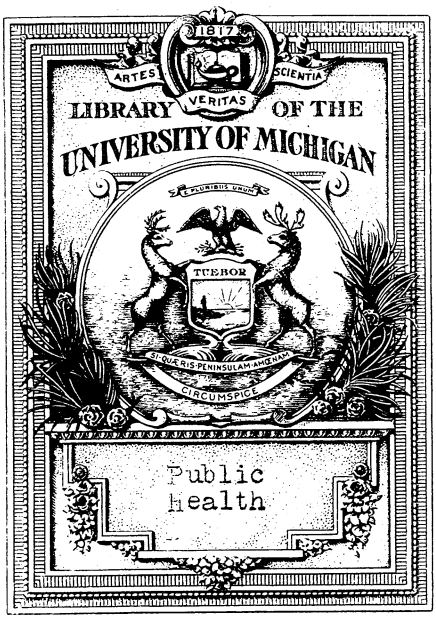

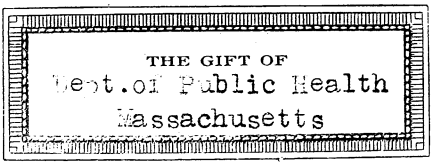

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OF THE

STATE BOARD OF HEALTH

OF

MASSACHUSETTS.

JANUARY, 1870.

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1870.

REPORT

ON SLAUGHTERING FOR BOSTON MARKET.

During the past year 53,000 beeves, 342,000 sheep and 144,000 hogs were slaughtered within six miles of Faneuil Hall. While the population within this circle of towns and cities has been every year growing more dense, requiring not only increased supplies of meat, but also, in common justice to all, increased precautions for the maintenance of health, the mode of slaughtering animals has undergone no change. The whole process is carried on in essentially the same way that it was half a century ago, when the population was not a fifth part of what it is to-day and when the influences affecting the health of crowded communities were almost unrecognized, and quite uncared for.

The vacant and waste places where offensive trades established themselves long ago, are now being rapidly filled by a busy population whose need of wholesome air is urgent. We have no room left for nuisances. They cannot exist in our midst without depriving somebody of what he has an inherent right to enjoy.

Practices in themselves objectionable may be permitted where there is plenty of fresh air, while in a crowded population they become offensive and dangerous. Unsewered houses, open privies, pig-pens, heaps of stable manure, may be suffered in the country, because their influence is modified by abundant ventilation; but in a crowded city, containing fifty or a hundred persons to the acre, they always increase the death-rate, and occasionally nourish a pestilence. The same considerations apply equally to the existing modes of slaughtering animals. The general welfare requires us to guard our populous towns from every form of impurity, to search out the origin of offensive, and particularly of *putrid* odors, and to show, when it is possible to do so, how they may be avoided or prevented.

Great cities everywhere are discovering that the slaughtering of animals may become a prolific and dangerous source of

filth. Paris discovered it under Napoleon the First, who applied the remedy. London was slow to reach the same conclusion, but has now followed the example of Paris. New York has recently become convinced that something should be done in the same direction, and the butchers themselves have entered upon the work of purification with zeal, and their complete success is already assured. St. Louis is now demanding a similar reform.

The great population within five miles of the State house, which really constitutes Boston, whatever may be the town and city lines, is still polluted by the foul air which proceeds from modes of slaughtering, and bone-boiling, and fat-melting, which are not only offensive, but old-fashioned, clumsy and wasteful.

The last annual report of the selectmen of the town of Brighton contains the following paragraph: "At certain seasons of the year it is almost impossible, as the slaughtering business is now managed, to prevent offensive smells, especially when found necessary to cast away the heaps of offal that have accumulated, and which, as long as left undisturbed, are prevented from emitting any disagreeable order by the daily use of disinfectants, applied as often as fresh material is added, and where hogs are not allowed to disturb the heaps."

