A treatise on public slaughter-houses, considered in connection with the sanitary question : describing the practice of slaughtering in France and England, with an historical and statistical account of the abattoirs of Paris, and accompanied by plans, with the view to the introduction of similar establishments into England / By Richard B. Grantham, C.E.

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A TREATISE

ON

PUBLIC SLAUGHTER-HOUSES,

CONSIDERED IN CONNECTION WITH

THE SANITARY QUESTION.

DESCRIBING THE

PRACTICE OF SLAUGHTERING IN FRANCE AND ENGLAND,

WITH

AN HISTORICAL AND STATISTICAL ACCOUNT OF THE ABATTOIRS OF PARIS, AND ACCOMPANIED BY PLANS, WITH THE VIEW TO THE INTRODUCTION OF SIMILAR ESTABLISHMENTS INTO ENGLAND.

"Away with me, all you whose souls abhor
"Th' uncleanly savour of a slaughter-house,
"For I am stifled with the smell."

SHAKESPEAR.

BY RICHARD B. GRANTHAM, C.E.,

Member of the Institution of Civil Engineers, Fellow of the Geological Society of London.

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PREFACE.

When the author was first induced by some friends to undertake this work, he was aware that a new principle of public slaughter-houses was being made the object of a projected commercial speculation, but it appeared to him that the subject was of such importance, and the objects to be attained by it so much higher than a commercial speculation would combine, that he thought the introduction of public slaughter-houses should be made a leading part of the Sanitary Question.

The work, necessarily, from the novelty of the subject, will be found to contain much that is new, a great deal of statistical information, which will be probably interesting to many, and relations of the mode of preparing so vast an article of human food, which, if it does not disgust, will probably astonish those who may inquire into it.

A great part of it is scattered through several other works, and has been the subject of repeated inquiries before committees of both Houses of Parliament, but it is believed has never before been treated in this manner, nor with the same aim that its title professes.

It is well known that those most interested, the butchers, have taken a very few steps towards endeavouring to improve the present system of slaughter-houses, to meet the just demands of the public, in order that a better and less objectionable plan should be instituted, and that they are too confident that no interference with their trade can take place, and are certainly not aware of the state of public opinion upon the question.

The public are becoming actively alive to the importance of the institution of sanitary measures, which, if carried out with the spirit which has been exhibited, will deal very summarily with the nuisances of slaughter-houses.

The propositions contained in the following pages not only apply to the metropolis, but to every town in the kingdom where the evils complained of are become *naturalized* to as great an extent as in the metropolis.

With respect to the Parisian Abattoirs, a greater part of the matter here treated of has never before by any means been made public in England, and forms a complete history of them, and contains the latest statistics.

Having investigated the subject in Paris, and examined the buildings of the abattoirs there, the author admits that the system of government and management would require to be greatly modified, in order to be applicable, and to meet the feelings, interests, and circumstances of this country.

The author begs to express his acknowledgments and thanks to several friends who have assisted him with information, particularly M. Biset, the superintendent of the abattoirs at Paris; Mr. J. R. Johnson, whose chemical exposition of the animal substances will be found most interesting; Mr. John Gatliff, then resident in Paris; Mr. Hugh G. Sutton, of Liverpool, and several others, who have freely given their services.

The plans attached to this work are not applicable to any particular locality, but are introduced for the purpose of giving general ideas of what may be best adapted to this country, and without any pretence to ornament or established design.

Adelphi, London, 1848.

LIST OF PLATES.

A TREATISE

ON

PUBLIC SLAUGHTER-HOUSES,

&c.

CHAPTER I.

THE USE AND ABUSE OF ANIMAL SUBSTANCES—CHEMISTRY OF PUTREFACTION—CAUSES OF DISEASE FROM DECOMPOSITION.

In no case do we find the beneficence of the Great Creator of the universe more beautifully illustrated than when we consider the uses and abuses of the material objects which surround us. Are these objects sources of pain—of evil to us? Rest assured it is because we abuse them, or that, ignorant of His wise intentions, we neglect to profit by His goodness. The evil is but the indication of the hidden good.

Our daily experience shows us that fire may consume our dwellings, devastate whole cities, and bring misery and desolation upon thousands. Yet fire is a necessary element of existence, a source of constant comfort and enjoyment. Steam, which has occasionally exercised its vast power to hurry to eternity crowds of unhappy creatures, when ruled

by intelligence is a docile slave which ministers in a thousand ways to our wants and luxuries. The deadly poisons which abound in the vegetable world, are so many active restorers of health.

The operations of the saltpetre-maker Courtois were arrested by a substance which corroded his vessels. He investigated the cause, in order to prevent it; he succeeded. He found that he could extract from his liquors the noxious substance, and that it was new to him. Chemists recognised a new substance, an elementary body, in beautiful crystals with metallic lustre, and yielding a vapour of a magnificent violet colour. New substances were discovered by its combinations. A scarlet colour was produced which rivalled vermilion, and our calico-printers applied it to ornament their fabrics. New uses were found on inquiry. Daguerre found that by it he could form out of silver plate a magic mirror which fixed the hitherto fleeting shadows of the gazer, and that he could thus transmit them to posterity. Medicine found uses for it. It proved a most active remedy, and the corrosive substance of the saltpetre-maker is now a cure for one of the direst evils which punish the ignorance of man.

The evil is, in all cases, but the indication of a misunderstanding of nature—a beneficent punishment, which, while inflicting pain on a small portion of humanity, points out a source of happiness for future generations.

If the truth of our remarks be admitted in the

cases quoted, there are others in which that truth is but just beginning to dawn upon us. It will be our object in the following treatise to point out the existence of one such case, and to suggest practical plans for its amelioration. We propose to show that a source of disease, of crime, and death is capable by a proper interpretation of nature, and by the application of the knowledge thereby acquired, of being converted into a source of increased production, of increased riches, and consequently of increased comfort and happiness.

The evils we allude to are those which arise from the abuse of animal substances, and particularly from those parts of animals which are called waste, or offal. In nature there is no waste; every particle of matter has its uses assigned to it; has its part to act in the great scheme of creation, and is thus as important an element as the rest. The uses thus assigned to it are all available, when applied by the intelligence of man, for his happiness; and what is more, by neglecting to avail ourselves of these uses, we entail not merely the loss of that certain portion of happiness which these are capable of affording, but frequently positive evils in addition. This is peculiarly true of the case we purpose to treat of in these pages.

USE OF ANIMAL SUBSTANCES.

The scheme of animated nature would seem to consist of a graduated series of animated beings,

each of which is subservient to those above it in the scale, and contributes to their wants and requirements.

The larger infusoria exhibited to us by the microscope in a drop of water, devour the smaller: these in their turn serve as prey to animals higher in the scale, and so on till we arrive at the extreme point of the other end of the series,—to man, the Lord of Creation. To him all are subservient. To him each ministers and pays tribute, contributing its quota to his wants and luxuries. The higher animals labour for him, and furnish food—his first necessity. From others he not only derives food but clothing, to protect him from the inclemency of the seasons. For this the sheep yields its own fleece; the animals of the arctic regions their furs; the eider duck her down; for him the worm spins her silken thread. There is no part of the animal which man does not, or may not, make useful to him, and render subservient to his wants and luxuries.

FLESH.

The flesh of animals is admirably adapted for man's subsistence. It contains in small bulk all the elements necessary to replace those destroyed by the wear and tear of the body. The nutriment so yielded has been collected from the grasses and other plants which contain this nutriment in small proportion only, by the laborious exertions of the

animal; which, by thus yielding to man in a concentrated form what it has amassed at so great expense of time and labour, gives him leisure for those pursuits which raise him so unmeasurably above the animals on which he feeds.

BLOOD.

If we examine the constituents of the blood, we shall find it eminently adapted for use as food, containing as it does a large portion of those substances which have been recognised as essential to animal life.

Blood closely resembles flesh in its chemical composition; it is indeed the vehicle from which the flesh is deposited in the animal. Considerable quantities of blood are converted into food in this and other countries, in the form of blood-puddings,—*boudin noir*, of the French.

To prepare the blood for this purpose, it is stirred constantly as it flows from the animal. The fibrine then separates, adhering in the form of fibres or strings (whence its name) to the rod employed for stirring. Without this precaution, the blood would separate into two portions, the fibrine and red globules solidifying to form the clot or crassamentum; and the albuminous portion remaining fluid with the water and the greater part of the salts, to constitute the serum.

The great tendency to the putrefaction of blood, and the fact that its manipulation for conversion

into food is intrusted to a low class of persons, who work up the rest of the offal, render the quantity of blood employed for food inconsiderable, compared with the amount produced.

This is to be regretted, for if we estimate the quantity we shall find it enormous, there being on an average, of all sizes of cattle, three gallons of blood, from sheep three pints, and from calves one gallon, and a larger proportion from pigs. Then, multiplying these quantities into the numbers slaughtered, we approach to a tolerably correct result.

There are various other uses to which blood may be applied. The serum can be employed when fresh for the clarification of sirups and other dense fluids. This property is founded on the fact that the serum of blood coagulates like other albuminous fluids, at a temperature of about 160 degrees. When it is mixed below this temperature with the fluid to be clarified, a homogeneous mass is formed; but on raising the temperature to the point of coagulation, the serum separates as a bulky mass, and entangling the solid matters in suspension, carries them to the top, whence they are easily separated.

The coagulated mass is thus collected in considerable quantities by the sugar refiners, and is by them disposed of as manure, but at a much lower rate than its qualities deserve.

The serum can also be employed instead of the

white of eggs by the kid and Spanish leather-dressers, bookbinders, &c. Large quantities of the "glaire" of eggs are employed for this purpose, and thus tend to raise the price of that valuable article of food. We are assured that blood serum, by care in its collection and conservation, is a perfect substitute.

Blood when dried forms a valuable material for the preparation of the prussiate of potass and other cyanogen compounds. It was the only material employed for a considerable time for the preparation of this substance, and of the Prussian blue. The Germans still distinguish the prussiate by the name of blood lye salt (*Blut Laugen Salz*).

The proper method of treating blood for this purpose, is to coagulate it while quite fresh by means of heat, using a jet of steam for this purpose. The coagulum formed is allowed to drain, and dries readily without undergoing decomposition.

As usually conducted, the process is of the most offensive description. The blood having to be collected in numerous localities at a distance from the place of manufacture, is in an advanced state of decomposition before being used, and has then to be evaporated in order to collect the whole of the solid matter.

The dried blood when simply charred, instead of being calcined with potash for the manufacture of the prussiates, forms a charcoal which possesses decolorizing properties in an eminent degree, and was

formerly employed for the purpose of decolorizing sirups, but the use of the charcoal of bones (bone black, *noir animal*, &c.) has superseded it.

Blood forms a manure of the richest quality. Its nitrogen compounds gradually yield ammonia by their decomposition, while its salts, principally alkaline phosphates, contribute an equally important constituent to the frame of the plant. It is largely used by the Lincolnshire farmers, and is procured in casks, principally from the slaughter-houses of Hull.

It is much more extensively employed in France, and for this purpose it undergoes a preparation.

Heat was formerly employed for the purpose, but this has given way to the coagulation by acids, or metallic salts. Sulphuric acid, chloride of iron, and more lately chloride of manganese, the refuse of the chloride of lime-makers, have been employed with perfect success.

The metallic salts are preferred, as, in addition to the property which they possess of dividing the clot, rendering it much less subject to decomposition, and fixing the ammonia when formed, they act as disinfectants in the event of decomposition having commenced. They also give a black colour to the mass, which in the opinion of the farmers in certain departments of France, is a necessary quality of a rich manure.

INTESTINES.

The stomach and intestines are used by man for food, and for packing food. Of these he also makes strings for lathes, clocks, and musical instruments. The delicious tones with which Paganini drew tears from his audience, were produced by the mere friction of the hair and intestines of animals, stretched on instruments constructed with mechanical skill, used with the inspired knowledge of genius.

FAT.

The fat of animals man employs for a great variety of uses.

Fat exists in animals, contained in minute bags, or follicles, of a skin-like substance (cellular tissue). It is found in the animals in large masses. These are collected together with the scraps and cuttings, and heated in large pans, so as to liquefy the solid fat, and separate it from the bags in which it is contained. It is not alone from these masses of fat that tallow is prepared. All parts of the animal contain more or less of it; and in cases where the flesh of the animal is unfit for food, it is frequently boiled until disintegrated. The fat is then liquefied, and rises to the surface. It is then skimmed off, and allowed to solidify by cooling. The liquefied fat is run into masses, and then constitutes tallow. Tallow is used in its simple state for

common candles. United with soda, it forms the basis of the hard soaps; with potash, soft soap. The process by which tallow or other fat is united with alkali is called saponification. It is not a simple union of one substance with the other. During the process, the fat is decomposed and converted into other products, some of which are likewise fatty bodies, but differ in their properties from tallow. When these are separated from the alkali, and subjected to pressure, a fatty substance is obtained which resembles wax, and serves for the preparation of candles which rival those prepared with that substance. It is also used for many purposes in the arts; for leather dressings, to render this material soft and pliable; for lubricating machinery; and for unguents and plasters.

If we consider the comfort we derive from the artificial light yielded by candles in our dwellings, and that from the cleanliness to which soap is essential, we shall be prepared to admit how much we owe to the animals which furnish the materials from which these are prepared.

SKIN.

The skins of animals furnish us clothing. The untutored savage wraps it round him when just flayed from the animal, or gives it some slight preparation over the smoke of his wood fire. The civilized man derives much more enjoyment from it. He has discovered various modes of communicating strength and durability to it, qualities which

it does not naturally possess. He produces leather, with its hosts of uses. Stout tanned leather for boots and shoes, for harness, for driving-bands for machinery, for covers of trunks and boxes, for bags, &c. Lighter leather for the covers of books; ornamental leather for books of luxury, for furniture, &c. *treated of various kinds to gratify the eye*,—dyed scarlet with the little bodies of the cochineal or of the lac insect, products of the animal kingdom, or blue with indigo brought from the plains of India, or purple with a weed collected in the Canary Islands, or red and yellow with wood cut in the forests of America and the West India islands.

He tans the leather with the leaves of the sumach-tree brought from Sicily, and polishes it with the glaire of eggs, and with the friction of lignum vitæ wood.

With the skin of the sheep he makes parchment and vellum as well as leather. Parchment, which formerly served for storing his knowledge for the use of succeeding generations, and still serves to record his more important transactions.

Of the cuttings too small for the above purposes he makes size and glue. With the wool separated from the skin he prepares soft warm fabrics, which serve admirably for protection from the cold, and at the same time are soft and pleasing to the touch. He gratifies his other senses at the same time by giving these fabrics lustre and pleasing colours.

HAIR.

The hair, separated from the skin, he uses to form cement or mortar for the inner walls of his dwellings, or mixes it with loam to assist him in casting iron. Of the longer descriptions he makes cushions, mattresses for beds, seats for saddles. Of the hair of other animals he makes brushes and pencils of various kinds. He applies the bristles of hogs to similar uses.

HORNS.

The horns are fashioned into drinking-cups, combs, substitutes for glass in common lanterns, &c.

HOOFS.

The hoofs of the animals are carefully collected. They are used for similar purposes to the dried blood; that is, for preparing animal charcoal and prussiate of potash.

BONES.

The bones of fresh-killed animals are carefully collected from the slaughter-houses. They have usually portions of flesh and tendon adhering to them. They are boiled to dissolve the muscular matter, and to separate the fat. The latter being skimmed off, the solution of the tendinous substance is boiled down to form a stiff jelly. In this state it constitutes size. Size, cut into slices and dried on nets, forms glue. The larger of the bones thus

cleaned from the flesh and fat, are sold to the cutler for the handles of knives, or to the button-maker, or fancy turner. The softer bones are then ground or crushed for manure, that is, to restore to the soil those elements which have been removed from it by the plants, and from them by the animal. The marrow is carefully collected and used by the chemists and perfumers, as the basis of salves, ointments, hair-grease, and have most inviting names attached to them.

ABUSE OF ANIMAL SUBSTANCES.

If it be true that from animal substances we derive food and raiment, and that they constitute a fertile source of comfort and happiness when used with intelligence, it is certainly not less true that, if we neglect to avail ourselves of these benefits, evils result, which are of equal importance as a source of pain. Used properly, animals furnish health and strength to the body; neglected, they bring disease, and its attendant evils,—poverty and crime. The flesh of the animal which furnishes us food, allowed to lay neglected, is changed, decomposed, or as we ordinarily express it, putrefies, or becomes putrid. A peculiar odour first arises, which in a state of nature is the indication to those natural scavengers, the animals of prey, that food is prepared for them. If this indication be neglected, as it usually is in our cities, whence these have been banished, the stench becomes greatly increased.

The solid matters of the putrefying body pass, by the active change it is undergoing, into volatile products, which mix with the atmosphere and communicate the taint to a wide circle around the neglected body. We all know that we cannot breathe this tainted atmosphere in the vicinity of its origin, without disgust and loathing; but we do not know, or at least we refuse to profit by the knowledge, that these sensations are the symptoms of an injurious influence on the living body, which, if continued, would produce disease and death. There is no fact more clearly demonstrated by experience, than that the putrefaction of animal substances is capable of transmission to other similar substances, whether these be living or dead.

