely ill patient to be isolated therein.

Permission for Arm Band Regulation Recommended by State Board of Health.

Children suffering with Whooping Cough need fresh air in abundance, and to give those who are able an opportunity to secure this without endangering well children, the afflicted child may be permitted by health officers to go upon the streets, provided he is accompanied by a responsible person, and wears upon his left arm a yellow band to aid in preventing contact with well children. Children wearing yellow bands should not be permitted in street cars, stores or other places where they are liable to come in close contact with well children. Violation of the rules of the health officer in the use of the yellow band should result in the withdrawal of this privilege. The health officer may and should, if he finds it necessary, placard or even quarantine Whooping Cough cases.

Children with Whooping Cough when confined to the home should be kept in a single room. All discharges from the nose and throat should be burned or thoroughly disinfected, and the patient through the entire course of the disease should have individual eating utensils.

The younger a child is when he has Whooping Cough, the more liable he is to die.

Whooping Cough is more fatal in children under five years of age.

Printed by John B. Clarke Co. 6315

subsequent desquamation. Special attention to be paid to examination of soles, palms, fingers and toe-nails."

In addition to the list of quarantinable diseases given above, whooping cough is also sometimes quarantined. The attached yellow folder shows the way in which whooping cough is handled. As a rule quarantine for whooping cough is avoided; instead a special arm band regulation is used. Children ill with the disease are required to wear a yellow arm band. They must avoid contact with other children, and cannot go in street cars, stores, or among groups of people. Of course it is necessary to have a responsible person with any child so quarantined. The reason for this method of handling whooping cough lies in the fact that fresh air, moderate exercise and sunshine have been found helpful in handling the cases.

Disinfection And Fumigation

The problem of disinfection and fumigation is of course not regarded as seriously nowadays as it used to be. The value of soap and hot water and sunshine is now uppermost in the minds of health officers. These two subsequent desquamation. Special attention to be paid to examination of soles, palms, fingers and toe-nails."

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Disinfection And
Fumigation

excellent measures of disinfection and the use of formaldehyde for fumigation comprise the chief methods employed by the Board of Health.

Tuberculosis

At the present time there is a very vigorous campaign in progress against tuberculosis in the State of New Hampshire. A glance at the vital statistics seems to show that this campaign has been of some benefit to Keene. Before 1900 more than 10% of the deaths in Keene were due to consumption. Since 1901 there has not been a year in which 10% of the deaths were due to tuberculosis. In 1919 only 1.17% of the deaths were due to tuberculosis. This is the lowest figure thus far reached. In the city were several posters regarding spitting. There was one poster of a little boy being led along the street by his mother; on it were the words "For my sake don't spit; spitting spreads disease."

They have a county nurse for tuberculosis, and Cheshire county holds a tuberculosis clinic in the offices of the Health Department at the City Hall in Keene once every month. In New Hampshire any kind of tuberculosis can be given sanitarium treatment. This saves the doctors the embarrassment of

trying to find a little activity in one apex, the way they have to do in Massachusetts when they want a case to get sanitarium treatment.