In 1866, when an epidemic of cholera was feared, the selectmen of Brighton employed Dr. Henry G. Clark of Boston to make a sanitary inspection of the town. His report was published, and the following extract refers to the slaughter-houses: "They all, with one exception, were in a condition and conducted in a manner which I consider both disagreeable and dangerous, directly and remotely, to their immediate vicinage, and to public and individual health. The slaughtering being done under cover, the blood, excepting what was saved in casks for sale or transportation, was suffered either to flow down through the floors into a sort of open cellar, or into the grounds immediately adjoining. The entrails and their contents were disposed of in the same way. At all of the slaughter-houses hogs were kept, and fed upon this material, reeking hot, or rotten as it might be by exposure to the sun and air, and to the wallowing of the swine in it. In some of these establishments all this filthiness was aggravated by long accumulation, and by fermentation in stagnant pools of water. The stench about all these places so kept is horrible, and although the day of in-

spection was a fine dry one, with a free north-west wind blowing, the odor from some of them could be observed for more than half a mile, very strongly."

"The grounds" (near points previously referred to in the report,) "being manured with heaps of the material, the whole neighborhood was infected with its odor." Dr. Clark also says, "Any description of the slaughter-houses must fall short of the perfectly disgusting reality, which can only be wholly appreciated by a personal inspection."

The selectmen in appealing to their townsmen to keep their slaughter-houses as clean as possible, say that "there are those who think it for their pecuniary interest to live, and compel their neighbors to live, in an atmosphere of putrid odors." Also, in another place: "The notion that one town in the vicinity of a great city can be set apart and endowed with a peculiar right to be offensive, is as contrary to common sense as it is to law. The streams which convey the decaying matter, the air which carries the sickening odors, do not stop at boundary lines—and our highways are as open, and as necessary to strangers, as to our townspeople."

This was the condition of the Brighton slaughter-houses in 1866, and they have not improved since that period. They are even more offensive now, because their number has increased, and a larger population is exposed to their influence. There are now about fifty slaughter-houses scattered through the town, none of them of great magnitude, each occupied by a single individual or firm, and each a separate centre of polluted air. The combined effect is familiar to all who pass the Allston Station, on the Albany Railroad, in the summer months, or who drive through the town by the common roads. It is perceptible on the other side of Charles River, in Cambridge, when the wind blows in that direction. *It is entirely due to putrefaction, and chiefly of animal matter.*

The great source of offence in all these establishments consists in the manner of disposing of the parts of the animal used neither for food nor in the arts. In the ox these parts are, the larger portion of the intestines and all of their contents, the "omasum" or third-stomach, the spleen, the lungs, and about half of the blood. In the sheep, the intestines, spleen, stomach and all of the blood. Every slaughter-house has a piggery into

which are thrown all these portions of the cattle and sheep. The result is a putrid mass, consisting of blood, which discomposes almost as soon as it falls upon such material, the excrement of the animals killed, and of the hogs, the half digested food contained in the entrails, and the offal itself, covered with decomposing matter. In this filth the hogs wallow. At uncertain intervals it is scraped out and banked up on the ground (often very spongy,) to await a purchaser, or is carted off to be spread upon land. The track of these carts is evident on the roads, both to sight and smell. The fat is carted for long distances in various directions, a portion going to Roxbury, another to Watertown, another to Cambridge and elsewhere. The portion of the blood of cattle which does not go to the hogs is taken away for the sugar refiners, but often not until it has become disgustingly putrid.

The heads and feet are taken to the bone-boilers and glue-makers; the hides to the tanners. This general description of the disposition made of different parts of the slaughtered animals applies to all the towns about Boston where the business is carried on, except Cambridge, which city prohibits the keeping of hogs. The offal is taken from Cambridge to Lexington and elsewhere.

The floors of the slaughter-houses are of wood, and are saturated with blood. In most of them there is no sewerage; generally an imperfect drain leads to some marsh or low piece of ground; sometimes to a brook. The surrounding ground is filled with decomposing matter.

The Slaughter-House Piggeries

are objectionable on the score of health: *first*, because they produce a questionable if not positively unwholesome kind of pork; *second*, because they poison the air of their neighborhood.