Chemically speaking, putrefaction is a change of form which the elements of the putrefying body assume, under certain circumstances, by the operation of certain laws. Let us see what are the elements of animal matter, and what are the circumstances under which they assume that change which we call putrefaction.

Chemistry teaches us that the material world, wonderfully diversified as it appears, has been formed by the Great Creator out of a few kinds of matter. By analysis, the resolution or splitting up of complex bodies into bodies of a more simple kind, we find that we can reduce all substances, however various their appearance and properties, into a few species of matter, the variety

being caused by the different modes in which the simple bodies are compounded.

When our means will not allow us to decompose or split up these simple kinds of matter further, we call them elementary bodies, or elements. Between fifty and sixty elements have been enumerated, but it is probable that, when our powers of analysis are extended, we shall be able still farther to reduce them. Many of these elements are extremely rare, so that those out of which the great mass of the world is formed are few in number. The organic or living world, which includes all vegetables and animals, is formed out of ten or twelve elements, and of these again, four constitute the great bulk of organic substances.

Elements unite in couples, to form a series of new species, and the binary compounds so formed unite again in couples to form other series. By the union of these, still more complex products are formed, and thus the variety we observe in nature is produced.

The force by which the elementary bodies unite and are held together to constitute the various substances, is called affinity or chemical attraction. It is more potent the less complicated the compound body; and, consequently, the more difficult it is to decompose or split up the different compounds, the more nearly we approach the elements. The facility increases, on the contrary, as the body operated upon is more complex, so that when we arrive at

those complex bodies which are the constituents of plants and animals, we find that it is merely sufficient to arrest their growth, to change the circumstances which are essential to their progress, for the substances which compose them do split up of themselves into those more simple forms of matter which are formed by the union of the elements into couples. Thus animal matter, such as flesh or blood, no sooner loses its vitality than a change is observed in it, if in the presence of moisture and air. The elements which compose it cease to form the complex products which are the constituents of flesh and blood, but arrange themselves into new and less complex groups. Among the products, we have the peculiarly offensive substance ammonia united with sulphur, to which principally the fetid exhalations are due.

A certain amount of water is essential to the process of putrefaction. Dry substances do not putrefy, but decay.

Heat, which separates the particles of water until it assumes the form of steam, separates also the elementary atoms of compound bodies, and either causes or facilitates their decomposition. In the case of water, the affinity which holds its constituents together is greater than the repulsion or tendency to separate, communicated to the particles by heat, so that it cannot alone effect the decomposition of this fluid. But in the case of more complex bodies, their decomposition is readily

effected by heat alone; and a temperature which is quite insufficient to decompose a body, may nevertheless greatly facilitate the operation of other causes, and *vice versâ*, a sufficiently low temperature may so approximate the elementary particles, that the decomposing influences cease to operate. Accordingly we find that temperature exerts an important influence upon that form of decomposition we are considering—putrefaction. Animal matters are effectually preserved and retained at a temperature which freezes water. On the other hand, in summer particularly, in a moist state of the atmosphere, putrefaction commences in animal substances almost as soon as life is extinct.

Heat and moisture facilitate putrefaction of organic substances, doubtless by facilitating motion among the particles of that matter. If we consider that animal matter is formed by the aggregation of the elements in certain proportions, and after a certain arrangement, and that ammonia and other products of the decomposition of animal matter are aggregates of the same elements in certain other arrangements, it is obvious that for one set of products to pass into the other, a change of place, in other words motion, is necessary.

There is considerable analogy between the motion of the elementary atoms of chemical substances and those of ordinary material objects. As the engine readily moves the train when once the *vis inertiæ* at starting has been overcome, or as the

stone freely rolls down the hill by the smallest impulse, so the decomposition of chemical substances is readily induced by the communication of impulse to a portion of the mass; the force which tends to keep the particles in that state of combination which determines the original character of the substance may be sufficient in a state of rest, but if once the equilibrium is disturbed, and the decomposition of a particle of the substance is effected, the motion thus induced is gradually communicated to the mass, and the decomposition of the whole takes place. Thus flour and water may be kept together for a length of time as simple paste, but the addition of a minute quantity of leaven, or of yeast, substances in a state of change, communicates motion, and consequently change of form to the whole mass, and we have leavened or fermented bread, as the product of the decomposition. Sugar and water may be kept as such, but the addition of a small quantity of yeast determines the decomposition of the sugar into vinous spirit and carbonic acid. If the sugar be pure, the decomposition is effected without the increase of yeast, which thus produces the decomposition without taking part in it. It gives the original impulse to the motion and change, but does not enter as a constituent of the products. A host of such facts might be cited. We learn, from these instances, that matter in a state of motion or change is capable of exciting motion in other matter in a state of rest; and we

further learn, that the change will be different as the motion of the excitant differs. Thus, in our first two instances, we had flour and water in both cases, but the excitant differed; hence the production of acidity in one case, and of panary fermentation in the other, the state of change of the excitant producing a corresponding change in the excited materials. The putrefying process of animal substances is capable of transmission in the same way. A portion of decomposing matter placed in contact with fresh meat, causes it as rapidly to assume a similar state of change, as the addition of yeast causes flour and water to become bread.

Actual contact is not essential to the action. Vicinity is sufficient. As the string vibrates when another string in the same state of tension is made to vibrate near it, so putrefaction is caused in the neighbourhood of putrefying substances.

The experience of medical men and chemists shows us, that it is not dead flesh alone which is subject to that change of constitution which we have called putrefaction. If a minute portion of matter from a putrefying corpse come in contact with living flesh, inflammation, decomposition, putrefaction in fact, result, and death follows. How many deaths have resulted from inoculation during dissection!

Vitality, the power which determines the elements to group themselves so as to form blood and flesh, is not sufficient in this case to resist the

influence of that tendency to decomposition induced by the inoculated matter.

In the preceding pages we have endeavoured to show the evils which result to the living organism from the vicinity of putrefying animal substances. We have supposed the case as arising from a deposition of animal matter unfit for human food. The chief application of animal substances cannot therefore here obtain. We nevertheless shall prove that in proportion to the evils which arise from this filth, so are the benefits to be derived from a proper use of it. In fact, if we consider the ordinary cases of putrefaction, we shall find that the offensiveness of the exhalations which are given off, and from which we suffer, is directly proportional to the loss accruing from allowing it thus to waste. The greater the stench during putrefaction, the greater the value of the material when properly applied.

We have stated that the peculiar offensive pungency of the exhalations is due to a compound of ammonia.

Will it be believed that for this very material, allowed to waste at our doors, and thus cause disease and death, our ships are sent by hundreds to another hemisphere? That of late we have paid hundreds of thousands of pounds for this material?

Let us see how it may be economized.

It is a well established fact in chemistry that substances are always definite in composition, whether just formed in the laboratory of the che-

mist, or in the great laboratory of nature thousands of years ago. Phosphate of lime (earth of bones) is always composed of a definite quantity of phosphoric acid united to a definite quantity of lime.

Phosphoric acid is formed of phosphorus and oxygen in equally well-defined proportions.

This is true also of the more complex substances which constitute organized beings.

Another equally well demonstrated truth in modern chemistry is, that the elementary bodies cannot be transmuted.

Phosphorus cannot be made sulphur, nor can the compounds of phosphorus be derived from those of sulphur.

From these premises it is evident that whatever be the elements of which animals are formed, they must have obtained them from the plants, their food, or from the air respired.

It has been ascertained that in the process of respiration, oxygen, one of the constituents of air, is absorbed but again respired, united to carbon obtained from the food. Air, it would appear, contributes nothing to the solid and liquid matters of which animals are formed. These must therefore have been obtained from the vegetable food.

We are therefore able with confidence to assert that plants and animals are formed of the same elements, and our assertion, founded on the constitution of animals, is proved to be true by analysis of the plants themselves.

For the same reasons, viz. that the elements cannot be converted into each other, it is clear that for the growth of plants the same substances are necessary. They must be taken from the air or from the soil.

Plants breathe as well as animals. There is unity throughout; but by an admirable provision of beneficent wisdom, plants inspire what man expires. They reject what is essential to his existence. The harmony of proportion, the definite constitution of air, is thus efficiently maintained. The carbonic acid which man and other animals expire from their lungs and from the pores of their bodies, and which when existing beyond a certain proportion in the air inspired is fatal to animal life, forms a necessary element of the existence of plants. It is inspired by the pores of their leaves: its carbon is absorbed and assimilated, and the oxygen with which it was combined, on the carbonic acid being evolved, serves again for the respiration of man to be reconverted into carbonic acid.

It is proved that this is the principal function of air in the vegetable economy. The nitrogen (another constituent of air) is indeed converted occasionally into a material capable of acting as food for plants, by yielding up this nitrogen; but this would appear to be quite insufficient for the supply of this element, so essential to their development. It is, therefore, to the soil we must look as the great reservoir of the food of plants, for it is

from the soil that the chief nutriment is derived by the radicles of the plant.

By the same argument by which we arrived at a knowledge of the constitution of plants from that of animals, we may ascertain the constitution of soils. Fertile soils must necessarily contain all the elements of plants and animals, minus that element (carbon) which the plants derive from the air. The analysis of rich soils proves the truth of our prediction. All the constituent elements of plants are found to be present, not even excepting the carbon, and from the uniform presence of this substance in rich soils, it would appear that all this substance, which constitutes so large a proportion of plants, is not derived from the air alone, but that a considerable portion was obtained from the soil.

It needs no demonstration, that for the existence and growth of animals, a due supply of food is necessary. As the phosphate of lime is deposited in the bones of the young animal and the nitrogen assimilated to form the flesh, for continued increase, these substances must be constantly supplied in the shape of fodder from the barn.

It is apparent to the most obtuse understanding, that as the store of fodder diminishes in the barn, it must be supplied from the fields, for continued consumption. But it is by no means so apparent, that in reaping our fields we as effectually remove the elements of reproduction from

the soil as in removing the fodder from the barn; and that we might as well expect the animal to increase without food, or the barn to reproduce fodder without the aid of the soil, as to expect the soil to continue to supply plants without the addition of those elements which we have removed in the plants reaped.

The question then arises—what must we add to the soil to restore its fertility? What is our best manure? After our previous considerations, the answer is obvious,—those substances which we have removed from the soil. The food removed has been converted into the animal and its excrements. Add these, and we have the original circumstances restored. The excrements are not alone sufficient. The young animal *grows*. The phosphate of lime accumulates in the bones, and the nitrogen in the flesh. These also must be restored, or supplied from other sources, to have again the original conditions of fertility.

The use of bones is well known and appreciated as a manure, but what a mass of other materials is wasted! Flesh and other animal offal is allowed to accumulate. A portion of the nitrogen in the form of the offensive and deleterious hydrosulphuret of ammonia escapes, and will doubtless, when condensed by the rain, contribute to fertilize the soil, but not before the action generating it has sown disease and death in the neighbourhood of its production. The greater part is washed away in our

sewers to fertilize a submarine world, and yield food to its finny inhabitants. These furnish sustenance to the fishing birds. A portion is thus brought back to land, and we send our ships for it, in the form of guano, to the coast of South America, getting it in exchange for gold, earned by the sweat of our labourers. South American guano owes its peculiar fertilizing properties principally to that material which gives pungency to the stench of putrefying animal substances.

To indicate all the sources of putrefying matter, and to point out means for removing it, and its attendant evils, disease, want, and misery, is a task beyond our powers. Our great cities have become so many Augean stables, for the removal of whose filth as many Hercules are required. I have directed my attention to one great source of neglected animal matter,—the slaughter-house, and to this I shall confine myself. I shall point out the manner in which these are conducted in our own country, and more particularly in the metropolis. I shall show, for the sake of comparison, the system of slaughter-houses in the metropolis of France, where the operations of the butcher are conducted systematically under the direction of the authorities, and profiting by the experience which the study of this system has afforded me, I shall offer suggestions of improvements, and such modifications as seem necessary to render a system applicable to this country. I trust that the sugges-

tions, the result of much time and labour, will be received in the same spirit that they are offered, that of a sincere desire to ameliorate the evils affecting the sanitary welfare of large towns, which I conscientiously believe to exist under the present manner of conducting the operations of the slaughter-house.

CHAPTER II.

BUTCHERS' TRADE OF PARIS—MARKETS—ABATTOIRS.

THE butchers of Paris and their trade have for a long period been under the direction and surveillance of the Prefect of Police. Regulations of a very stringent character have been enforced to prevent the sale of meat which is diseased or otherwise unfit for food. The regulations as to the sale of cattle, as to the manner of driving them, the route to be taken to the slaughter-houses, the cleanliness to be observed at the slaughter-houses, the sale of the offal, the regulations of the markets, the number of stalls, &c. &c., are all subjects within the cognizance of the police. To prevent the trade falling into the hands of improper persons, each butcher is licensed, and pays down a sum of money, not bearing interest, as security for the observance of the regulations.

The details of the trade have been conducted since 1802 by a sort of board (syndicat), consisting of a syndic and six members of the board (adjoints). These act under the Prefect of Police, and are to a certain extent accountable to him. The number of butchers is limited. The number fixed upon has varied greatly. In a report made to the king by the syndic of the butchers in 1829, we find a very

complete account of the laws which regulate the trade of the butcher, and the effect of these laws upon the trade, on the fattening of cattle, consumption of meat, &c. It seems to us, however, that their importance is much exaggerated; effects being attributed to them which are due to very different causes. We shall, however, give some of the views as presented in the report itself.

The syndic commences by stating, that in all times, and in all nations, the trade of the butchers and bakers has been regulated by special laws; and in France up to 1791, one of the objects of these regulations was to limit the number of individuals exercising these "professions."

Thus in 1789 the number of butchers in Paris was limited to 230. The new law of the 17th of March, 1791, was based upon the principle of free trade, and the numbers were then unlimited. Frightful disorders ensued. Tainted meat was exposed for sale in the streets, in the squares, even in the alleys, and at the very doors of the houses. After ten years of experience, such a system could be no longer endured. A decree of the 30th September, 1802, prohibited the public exposition (*étalage*) of meat. It obliged the butcher to furnish security for the proper observance of the regulations, to the extent of £120, £80, or £40, according to the extent of his transactions. The evil was lessened, but not removed. By another ordonnance in 1808, the trade of the butcher was

still further restricted, and in February, 1811, the principle of a limited number was again resorted to, 300 being fixed upon as the number of butchers for Paris, and insisting that no fresh license should be granted until the number had been gradually reduced to this point. We find in 1822, eleven years after, that the maximum had not been attained, and a new ordonnance was promulgated, fixing the maximum at 370, the number then existing. In 1825, a new decree permitted the granting of 100 new licenses for each of the years 1825, 1826, 1827, and ordered that after the 1st January, 1828, the number of places of business (*étals*) should be unrestricted.

It is against this regulation that the butchers complain in the report referred to, and the syndic argues at great length that it has failed to attain its objects. It is not surprising that these objects should have been unattained if the syndic represents them correctly.

By the regulations of 1825, he says it was the intention of the authorities to encourage the breeding of cattle by increasing the competition of buyers in increasing their numbers—to increase the production of manure—to reduce the price of the meat on the stall of the butcher, while it was proposed at the same time to increase the price of the live ox. The syndic, after showing that these intentions had wholly failed, proceeds to contend, that the principle of unrestricted competition,

although generally good,—generally salutary in its effects, is not applicable to the sale of an article of consumption, which must be bought in considerable quantity, and retailed in comparatively small quantities, and which, by its tendency to putrefaction, may be thrown in a few hours worthless into the hands of the dealer. He then shows that the quantity of cattle sold openly at the markets of Sceaux and Poissy has progressively diminished since 1824, although the consumption of Paris had been greater in 1825 and 1826, from the accidental presence of fifty to sixty thousand workmen, and he shows that the consumption has been kept up by the surreptitious sale of meat of bad or of inferior quality. The price of inferior descriptions of meat was disproportionately high, selling at the date of the report at eight, whereas it had usually been sold at six sous the pound. And yet the number of butchers had not increased to the extent contemplated, that is by 100 in each year, amounting in 1829 to 514 only. The syndic concludes his report, by praying that the number of butchers may be reduced to 400. The prayer of the petition was accorded, and by ordonnances promulgated in 1829 and 1830, the number of butchers was ordered to be 400, the reductions, however, having to be made gradually, and by purchase, or by the death or failure of the existing butchers. The security was fixed at £120 for all. By the same ordonnances, the regulations were consolidated and

fully detailed, and it is by these decrees that the trade is now governed.