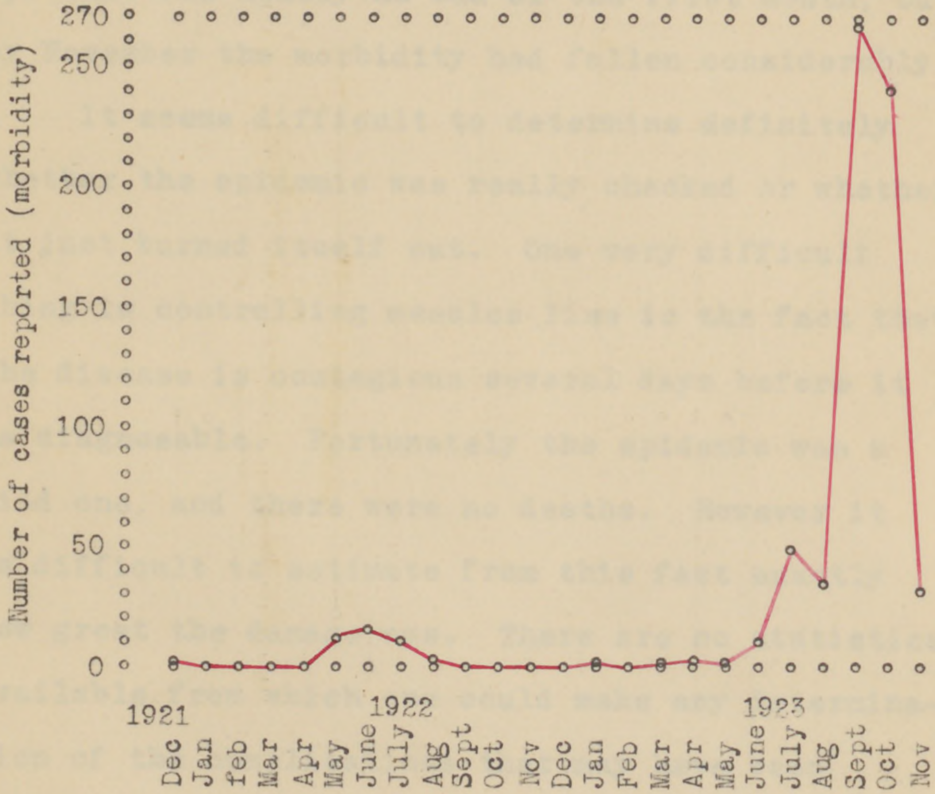
I asked the health officer what measures would be taken if some other disease were prevalent. He stated that in epidemics the usual method was to quarantine houses. This measure can be enforced better than any other, because breaking the quarantine regulations is a criminal offense in the State of New Hampshire. It is of course very inconvenient to the public to be quarantined. A variable sum of money is spent every year in the city of Keene to aid those people who are in quarantine. In 1923 $495.86 was so spent.

One occasion for this large sum was the epidemic of measles which occurred in the autumn of that year. Thus it will be seen that the system of quarantine in this epidemic of measles was rather expensive. The city was fortunate in having Dr. A. A. Pratte for president of the Board of Health.

Measles During the year there were 636 cases of measles with no deaths. In this epidemic the chief reliance was placed on quarantine. In releasing the houses from quarantine, the quarantined rooms were fumigated and cleaned, then aired and

exposed to as much sunlight as possible.

In comparing the morbidity statistics of measles for the two years 1922 and 1923 it seems apparent that the measures taken to control the spread of the disease were not adequate. In 1922 nearly all the cases were reported during the summer months: May, June, July and August; there were no cases in September, October, November and December of that year. In the epidemic of 1923 the morbidity from measles seems to begin later, reaching the climax



in July -- one month later than in the previous year -- then falling slightly in August and rising again to epidemic proportions in September; in other words, the epidemic seemed to come at about the time the school began. The second month of the epidemic was nearly as bad as the first month, but by November the morbidity had fallen considerably.

It seems difficult to determine definitely whether the epidemic was really checked or whether it just burned itself out. One very difficult thing in controlling measles lies in the fact that the disease is contagious several days before it is diagnosable. Fortunately the epidemic was a mild one, and there were no deaths. However it is difficult to estimate from this fact exactly how great the damage was. There are no statistics available from which one could make any determination of the complications that may have been eventually fatal. From the financial point of view it is evident that the epidemic cost the city a considerable sum of money, as aid to those in quarantine alone amounted to nearly $500.

All cases of venereal diseases are supposed

to be reported and are quarantinable if necessary.

Venereal Diseases

The doctors are lax about reporting these cases however. In 1923 two cases of syphilis and six cases of gonorrhea were reported; in 1922 five cases of syphilis and twenty-five cases of gonorrhea were reported.

SCHOOLS

The city of Keene takes considerable pride in its high school building. This building is valued at a hundred thousand dollars. It is relatively new, well built, and up-to-date.

Ventilation

The ventilator system is combined with the heating system. Air is not used over. Air is drawn through a screen from outdoors, and passed through a steam heating chamber from which it goes up through flues to the ventilators in the various rooms and in the auditorium. These ventilators are placed rather high up on the walls. They are equipped with shutters controlled by chains, and the temperature in the room can be controlled by varying the amount of heated air which is allowed to pass the shutters. Along the walls near the baseboard are gratings from which the air passes out of the building. The building was inspected while school was in progress, and I was told by the teachers that there was plenty of heat in the winter from this system. In addition to this system there are large windows in every room -- most of the study

rooms are twenty by twenty-five feet and have four windows.

Upon analyzing the system of ventilation it seems probable that in winter, when the windows are closed and the doors shut, there is a very gradual current of air flowing from the upper part of the room where the air is warmer down to the lower part of the room where the air is cooler and wasting out through the lower ventilators. In hot weather the flue system of ventilation probably amounts to very little. No blowers are employed.