The pig is almost the only quadruped feeding, in whole or in part, on flesh, which civilized man is willing to eat, unless pressed by starvation; among ourselves the only exceptions are the bear and the raccoon, and meat is not the chief food of either of these animals.

The slaughter-house hog not only eats flesh, but flesh in a state of putridity, and is therefore entitled to be regarded as

the *carrion beast.* If he is good to eat, so are the crow and the buzzard. Few persons would be willing to eat him if they saw him in his putrid sty, with wreaths of entrails hanging about his neck, and his body smeared with blood. We are not prepared to assert that eating pork fed in this way is productive of any special disease, parasitic or otherwise. It would be very difficult, and perhaps impossible, to prove. Butchers often say that pigs fed on beef offal make good pork, and better than pigs fed on sheep offal. However this may be, we can say with certainty that *human instinct* (which is sometimes better than reason,) *recoils from such food.*

We know that the fat of the carrion beast is soft, and prone to decomposition unless his diet is changed to grain before killing. If the question is asked of any butcher in the market whether the pork he offers for sale is from a slaughter-house pen, the reply will be such as to satisfy the inquirer that such origin is not considered a recommendation.

The second objection to slaughter-house piggeries is of a more positive character. If anything is settled as to the causes of disease it is the influence of decomposing organic matter in giving rise to diarrhœal affections, and typhoid fever, in depressing the vitality of children, thus rendering them less capable of resisting disease in every form, and in making all the epidemics more active and virulent. The slaughter-house pig-pens are filled with putrid animal matter, with rotting blood mingled with excrement, and are *therefore a source of danger to public health.*

In making this statement we do not overlook the fact that Brighton, where most of the slaughtering is done and in the manner described, has not been, up to the present time, an unhealthy town.* This apparent contradiction of a general law whose truth has been proved all over the civilized world, is capable, we think, of explanation.

* The death-rate of Brighton in 1865 and 1866 was a little less than that of the whole State; in 1867 it corresponded with that of the whole State.

While these pages are passing through the press, we have learned the mortality of Brighton for 1868 and 1869, and have received an estimate of the population in those years from the Selectmen. Assuming the number of people to have increased 500 since the census of 1865, the death-rate of Brighton in 1868 was 22, and, in 1869, 27 in a thousand. These rates are as high as in the crowded wards of Boston, higher than in any one of the nineteen most populous cities and towns in the last published report, and are not equalled by any town of corresponding size in the Commonwealth.

The town of Brighton is three miles long and a mile and a quarter wide, and contained in 1865 less than 4,000 people. Its natural sanitary advantages are very great. Its soil is for the most part dry, its surface is broken by hills of considerable height, and it is drained on its whole northern and eastern side by Charles River. The occupations of its people oblige them to *work in the open air*. They are butchers, farmers and market-gardeners. There are no shoe factories, or other industrial establishments requiring numbers of persons of either sex to work in doors.

There is also general thrift, industry and prosperity, which, in themselves, always tend to make a people healthy. Scattered over the whole territory are about fifty slaughter-houses. It is evident on looking at these establishments with reference to the position of the dwellings, that no one will live near a slaughter-house if he can help it.

Each slaughter-house, with its associated pig-pen, is isolated, and exposed to the freest possible ventilation, both without and within. The foul air to which these places give origin is not breathed until it has freely mingled with air which is pure.

The absence of excessive mortality in Brighton up to the present time, is due, in our opinion: 1st, to the almost exclusive *out of door occupations* of its people; 2d, to its healthful site; 3d, to the separation and abundant ventilation of each of its many nuisances; and 4th, to the possession, by its people generally, of the means of procuring all the comforts of life.

The happy exemption from serious disease to which we have referred *cannot continue* if ventilation is obstructed by a dense population. As soon as people are compelled to live in large numbers in the vicinity of rotting organic matter it cannot fail to produce its legitimate and well-recognized effect.

The future character of this beautiful township, possessing rare advantages for the establishment of healthful and pleasant homes for a hundred thousand people, must depend upon the manner in which its chief business is conducted. Tainted air will finally attract a tainted population, while a reform of its slaughter-houses, which is both practicable and safe, will not only insure the *future* health of Brighton, but greatly increase the value of its territory.