The Syndicat of the Butchers.—The syndicat, or board of management, is formed by the Prefect nominating from among the butchers who have given due security, and otherwise conformed to the regulations of the trade, thirty electors. These constitute a re-union, and choose for themselves a syndic and six adjoints. The duration of the functions of the syndic is for a year, but he may be re-elected. The adjoints are elected for three years. At every December the election of the syndic and of two adjoints, who go out in rotation, takes place. The board meets weekly on Tuesdays and Fridays. They have an office with an agent or manager, and a clerk, appointed by them. Six inspectors, for the execution of the laws of the trade, are appointed by the Prefect of Police, on the nomination of the syndicat. The board names also eighteen overseers of the slaughter-houses. They nominate also five head drovers for oxen, and two for cows, and as to them may seem fit, two or three head drovers for sheep. The board is the arbitrator of all differences arising among the butchers, the stall-keepers, or the butchers' apprentices. With the approbation of the Prefect of Police, the board may grant pensions to distressed butchers.

The interest of the sums paid as securities by

the butchers, and other sources of revenue to be hereafter mentioned, are paid to them for the various expenses of management. They render an account yearly to the electors of their proceedings. A consulting council is named by the board, consisting of two barristers, a notary, and an attorney.

Conditions for the License of a Butcher.—As the number of the butchers has not yet been reduced to the amount specified as the maximum, no person can be admitted at present, except

1. By purchasing the business of a bankrupt butcher.

2. Or by purchasing the business (*fonds de commerce*) of two retiring butchers, of which he shall suppress one.

3. By inheritance.

In all cases he must have served a regular apprenticeship, and must show that he is practically acquainted with the trade. Butchers cannot sell again the cattle they may have purchased at the regular markets, either alive or slaughtered. They can only sell by retail. They cannot carry on any other trade.

Markets.—All the cattle destined for the consumption of the city of Paris must be purchased at the markets of Sceaux and Poissy. Sceaux is situated about five miles and a quarter south of

Paris. Poissy, on the north-west side, at a distance of thirteen miles. The market is held at Sceaux on the Monday, that of Poissy on the Thursday of each week. There are also two markets within the walls of Paris, for cows and calves,—the market of La Chapelle and La Halle aux Veaux. They are held on Tuesdays and Fridays. The regulations are very strict. A declaration must be made on the arrival of the dealer with his cattle, stating precisely the cattle brought by him. The declaration is registered. Cattle arriving after the opening of the market cannot be admitted, unless the cause of delay can be justified to the clerk of the market.

At Poissy, the sale of the calves begins at six in summer and seven in winter.

The sale of oxen at eight o'clock.

The sale of sheep at twelve o'clock.

The commencement of the sale of each is announced by a bell.

Regulations are also made for the conclusion of the sale of each description of animal, and for their removal. No sale can be made either before or after the formal announcement of the opening and close of the sale. At no period of the day can sales be made, except under penalty, at the inns, or in any locality except the market itself. The penalty for the infringement of these conditions is 100 francs (£4). The inspectors of the market examine all cattle, and have the power of

ejecting any which they may deem unfit for use, on account of age or condition. Cattle bought at Sceaux and Poissy for the purpose of being sold again, are liable to be seized, and the buyer subjects himself to a penalty. If a beast dies within nine days of the sale, the buyer may recover the price of the animal. Veterinary inspectors are appointed by the syndicat to inquire into the cause of death, and to establish a ground of action in case of the refusal of the seller to refund the price.

Consumption.—The population of Paris in 1841 was 875,495, and the consumption of meat of all kinds for the years 1844, 1845, 1846, and 1847, is given in the following table.

	1844.	1845.	1846.	1847.
Oxen ..... head	76,565	77,543	80,256	82,519
Cows ..... do.	16,450	20,954	21,980	24,990
Calves ..... do.	78,744	83,282	84,444	83,577
Sheep..... do.	439,950	459,470	487,644	503,113
Pigs and Wild Boars..... do.	87,987	96,880	93,501	
All other Meat lbs.	14,535,467	15,741,289	15,741,158	
Tallow Melted in the Abattoirs ..... lbs.	..	..	11,085,963	11,867,567

The parts of France from which the greater part of the cattle are taken to Paris are Calvados, Maine et Loire, Eure, Manche, Orne, Vendée, and Haute Vienne. The cows come from Maine, Normandy, Beauce, and Brie; calves from Auvergne, Normandy, and Pontoise, and sheep come from Seine et Oize, Indre, Marne, Orne, and Germany.

From what I have seen at the markets and abattoirs, I was not impressed with a very high opinion of the breed or condition of the cattle for killing. They were generally of a large, coarse description, and had not the appearance of being easily fatted, nor were they what may be termed *profitably fatted for killing.*

The cows were of the same character, but of still more inferior condition. The sheep appeared to be of two or three kinds;—one very small and miserably poor, another tall, long-legged, and wretchedly thin. The calves were decidedly the best, and there were several very well fed; indeed the veal is the best meat, and is more generally used in a variety of ways of cooking.

Description of Poissy Market.—The market of Poissy is held at the town of that name, which is on the line of the Paris and Rouen Railway, and the banks of the Seine at the point where the railway crosses that river.

The market-place is a large, spacious piece of ground, fitted up respectively as a calf, beast, and sheep market. The calf-market, as is usual in France, is a platform raised two feet eight inches above the ground, and covered with a shed supported on pillars. This arrangement is for the purpose of allowing the carts which bring the calves, which are all bound their hind to the fore legs, and are laid on their sides on the platform on straw, to

be backed up close and on a level with it so as to afford facilities in moving the calves, and the same is necessary when the calves are taken away again.

The portion of the market assigned to the beasts occupies the centre, and covers the largest space. It is divided into four tiers of pens in the breadth, having a wide passage up the centre, and two smaller ones, five feet wide each, up the centre of the two divided parts, and the pens are entered at their sides, their greatest length being breadthways of the market. The pens are formed by strong stone posts, three feet three inches high, two at each end and four in the length, and they are connected by a strong iron bar along their tops, and another about half-way down—they are forty-two feet six inches long, and eleven feet six inches wide, each capable of holding ten beasts abreast, and each beast is tied to the top bar; there is a chain at the entrance, which unhooks.

The farther or upper end of the market is occupied by sheep and pigs, the pens for which are composed of double rows, each pen side by side lengthways of the market, and divided by passages in the same direction. They merely consisted of double rows of bars of iron driven into the ground about two feet six inches high, between which moveable wooden frames were placed, on market-days, as divisions to the pens. This arrangement did not seem to answer, for several of the iron bars were bent, and then the divisions between the pens

became unsteady, and there was considerable trouble in putting up and taking down the division-frames, and storing them away in vaults or sheds provided for the purpose, and it appeared as if they suffered as much, although light, by the moving, as if they were always exposed to the air.

Upon the whole, the arrangement of the market is good; there is ample space in the passages and approaches for large droves of beasts and sheep, and the whole being paved with stone, and with proper channels for the surface water, makes it dry and clean; and the system of having distinct times for each description of market to commence and end is advantageous, as it enables a buyer to attend to each if he should wish to purchase of each kind, and it prevents confusion in the admission and departure of the cattle.

On one side of the market is a spacious building, in which the Bank is held.

Bank of Poissy.—Since the 1st of March, 1811, all the transactions between the butchers and cattle-dealers at the markets of Sceaux and Poissy have been conducted through the Bank of Poissy, established for the special use of the butchers. It is conducted for the profit of the city of Paris; it is, in fact, a sort of branch of the Municipal Bank, under the direction of the Prefect of the department of the Seine. In it are deposited the sums paid as security by the butchers, and this, with a credit upon

the Municipal Bank, forms the basis of its operations. The syndicat reports to the Prefect of Police the amount of credit which may be granted to each of the Paris butchers, and through his report to the Bank, payments are made on account of the butchers for purchases by them up to the amounts specified. The cattle-dealers thus are able to draw cash at once for the amount of their sales direct from the Bank.

The Bank is conducted by a director and cashier. In addition to the management, it is the duty of the director to levy a toll upon all cattle sold at the market. This toll, which amounts to three-and-a-half per cent. upon the sales, is applied to defray the expenses of the Bank, and the surplus to the general expenses of the city. The toll is deducted from the sale, and is therefore paid by the vender.

Each butcher has a certain limited credit allowed to him, which is fixed by the Prefect of Police upon a report made to him by the syndic. The minimum amount of credit allowed is the amount of his security (£120). This credit can be suspended by the Prefect of Police in the event of the butcher's affairs becoming decayed. If the purchases of the butcher exceed his credit, he is called upon at once (*marché tenant*) to pay the amount; in default of which, the cattle purchased may be seized, and only delivered to him as he pays. If the amount be within the amount of his

credit, he may have twenty-five or thirty days for payment, paying at the rate of five per cent. per annum for the loan.

All the cattle, without exception, destined for the consumption of Paris must be slaughtered at one of the five public slaughter-houses or abattoirs. When sold, the animals are marked with the mark of sale and with that of the purchaser, and are then collected together into five buildings, and distinguished by the name of one of the abattoirs. They are thus sorted for their particular destination, and intrusted to the regular licensed drovers. No person can be a drover, except he be licensed by the Prefect on the representation of the syndic and his colleagues.

The drovers are responsible for all accidents which may happen to or from the beasts while under their care. The oxen are separated from the cows, and divided into droves of not more than forty each, under the charge of not less than two conductors. They must be driven at a foot pace, under a penalty of £8. The cattle entering Paris can only do so by certain barriers, and they must pass these in the daytime, under a penalty of £12.

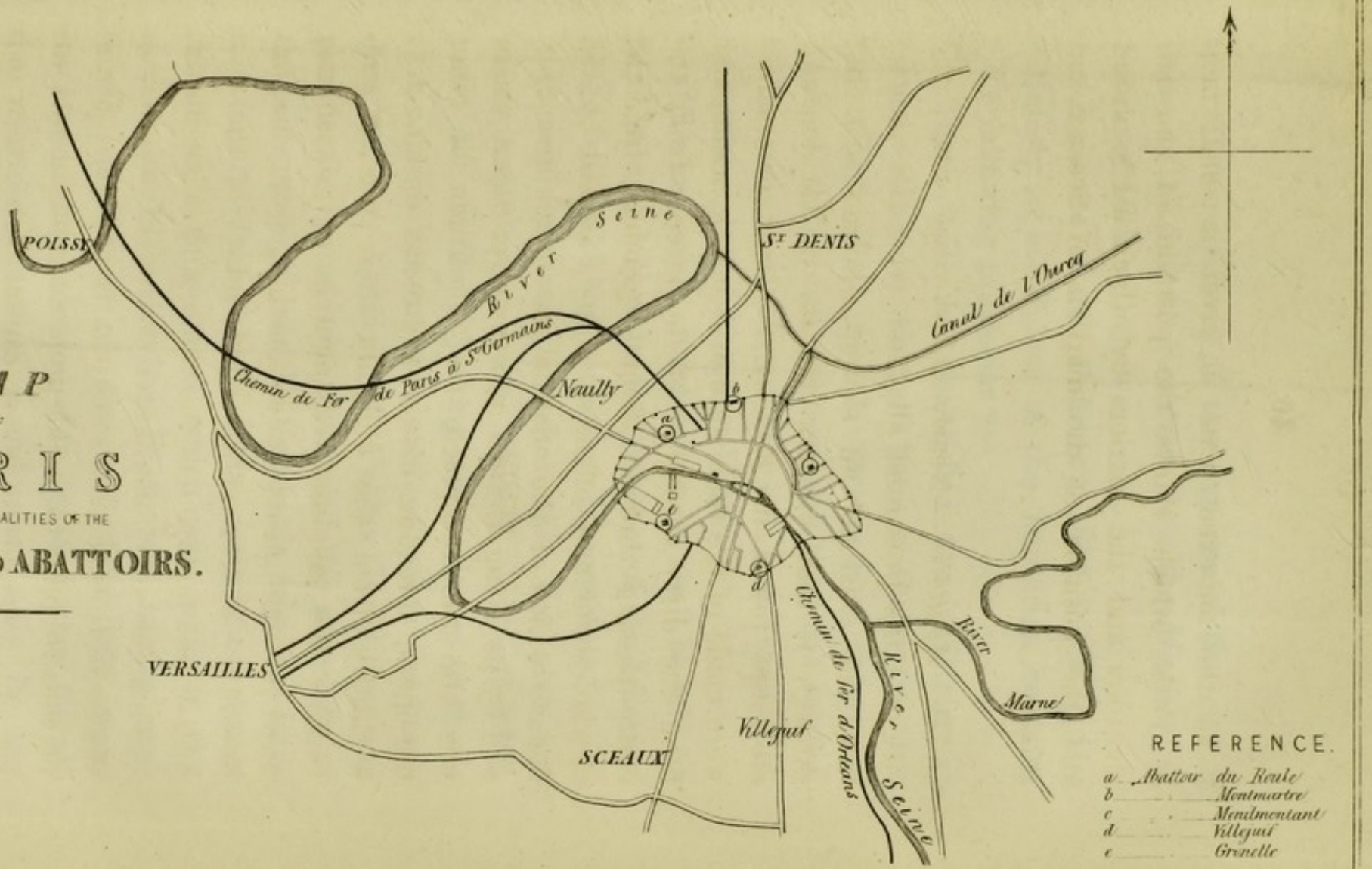
A regular itinerary is laid down for the passage of the animals through the streets, and strict regulations are enforced as to the observance of these directions. The cattle must not rest upon the bridges, or in the public places, and they are particularly urged to occupy one side of the road only.

In the annexed plate is given a small map of Paris, which shows the position of the five abattoirs and the barriers by which cattle enter, and the position of the markets of Sceaux and Poissy.

The Abattoirs.—Nearly forty years since, the city of Paris presented all the horrors and dangers from the existence of slaughter-houses scattered through it that we now witness in London and all large towns in England. Great complaints were made of the then state of that city, arising first from the dirty condition of the streets from the cattle passing through them;—secondly, from the unwholesome and offensive effluvia caused by the decomposition of the offal in the slaughter-houses, and by its being thrown into the river Seine, which was also the receptacle for all kinds of other nuisances, spreading disease and death on all sides; —thirdly, from the difficulty there was of preventing the sale and consumption of tainted and unwholesome meat;—and fourthly, from the impossibility of controlling the conduct of the men who were employed in the trade of the slaughterer.

The necessity for a better system of conducting the trade, thus become so imperative, induced several persons to offer to build proper establishments for the purpose, and to invest capital with a view to a profit from them; but by a decree made by Napoleon, dated February 9th, 1810, it was determined

MAP
OF
PARIS
SHEWING THE LOCALITIES OF THE
MARKETS AND ABATTOIRS.



Madeley lith. 3 Wellington St Strand.

to erect five abattoirs at the expense of the city of Paris, as the following extract from the *Moniteur* of February 10th will show.

"A decree of 9th February, 1810, made by His "Majesty in his Palace of the Tuilleries, contains "the following provisions :—

"There shall be established five abattoirs at "Paris,—three on the right bank of the river,—one "of which shall contain twenty-four slaughter-"houses, the second eighteen, and the third twelve. "The two abattoirs on the left bank shall each "contain eighteen slaughter-houses.

"The first stone of four abattoirs shall be laid on "the 25th of March by the Minister of the Interior, "who will make the necessary arrangements."

It will be seen hereafter that the plan was subsequently very much altered and extended, but I did not find any thing more relating to them.

A commission was appointed, of which the president of the Council of Public Buildings was president; united with him and the secretary of the same council, was M. Combault, who was himself formerly a butcher. This commission determined on a programme, which was made in the session on 14th October, 1810, and having examined the plans of five architects who were employed, they adopted one general plan for all the abattoirs, making a difference only in the number of the slaughter-houses in each. Their plan and execution show the great pains and fore-

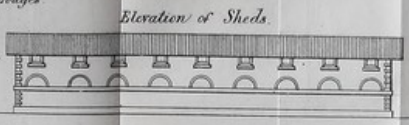
sight which had been bestowed upon them, and they remain to this day specimens of the great knowledge of the purposes for which they were designed, as M. Biset, the intelligent superintendent of them, declared to me, that nothing more was required in them, and that he had been unable to improve upon them up to this time.

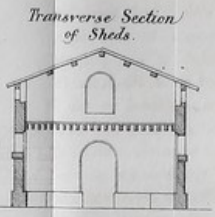
The spacious and airy situations in which they are built, the great width of the areas and passages round each compartment of building, the extent and convenience of the interior of the buildings themselves, the provision for cleanliness and drainage, the suitable accommodation for the residence of the superintendents or for those who frequent them, and the substantial construction and appropriate design with which they are built, all fully attest the soundness of the views and judgment of those who proposed them, and entitle them to be, as they most justly are, the finest structures in the world, and models for others in every town.