Lighting

For the rooms mentioned above, those about twenty by twenty-five feet in floor space, daylight is secured from four windows. This is inadequate on cloudy days, and is supplemented by four 60 watt electric lights suspended from the ceiling. Each of these lights is about 160 candle power. The assembly hall has thirty-six similar lights.

Temperature

As indicated in the paragraph headed "ventilation," the temperature is controlled at the upper ventilators along the walls of the rooms. These have two chains: one marked "cool," the other marked "warm." The heat is regulated by this device according to

the teachers' sensations -- they tend to keep the temperature rather warmer than is considered desirable. At the time I inspected the buildings the temperature averaged 72°F. on the first floor and 73°F. on the second floor.

Playgrounds

The high school building sets on 73,500 square feet of land. Thus there is adequate space about this building for play. In addition to the various schoolhouse playgrounds -- at least the grammar school playgrounds --, which in general consist of a few swings and a teeter board, there is a playground at Wheelock Park. This is located in a pine grove, a beautiful spot for a playground. It is equipped with the usual playground apparatus: swings, etc.

Medical Inspection

Medical inspection is carried out by the school physician and a nurse. The examining is done at various intervals throughout the year,- whenever the doctor and nurse find it convenient. The nurse has a list of all the students; the list is not arranged according to the rooms, and the teachers are not supplied with a copy of the list. When one student has been examined, that student tells the next one to go for examination. Such a method breaks up the

discipline of the class room a great deal. Students will claim that they have been told to go for examination and will skip out for the whole morning. The doctor does not find time to carry out the examination at all thoroughly. Sometimes the nurse examines alone, so that some students do not really get a medical examination oftener than once or twice during their whole high school career. Many mistakes are made in the listing, so that some children are fortunate enough to have two or three examinations every year.

Children are excluded from school for all quarantinable disease listed on page 61 and for whooping cough.

MISCELLANEOUS

Markets
Provision Stores
Soda Foundtains

All markets, provision stores and soda fountains are inspected once a month or oftener by the health officer, and are governed by the state laws of New Hampshire. A copy of the food and drug laws of the State of New Hampshire, published in 1923, accompanies this report. In 1923 there were seventy-three stores in the city handling food and food supplies, also there were five bakeries, nine restaurants, one lunch cart and five drug stores. Of these places of business one store was forced to go out of business because they were selling food products and living in the same room. Besides the city inspection of such places, the state inspector visits them regularly.

I inspected the following provision stores: the Keene Fruit Company, the Central Market, and a store of the Atlantic and Pacific Tea Company. The Keene Fruit Company does a wholesale and retail business. For such a store the place is fairly clean; there were, however, many flies at the time (June 1924). The Central Market was even worse as

far as flies were concerned. The odor in the market was not pleasant. It was not so neatly kept as the other stores in Keene. They sell no cold storage goods. The store of the Atlantic and Pacific Tea Company was roomy, clean and almost free from flies.

Meat Inspection
Cold Storage

The federal veterinary inspector inspects all cold storage plants in this region. In Keene there is only one cold storage plant, the various markets depending upon simple refrigerators. I visited the cold storage plant, which is a part of the Cheshire Beef and Produce Company, on Emerald Street. Here I happened to meet Dr. Carnachan, the present federal veterinary inspector. He very kindly took me through the cold storage plant, which is quite a large one. Refrigeration is maintained by the evaporation of liquid ammonia, the usual system employed. The pumps are driven by steam in this case. There are several rooms for storage; different rooms are kept at differing temperatures, certain goods not requiring as low a temperature as others. One of the important points about a cold storage plant is the maintaining of a constant temperature, for of course if the foodstuffs

are occasionally allowed to warm up for a few hours all security is lost and there is no telling what decomposition the foods may have undergone. Some of the wholesale beef houses rent space in these cold storage rooms from the Cheshire Beef and Produce Company.

Restaurant Food

I sampled food in a number of restaurants, and in all cases it was decidedly cleaner and better in quality than that obtainable near the Harvard Medical School.

Food and Drug Administration

The food and drug administration is controlled chiefly by the State. The only activities of the city in the matter are those of inspection as carried out by the health officer. The food and drug laws of the State of New Hampshire are in general very satisfactory.

Barber Shops

The health officer in his report for 1923 states: "There are 11 barber shops in the city, all of which are conducting their shops within the State law covering barber shops, and have been clean and sanitary when inspected." From what I saw of them I found no reason to doubt this statement.