Fat-Melting and Bone-Boiling.

The fat and tallow and heads from the various slaughter-houses around Boston are carried to the melting and bone-boiling establishments. They also receive a large portion of the feet of the animals, and the fat, and odds and ends from provision stores, also very lean and unsalable meat from the markets. Some of them receive dead animals. These various portions are separated according to their fat-rendering value.

This material is carried about the neighborhood of Boston, and is finally delivered, in Boston proper, in Cambridge, Charlestown, Brighton, Roxbury and other towns. Here it is boiled in open vats, and emits a most offensive odor. Sometimes an attempt is made to carry off the vapors by a high chimney, but even in this case the lids of the vats are of wood, and the foul smell freely escapes.

The effect of boiling is to drive off the watery portions, leaving in the vats tallow, lard, oil, or grease, according to the materials employed; also bones, and the scrap or "greaves."

The bones are shipped to New York or sent to East Boston to be ground and used, for the most part, as fertilizers. The scrap is generally pressed into cakes to be used for feeding hogs or poultry, and sometimes is used as manure. At one of the largest of these establishments the scrap, dipped out of the vats, is spread in layers like fish-flakes and dried by a furnace. The odor in the building where this drying process is carried on is insupportable, and the general stench from the premises is such as to be perceptible several hundred yards from the entrance. And this in a part of Boston filled with a crowded population.

Disposition made of Dead Horses, Cattle, Sheep, Pigs, Dogs and Condemned Meat.

In a population as large as that of Boston and its immediate vicinity, the amount of dead material of the description above referred to is very great, and it becomes every year more important that it should be disposed of in an orderly, cleanly and healthful manner. Dead horses from the streets and stables of Boston proper, are now carried through South Boston and shipped from the "Point" to Spectacle Island. Fifteen to twenty a week are here boiled in open vats, emitting a horrible stench, which is carried by the wind over the inner harbor and

adjacent islands. Pigs have been kept at this place in large numbers, but on a recent visit we found only two. The place is disgusting, and filthy in the extreme.

Dead cattle and sheep and pigs, from the railroad trains, are bought by the various bone-boiling establishments in the neighborhood of Boston and "rendered" in the manner described. Some of them also receive horses. Many of the animals are putrid before a bargain is made for their removal. Dogs and cats for the most part get into the docks, or are thrown into the ash carts and go to make up the filling of new land.

The Remedies

for the evils to which we have called attention, may be thus expressed in their simplest form :—

1st. The prevention of putrefaction.

2d. The conversion of the offensive vapors resulting from boiling, into inodorous and harmless gases.

Everything connected with the business of slaughtering can, in one of these two ways, be disposed of, except the manure made by the animals, which need be no more offensive than in a well-kept stable.

To accomplish all this it is necessary,—

1st. To give up the practice of feeding the offal to hogs.

2d. To build abattoirs and melting houses within the same enclosure.

Not a single step can be made in the improvement of existing modes of slaughtering without giving up the practice of feeding the offal to hogs ; with them, reform is hopeless.

It is not necessary to go to either Paris or London to see an abattoir on a very extensive plan. The "Butchers Hide and Melting Association" of New York have one in successful operation at the foot of 44th and 45th streets, East River. They never fed the offal to hogs in the city of New York, but every other imaginable form of nuisance had grown up about the slaughter-houses which existed there five years ago. Now all is changed, and the business is conducted in an orderly, cleanly and healthful manner, giving no offence whatever to the surrounding population, and as we were informed on the spot, with increased economy, profit, and satisfaction to the butchers themselves. There are twenty-nine bulks or compartments within

the immense structure to which we have referred, each of which is occupied by a separate butchering firm who have complete control of their premises. The "terms" to butchers using this abattoir or any other of the recently improved slaughter-houses in New York, are now fixed, and consist simply of *the feet and legs of the cattle from the knee down, with the skin on.* These are sold by the proprietors to the manufacturers of glue and Prussian blue for eleven cents a piece, or forty-four cents for a set of four. This pays a good profit upon investment for buildings and appliances, and all parties are satisfied.