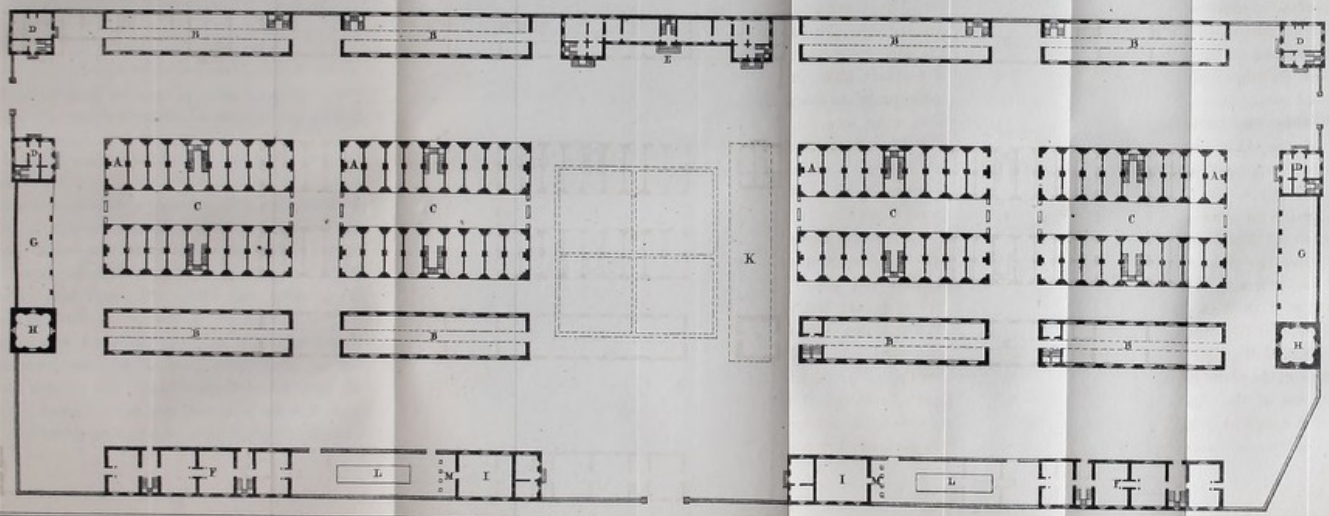
The abattoir of Montmartre being the largest, and where there are more cattle slaughtered than in any of the others, I have preferred giving a plate (No. 1) of it as it at present exists; and its details will explain the other four sufficiently to render the uses of the different parts intelligible. The reference on the plate gives the information as to the purposes of the different buildings. The section of the slaughter-house shows the construction of the floor above, and the roof, which is con-

Pl. 1.

Plan, Elevations & Sections of the Abattoir, Montmartre, Paris.







Reference.

A - Slaughter house.
B - Sheds.
C - Yards.
D - Porters Lodge.
E - Residence of Superintendent.
F - Melting houses.
G - Stables.
H - Reservoir.
I - Tripe houses.
K - Pens.
L - Manure Yard.
M - Privies.

H. E. Grantham Del.

Hedsley lith. 3 Billington St. Strand.

structed of timber covered with heavy tiles; but the walls do not rise higher than the first floor, from whence the roof is carried upon a timber framing.

The following Table will give a summary of the relative sizes and capabilities of each of the five abattoirs :—

Name of Abattoir.	Size in Acres.	No. and Area of Slaughter-houses.	Cattle slaughtered in 1846.	
			Cattle.	Sheep.
		Sq. Yds.		
Montmartre.....	$8\frac{3}{4}$	64—3,872	44,204	239,058
Grenelle	$7\frac{3}{4}$	48—2,904	11,015	55,685
Du Roule	$5\frac{3}{4}$	32—1,936	6,898	36,841
Menilmontant ...	$10\frac{1}{4}$	64—3,872	34,883	136,674
Villejuif	$5\frac{1}{2}$	32—1,936	5,236	19,386

Each of these is about $1\frac{3}{4}$ miles from the centre of the city, but within the barriers, as the general plan will show.

In contemplating these fine establishments, we cannot but admire the mind of that man whose intimate acquaintance with the evils and abuses of parts of the internal government of the country could devise and carry into execution a system conducted by such establishments, and no doubt foresaw that those evils would have gone on increasing with an increasing population, until it would have been impossible to have checked it. Compared with our internal government on the same subject, and many others, we fall very far behind indeed. The abattoirs of Paris were established nearly thirty years since, when it would be

expected that little attention could be paid to such subjects, and particularly when we remember that France was at about that time involved in wars and in distractions and contentions with nearly every empire in Europe; but we at this hour have scarcely a single police regulation to govern that trade in this vast city.

I will now describe the mode by which these abattoirs are governed, their cost of construction, their resources, and the details of the working of them, and afterwards describe some of those in the principal towns in France.

I have already stated that the decree for the erection of the abattoirs was passed in 1810, by the Emperor Napoleon, but it was on September the 15th, 1818, that they were completed and ready to be occupied.

In 1830 an ordonnance of police was issued, which consists of about 300 articles, and makes the strictest rules and orders upon every part of the butcher's trade, confirming or repeating former laws for the same purposes.

The regulations laid down in these ordonnances are most minute and rigorous, and they are generally acted upon with tolerable strictness by the police, who are very numerous, and who have a very active surveillance constantly kept upon them.

We have before briefly related all the laws affecting the trade of the butcher, and for the

regulation of the markets, and we shall now briefly recite those which relate to the abattoirs only.

The syndicat or guild appoint inspectors in each abattoir, who keep the keys of the slaughter-houses, are charged with the delivery of the hides and skins to the tanners and fellmongers, take care of the pens of the sheep, go the rounds, at certain hours day and night, of the buildings, to watch the cattle, and do any thing which is required for the safety and health of the establishments.

They sell the manure, and dispose of the blood. They appoint and govern the drovers belonging to Sceaux and Poissy.

All beasts which are for the consumption of Paris must be slaughtered in one of the five abattoirs, the slaughter-houses in which are distributed among the butchers, there being 240 in number, and as there are 500 butchers, some are occupied by two or three butchers, according to the extent of their trade.

The cattle and sheep must be regularly fed and watered, and any neglect of these rules subjects the owner to be summoned before the police; and they are obliged to have a certain amount of fodder in the lofts over the stalls.

The butchers have a certain number of men at the abattoirs, who receive and take care of the cattle as they arrive, slaughter and dress them, and prepare all the other parts of the offal, and are paid by the butchers, but are under very strict rules of

the police of the abattoirs, and are punished in case of neglect; and it is found highly necessary, but the whole establishment is benefited by it. The butchers are not allowed to enter with their carts and unload the hay and straw after nightfall; certain hours are prescribed when they can go into the lofts, and candles cannot be taken into the stalls without lanterns. They must clean the lofts and stairs once every two days. They may kill either day or night; and if during the night, they must give notice to the inspector of the police. They must not have the doors of the slaughter-houses open during the killing of the animals, and they must be washed down after each killing; and all grease, fat, entrails, paunches, skins, hides, &c., must be taken away out of the slaughter-house. They must remove the manure from the stalls every month, or as often as the police require it, and the contents of the paunches must be removed every day. They must not kill cattle in the paved courts, but they may calves and sheep. The butchers are responsible for any damage that any neglect in not properly securing the cattle when killing may occasion; and those known to be dangerous are to be securely tied. They are required to scrape and wash the walls and doors of the slaughter-houses frequently. The carts which convey the meat to the markets from the abattoirs must be covered. There are several regulations which

relate to the hiring and apprenticing the men employed by the butchers.

All the fat that comes from the beasts, calves, and sheep is taken to the boiling-house, which is on the premises, and an account taken of each butcher's quantity, and the whole is melted together, after which the tallow is given to each butcher in proportion to the quantity of fat melted, and the persons contract with the abattoir for the labour of melting and collecting the tallow. There are several regulations relating to the mode of letting the melting, the responsibility of the proper care of coppers, presses, and other utensils, precautions against fire, &c.

They are obliged to take the tallow to market, and they cannot sell it elsewhere, and the tallow-chandlers cannot buy it otherwise than in the market; and they are compelled to take samples to market once a week, and state the quantity which they have of each kind, the samples being not less than three pounds weight.

When one of the melting-houses becomes vacant, the Prefect of Police, acting under the advice of the guild, will advertise it for one month, and parties wishing for it must send in tenders; and if there is no offer, the oldest melter may have it if he wishes.

There are also buildings called tripperies, where the paunches are cleaned, and where they must be taken, and also the feet of sheep, where they are

cleaned and scalded, as well as the calves' heads. These buildings are properly fitted up with boilers, tubs, and every thing necessary for the business. The small guts are also cleaned here, and the manure collected to be ready to be carried off. The dresser of the tripes is paid for dressing the tripes of cattle and sheep according to the following scale :—

For each tripe of ox or cow	6d.
For each sheep's tripe	1d.
For 400 sheeps' feet	12½d.

The small guts from the cattle are sold to the highest bidder every three years, entirely to the profit of the workmen. Properly dried and prepared, they are rolled up and sold principally to Spain, where they are used for packing meat, or rather, they are stuffed with it. The price obtained at the last bidding was threepence per beast. The small guts from sheep are sold by the men, to their own profit, and are manufactured into violin strings, &c.

The blood is sold by adjudication at the guild, for a period of ten years, or rather, the best bidder pays the price during the whole of that period. The price given at the last bidding was fourpence per head of beast, with the condition that the blood from the sheep killed should be included, no matter their number; but this latter, from the poverty of

the sheep, appears to be very little, and is not collected.

The fund thus formed, three-halfpence per beast, and a sum considerably less than a farthing (one centime) per sheep, is retained by the guild towards the various expenses, charges, and charities already alluded to. The remainder is distributed by the guild amongst the butchers' head men, and by them again amongst their fellow-workmen.

The blood was some years ago sold entirely to the sugar-refiners, who still take a portion; but as they now mainly use calcined bones, the blood is prepared for, and sold as, a valuable manure.

The legs of the beasts, after being skinned to the hoof, are cut off at the knee-joint, and sold by adjudication at the guild, but for the benefit of each butcher, in proportion to the number of animals he has killed. The last adjudication was for ten years, at one shilling and ten-pence for four legs. The hind leg is cut off at the hock-joint.

From them is made a valuable oil for machinery, glue, &c.

The larger intestines, namely, the liver, heart, lights, spleen or gall, paunch and sweetbread, are disposed of by the butchers themselves to the tripe-man or otherwise. This is also the case with the same parts from the calves and sheep. The manure from the stalls and stables, where the animals are kept and fed previously to being killed,

is also sold by adjudication at the guild, and entirely to the use already named,—the expenses, charities, &c.

The last bidding produced for each abattoir as follows :—

	£
Montmartre	107
Menilmontant	67
Grenelle	56
Roule	30
Villejuif	14
	£264

The abattoirs find the straw for the cattle, and some of it is brought in the carts which convey the calves.

The manure from the slaughter-houses which is taken out of the paunches is sold apart from the stall and stable manure, but in the same manner, and the fund arising from it is also applied to the same purposes. The police regulations fix the mode of collecting and carrying away all the manure, so as to promote the utmost cleanliness, and avoid nuisance; but large quantities of it are nevertheless needlessly lost in the common sewers leading to the river Seine.

The carcasses of the animals are conveyed away in covered carts to the stalls and shops of the butchers whose property they are, being first weighed at

the machine at the entrance of each abattoir. There are lofts over each slaughter-house, which are open to the roof and at the sides, for the purpose of keeping the meat, as well as for drying the hides and skins; but they have gone into disuse, and there is not any other provision for storing the meat.

There are no shops attached to any of the abattoirs in Paris, but in the towns in France there are some which have shops attached to them, as we shall have occasion hereafter to describe.

By an ordonnance passed in 1815, the charge for killing in the abattoir, and in 1832, the amount of custom paid to the town, are as follow:—

	Abattoirs.			Tolls.		
	s.	d.		£	s.	d.
For each oxen ...	5	0	...	1	1	2
„ cow ...	3	4	...	0	16	6
„ calf ...	1	8	...	0	5	5
„ sheep ...	0	5	...	0	1	4½
For the tallow ...	2	6	per 200 lbs.			

By an ordonnance in 1846, a change was made in the manner of collecting and charging both the town tolls and the abattoir dues, namely, ·09d. per lb., which is ascertained by weighing all the meat killed as it leaves each abattoir; and the toll for tallow was reduced to ·045d. per lb. This last regulation only came into force at the beginning of 1847, and, as far as they have been able to judge,

there will be a slight increase in the total amount in favour of the town.

The charges for cleaning the tripes of cattle and sheep are not altered. There are other regulations in the same ordonnance, but they are merely local, and of no importance to the matter in hand.

The original cost of the five abattoirs was about £680,000, including land and every contingency; therefore, allowing that the three largest cost £150,000 each, the other two will have cost about £115,000 each. This large cost, it must be remembered, came from the public funds, and there was no expense spared; but their great strength and durability have been tolerably tested after the lapse of upwards of thirty years since their construction.

The following are the different sources and accounts of revenue derived from the killing cattle, melting tallow, washing and dressing tripes, &c., and letting the slaughter-houses, &c. for the year 1846, and consequently previous to the present system of collecting the tolls.

For killing in the abattoirs :—

	Roule.	Mont-martre.	Menil-montant.	Villejuif.	Grenelle	Total.	Total of Tolls received at the Abattoirs.
							£ s. d.
Cattle ..	6,898	44,204	34,883	5,236	11,015	102,236	22,778 5 0
Sheep ..	36,841	239,058	136,674	19,386	55,685	487,644	9,752 18 4
Calves..	..	..	..	..	..	84,444	6,755 10 0
						£	39,286 13 4

Toll arising from melting the tallow in the abattoirs :—

Name of Abattoir.	Quantity.	Amount at 2s. 6d. per 100 Kilos.
	lbs.	£ s. d.
Roule	1,588,551	866 10 0
Montmartre	3,625,820	1,977 15 0
Menilmontant	2,916,379	1,590 15 0
Villejuif	1,260,329	687 9 0
Grenelle	1,694,884	924 10 0
	11,085,963	£6,046 19 0

Tolls arising from the washing and dressing the tripes of cattle and sheep :—

Name of Abattoir.	Oxen and Cows.	Sheep.	Washing.	Dressing.	Amount.
			£ s. d.	£ s. d.	£ s. d.
Roule	6,904	36,820	13 15 0	128 19 0	142 14 0
Montmartre	44,233	239,037	52 16 0	903 0 0	955 16 0
Menilmontant	34,897	136,653	7 16 0	676 3 0	683 19 0
Villejuif	5,238	19,363	..	101 10 0	101 10 0
Grenelle	11,023	55,664	25 2 0	193 4 0	218 6 0
					2,102 5 0
Deduct 2 per cent. for loss and waste					40 0 0
				£	2,062 5 0

Tolls arising from letting the slaughter-houses as follows :—

Name of Abattoir.	£	s.	d.
Roule	24	16	8
Montmartre	56	0	0
Menilmontant	83	0	0
Villejuif	20	0	0
Grenelle	29	4	0
	£213	0	8

Recapitulation of receipts :—

	£	s.	d.
Produce of the tolls for slaughtering.....	39,286	13	4
Ditto ditto melting tallow.....	6,046	19	0
Ditto ditto washing and cleaning tripes	2,062	5	0
Ditto ditto rent of slaughter-house	213	0	8
	£47,608	18	0

The following are the receipts at the abattoirs for the three last years :—

	£	s.	d.
1844	44,077	14	0
1845	46,822	19	0
1846	47,608	18	0

Which shows an increase in the year 1845 above that of 1844 of £2,745. 5s., and an increase in 1846 above that of 1845 of £775. 17s.

I have given below an account of the expenses attending the working of the abattoirs as charged in the " Compte général de la Ville de Paris," which, when brought together with the receipts hereinbefore enumerated, will show the large revenue accruing to the city from this source.

The fixed expense of the agents for the service of the abattoirs is as follows :—

	£	s.	d.
Appointments of conservator, lodge porters, porters, and labourers	946	2	0
Fixed indemnity and expense of circuit of conservator	56	0	0
Fixed expense of fuel and office at the lodges, porters, and overseers of police	90	5	0
Carried forward ...	£1,092	7	0

	£	s.	d.
Brought forward ...	1,092	7	0
Expense of utensils for cleaning	67	4	0
Gratuity to the lodge-keepers of Menilmontant, of Grenelle, and Du Roule, for water service ...	17	17	0
Gratuities to the sewer-men	6	0	0
Expense of the overseers for the collection of the customs in the abattoirs	855	19	0
Shelter ascribed to the same	78	8	0
	£2,117	15	0

Expense of the material for the service of the abattoirs is as follows :—

Salaries of auxiliary workmen employed in place of the regular men sick	38	13	0
Lighting with oil the lamps	793	16	0
Supply of water in the abattoirs of Montmartre and Villejuif, and support of conduits and water-cocks in the five abattoirs	810	0	0
Support of weights and scales	16	0	0
Ditto of the stones, and expense of fuel for the lodges, overseers of police, firemen, and lighting the stations	102	18	0
Different expenses for the use of the customs ...	8	10	0
Works and furniture for the use of the abattoirs ...	57	0	0
	£1,826	17	0

In the same account is charged for restitutions of undue and over-payments, the sum of	200	0	0
And also in another part of the same, there are repairs of the slaughter-houses, stalls, and stables, and other works	814	0	0
	£4,958	12	0

Brought forward the total received	£47,608	18	0
Same, paid	4,958	12	0
Profit to the city of Paris...	£42,650	6	0

This does not show the whole amount of revenue obtained from the abattoirs. A certain per-centage of the sale of the blood and other offal is retained by the syndicat. Out of the revenue so derived, the salaries of the inspectors of abattoirs officers appointed by the syndicat are paid, and the surplus is appropriated principally to charitable uses. The following statement will show the amount of revenue derived from this source :—

Abattoirs in Account with the Butchers' Guild.

