

## MEAT PRESERVING IN MELBOURNE, AUSTRALIA.

Having in regard the enormous and continually advancing progress which meat preserving and its consumption have taken of late years, we are induced to present to our readers a description of the works of the Melbourne Meat Preserving Company, condensed from the *London Grocer*.

The Melbourne Meat Preserving Company was established on December 31, 1867, at a meeting of squatters, and others interested in finding a market for their surplus stock, and the projected process of preservation was that devised by Mr. S. S. Ritchie, who earned his experience in meat-preserving establishments in Great Britain. He was supported in the first instance by the firm of Holmes, White & Co., who encouraged his experiments with Australian meat, and backed his enterprise. The result has been successful. At the present moment the Company's capital consists of £40,000, in 8000 shares of £5 each, all called up, and the premises consist of an extensive series of buildings, erected on a site adjoining the Saltwater River, within three miles of Melbourne. It employs 251 persons, including a large number of boys; pays weekly wages amounting to £493, purchases from 7000 to 8000 sheep, and from 80 to 100 head of cattle, worth together from £3500 to £4000 (the present average price is 8s. per sheep, and £7 per bullock) per week; and produces weekly £6000 worth of produce—item, 17,000 tins of preserved meat, worth £2450, 65 tuns of tallow, worth £2350, and sheepskins, hides, bones, and sundries worth £1200. Its operations in January, 1870, alone, comprised the shipping to London of 48,620 tins of meat (weight of meat 295,012 lbs.), and 780 casks of tallow, weighing 254 tuns, 1 cwt., 2 qrs. But this is not all for the excellence of the meat, so preserved, has caused an enormous local consumption, and the local demand is daily increasing. In the article of ox and sheep's tongues, for instance, export is not to be thought of, for though the Co. purchase about half the amount of sheep and cattle consumed in Melbourne itself, yet it is unable to supply these tongues (in a preserved form of course) fast enough for its local customers. Its sale for consumption in the colony amounts to 61,455 tins, or 183,806 lbs. of meat.

The above are preserved in vacuo, and guaranteed to remain perfectly sweet any length of time and in any climate.

The Company's buildings being on the side of a hill, are arranged conveniently in stages, and as they spread over a considerable area, tramways, ingeniously designed for easy transit, connect the departments. First come the slaughter houses and sheep and cattle pens. The former are substantially built of stone, with ample means of ventilation. Drainage is obtained by a false floor, composed of joistings laid as a grating, and thus all fluid matter runs through into a blue-stone reservoir beneath, which, in its turn, drains into the places prepared for that purpose. The strictest exercise to obtain cleanliness appears to be the pervading rule of the establishment, and necessarily so, for much of the Company's success depends upon the meat being put up in the best form, which could not be the case if it had to remain in an atmosphere charged with noxious gases. The Company is now working day and night, and 1000 head are brought in for the day's work, and 500 head for the night's operations. Water is laid on in every direction. The process of slaughtering is of the simplest, and the sheep are brought into the slaughter-house, polled, disemboweled, and skinned with such amazing speed that it is only the allotted work of two men and a boy. The bullocks are killed by spearing, and the use of very simple tackle enable the easy transit of the carcasses, which are eventually hung on a truck (used for sheep also) constructed for the purpose, and run along a tramway to the scene of the next series of operations. It is not too much to say that the only observable smell in these slaughter houses is that of fresh meat, for the blood and offal have no time to accumulate.

The carcass, as it leaves the slaughter yards, is next taken to the "butcher's shop," where the meat is boned and jointed, ready for the kitchen, and it is fully occupied by the men and boys at work preparing mutton and beef for the tins, and sorting it into the lots required. The greatest cleanliness prevails here. In dealing with mutton, the legs and shoulders are boned, and, sometimes, when the sheep is a particularly fine one, a portion of the sides is put up, too, as mutton with bone; but, in most cases, the fore-quarter, except the actual shoulder, is abandoned altogether to the boiling-down part of the establishment, where the tallow is extracted, and the remainder turned into manure. Indeed, it is a fixed rule to consign to the tallow vats all the inferior portions of every animal preserved. All the bone is taken from the beef, the rounds, flanks, and briskets of which are turned into "corned beef," and the rest is made into "roast or boiled beef" (fresh). As fast as the meat is sorted into the requisite quantities, it is placed in trucks, which run on a tramway to the "kitchen." The first process there is to place the meat on large trays, and immerse it for a few minutes in boiling water, which scalds it, and removes scum and possible impurities. Steam lifts next carry the trays away to tables, on to which their contents are shot. Nimble fingers then place the meat in the tin canisters, which are brought in from the tinmen's room; and it is now that care is taken to give adequate weight, and to insure further the great desideratum of cleanliness. As fast as the canisters are filled, tinmen solder on the tops, and each canister is then intact, save a small pin-hole in the center of the convex-shaped cup. The canisters are next put into huge trays, which steam hoists carry aloft into the preserving room. In the "roasting and soup" department of the kitchen are six 360-gallon coppers, of the kind known as "jacketed pans"—i.e., with a chamber left between the outside and inside coating of the copper to be filled with the steam by which the boiling process is effected. In these

coppers is boiled the stock for the soups, which, when ready for use, is drawn off by taps, cooled, and passed into the kitchen, where it is placed in the pans with the material that establishes its flavor, and which is prepared in the same apartment. In this place, too, is a special process for the manufacture of "extractum carnis," or the essence of meat prepared according to Liebig's process. An essential feature of the latter is the reduction of the extract in shallow pans at a low temperature.