Every portion of the animals liable to become putrid or offensive is removed before decomposition can attack it, even in the warmest weather, and this is done in an orderly and methodical way.

Melting vats are under the same roof. The vapors from these vats are condensed in the East River, and there is no offensive odor whatsoever. Nothing is wasted, and everything is made to bring the highest price by the saving of the cost of transportation. The only thing needed in this establishment to make it complete is a vat for "rendering" offal. This is now carted across the city before decomposition can attack it, to the "rendering dock" at the foot of 38th street, North River, where it is dumped directly into vats which are then hermetically closed except for the escape of the vapors and noxious gases, which pass through coils of iron pipe intensely heated by a furnace. These vapors are finally mingled with a certain proportion of air, by an arrangement similar to an argand burner, and are conducted into the flame of the furnace where they are consumed. There are received annually in the vats of this establishment 4,000 dead horses, many hundreds of dead cattle and sheep, 5,000 dogs and cats, 125,000 pounds of condemned meat, and *those parts of the slaughtered animals which at Brighton go to the hogs*, from every slaughter-house in the city of New York.

This material is "rendered" into tallow, grease, bone and scrap, without the slightest odor proceeding from the vats during the process. The scrap and bones are removed in barges to be used as fertilizers.

By either of these processes, the condensation of the vapors by cold water, or the destruction by fire, every tallow-rendering and bone-boiling establishment can be made perfectly inoffensive.

The Value of Blood.

The reform of any social evil may be greatly hastened if it can be shown that it does not involve pecuniary loss. Whoever attempts to reform our modes of slaughtering animals must be prepared to meet the universal statement among the butchers that hogs fed upon blood and offal are a source of profit. *We cannot deny it*, while at the same time asserting that, as a source of danger to public health, the practice ought to be given up. But we also believe that *the loss of the value of blood* involved in the present system is enough to nearly, and perhaps quite, compensate for the gain in hog keeping.*

The blood of slaughtered sheep and hogs is now entirely lost. No attempt is made to save it, and it is left to putrefy in the pens. The blood of cattle killed at Brighton is scattered over its many slaughter-houses, and is regarded as of so little value that the portion saved is sold by the butchers for anything they can get. Some of them say that they are glad to be rid of it at any price, because it so quickly becomes offensive. *The blood of Brighton does not bring to the butchers more than a cent a gallon*, reckoning one season with another. On the other hand, at the largest slaughter-house in New York, and a very fine one, although not equal to the one just described, the proprietor informed us that he sold the blood of 30,000 cattle killed last year for $5,000 cash, which was enough to pay *the interest on the cost of his establishment*, and that he expected to get a good deal more in future.

The value of blood consists chiefly in its serum or watery part, which separates from the clot on coagulation; and the value of this portion depends upon its containing *albumen*. Sugar refiners use the fresh blood because it is cheaper and the color is not objectionable, but calico printers and photographers require it to be colorless and therefore use either egg albumen, or blood albumen from which the red clot has been carefully

* This gain is not as great as might at first appear, since a good deal of the offal now thrown into the pens is only partially stripped of its fat; under a better system *all* this fat would go with the tallow.

separated. From these two sources, egg and blood, comes all the albumen used in the arts. Albumen constitutes seven per cent. of the whole mass of the blood, and is readily prepared from the serum, by simple evaporation, without the addition of any other material. The process is fully described in a report made to the "Societe Industrielle" de "Mulhouse" April 28, 1869, a translation of which is furnished in the Appendix.

Solid blood albumen, the result of the evaporation, is a dry, brittle, translucent material, resembling horn, or fragments of glue. This, when dissolved in water, resumes its primitive consistence.

Blood albumen in this form is imported from France, and costs at present $1.20, gold, per pound. Our cloth printing establishments use it very extensively. It is also used by sugar refiners, and if the production should be increased, it would, for every purpose, take the place of fresh blood. At one of the largest sugar refineries in this vicinity, the supply of blood from Brighton has been found to be so uncertain and unsatisfactory (often putrid and offensive*) that the imported dry albumen has entirely taken its place. In addition to this real "blood albumen," there is another dry black material imported at a much cheaper price which is used also by the sugar refiners. This is evidently *dried blood*, with all the coloring matter retained.