Dr.	£	s.	d.	Cr.	£	s.	d.
To salaries of inspectors	840	0	0	By per-centage on the sale of blood :—			
To balance of profit for petty expenses, charity, &c. ..	363	0	0	Cattle .. 1·6d.	654	0	0
				Sheep .. ·10d.	195	0	0
				Manure { Sewers	76	0	0
				Manure { Dung & litter	278	0	0
	£1,203	0	0		£1,203	0	0

The profit, therefore, accruing to the city of Paris is considerable, and is nearly $6\frac{1}{2}$ per cent. upon the original expenditure; and if the quantity of cattle were slaughtered and kept in them that they are capable, a much larger revenue might arise. The abattoirs are tolerably well occupied; but it will be observed that there is a great disproportion in the amounts of cattle slaughtered in them; for instance, in Du Roule, with half the number of slaughter-houses and stalls of Montmartre or Menilmontant, there is only one-sixth of the number of oxen, cows, and sheep killed, that there are in the former, and about one-fifth in the latter; and in Villejuif, which is the same size as

Du Roule, there is not an eighth part of the number of cattle, and not an eleventh part of the sheep, that are killed in Montmartre, nor a sixth of what are killed in Menilmontant. In Grenelle also the number killed, as compared with Montmartre, is about one-fourth, and as compared with Menilmontant, about a third. The relative accommodation in Grenelle is about four-fifths of the number of slaughtering-places, and nearly the same amount of stalls as compared with Montmartre;—and neither Montmartre nor Menilmontant was in the least crowded,—in fact, the stalls seemed only half-filled; and if there were a better and quicker manner of getting rid or putting out of the way the oxen and cows that were skinned and dressed, instead of remaining hanging in the slaughtering-places, a much greater facility would arise, and more could be killed.

There is a large establishment for killing horses, commonly called a knacker's yard, about five or six miles from Paris.

The following are brief descriptions of some abattoirs in the principal towns of France.

ABATTOIR OF LYON.

There are two principal slaughter-houses in Lyon, viz., that of L'Hôpital and that of Des Terreaux; the former is situated near the river Rhone. This river receives the filth and dirt,—and the butchers wash the intestines in it. A sufficient supply of

water is furnished by a well worked by a hand-pump.

The oxen are killed in the shambles ;—at the end of each butcher's stall, the calves and sheep are slaughtered in the open yard which separates the rows of stalls.

The chief advantages of these slaughter-houses are for those who work in them, as the scalding-house and stalls are built in the same compartment, —besides this, the butchers are accommodated with private apartments in the upper stories. But this combination of offices in the same department is a cause of serious inconvenience to the public ;—but the streets in the town do not exhibit a show of meat hung out for sale, as is the case in other places.

ABATTOIR OF BLOIS.

This establishment consists of two rows of buildings, one of which contains a common abattoir, and the other stalls, besides stabling for fat and lean cattle.

The public fountains in the neighbourhood afford a constant supply of clear water.

The blood and filth are carried away into the river Loire by a spacious sewer, which is situated under the slaughter-house.

This small establishment is noted for the excellency of its arrangements, its cleanliness, coolness, the absence of all bad smells, and the consequent facility in keeping the meat fresh and wholesome.

ABATTOIR OF ROCHEFORT.

This abattoir was built about thirty years ago at the expense of the town; it consists only of one large hall, where the butchers kill in common.

There are rollers placed along the walls for the purpose of raising the slaughtered oxen, in order to dry them; but this mode is rather inconvenient. The cattle graze in the pasture-grounds in the vicinity of Rochefort, whence they are generally brought direct to the slaughter-house, seldom or ever remaining more than one day in the stables. This establishment affords a sufficient supply for a population of from fourteen to fifteen thousand inhabitants.

ABATTOIR OF LA ROCHELLE.

This abattoir is nearly similar to the preceding ones, but it is more extensive, and certainly more convenient, as each butcher is furnished with a small division or compartment. There are no accessory buildings. This abattoir cost about £4,000, which is held by a lessee, who levies the duty upon slaughtering for the term of twenty-five years, and is bound at the expiration of that term to restore the building in proper order.

ABATTOIR OF GRENOBLE.

This abattoir offers nothing very remarkable. The butchers kill the oxen in a common hall, and the calves and sheep are killed in a separate depart-

ment. Besides these, there are a yard, a stable, and places to store the fat.

ABATTOIR OF ORLEANS.

This establishment embraces all the accessories which are wanting to most of the preceding abattoirs. It was built from the designs of M. Pagat, architect of the town.

It would be desirable if the slaughtering-places admitted more light, and were more detached from the other departments.

There are several other abattoirs, which have been recently constructed in France, Belgium, Germany, and other parts of Europe, all of which indicate the advantages, both in a sanitary and commercial point of view, resulting from the system.

CHAPTER III.

BUTCHERS' TRADE OF ENGLAND—METROPOLIS.

THE butchers' trade of London may be summarily classified under the three general heads of salesmen, and wholesale and retail butchers. The salesmen of Smithfield Market, of whom there are about 160, may be described as commission agents, to whom the farmers and others who fatten cattle consign their stock, which they usually transmit (if from any distance) per railway, to save the loss both of time and weight, consequent upon their travelling on foot. As, however, the animals sometimes get much bruised by the railway travelling, it is a question with many which of the two is the better plan. The salesmen hire a standing of the city authorities, regulated by the supply they expect, and endeavour, by the realization of a good price, to inspire confidence in their judgment, and increase the number of senders.

They receive from 2s. 6d. to 4s. per head for the sale of oxen and cows; from 10s. to 15s. per score for sheep and lambs; and 1s. per head for calves.

It is, however, optional with the farmer to sell his stock through the medium of a regular salesman, or to hire a standing for himself, which latter course is sometimes adopted, which, whether it

be positively advantageous or otherwise, insures at least to the owner the satisfaction of knowing that he received the full amount for which his stock is sold.

The salesmen at Newgate Market, or those to whom the dead meat (if we may be allowed the expression) is consigned, need no farther description than that already given of their brother salesmen at Smithfield, if the obvious destination of what they sell be borne in mind. Their supplies are received from several quarters :—

1st. From those in the country, who, slaughtering their cattle on the spot, sell the coarser parts to the farmer and labourer in their immediate neighbourhoods, and transmit the primer parts to gratify the more fastidious tastes of the metropolitan gentry.

2nd. Perhaps a supply as great as the above is furnished by those who by dint of an experienced judgment, exercised in purchases to a large amount, and having slaughter-houses and stalls in the market, are enabled to offer their meat in successful competition with the supply from other quarters.

3rd. Others, again, adopt the foregoing plan, without, however, the advantage of living in the market, and are therefore subjected to certain charges, which of course diminish their profits, and at all times render them very precarious. Such men, to render themselves more secure of profit, sell their meat to the smaller butchers in their own neighbourhood, or elsewhere, and are consequently denominated carcass butchers.

4th. Another source of supply is found in the

London butchers themselves, who transmit to the general emporium such parts of the various animals they slaughter as are not suitable to the several localities in which their businesses are carried on.

The wholesale or carcass butchers have been incidentally described, and may need no further explanation than that implied under the third general class of butchers; viz. those who are engaged in the retail trade: of such there are two classes.

1st. Those who supply the wealthier portion of the community, and are denominated family-trade butchers; and,

2nd. Those who, from the uncertain nature of their trades, and peculiarity of their systems of business, receive the designation of chance-trade butchers.

The former are considered the more respectable class, and keep the best meat, which they, for the most part, procure from Smithfield Market, as affording the most certain source for the quality they require, completing their stocks from Newgate Market, which affords the great facility of the supply of certain specific parts, the demand for which is varied and local.

Of the latter class, viz. the chance-trade butchers, it need only be said, that, supplying as they do the poorer class, they necessarily render their purchases subservient to the necessity of their circumstances, and buy when and where they can do so, so as to sell most cheaply, that the mouths of the "million" may be stopped.

In Smithfield there are seven bankers, who are either salesmen or butchers, and are generally connected with those trades.

These transact the business only for those trades, by receiving the money from the buyer, and transmitting it to the sellers, in the country, and are paid a certain per-centage for their trouble. They also keep the accounts of a great many in the trade.

We extract from Dr. Guy's evidence before the Committee of the House of Commons on Smithfield Market of the session of 1847, the statistics of health of the butchers, which may prove interesting as showing the sanitary condition of a class.

HEALTH OF BUTCHERS.

"The following is the average age attained by butchers dying fifteen years and upwards in the metropolis during the year 1839, compared with the average age attained by certain other classes. The facts themselves were obtained from the office of the Registrar-general.

	Deaths.	Yrs.	Mths.
Out-door occupations	3,143	49	2
In-door employments	2,774	47	3
Hawkers	94	47	6
Butchers	132	46	8
Grooms	83	42	5
Tanners	14	40	4

"Butchers therefore live, on an average, 2½ years

less than the entire class of men working out of doors, seven months less than men following in-door occupations, and ten months less than hawker. On the other hand, butchers are longer-lived than grooms by four years and three months, and than the small class of tanners by six years and four months.

"These three occupations have been brought together, inasmuch as they expose those who follow them to such emanations as are encountered in markets, slaughter-houses, and the nuisances which abound in their neighbourhoods.

"Relative proportion of cases of fever and consumption treated as out-patients of King's College Hospital, among butchers and men following certain other employments:—

	Proportion of Fever Cases.	Proportion of Cases of Pulmonary Consumption.
Out-door employments ...	1 in 97	1 in 513
In-door employments.....	1 in 100	1 in 481
Butchers.....	1 in 17	1 in 566
Hawkers.....	1 in 102	1 in 566
Grooms	0 in 45	1 in 563

"The proportion of fever cases, therefore, is higher among butchers than among men following other occupations, while the liability to pulmonary consumption is as nearly as possible the same in butchers, grooms, and hawkers, little less than in the whole class of men following out-door em-

SUMMARY OF MONTHLY RETURNS.

	From September 1844 to August 1845 inclusive.				From September 1845 to August 1846 inclusive.				From September 1846 to August 1847 inclusive.			
	Beasts.	Sheep and Lambs.	Calves.	Pigs.	Beasts.	Sheep and Lambs.	Calves.	Pigs.	Beasts.	Sheep and Lambs.	Calves.	Pigs.
			(1844.)				(1845.)				(1846.)	
September ..	20,544	203,081	2,029	3,685	21,406	163,280	2,532	3,005	19,167	164,380	2,389	2,738
October	18,261	155,120	1,673	3,300	18,341	126,810	1,738	3,548	20,386	122,190	2,113	3,383
November ..	17,204	139,660	1,341	3,660	17,393	119,910	1,183	2,890	24,600	142,010	1,278	3,455
December ..	21,730	156,270	913	2,990	19,795	115,320	856	2,930	17,918	100,590	930	2,345
			(1845.)				(1846.)				(1847.)	
January	14,233	117,490	1,030	3,200	14,946	98,480	921	3,130	14,878	100,190	1,273	1,882
February ..	15,388	130,880	868	3,211	13,554	82,120	789	2,957	15,393	90,210	968	2,310
March.....	16,879	131,210	889	3,135	15,911	98,780	819	3,310	19,002	109,040	1,060	2,320
April	14,724	136,420	1,250	3,010	14,281	92,770	904	2,645	18,593	111,940	1,475	2,962
May	15,036	137,960	1,790	3,028	14,910	132,010	1,549	3,165	20,433	134,980	2,030	3,287
June	16,370	158,010	2,657	3,015	16,645	194,480	2,807	3,005	15,540	148,560	2,985	2,237
July	12,958	145,160	2,650	2,815	16,534	190,500	3,059	3,359	16,553	166,810	3,973	2,788
August	16,883	149,640	2,395	2,988	20,450	212,450	2,582	3,607	23,687	202,370	2,882	3,824
	200,140	1,760,901	19,485	38,037	204,166	1,626,878	19,748	37,551	226,132	1,593,270	23,356	33,531

The market dues are as follow:—Sheep, calves, and pigs, permanent pens, one shilling; hurdle pens, tenpence; ties of beasts, one penny each; ties of calves, one penny each; ties of horses, twopence each; hog-duty, sixpence per load, and one penny entry, the property of non-freemen; straw-duty, one penny each entry of sale, drovers' licenses, and Bartholomew Fair.

	£	s.	d.
Average yearly produce from 1828 to 1846 inclusive	6,073	16	0
Ditto expenses in that time	2,789	6	8
	£3,284	9	4

Tolls of the market are:—Beasts sold belonging to non-freemen, twenty-pence per score; sheep ditto, twopence per score; horses, fourpence each for entry of sale; pigs, fourpence per score.

	£	s.	d.
Average produce of tolls from 1828 to 1846 inclusive	1,355	16	0
Ditto expenses	124	6	7
	£1,231	9	5

Smithfield Market is the property, and is under the direction, of the Corporation of London.

A charter, which was granted in March, 1st Edward III., gave the city right to hold the market, and that no other should be held within seven miles "round about the city." Another charter was granted, dated May 25th, 1st Henry IV., giving

the city of London the charge of the gates of Newgate and Ludgate, and power to collect tolls thereat. On October 18th, 14th Charles I., another charter was granted, giving the city the right to hold the market "in all those fields called or known by "the names of Inner and Outward Moor; and "also all that field called West Smithfield, in the "parishes of St. Sepulchre, St. Bartholomew the "Great and the Less, *in the suburbs of London*, "*aforesaid*." And it goes on to grant the right of collecting the tolls and the use of them, and prohibits buildings being erected in those places, and it also confirms the former charter, "that no market "shall hereafter be granted, erected, or allowed by "us, our heirs or successors, within seven miles "round about the aforesaid city." In the 3rd Richard II., an order (in old French) of the council of the city was passed to regulate the drovers who were free of the city, assigning to them proper places in the market of Smithfield for selling the beasts and pigs, and the *foreign* drovers might take their places there wherever they chose, except in those appointed for the freemen.

The wisdom of our ancestors made it penal to slaughter within the walls of the city, and placed the market in certain moors and fields in the suburbs. The obstinate advocates of the existing state of things profess great devotion for the institutions bequeathed to us, and admire every thing but the spirit in which they were founded.

West Smithfield is no longer in the suburbs, but it is still what it always has been, the very best locality for the purpose!

The cattle have now to be driven for miles through the streets. They are brought, it is true, after midnight, but they are removed during the most busy part of the day, when the traffic is interrupted.

The place designated as West Smithfield is no longer a "field," in the suburbs of London, but a mere open space of barely more than five acres, in the centre of a densely-populated neighbourhood, full two miles from what can hardly be called suburbs. Yet the charter is in full force! The inconveniences arising from such a state of things can be readily conceived by an unprejudiced consideration. In the first place, the space is ridiculously small for the number of cattle sold there. This has been admitted by the most interested and prejudiced of those examined before several committees of the Houses of Parliament, which have been called to examine into the subject of its removal. And the confusion which results, and the cruelty practised to force the frightened animals into some order, is described as revolting in the extreme. A considerable portion of the animals are tied to rails, two feet of space being allowed to each animal. With a view of preventing the beast lying down, and to keep it to the rail, a slip knot is employed, which partly

strangles the animal on his attempting to shift his position. To force the animals, which have probably never previously known confinement, into the contracted space allotted to them, is most painful to witness. The drovers are furnished with stout sticks, armed with iron goads or "prods." These are freely used in the fleshy parts of the hind quarters of the animal, or the drover strikes the hock of the beast with his stick. These, however, alone, would be insufficient to force the animal into the narrow space assigned to him in certain cases; the drover is therefore obliged to have recourse to a refinement of cruelty which practice has shown him to be more effectual. He seizes the tail of the animal firmly, and gives it a sharp twist by a turn of his wrist. A crack is usually heard, and the tortured beast rushes forward. One or more of the vertebræ of the tail have been dislocated, and enabled the torturer to act upon the spinal cord.

A portion only of the animals can be tied to the rails. Numbers, not finding space in this part of the market, form their beasts into what are called "ring droves," or "off droves." These are formed by bringing the heads of twenty or twenty-five animals together, so as to allow of the hinder parts of each being examined. To effect this, if possible, a still greater amount of cruelty is exercised. The practice is for the drover to strike freely the head of the animal, or, according to the testimony of

witnesses well acquainted with the practice of Smithfield, to give the "beast a poke in the eye, "for the drover is not particular to an inch." The animal, to avoid the blows, attempts necessarily to change his position, turns in every possible direction, and the beating is continued without intermission until the poor beast has hit upon that point where he is required to stand.

The sheep do not escape with less suffering. They are placed in pens, which are arranged, from want of space, in the most inconvenient manner. They are five to eight deep, the access to the more remote being effected only by passing through those nearer to the road or avenue. It frequently happens that these are first filled, so that the sheep have to be forced through the intermediate pens already occupied. This is effected by forcing the animals, already too crowded, into a still less space, and then "dogging" the sheep through the narrow passage thus formed.

This dogging consists in the trained dogs rushing, on a signal from the drover, over the backs of the hindmost sheep, and tearing the ears, and eyes, and cheeks of the leaders.