Nursing
Social Service

There is a department of district nursing and social service which meets at the hospital from 4.30 to 5 o'clock every day. The problems of social service in Keene are not so great, because there are fewer people in Keene in extremely hard circumstances than there are in large cities such as Boston. District nursing is not so imperative as in larger cities. The District Nursing Association maintains two nurses on duty at all times. Their office is in the Health Department of the City Hall, also they have a telephone at a drug store so that they can be reached at all times day and night.

Charitable
Institutions

At present the overseer of the poor and the health officer are one man. There is a county poorhouse, also aid is furnished to a large number of city paupers and dependant soldiers.

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SUMMARY

Keene is a delightful little city in God's country. It lies in the verdant and wooded hills of southern New Hampshire. It is endowed with all the advantages Nature can offer, except weather. The weather is capricious and is perhaps partly responsible for the large number of respiratory infections that occur among the populace. Keene is in a strong financial position.

Beech Hill
Reservoir

The geographical position of Keene is such that an abundant supply of excellent water is available for drinking purposes. However, the fire menance causes them to keep a reservoir which should long ago have been discarded. I refer to the Beech Hill Reservoir described on page 12. The water from this reservoir is unfit to drink and the reservoir should be permanently disconnected from the pipe lines. The city should heed the warning given it in the spring of 1924 when B. coli was found in the water near the place where this reservoir connects with the mains. If this reservoir were disconnected, Keene could rightfully boast of an excellent water supply.

Keene is in the enviable position of having lake water for drinking purposes, and a river handy to dump its sewage into. The sewage is not treated in any way. There is no necessity for any treatment.

Sewage Disposal

Would it not, however, be advisable, if only to avoid nuisance, to have the sewage enter the river at a point some distance below the thickly inhabited part of the city? Perhaps the added value of real estate along the river would eventually make the undertaking a profitable one. About 1800 feet of fairly large sewer pipe used as suggested on page 25 would solve the problem.

The use of septic tanks seems to offer the best solution for those who live too far out of the city to connect with the sewerage system.

Keene has chosen well in adopting the incinerator method of disposing of garbage. The main problem now lies in the financial aspects of collected garbage.

Garbage

The present method of charging each family for the collection seems to offer the only alternative to supporting the work out of the taxes.

The death rate and birth rate of Keene are both

rather low and suggest poor statistics. It is indeed surprising that the birth rate should be low in Keene. One gets the impression that there are many large families and a relatively small number of unmarried men and women.

Vital Statistics

The specific mortality rates are rather unsatisfactory because of the small population on which they are based.

Keene has no pasteurized milk. I think that under the circumstances this is fortunate. The raw milk is well inspected now. In 1901 there were twenty-one deaths from scarlet fever and this probably taught Keene a lesson about milk. Keene has a certified milk plant which is being run properly. Even at a price of 35¢ a quart this is cheap. We can feed an infant with certified milk more cheaply than we can feed an adult on any food.

Good Milk Supply

The problem of nuisances is being well handled, with one exception,-- the mosquito problem. This is not handled at all. An anti-mosquito campaign should be launched next spring.

Mosquitoes

Industrial hygiene offers no real problems in Keene; at least the main industry, wood working, is not dangerous to health.

Housing and ventilation are also satisfactory from the sanitary aspect.

Infectious Diseases

In glancing over the list of notifiable diseases it will be seen that the occupational diseases are not notifiable. Chancroid is about the only addition to the usual list of notifiable diseases. The quarantine regulations are not remarkable, excepting those for whooping cough. The method of handling whooping cough seems to be quite satisfactory however.

The epidemic of measles was perhaps handled as well as it could be. It would be interesting to study this epidemic further, not so much from the point of view of how it could be handled better as from the point of view of preventing its recurrence. Of course the morbidity of measles tends to vary considerably from year to year in pendulum fashion, owing to the fact that the number of cases that can occur is limited largely to the young folks who have not had the disease in the previous years.

Schools

The schools of Keene seem to be well equipped and well run for a city of such small size. The medical examination of school children is at no places as thorough as it really should be. In Keene there seems to be much room for improvement. Perhaps if the city would pay for the services of a physician to do this work on a definite schedule rather than as a spare time job, the matter could be handled much better.

Suggested Improvements

1. Disconnect and abandon Beech Hill Reservoir.
2. Construct an intercepting sewer to convey sewage downstream beyond thickly settled district.
3. Launch an anti-mosquito campaign every spring and continue it through the summer.
4. Employ a school physician to examine all school children regularly, systematically and thoroughly.