It will be recollected that the soldered canisters, the pin-hole open at the top, have been conveyed to the "preserving room." The trays—in each of which 100 tins have been placed—have perforated bottoms—and they are carried along the room on travelers, and lowered into the cisterns ranged round the room, and sufficiently full of a chemical composition of which muriate of lime forms a large ingredient. The cisterns are heated by steam, and here the canisters are boiled, according to the nature of their contents and the amount of cooking they are intended to undergo. As we have before indicated, Mr. Ritchie's process involves the expulsion of air to the last particle possible, and to secure this, whatever the amount of cooking required, the concluding point is always when a jet of steam is being expelled through the pin-hole. At this juncture the solderers come and solder up the pin-hole, applying a cold sponge immediately afterward to cool the solder and prevent the steam from forcing its way through. This final process is a very delicate one, and great skill is demanded from the workmen who perform it, for an extra pressure of the finger might cause air to re-enter the tin, the effect of which would be found out in the testing room, and cause the ruin of the meat. So soon as the tin is hermetically sealed in this way, the canister is subjected to a still higher heat, by which means the trifling quantity of air that may be left inside is nullified. The tins are then hoisted away into the cooling room, from which each day's work passes in batches to the testing room. The appliances for cooling are so arranged, that when once the contents of the canisters have received their last heating, the temperature is rapidly reduced by cold water, and in this way the cooking is not allowed to continue a moment beyond the needful point. The temperature of the testing room is kept at 100° Fah., and here the canisters remain a certain time—generally seven days—to develop defects which are ordinarily exhibited by the exudation of the contents or the convexity of the ends of the tins. On leaving the testing room, the tins are carried off into other apartments, where they are painted, labeled, and packed in wooden cases, stenciled with marks showing their contents. Last of all, they are placed in trucks and transported by rail to the Company's wharf on the river side, when they are put into lighters for transit to the exporting ship's side.

Besides all this, there is a melting department for tallow, which the Company export so largely, being impelled thereby to the necessity of utilizing their *débris*. The latter is packed into trucks and carried on rails to a staging in the melting room, from which it is unloaded into six huge vats. There are three large and three small vats, and they hold, collectively, as much as would constitute the carcasses of 1200 sheep. The fat, being boiled out, is carried off by spouting for refining, and from the refinery it runs into coolers, from whence it is turned off by means of taps into the barrels in which it is sent to market. All the above processes are arranged so that there shall be no handling of the fat, and the human labor required is comparatively trifling. Outside this department is a kind of mill, where the bones and other *débris*, after boiling, have their last drop of fat expressed from them.

The Company's works include other processes and manufactures, the most interesting of which is, perhaps, to be seen in the tinmen's room, which is fitted with a large variety of cutting, rolling, and die sinking machines. Here are forty-four tinsmiths preparing the tins. The engineer's room is provided with lathes, forges, and all the appliances for keeping the tools, etc., of the establishment in order. There is, also, a cooperage, where the tallow casks are made to exactly suit the purpose in view.

## Curiosities of Breathing.

The taller men are, other things being equal, the more lungs they have, and the greater number of cubic inches of air they can take in or deliver, at a single breath. It is generally thought that a man's lungs are sound and well developed, in proportion to his girth around the chest; yet observation shows that slim men as a rule will run faster, and farther, with less fatigue, having "more wind," than stout men. If two persons are taken, in all respects alike, except that one measures twelve inches more around the chest than the other, the one having the excess will not deliver more air at one full breath, by mathematical measurement, than the other.

The more air a man receives into his lungs in ordinary breathing, the more healthy he is likely to be; because an important object in breathing is to remove impurities from the blood. Each breath is drawn pure into the lungs; on its outgoing, the next instant, it is so impure, so perfectly destitute of nourishment, that if re-breathed without any admixture of a purer atmosphere, the man would die. Hence, one of the conditions necessary to secure a high state of health is, that the rooms in which we sleep should be constantly receiving new supplies of fresh air through open doors, windows, or fireplaces.