Such is, we believe, a true account of the practice of the drovers which at present obtains in Smithfield. All witnesses concur in the vast improvement which has of late years been effected by the exertions of the police. Yet the practices we have described may be daily witnessed. The

serious demoralizing effects upon those practising them are a matter of course.

A witness, not yet become callous after some years' residence in Smithfield, describes the language used and scenes witnessed in Smithfield, as of the most odious description.

It must be admitted that the corporation and its officers have shown themselves most desirous of ameliorating the evils, and they have doubtless effected much. Their regulations require that each drover, of whom there are upwards of 900, shall be licensed, and shall wear a badge, He obtains this badge by a certificate of good conduct from a respectable householder. The license and badge are required to be renewed periodically, and are forfeited by misconduct.

Yet in spite of this control, is it surprising that many become demoralized by the nature of their business?

From McQueen's Statistics of the British Empire, we have selected the following statement relative to the value of the live stock in the kingdom.

Description.	Numbers.	Value.	Remarks.
		£	
Horses	2,250,000	67,000,000	Of which more than 1,500,000 are used in agriculture, valued at £45,000,000.
Black Cattle	14 to 15,000,000	216,000,000	
Sheep	50,000,000	67,000,000	
Pigs.....	18,000,000	11,870,000	

An account of live stock imported from the continent into England during the past year.

	Oxen, Cows, and Calves.	Sheep and Lambs.	Pigs.
London, Jan. 1 to Dec. 31, 1847.....	47,467	138,739	589
Liverpool, ditto	33	9	25
Hull, ditto	10,017	6,565	206
Southampton, ditto	838	24	—
Yarmouth, ditto	6,164	1,361	36
	64,519	146,698	858

CHAPTER IV.

SLAUGHTER-HOUSES IN ENGLAND—METROPOLIS.

In considering the state of the slaughter-houses, and the practice of the butcher in this country, I shall more particularly dwell upon that practice as it exists in the metropolis. It is here where I have more particularly considered the subject, and where, from the greater magnitude of the operations of the butchers, the advantages and disadvantages the existing system are necessarily more apparent.

Such supervision or control as the butchers are subject to is on the part of the municipal authorities.

Observations on Amount of Cattle sold by Carcass Butchers.

The professed slaughterers are generally in the neighbourhood of Smithfield, in Newgate Market, or Whitechapel, or rather Aldgate.

When the animals are not destined for the slaughter-houses in the immediate locality, they are collected into droves under the command of a head drover, according to their destination, those for one neighbourhood being collected together.

The animals are then dropped at the slaughter-houses for the different butchers who have purchased them in their line of march, until the whole have been disposed of. From ninepence to eighteen-pence per bullock is charged by the drover for the delivery, according to the number in each lot and the distance. The slaughter-houses are frequently most inconveniently situated, and great difficulty is experienced in getting the bullock to its destination, irritated as it must be by the treatment it has experienced, and from having been kept, even through the heat of a midsummer day, without food or water.

Nearly all the slaughter-houses in Whitechapel, or more properly Aldgate, are at the backs of the houses, to which there is no access but through the front shop. The animals, however infuriated, have to be forced, usually by the tail-twisting process, into their places. The slaughter-houses for sheep are frequently, and in Newgate Market almost exclusively, in cellars underneath the shop. The access to these is by steps, over which a board is occasionally placed to act as an inclined plane for the animal to slide down. More frequently a much more summary process is had recourse to. The animal is seized by the butcher and pitched headlong into the cellar, by main force, when, unable to rise from broken limbs, or other injuries sustained by the fall, they lie awaiting their turn to be slaughtered. They are then stabbed; after being

allowed to bleed for some time, they are dragged to the only opening, which serves both for the entrance and the admission of light, and are skinned and dressed with the despatch and skill peculiar to the London slaughtermen.

Places more unfit for the purpose than are these cellars, cannot possibly be conceived. Dark—low—without ventilation, and frequently with most imperfect drainage, they are a disgrace to the owners, and to the authorities which permit their existence. The large slaughter-houses in the neighbourhood of Smithfield, although more favourably situated, are scarcely less disgusting.

The blood is not so valuable as formerly, and is not so carefully collected. This and the contents of the paunches are allowed to escape by the drains, or are carried to the dung-hill, where a herd of pigs fatten for the market upon this choice food. The smell during the heats of summer, when from the temperature the tendency to putrefaction is increased, is intolerable. The blood mixing with the fecal matter of the intestines, and the half-digested contents of the paunch, and the ordure of the feet, is soon in an active state of putrefaction, with its attendant evils. Even if the offence has become so great as to call for its removal, it is consigned to the imperfect drain, where, partly resting, it evolves its fetid gases;—these escape by the different outlets, and thus carry disease into every house.

Such is an imperfect sketch of the state of some of the principal slaughter-houses, and of the evils they entail upon the surrounding population.

I by no means wish it to be understood that this is the case with all. Many honourable exceptions are met with, particularly among some of the retail butchers. These have often slaughter-houses at some short distance from the place of business, which are admirably conducted, being well supplied with water, well constructed, with a slope to allow of its removal, and with properly-constructed drains, having a "flush" for the effectual removal of the filth. But these effect the cleanliness at a great waste of matter; the blood and other animal matter thus rejected would, if produced in a proper locality, contribute materially to the income of the butcher, while it furnished increased fertility to the land, and consequently would contribute to cheapen food, the basis of national prosperity. This economy might be effected in a well-organized establishment without nuisance, and yet without adding to the contaminations of our already deadly sewers.

The blood and contents of the paunches are generally thrown into the sewers. The skins and hides are taken to the tanners, and are made into leather and parchment. There are also vast quantities of hides imported from abroad.

The intestines of sheep are made into cat-gut, and those of oxen are dried and prepared, and

exported to Spain and Portugal, for the purpose of packing preserved meats in.

The liver, feet, feck, &c., are boiled down, and sold for dogs' and cats' meat.

The hoofs and horns are collected, and made into Prussian blue.

The bristles of pigs are preserved, and used for brushes, and by the shoemakers.

It will scarcely be denied, I think, by the warmest advocate of things as they are, that slaughter-houses in the centre of a populous city are a nuisance. A correspondent of the "Times" (October 4th, 1847) speaks "of the disgraceful, "brutalizing, and pestiferous evils arising out of the "practice of slaughtering animals in the very centre "of the city. There is a range of slaughter-houses "at the back of Bear Alley, in my neighbourhood," he says, "the refuse matter, offal, putrid blood, and "excrement from which are thrown into the drains, "and while this liquid filth is running down the sewer, "the stench in Bear Alley is intolerable. The "same nuisance exists around Smithfield, Newgate "Market, and in various other parts of the city."

I have been enabled to take a cursory survey of the slaughter-houses of the metropolis in the principal localities where they are mostly congregated, but I was prevented from procuring as much information as would enable me to give the total number of cattle killed, or the number of slaughter-houses. I have, however, procured sufficient to state their

general condition, and shall commence with the neighbourhood of Newgate Market. In five slaughter-houses in Rose Street, Newgate Market, there are from 100 to 150 sheep killed every day, and from five to ten bullocks in one of them; they are generally very confined, in back premises, and in one case in the cellar, where the sheep are thrown down in the most cruel and barbarous manner head over heels. In Newgate Market, in thirteen slaughter-houses, there are about 600 sheep slaughtered every day, and in some as many as 50, 60, 80, 100 to 110 bullocks per day. Some of the places are clean and well kept, but generally they are very confined, being either at the back of the shop, or under the stalls in the cellars, and in some cases the effluvia is very strong, as must necessarily be the case where between 50 and 100 have been recently slaughtered, and hung up in the small place while still reeking from the freshness of the partly warm state of the flesh. In Warwick Lane, where calves are principally slaughtered in four slaughter-houses, between 300 and 400 are killed daily, and about 50 sheep. In one of these, also, was witnessed the barbarous practice of throwing the sheep headlong down into the cellar, the same practice before mentioned as obtaining in Rose Street. Some of these houses in Warwick Lane are in a most filthy state, in confined places behind the stalls, or in cellars. In —— Court, Snow

Hill, from 80 to 120 bullocks are slaughtered in one day; 95 were counted as recently slaughtered and hanging up. Children run about in the alleys and passage ankle deep in the blood and filth. In West Smithfield there are from 40 to 50 bullocks per day slaughtered. In Red Lion Alley are the general slaughter-houses for that neighbourhood or Newgate Market, which are filthy in the extreme, and abounding with the most offensive smells. They kill in each from 35 to 40 bullocks per day, and from 180 to 200 were seen at one time hanging up, steaming from their being recently slaughtered. The enormous quantity of offal which such a number must produce is carted away as quickly as possible.

I next proceed to Leadenhall Market, where there are no bullocks slaughtered, but calves and pigs only. There are from 35 to 40 salesmen, who all kill on an average from 300 to 400 sheep per week, and occasionally some of them slaughter as many as 200 per day. Calves and pigs are also killed here, the numbers varying considerably, according to the demand. The slaughter-houses are all under the market, or in cellars, and the cattle and sheep are thrown down in the most cruel manner. In High Street, Aldgate, in twenty-six slaughter-houses, there were killing and killed about 600 bullocks, 700 sheep, and 80 calves, and some pigs, all nearly at the same time.

When the locality was visited, most of the shops were crammed with beef, mutton, and veal, and the slaughter-houses so full that they are obliged to be constantly carrying off the carcasses to make room to slaughter more. In one instance the bullocks and sheep are driven in front of the houses and stalls up narrow passages to the slaughter-houses, which are flowing in streams of blood and filth in all directions, and are most disgusting, and through which from forty to fifty pigs are wandering and feeding upon all the offal and blood that they meet with. The stench from these slaughter-houses is almost overpowering, and foot-passengers are obliged to hold pocket-handkerchiefs to their noses while passing. This was observed in cool weather in September, but the nuisance is considerably increased during the heats of summer. There are several butchers in Spitalfields, whose shops do not exceed six feet by nine feet, where they slaughter sheep and sell retail at the same time.

The leather and hide market is not less a nuisance; it is, indeed, worse than the slaughtering-places, the hides being subject to decomposition, the smell of which is almost overpowering.

In Newport Market and its neighbourhood there are from forty to fifty butchers, together with slaughter-men and drovers. They kill upon an average from 300 to 400 bullocks weekly, from 500 to 700 sheep, according to circumstances, and from

50 to 100 calves; the number of the latter varies very much; 1,000 to 1,100 sheep have been known to be killed in one week, and many more bullocks than at the present time, as many are killed in the country, and are brought in by the railways. In this market there is a large building erected for the purpose, in which several butchers slaughter. It is situated behind the market, and in Market Street is one of the entrances. There are, besides, several other private slaughter-houses, placed in a square piece of ground, and surrounded by a dense population, which is, generally speaking, in a most filthy and unhealthy state. The stalls are dark, confined, and deplorably dirty; some sheep were being killed in them during our visit. In one of the principal slaughter-houses, from thirty to sixty bullocks were frequently seen at one time. In some of them they continue killing night and day without cessation.

Clare Market, although smaller than others, is not less a nuisance. There are about twenty-six butchers in and about it, who slaughter from 350 to 400 sheep weekly in the market, or in the stalls behind them, and in cellars. There is one place only in which bullocks are slaughtered. The number killed is from fifty to sixty weekly, but considerably more in winter, amounting occasionally to 200. The number of calves is very uncertain. Near the market is a tripe-house, in which they

boil and clean the tripes, feet, heads, &c. It is a most disgusting and offensive place, and in the centre of a dense population of the poorest description. In this market, apart from the more public part, is the place where the Jews slaughter their cattle, which, from being conducted according to a ceremony prescribed by the laws of their religion, is totally distinct, and great attention is paid to cleanliness.

Is it surprising that the country meat, notwithstanding the well-known injurious effects of a long journey upon it, should be so much superior, should "eat so much better," and fetch a higher price than the meat produced from animals which have been subjected to the cruelties of Smithfield, or passed through the streets of the metropolis, under the goad of a London drover?

The superiority of the country-killed meat no doubt partly arises from being slaughtered in a superior atmosphere than that which surrounds the London slaughter-houses; but the actual injury to the quality of the meat thus caused is by no means so great as that due to the treatment of the animals. The disadvantages arising from an ill-conducted slaughter-house are great enough, but those disadvantages are of another character. The meat slaughtered thus is much more prone to decomposition, it sets with greater difficulty, and cannot be kept so long as that brought from the country;

but we greatly doubt whether, if the meat be removed before the decomposition ensues, that its quality will be inferior. Besides, the comparison has been instituted between country and town meat generally, whereas a considerable portion of the town meat is killed in slaughter-houses which, although situated in localities most injurious to the surrounding dwellings, are nevertheless in themselves well ventilated and cleaned. The inferiority spoken of appears, however, still to exist.

It may be observed, that there are common slaughter-houses, where any butcher may have his own cattle slaughtered on the payment of a stipulated sum, generally

3s.	6d.	per head for	Oxen,
0	4	do.	sheep,
1	6	do.	calves,
0	6	do.	pigs.

These charges include every expense necessarily connected with slaughtering; and the facilities which these establishments afford strengthen us in the opinion, that properly-constructed and well-managed public slaughter-houses would be productive of great advantages to the trade and the public.

PUBLIC SLAUGHTER-HOUSE AT LIVERPOOL.

I have procured, through the assistance of a friend, H. G. Sutton, Esq., of Liverpool, who takes great interest in the Sanitary Question there, a most interesting statement of the abattoir, which has been long enough at work to prove the advantages of the system, and to conquer all the prejudices with which it was assailed at its first establishment.

This abattoir is the best in England of which I have any account, and it is to be hoped that, ere long, we may hear of one or more being erected in every well-regulated town.

The following is a statement of the quantity of cattle imported into Liverpool in 1846:—

Where from.	Cattle.	Sheep.	Pigs.	Horses.	Mules.	Calves.	Lambs.
Ireland	131,389	137,588	315,338	2,736	—	1,351	51,076
Coastwise ..	8,396	160,156	27,357	109	—	997	10,884
Totals....	139,783	297,744	342,695	2,843	—	2,348	61,960

The above is exclusive of the cattle which come into town from the country around, and across by the ferries from Cheshire, which will consist principally of sheep and calves; a considerable number of the latter are brought by the Ferry Company, from the county of Chester; but no accounts of the quantities are kept at the respective ferries.

The following particulars are extracted from the accounts of the cattle-market here, and exhibit the quantity of cattle, sheep, and lambs exposed for sale from March 1846 to March 1847. This market is not in the heart of the town, as the Smithfield of London, but is about three miles out of town :—

Quarter.		Cattle.	Sheep and Lambs.	Remarks.
Commencing.	Ending.			
1846.	1846.			
March 22	June 22	15,379	74,292	It is doubtful if an account of pigs and calves was kept; the quantity was small. The pigs are sold in all parts of the town and neighbourhood, and a good many of them at the pig-market of the Abattoir Company.
June 22	Sept. 22	18,994	128,404	
Sept. 22	Dec. 22	25,872	101,935	
	1847.			
Dec. 22	March 22	18,777	61,600	
Total for the year		78,972	366,231	
Average value from best authorities		£11. 10s. ea.	£11. 0s. ea.	

The probable consumption of the town of Liverpool may be taken as follows :—

Description.	Per Week.	Per Annum.
Cattle	About 800	About 41,600
Sheep and Lambs	About or rather more 3,000	,, 160,000
Pigs	——	,, 42,000
Calves	——	,, 10,830

The following is a description of the places in which the cattle consumed in Liverpool are prin-

cipally slaughtered. Some years ago the slaughter-houses were under very bad management, and not under the control of the authorities, and, in addition, were badly situated for the health of the town, being principally in a narrow street, called Harrington Street, where the drainage and other requisites were very deficient. This led to many complaints on the part of the public, they being in the neighbourhood of one of the best and most crowded thoroughfares, and the stench in hot and close weather being quite insufferable. It resulted in the corporation getting a clause inserted in one of their Improvement Acts, empowering them to compel all parties slaughtering for wholesale purposes to do so in some fixed and defined place, and under certain restrictions; and Mr. I. C. Etches, a most enterprising man, and at that time the principal wholesale butcher in Liverpool (and who has since retired upon a handsome independence), in anticipation of the provisions of this Act being carried out, and under a guarantee as to the annual rental from the corporation, built the premises now occupied by the Abattoir Company, who have purchased them from Mr. Etches. The Act referred to, and which has been further enforced by clauses in the Liverpool Sanitary Bill, enables the corporation to compel all butchers killing for wholesale to resort to the premises of the Abattoir Company; but this does not apply to those who kill for retail sale upon their own premises only, or for the supply

of shipping—such parties kill under special licenses, as provided by the Act, which licenses can be withheld if its sanitary provisions are not complied with. The removal of the slaughter-houses in this way has been a very great public benefit. The premises of the Abattoir Company are built in the highest part of the town, in a locality as easy of access from the cattle-market as is possible, consistent with all the other requisites and conveniences of a building so appropriated. The drainage is good, and the system of cleanliness, &c. fully and effectually carried out.