Map of the CITY of KEENE

From recent surveys by

SAM'L WADSWORTH

1917

0 400 800 1200 1600

SCALE OF FEET

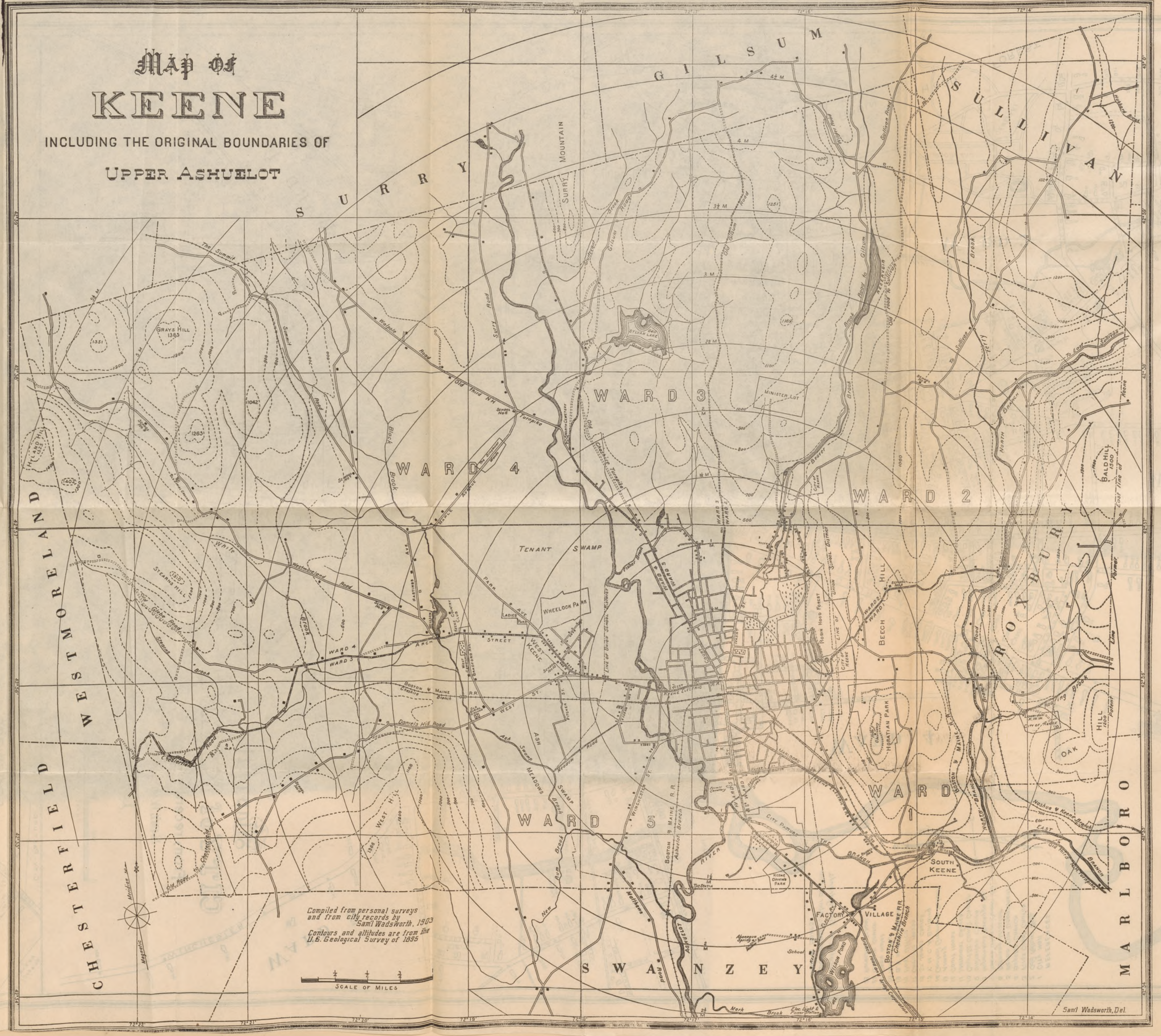
SAMUEL WADSWORTH, DEL.

REFERENCES

1 City Hall
2 Odd Fellows Bldg.
3 First Cong'l Church
4 Baptist Church
5 Keene Fire Department
6 Bethany Mission
7 Keene Steam Power Co.
8 Impervious Package Co.
9 Unitarian Church
10 Court St. Cong'l Church
11 Methodist Church
12 Court House
13 Armory
14 Central Grammar School
15 Y. M. C. A. Building
16 St. James Church
17 Cheshire House
18 Post Office
19 B. & M. R.R. Station
20 Hotel Ellis
21 Eagle Hotel
22 Catholic Church
23 Parochial School

• Location of Fire Hydrants.