Of these two articles, there passed through the Boston custom-house in 1869, 10,346 pounds of blood albumen, and 6,234 pounds of dried blood.

The amount brought into the port of New York† we have been unable to ascertain, but it was probably very much larger.

The calico printers use, it is estimated, from 8,000 to 12,000 pounds of blood albumen per annum, and the consumption for their purposes is rapidly increasing and promises to continue. If the article should be manufactured in such close connection with slaughter-houses as to preserve the clearness of color it would take the place of egg albumen for every purpose. The use for refining sugar would be very great even if the blood were

* From this cause the city of Cambridge does not permit the carts carrying blood to pass through its streets.

† Egg albumen and blood albumen are not distinguished on the books of the New York custom house.

simply dried, without attempting to separate the clot from the serum. These are doubtless the chief uses of blood albumen, but there are many other arts in which it is essential in small amounts. The market is extensive, the demand is increasing, and the price is such that the blood of an ox (according to French experience*) is worth $1.05 gold, when separated from its clot and coloring matter, and dried. Even with the fresh blood allowed to run into vats, as in New York, $5,000 divided among 30,000 cattle gives 16⅔ cents for each animal, which is five times as much as the Brighton butchers receive.

So much for the *serum* of blood. But there is another element of value in its *fibrine*, or the portion which coagulates, holding the red globules in its meshes.

This is a fertilizer of the most powerful kind. We have the highest chemical authority for saying that this when dried is worth more than Peruvian guano. A company is now preparing it for this purpose at the Communipaw slaughter-houses near New York, without separating the serum. It certainly is practicable to make both the serum and fibrine available. After the separation of the serum on coagulation, the clot might be mixed with dried earth or clay, or dried peat or gas lime (holding carbolic acid) or some similar material, and rapidly dried before decomposition could reach it.

We have endeavored to show that blood, under our present system (or rather want of system) is a source of filth and a source of waste—that it has a value much greater than has been generally supposed, and greater now than ever before—that the interests of health and economy combine to make it important to save it from putrefication, and to utilize it. But this can only be done to advantage in large establishments, and by dealing with large amounts.

To complete the reform in modes of slaughtering in the vicinity of Boston in such a way that nobody shall suffer and everybody shall gain, there are needed one or more "*Abattoirs*," containing all the improvements which European experience can furnish, or modern science suggest. They need not be expensive buildings, although they should occupy a large space. They should have comfortable stables for protecting and feeding

* See Appendix.

the animals. As regards the slaughter-house itself, the essential things seem to be,—

1st. A pavement of stone or of some material impervious to blood.

2d. An abundant supply of water.

3d. Complete drainage and sewerage.

4th. Vats for the "rendering" of fat and offal on the spot, before putrefaction can attack them.

5th. The means of converting blood into blood albumen.

If disinfection of "offal scrap" should be necessary at any season it could be done by means of *earth dried in the sun*, with perhaps the mixture of a little fresh lime, thus increasing its value as a fertilizer.

The *sanitary* advantages of such a system would be,—

1st. The removal of the present offensive odor, which, as population becomes more dense, must affect public health.

2d. The removal of slaughter-house pork from the markets.

3d. The ready inspection of meat, thus insuring the rejection of that which is unfit for food.

The *economical* advantages would be,—

1st. Diminished liability of having meat "spoiled" by exposure to the emanations from the putrid pig-pens.

2d. The value of the blood which would be saved and utilized.

3d. The savings which must always accompany order, system, the division of labor, the avoidance of transportation, and the doing any business on a large scale.

4th. The greatly increased value of land in the vicinity of the present slaughter-houses.

The preceding considerations, together with the appended documents throwing additional light on the whole subject, are respectfully submitted to the legislature and to the people of the State, in the hope that they will hasten the day, which is sure to come, when the present offence will be removed.