One great nuisance remains, and that one not easily remedied, viz.—the driving of the cattle landed from the steamers at the Clarence Dock, &c., through the town to the *Cattle Market;* but that is regulated to a certain extent so as to avoid crowded neighbourhoods, by keeping in the outskirts of the town as much as possible, and this will perhaps be a natural result, and as much from the facility in the driving of the cattle, which must be much more easy in open roads than in crowded thoroughfares, as from any regard to the health of the community.

Some details as to the Abattoir Company and its arrangements may perhaps prove interesting.

In the first place, it may be well to contradict the statements made in London as to the bad success of the company. About the best proof of its *prosperity* is the fact, that the £25 shares are worth

£60, which does not look much like a failing concern.

The mode of charging for the killing is regulated as follows: portions of the slaughter-houses are let at *annual rents* to the butchers, and others are left for strangers and public accommodation, and these latter parties, in lieu of rent, pay the following rates; viz.—1s. for beasts, 1s. per score for sheep, 4d. for calves, and 3d. for pigs. Those occupants who are *non*-proprietors are required to sign an agreement to abide by all the rules and regulations to which proprietors are bound by the deed of association, which may be shortly stated to be somewhat to the following effect; viz.—that they are to see to the proper collection of garbage and offal of all kinds, and of slink calves, in order to do away with nuisance, and to prevent foul meat being offered for sale; and the company keep a cart going round to remove all such, after being so collected. No midden-steads are allowed, but boxes put upon wheels are used, so that all manure and dirt may be taken away as soon as found, and this does away with one of the most fruitful sources of nuisance. These are some of the regulations of the company which bear upon the question. Of course, they are much more in detail, and more numerously inserted in the deed of association.

The advantages derived by the company are not so much from direct rental as from the profits arising from the collection of the garbage and offal of

all descriptions in bulk. The following particulars will explain the mode of its disposal and the prices generally procured for what is sold :—

Blood sells for about 12s. per cask, containing about 60 gallons. This is used for dying purposes.

Stirred blood sells for about 30s. per cask, containing about 80 gallons. Used for sugar-refining.

Sheep rop is manufactured by the Abattoir Company into whip gut, and sold at various prices.

Cow rop is manufactured by the Abattoir Company, and exported to Lisbon for sausages.

Bung gut is sold in an unmanufactured state to the gold-beaters at 3s. 6d. per score.

Bladders sell for about 2s. 6d. per dozen.

Manure sells for about 5s. per ton.

The system is more approved by the butchers than it was at first; some of the wholesale men, who supply shipping, and require to kill near the docks, in order that their meat may be the more readily seen in quantity by the purchasers, cannot well join. It is probable the corporation may compel them to do so under the terms of their Act, by withholding the annual licenses for their own places; and they would no doubt certainly stop the license of any one who created nuisance by non-performance of the sanitary regulations as to cleanliness, &c.

The expense of slaughtering and killing is somewhat increased by the Abattoir Company's arrangements, but it is increased by the loss of the garbage only; there is a saving in *rents* as compared with the old plans.

The quantities of cattle, &c. killed on the premises of the Abattoir Company, when compared with the previously given estimates of the consumption of the town, are interesting. The quantities of each sort killed during each half-year in 1846, separately, are as follow:—

Period.	Beasts.	Sheep and Lambs.	Calves.	Pigs.
First Half-year in 1846..	5,774	36,339	8,390	1,232
Second ditto ..	6,787	48,392	2,140	4,259
Total killed on Abattoir Company's premises	12,561	84,392	10,530	5,491
Estimates of Total consumption of Town as previously given	41,600	160,000	10,830	42,000

There is no chemical establishment on the premises to work up the offal, &c., which is disposed of in the manner before described; but over part of the slaughter-houses is a candle-manufactory, which is let to a candlemaker. No doubt the inducement, to a certain extent, is the facility of getting rough fat in quantities, and near at hand.

PUBLIC SLAUGHTER-HOUSE AT NORWICH.

The following particulars respecting Norwich cattle-market are gathered from the evidence given before a committee of the House of Commons in the session of 1846-47:—

Norwich cattle-market is one of the largest in

the kingdom; the season when there is the greatest amount of cattle comme ces early in January, and terminates in July, and during that time the average number which is sent up to Smithfield is 2,000 weekly. The market is held on Norwich Hill; and there is as much crowding in the streets on a Saturday as in London on Monday,—the Smithfield market-day. From a return of one week during the month of April, 1847, from the Norfolk Railway Company, we find that they brought up cattle from the following places.

They are brought into the county in March, April, May, September, October, and November, and fed on the root crop during the following winter and early the ensuing year, and then are ready to send to London:—

	Cattle.	Sheep.
From Yarmouth.....	109	60
,, Needham	134	60
,, Norwich	1,110	801
,, Wymondham	94	300
,, Attleboro'.....	122	81
,, Thetford	2	70
,, Dereham	266	1,326

The county of Norfolk is celebrated as a cattle-feeding county, the cattle mostly coming from Scotland and the north of England, and but few bred there: there are large quantities of sheep bred

and fed in the county. Nearly all the cattle are fed on root crops, together with oil-cake, corn, &c.

There is a small abattoir at Norwich; it was built by the Norfolk Railway Company, who have made extensive arrangements for live cattle near the Trowse Station. This abattoir is on a siding near the above station, but is of small extent, not exceeding one quarter of an acre, and is let to one person, who is a butcher. The arrangements are not so complete as they might be, and require alteration; but it can only be considered as a private slaughter-house, and therefore is scarcely within the object of this treatise.

We may however state that about 20 beasts, and 200 sheep, are the greatest amount which are killed weekly in this establishment, and also, that small as the attempt has been, great advantages have arisen from it, and that the butchers of Norwich are very much in favour of it; and it is to be hoped that a more extensive establishment will spring up and demonstrate the great superiority that public abattoirs have over the present system.

The injury and nuisance of the present system of private slaughter-houses to the health and comfort of large masses of persons is strongly described in the following extract from the Second Report of Commissioners of Inquiry into the State of large Towns and Populous Districts, 1845 :—" The state of the " slaughter-houses is an almost constant source of " complaint. They are very rarely placed under

" any regulations with regard to the constant re-
" moval of the animal refuse, their proper ventila-
" tion, or a sufficient supply of water to insure due
" cleanliness. The improper situations in which
" these places are found, sometimes even under
" dwelling-houses, and the effect produced upon
" the health of the inhabitants, is thus described in
" the report on the towns of Lancashire :—' Slaugh-
" ' ter-houses are found below dwelling-houses, the
" ' smell in which was most insufferable. In many
" ' of these cases, the inhabitants looked pale and
" ' sickly, and diarrhœa frequently prevailed, al-
" ' though absent from the courts contiguous.'

" The effluvia arising from the blood and entrails
" of animals, where recently slaughtered, renders
" the carrying on of such business in the precincts of
" large towns incompatible with due sanitary regu-
" lations, even when the offal and filth is speedily
" and effectually removed. In scarcely one instance,
" however, in which shambles or slaughter-houses
" have come under the observation of the commis-
" sioners, either in the metropolis or in provincial
" cities or towns, have there been found in force
" any regulations or authoritative supervision to com-
" pel the speedy and regular removal of offal from,
" or the efficient cleansing of such places. They
" have, on the contrary, been found to be, almost
" without exception, centres of the diffusion of
" noisome influences, affecting, with more or less
" intensity, the immediate vicinity, deteriorating the

" sanitary condition of the surrounding population,
" commonly poor and dense, as recorded in the
" local reports of the commissioners, and in a more
" remote degree vitiating the general atmosphere of
" the town, and thus becoming a nuisance to the
" inhabitants at large. A second evil and nuisance,
" necessarily contingent upon the locality of slaugh-
" ter-houses, however stringently supervised and re-
" gulated, in the midst of large and populous towns,
" is the quantity of animal ordure deposited upon
" the public streets and thoroughfares leading to
" such slaughter-houses, which, besides forming a
" most offensive addition to the ordinary surface
" filth, excites and accelerates its decomposition.
" This evil is augmented in the ratio of the size of
" the town, and where, as in London, most of the
" surface filth of the streets is washed down into
" the sewers, the continual passage of the cattle,
" sheep, and pigs in the neighbourhood of the intra-
" mural slaughter-houses must materially increase
" the amount of that decomposing matter, the
" emanations of which are constantly escaping from
" the untrapped gully-holes to infect the atmo-
" sphere of the metropolis. Nor ought the occa-
" sional fatal injuries, and the constant peril of life
" and limb, incurred by the inhabitants of large
" towns, the streets of which are so frequently tra-
" versed by goaded and over-driven cattle, to be
" overlooked in an enumeration of the inevitable
" evils of slaughter-houses situated in the crowded

" parts of towns, and as strengthening the more " general sanitary grounds for urging upon the " legislature the expediency of abolishing them, " and of establishing properly-constructed and effi- " ciently-regulated places for slaughtering cattle in " the suburbs." Sir Henry de la Beche says, in his report on the state of Bristol :—" Slaughter-houses " in Bristol are scattered over the town, without " any special regulations. Very frequently they are " situated in unventilated courts, and are much com- " plained of, both by medical witnesses and by the " inhabitants of the courts themselves." Then, again, we have the testimony of Dr. Lyon Playfair to the following effect :—" The following statement, given, " during the inquiry into the state of Bristol, to Sir " H. de la Beche and myself, by a respectable shop- " keeper, whose sleeping apartments and sitting- " rooms look over a court in which a slaughter- " house for pigs is situated, will illustrate at the " same time the evils, and the ignorance of the bad " effects produced.

" ' Have you resided for some time in this house ?'

" ' Yes, for several years.'

" ' What occupation does your neighbour pursue ?'

" ' He kills pigs, which he gets over from Ireland.

" ' Often the pigs, in coming over in the Packet, die,

" ' and I have seen as many as thirty dead pigs at a

" ' time brought into the yard. They are thrown

" ' under that shed there, until there is time to cut

" ' them up, and by that time, I have seen the mag-

" ' gots fairly dropping out of them. Then they are
" ' cut up, and I believe are made into salt bacon or
" ' sold for sausages. The entrails of such pigs are
" ' generally too far gone to be of use, and they are
" ' thrown into the dunghill. When the dunghill is
" ' stirred up to be taken away, Oh ! Sir, the smell
" ' is awful; we are forced to shut our windows and
" ' doors, and stuff pieces of cloth into the key-holes;
" ' but all this does not keep it out. The entrails of
" ' the live pigs killed in the yard are boiled and sold,
" ' and give out a very bad smell, but nothing like
" ' the others.'

" ' Have you not complained of this nuisance ?'
" ' Yes, we have; but we were told it was no use
" ' complaining, for doctors agreed that these smells
" ' were very healthy. Besides, the owner of the
" ' yard is a very good neighbour, and tries to keep
" ' things as clean as he can, but his occupation beats
" ' him in that.' "*

It was proposed to have placed an Appendix to this work, consisting of extracts from the reports of the Commissioners upon the State of the Slaughter-houses in the principal large Towns in England; namely,—in the large towns in Lancashire, by Dr. Lyon Playfair; in Newcastle-upon-Tyne, Gateshead, and North and South Shields, by Dr. D. B. Reid; in Coventry, Derby, and Norwich, by J. R. Martin,

* Part II. App.; Second Report of Commissioners of " In-
" quiry into the State of large Towns and populous Dis-
" tricts."

Esq.; in York, Kingston-upon-Hull, Leeds, Bradford (Yorkshire), Sheffield, and Halifax, by James Smith, Esq.; in Bradford (Yorkshire), by the Board of Surveyors; in Exeter, by Dr. Shapter; in Derby, by Dr. Baker; and Birmingham, by a committee of Physicians and Surgeons; but it was found to extend the work beyond the proposed limits, and therefore it has been dispensed with. All these reports concur in stating the baneful effects of slaughter-houses upon the health and comforts of the inhabitants, because they are mostly placed in the centre of the towns, or in the most densely-populated parts of them, and because there is no control over the management of them; and the consequence is, that in hot weather the offensive smell and effluvia arising from them is insufferable. In some cases reported by Dr. Lyon Playfair, at Bolton, the slaughter-houses are in cellars under the dwelling-houses, and that "the inhabitants looked pale and "sickly, and diarrhœa frequently prevailed, although "absent from the courts contiguous;" and in the same report, it appears that the nuisances were not removed, because those who were most injured by their existence had not the means to prosecute, or were afraid of the uncertainty of the law in case they indicted them, and those who could do it took no trouble about it. In North and South Shields, where great quantities of cattle are slaughtered for the shipping as well as for a large population, great complaints are made of the want of proper

slaughter-houses, as the blood and offal find their way into the main streets along the channels. In Coventry, the nuisance is magnified by the offal which is thrown into the river being prevented from floating away by the mill-dams, and by there being a large slaughter-house cesspool in the centre of a dense population.

In the report on Derby a small plan is added, by which it is seen that a number of wretched houses line one side of a court, called Robinson's Court, and there is a slaughter-house on the other side, without any drainage, and the offal is thrown on a dunghill, where it is suffered to decompose. In Leeds there is a mass of slaughter-houses, of the worst description, immediately under the windows of the Fever Hospital. In Sheffield, the mill-dams in the rivers Don and Sheaf are a means of causing the offal and contents of sewers and dead carcasses of animals to accumulate. In some of the reports it is stated that pigs are kept and fatted on the offal of the slaughter-houses.

The boiling the offal, bones, blood, &c. is described as very common and most injurious.

CHAPTER V.

CONCLUSION.

THIS work being exclusively devoted to the consideration of the introduction of public slaughter-houses into our large towns, markets, whether attached to them or not, have not formed any part of its plan, and I do not nevertheless reject them; but the circumstances of each case may be so totally different, as to render it impossible to lay down any other than general recommendations. For instance, I have avoided as much as possible the much-argued question of the removal of Smithfield Market, but shall eadeavour to suggest some plan for the formation of slaughter-houses in the metropolis.

I consider that, holding the opinions I do, I am bound at once to deprecate the attempt of any private company, formed of persons wholly unconnected with the butcher's trade, making it compulsory on the trade to slaughter cattle in abattoirs remote from the great masses of the population, and those only few in number.

I object to it upon the principle that no trade ought to be interfered with to this extent by any party not connected with that trade, and that it ought not to be confined to certain localities, and I

do not believe that the public will be better served by being subject to the control of an independent body; at the same time, if the trade will not or cannot see that it is incumbent upon them to meet the demands of the times, and endeavour themselves to abate the nuisance of the badly-conducted slaughter-houses, some one must take up the matter, and they must be subject to their rules; but it ought to be some constituted body already in existence.

It is preposterous to take the Paris abattoirs as a precedent for the circumstances of London. In Paris, as I have elsewhere stated, the number of butchers does not exceed 500 in a population of nearly a million; and the French citizens are not in the habit of consuming nearly the quantity of meat per head that the English do; whereas in London alone, there are about 4,000 butchers in a population of above two millions, and the consumption, probably, four times greater in proportion. And although the five Parisian abattoirs may not a tall times be over-crowded, particularly some of them, it forms no argument that six or seven public slaughter-houses, placed round about this metropolis, will be sufficient, nor that the distances at which they would probably be located prove the greatest possible injury to the trade and inconvenience to the public. Unfortunately in this country, particularly in London, we have no means by which we can, with any confidence as to the correctness, estimate the amount of the consumption of meat, but we

have been informed by a good authority, that it may be considered to be nearly double of that which is slaughtered in London. I have before alluded, at some length, to the laws and restrictions to which the butcher's trade, in all its branches, is subjected in France; but that system is totally inapplicable to this country. The surveillance and control would not be submitted to here,—every man has always been accustomed to conduct his own affairs in his own way; and so long as he does not interfere with, or prejudice, the public welfare, or violate the laws, he has a prescribed right to perfect freedom. In France they have been taught to respect that kind of control, not only by habit confirmed for a long period in the general government of the country, but in the details of their trade, ever since that trade assumed any importance in the internal economy of the country. We cannot help fearing for the trade here, that should public companies, not being butchers, establish public slaughter-houses, that it will be reduced very nearly to the same state as the trade is in France, and that of the most disagreeable description, namely, of a power which will have only its own private ends to gain.

I will now endeavour to draw a few conclusions from the information which I have been at some pains to collect, and to point out the result that may be expected to arise from it. I have therefore divided the consideration of it under two heads; namely, first—The advantages of abattoirs as a

branch of the sanitary question; and secondly, in a commercial point of view.

The advantages as a branch of the sanitary question.

If we refer to the evidence which has been taken before the Health of Towns Commission, we shall find numerous instances of the injurious effects that are produced in a great many of our large towns where the population, generally poor, are obliged to live in the neighbourhood of badly-constructed and ill-managed slaughter-houses. Medical men have spoken positively of the evils resulting to health attending their present management; and in committees of the Houses of Parliament strong opinions have been expressed by them of the necessity for their removal to proper localities, and of their being placed under proper surveillance.