If a person's lungs are not well developed, the health will be imperfect, but the development may be increased several inches in a few months, by daily out-door runnings with the mouth closed, beginning with twenty yards and back, at a time, increasing ten yards every week, until a hundred are gone over, thrice a day. A substitute for ladies and persons in cities, is running up stairs with the mouth closed, which

compels very deep inspirations, in a natural way, at the end of the journey.

As consumptive people are declining, each week is witness to their inability to deliver as much air at a single out-breathing as the week before; hence the best way to keep the fell disease at bay is to maintain lung development.

It is known that in large towns, ten thousand feet above the level of the sea, the deaths by consumption are ten times less than in places nearly on a level with the sea. Twenty-five persons die of consumption in the city of New York, where only two die of that disease in the city of Mexico. All know that consumption does not greatly prevail on hilly countries and in high situations. One reason of this is, because there is more ascending exercise, increasing deep breathing; besides, the air being more rarefied, larger quantities are instinctively taken into the lungs to answer the requirements of the system, thus at every breath keeping up a high development. Hence the hill should be sought by consumptives, and not low flat situations.—*Hall's Health Tracts*.

## The Birmingham Die-Sinkers.

Die-sinking is a most important branch of Birmingham industry, and has had an existence since the year 1650. It is now almost wholly in the hands of "garret-masters," who work for the larger manufacturers, its wide distribution having chiefly been brought about during the last half-century. It has been well remarked, that as the die-sinker executes almost all, and in some cases quite all, his work for various manufacturing houses, he seldom gets the credit of his performances with the public. Some well-known manufacturer in Birmingham, London, or elsewhere, brings the finished goods into the market, often stamped with his own name, and absorbs the praise justly due to the garret-master, up an entry, in a back street, who is the real author of the work.

The principal departments of die-sinking, in Birmingham, as indicated by the industries in which dies are most largely used, are, says the *Engineer*, coining, medal-making, button-making, steel seals, and ornamental metals.

The demand for dies used in coining has been subject to considerable fluctuations, owing, in many cases, to Government interference. In 1812, dies were made for coining gold forty-shilling pieces, of which 800 were struck, the only gold coins ever struck in Birmingham. They were for a banker in Reading, named Monk. Two millions of penny tokens for circulation among the British forces in Spain were struck, in the same year, from Birmingham. The issue of gold tokens was, according to Mr. Timmins, stopped by the Government at the onset, and that of silver, copper, and other metals was, with some temporary exceptions, declared illegal after January 1, 1819. The only coin now produced in Birmingham, is the current copper coin for English and foreign Governments.

Medal-making is an important industry, affording considerable employment to the Birmingham die-sinkers. The varieties of medals produced in commemoration of events or individuals are very considerable. Royal births, coronations, marriages, and deaths, anniversaries of schools, churches, chapels, societies, and institutions of almost every kind; weddings, "silvers" or "golden," laying of foundation stones, or inauguration of public buildings, of every popular hero, or as decorations or prizes for schools and colleges, or for athletic sports. It is noticeable, that almost every metal known to manufacturing industry has been used, at some period or other for striking medals in. An excellent authority, in Birmingham, informs us that most of the ordinary medals are struck either in bronze or tin, the latter carefully refined by the metallist, being the familiar white metal of the "coronation" medals. In bronze medals, the process of "bronzing," which gives their peculiar color, is generally performed before the medal is struck for the last time.

In button-making, the labor of the die-sinker is chiefly expended in livery buttons. The figured gold buttons of the pigtail period, and the sporting buttons, both in horn and metal, fashionable in the early years of her Majesty's reign, many of them of exquisite workmanship, and by first-class artists, have now almost entirely disappeared.

Steel seals, for public and private use, have enormously increased of late, and, as a manufacturer writes, "the demand has been largely augmented by the limited joint-stock companies recently sprung into existence." The enormous development of the envelope trade, and the equivalent demand for stamped note paper, have opened up for the die-sinker quite a new field of enterprise.

Dies for the stamping of ornamental metals are used, of almost every sort and size, varying from two ounces to two tons in weight. A practical maker remarks that the heavy dies are for the most part cast, and only finished (if finished at all) with the graver or in the lathe. Among the largest dies principally worked by the graver, are those for brass handles and feet, curtain poles, and cornice ornaments.

The processes employed, says Mr. Timmins, are simple, though frequently demanding the exercise of great artistic skill and delicacy of manipulation. In ordinary cases a piece of steel is cast of the requisite shape, round which a collar of iron is welded, in order to prevent the steel cracking when hardened. The surface being prepared, the die-sinker stretches his design upon it, and engraves it, employing for the purpose, gravers with edges of three different shapes—one straight, with the corners rounded, and one semicircular—some forty or fifty sizes of each of these three kinds of gravers being required to suit the varying character of the work, and the special treatment demanded in the several portions of the die. When the engraving is finished, the die is heated and suddenly hardened by cooling; the surface is polished by "lapping," and it is then ready for use in the stamp or press.