■9 Location and number of Fire Alarm Boxes.



MAP OF KEENE

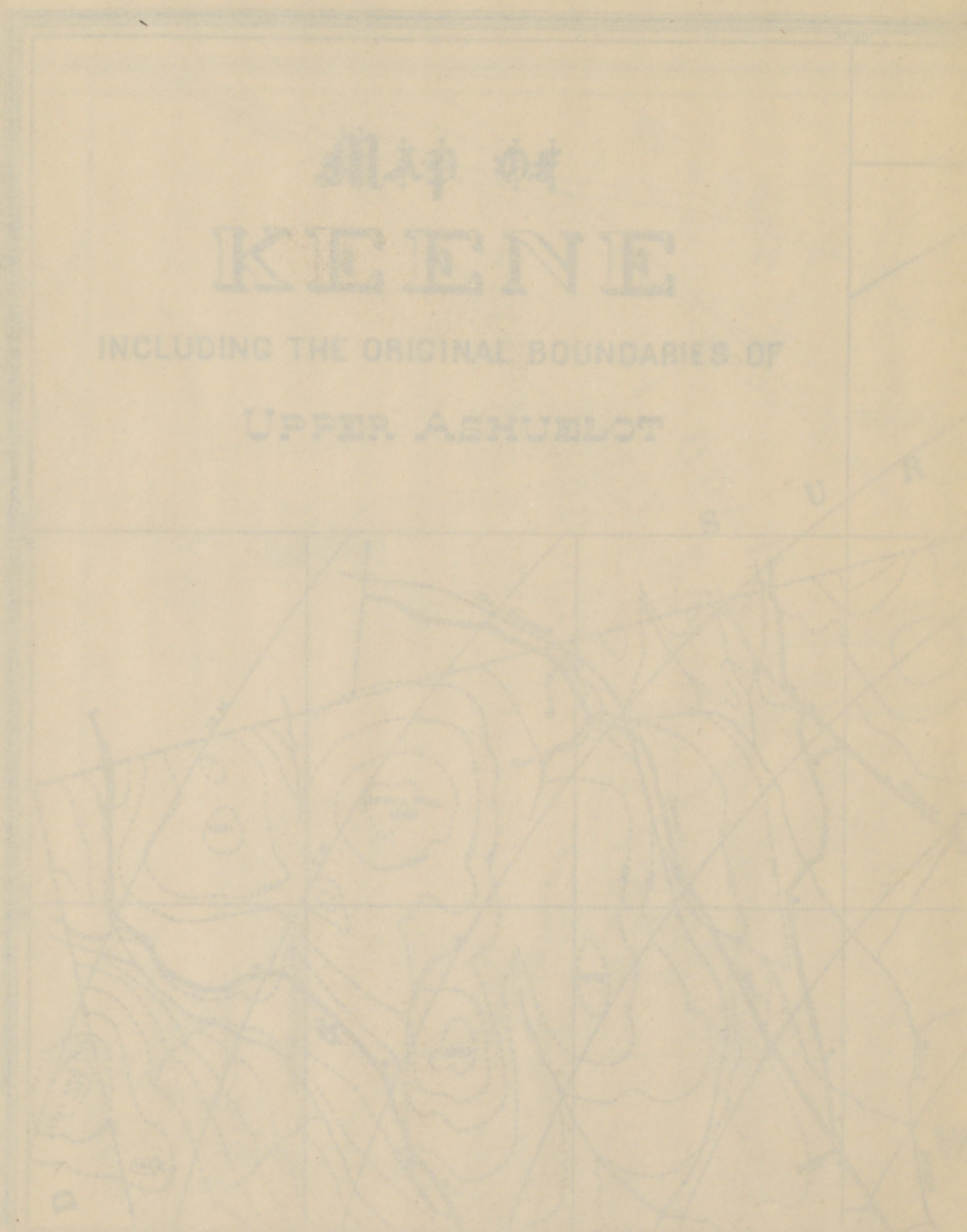
INCLUDING THE ORIGINAL BOUNDARIES OF

UPPER ASHUELOT

Compiled from personal surveys and from city records by Sam'l Wadsworth, 1903

Contours and altitudes are from the U.S. Geological Survey of 1895

Sam'l Wadsworth, Del.



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