1st. By their establishment, the filth produced by the passing of cattle through public streets would be avoided. The garbage and offal of large slaughter-houses may be removed with much less annoyance and injury to the public, and ought not to be allowed to be sent through the public sewers, nor into rivers and streams which frequently pass through towns; but it ought to be conveyed away by other means, or destroyed, and the slaughter-house placed in a locality properly selected with that view.

2nd. In a concentrated establishment, such as we contemplate, great facilities will be offered for a complete supervision of the condition of the meat

which is intended for human food. Inspectors would have such complete power for the purpose, that much certainty would be gained that none of the meat escape their attention, and the expense for that purpose would be very much lessened.

3rd. The melting of the tallow in every well-arranged establishment ought to be so conducted as that every unpleasant or injurious effluvia should be carried off, so as not to affect the neighbourhood, and which may very easily be done. It is quite essential that this process should be combined with a slaughter-house, owing to the facilities that there are of carrying it on; and the risk of loss from peculation and waste is very much diminished.

4th. A small portion of the establishment may be devoted to the manufacture of catgut, glue, and Prussian blue, whereby those most disagreeable and unwholesome operations would be removed from the places in which they are generally carried on, frequently in the most crowded and dirty parts of a town. We might also provide for tanning within the jurisdiction of the slaughter-house; but as that trade requires great space, and its locality is generally very different from that that would be suitable for slaughter-houses, we have not thought that it ought to be included.

5th. As regards the metropolis,* a large question

* The following is extracted from the Report of a Committee of the House of Commons, in 1828 (p. 6):—"Your Committee "would rejoice at the establishment of slaughter-houses on an "improved plan, which, by affording every facility to the butcher,

is opened to us when we attempt to act upon it, and we must, therefore, only treat it very generally, and we hope in such a manner that the practical portion of the various branches of the trade will consider it adequate, and also such as the advocates of sanitary reform may approve of. The proposition, therefore, is,—1st. That there should be several public slaughter-houses, constructed on certain plans, and managed under proper rules, and placed in various parts of the town, and as near as possible to the centre, in the precincts, near the river, canals, railways, and in open spaces. 2nd. That all existing slaughter-houses, where cattle are killed for the trade by the professed slaughterers, ought to be done away with; the private slaughter-houses, should be allowed to remain, but only under certain conditions as to locality, construction, quantity of killing, and regulations to be observed as to offal, admission of cattle, and exposure of the meat. 3rd. That all tallow-melting-houses, manufactories of catgut, bones, glue, blood, Prussian blue, and other processes which it is well known may be produced from the offal, &c., or which may hereafter be

" might introduce a better system, and to which those connected " with the trade might be induced voluntarily to resort. Such " establishments (*for there should be, in their opinion, several in* " *the environs of London*) would well merit the patronage of the " public, to whose opinion on such a subject, if strongly mani- " fested, the butchers must yield, and from whose decision there " could be no appeal."

invented, ought to be under similar restrictions as to locality and management.

In a commercial point of view, on this part of the subject I shall only refer to the accounts which I have heretofore exhibited of the five abattoirs of Paris, and the various sources of revenue from which the income is derived, together with the account of expenses attending the management and repairs. The abattoir of Liverpool also shows that it is highly profitable. But I believe that a much larger return might be made from them, by including the manufacture of many substances now almost neglected and thrown away, and by more economical processes of manufacturing them, which a combined system affords. There is no doubt but the expense to the butcher in slaughtering will be increased, either by direct rental, and having men at the abattoirs, and by his disposing of the offal; or if he should be charged a nominal rent, and give up the offal and manure to the abattoir. But it may be reasonably expected that if every advantage is taken by manufacturing the offal, &c., as part of the revenue of the establishment, the expense to the butcher may be reduced, so as to bring it nearly to what he is now subject to.

The buildings which I contemplate as suitable for these descriptions of establishments should possess every requisite, duly commodious as to size, and only so far ornamental as the nature of the service may point out as necessary. The Parisian abattoirs offer

Elevation, Plan, & Sections of an Abattoir.

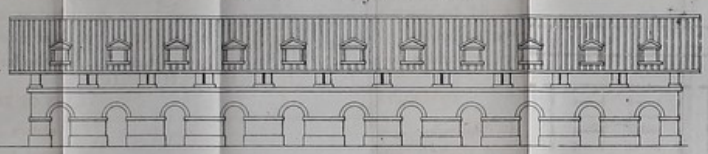
Reference.

A — Slaughter-houses.	E — Tripe house.
B — Sheds.	F — Stables & Reservoirs
C — Lodges.	G — Pens
D — Melting houses.	H — Fountain.

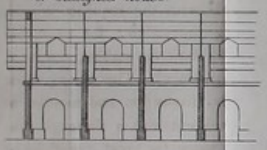
Elevation of Entrance Front.

Transverse Section of Slaughter-houses.

Elevation of Slaughter houses.

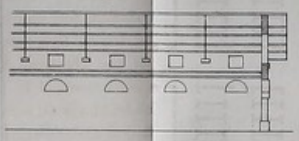


Longitudinal Section of Slaughter house.



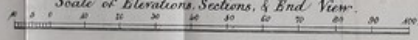
Section of Sheds.

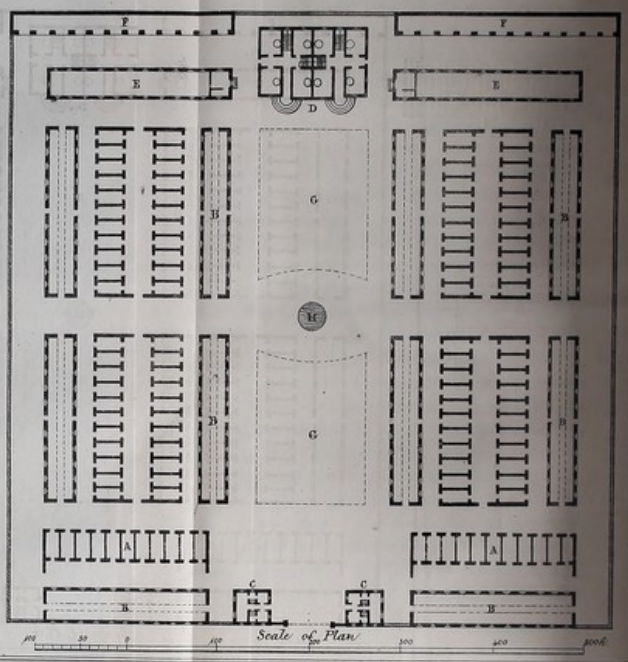
Longitudinal Section of Sheds.



End View of Slaughter houses & Sheds.

Scale of Elevations, Sections, & End View.





Scale of Plan.

R. B. Grantham. Del.

Hadley lith. 3 Willanson 2d. Strand

a fair specimen of style, but they would probably be erected at a much less cost at the present time.

I look forward to a time when many of the railways will have properly-constructed slaughter-houses attached to them in the country or in large towns, so that in case of sudden demands for meat, it would be despatched at once, and that it will lessen the necessity that now prevails of killing so much in London, or in the largest towns.

DESCRIPTION OF THE PLATES.

In plate No. 2 is shown a design for a large-classed abattoir, supposed to occupy ten acres of land, containing 110 slaughtering-places, and an equal number of sheds, with the requisite accommodation for melting the tallow; for preparing the tripes, feet, heads, &c.; for stables, reservoir, and the chemical department. The arrangement is as economical in the disposition and number of the buildings as is consistent with a thorough ventilation, and enlarged space for great quantities of cattle and sheep, and is not unlike those of Paris; the plan of which is not easily departed from, if all the objects they possess are to be attained. But in the construction of the roofs I have made some alterations, in order to give greater facilities to the butchers, which I deem improvements, and which I shall proceed to explain. I have adopted the same dimensions for each slaughter-house as those of the Paris abattoirs, as they appeared to be suffi-

cient, excepting in those points which I shall remark upon. The roofs are proposed to be of iron, capable of carrying a considerable weight, and may be covered with any light material, such as galvanized sheet iron or other metal, that may be found most durable.

The object of this mode of construction is to obviate a difficulty which at present exists, and if a larger quantity of cattle is required to be slaughtered, must limit the amount very considerably.

In the Paris abattoirs, when they have killed and dressed a bullock, it is suspended nearly over the place where it was killed, and the space will not admit of more than seven or eight being up at the same time, so that the butcher can only slaughter that number until these are removed. The sheep and calves, from twenty to thirty in number, are suspended on hooks in the walls and beams on each side of the beasts, so that the place becomes totally blocked up. I propose, therefore, to remedy this, by having in each slaughter-house a travelling frame, upon which the beast will be raised and dressed, and moved along from where it was, and by another contrivance, raise it up into the roof; it will then leave room for another to take its place, so that two can be dressed at the same time and then raised, where they will be exposed to a free current of air; it will then be moved along on an iron rail to the dormer, through which it will be lowered into a cart. By these means, several

bullocks can be slaughtered and stored at once, until they are required to be conveyed to the retail shop; sheep and calves, being less bulky and lighter, I propose a simpler arrangement for them; and it will not be so necessary to raise them out of the slaughter-house as the heavier descriptions of meat.

The examination of the sections and elevations of the slaughter-houses in this plate will assist this description. As to the sheds, there appears very little, if any, alteration from those of Paris, except that the roof will be iron.

Another part of the subject is the storing and preserving large quantities of meat in warm weather, or at any time when it may be found convenient. It is proposed that every large-classed abattoir should be provided with large rooms, having ventilators in the roof, and every requisite for hanging the meat, and underneath these rooms are to be vaults, in which ice is to be so placed, that the external air may come in contact with it and pass up through gratings in the floor, and by those means lower the temperature of it to almost any required degree. The rooms should be kept as dark as possible, as meat always keeps better, and it will prevent the flies from injuring it. Another plan may also be adopted and that is, to have the centre space of the abattoir vaulted underneath, with areas, and gratings over them to admit the air, which should also be brought into contact with ice if necessary, and no light but that of gas-lights admitted;

and, in order to keep the upper surface of the ground cool, trees might be planted, and the same means adopted as for the preservation of ice-houses. The trees would improve the appearance of the place, and afford shade and shelter to cattle and sheep similar to some of the continental abattoirs.

I have also considered that it would be an improvement to provide a ventilating tower, or chimney, to the tallow melting-house, which may be made ornamental, so that the effluvia can be carried off at a considerable elevation.

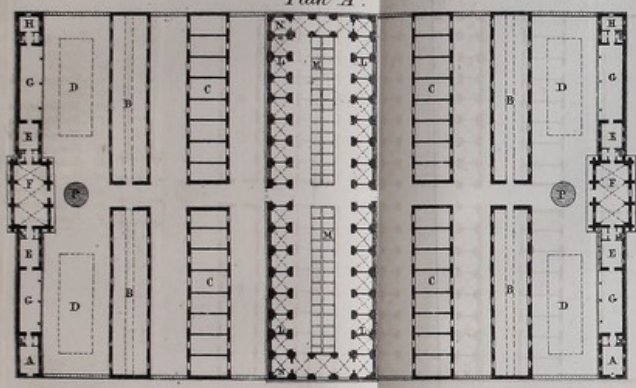
The buildings set apart for the chemical manufacture of the offal will be provided with every requisite, and, if necessary, a ventilating tower might be attached to them.

As it is most probable that the water will be supplied by a company, I have not provided any means for raising it into the reservoir.

Plate No. 3 represents two plans of abattoirs, with markets attached, which may be either retail or carcass markets, and are adapted to small towns. The plan on the left of the plate is that of the elevation above, and the plan on the right is the plan of the lower elevation; the former having the market situated between the abattoirs and the melting-house, tripe-house, &c., at each end, and better suited for a retail market; and the latter, havnig the market at each end of the abattoir, probably better fitted for a carcass market; and in this case the melting-house, tripe-house, stables, &c.,

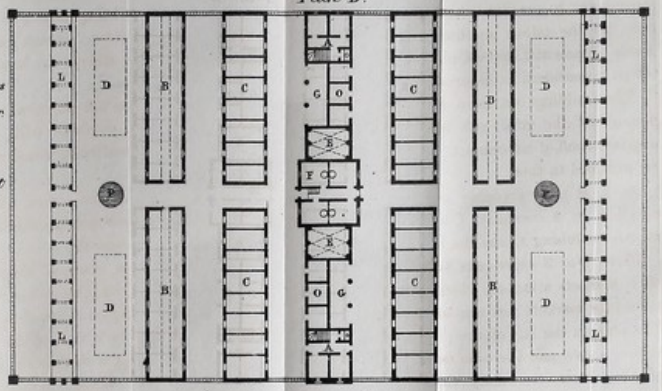
Elevation of Abattoirs with Market in the Centre. – (See Plan A.)

Plan A.



Reference.
A – Lodges
B – Sheds
C – Slaughter-houses
D – Pens
E – Stables & Reservoir
F – Melting house
G – Manure Shed
H – Porches
L – Butchers Stalls
M – Vegetable Market
N – Porters Lodges
O – Tripe houses
P – Fountains

Plan B.

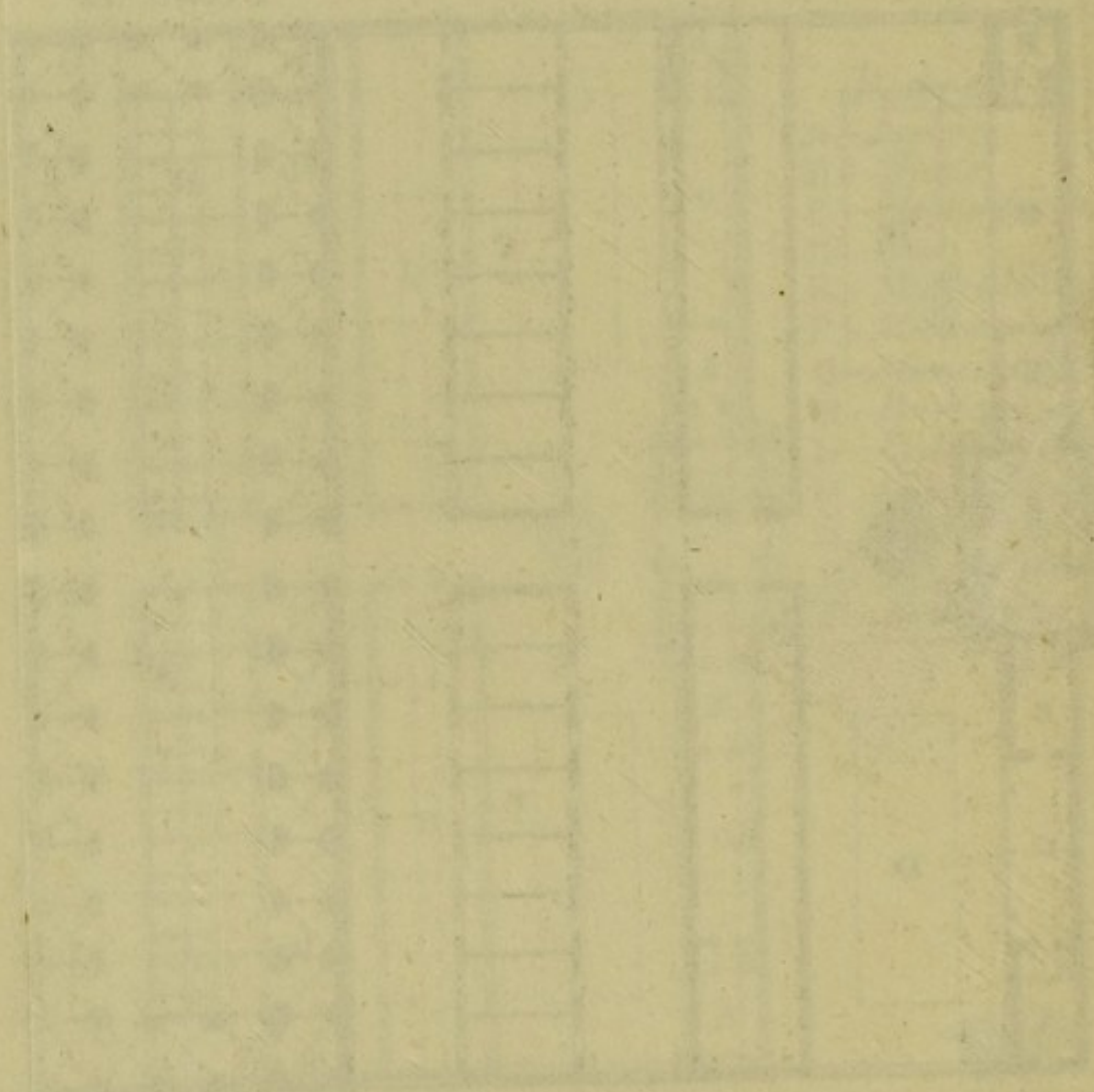


Scale of Plan.

Elevation of Abattoirs with Markets at the ends – (See Plan B).

R. B. Grantham, Del.

Hedsley lith. 3 Wellington St. Strand.



are placed in the centre, with a ventilating tower over the melting-house; altogether forming a compact arrangement for a moderate-sized town. The same principles in the details of the construction will be followed in these buildings as I have before described for the large abattoirs.

FINIS.

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