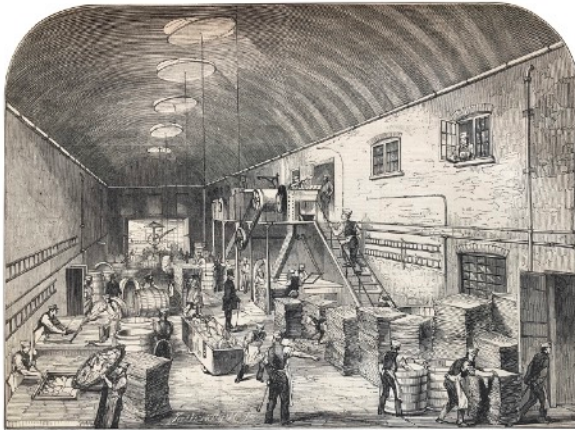


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1 - The spreading and stripping department



2 - The steam boiling and engine house



3 - The candle moulding room



4 - The "night light" and packing department

PRICE'S PATENT CANDLE COMPANY'S WORKS

PROBABLY, there are thousands of our readers who either have used, or heard of, Price's Patent Candles; but we feel certain there are very few among the number who have the least idea of the immense extent to which machinery, aided by chemical science, is applied in manufacturing that simple article of nightly consumption—a Candle. Almost every inhabitant of London, and of our provincial cities and towns, must have witnessed the primitive, and equally patient, process of what an angler would term "dipping for tallow candles with cotton lines."

Every one knows how rude and ill-formed are these primitive occupants of the candlestick; but, in course of time, progression, one of the natural laws governing all civilized communities, led to the production of the moulded candle, an obvious improvement, so far as form is concerned, upon the original dip. But the mould candle, though presenting a smoother exterior to one sense, was still the offensive tallow to another, with all its collateral disadvantages of guttering and sputtering, besides endless

snuffling, To those fortunate people inhabiting such terraces as Carlton-terrace, and such squares as Grosvenor-square, the Candle question was, like many others, both of domestic and political economy, of little import. The magnates of the land were perfectly satisfied, and wisely too they had their wax and spermaceti lights, their portable gas thermo-lamps and glittering chandeliers, their girandole and carcel lamps, in which they burnt *huiles au naturel ou parfumees*, just as they pleased; and, what was better still, they had plenty of money to pay for these lustrous refinements.

Such was the position, or rather the clare-obscure of artificial light in this country, when Messrs. Edward Price and Co. started up and solved the great problem of cheap illumination, by the production of the Belmont and Composite Candles, which have the external beauty of wax, combined with an equally illuminating power; which are divested of the objectionable odor of tallow; and, finally, which are so perfect in their combustion as to require no snuffing. These candles were not only welcomely received by the general public, but were speedily adopted by the wealthy classes; and many an unsuspecting traveller may have paid at an hotel for " Wax Lights, 2s. 6d. " when the cheap and excellent commodity from Belmont has really been the illuming power.

The discovery was worked out, upon a moderate scale, at Belmont, Vauxhall, until first gradually, and then rapidly, superseding the use of mould tallow candles in private families, the business became too extensive for the capital of a single firm, and in the year 1847 Price's Patent Candle Company was incorporated. At the present moment above 700 hands are employed in the establishment, in addition to immense steam and hydraulic power; and upwards of 4000 tons of palm and cocoa-nut oil per annum are here manufactured into candles. The works at Belmont have, in a few years, extended progressively with the demand for the manufactures, until they cover an area of nearly two acres. The Company has also very large branch works at Battersea, and occupies a score of the capacious dry arches over which the South-Western Railway traverses the neighborhoods of Vauxhall and South-Lambeth. In Miami to these home-works and premises, the Company possesses cocoa-nut estates in Ceylon, and ex-tensive mill-works there for the manufacture of cocoa-nut oil. The Patent Candles, however, are principally made from another species of palm growing on various parts of the coast of Africa, and botanically known as *Avouea Elais*, and *Elais guinaensis*. It may be satisfactory to those of our readers who advocate the non-consumption of slave-grown sugar, to know that it was shown in evidence, before a Committee of the House of Commons, that the increased consumption of palm-oil, greatly attributable to the above improvements in candle manufacture, had led to the employment of a vast number of persons, who, otherwise, would be engaged in the slave-trade.

We will now leave both Ceylon and the slave-trade, with the permission of our readers, inviting them to accompany us to Belmont, while we describe the various departments of the works as they were explained to us, on our recent visit, by Mr. G. F. Wilson, the managing director. A barge, laden with tuns of palm oil, has just arrived alongside the river frontage of the premises, and the huge iron cranes are employed in discharging the cargo. Each enormous tub is lifted in succession upon a raised platform, where a steam pipe is introduced into it to liquefy the contents, which the change of climate in the transit from Africa has thoroughly solidified. The oil, thus dissolved, which is of a bright orange color, is conveyed through a pipe to reservoirs. From these reservoirs it is

by chemical processes converted into an acid, and becomes a discolored concrete mass. These processes being completed, the material is again loaded into barges, which are taken up to the branch works at Battersea. Here the discoloration of the material, engendered by the previous processes, is expunged.

From Battersea the material is re-conveyed to Belmont, where, upon being landed, it is taken to the spreading and stripping department. (See Engraving No. 1). Here the purified palm-oil is carried in large masses to the machine shown in the centre of the Illustration, and, by means of an endless strap, is carried against a revolving cutter which shaves it into pieces sufficiently small to pass down the sliding tube, attached to which is a carriage provided with two heavy rollers. Falling upon this carriage, the material is spread upon cocoa fibre mats in layers of an equal thickness, regulated by an iron frame. Each layer of the material is covered with another mat, and, when sufficient masses of these composite sandwiches have accumulated, they are dragged on trucks to the pressing department. In these rooms stand forty-two powerful hydraulic presses, worked by applying steam power to several pairs of pumps, the bands of which are driven up or down two cones, according to the power required. When placed in the press, an iron plate is introduced between each pair of mats, to counteract the spongy effect the pressure would otherwise have to encounter. The object of applying this immense hydraulic power is to extract from the stearin the oleic acid, which, as it is forced from between the mats, trickles down into a vessel placed to receive it. After the mats, with the layers of stearine between them, have been submitted to the utmost power of the hydraulic pressure, at the temperature of the atmosphere, they are, for the purpose of farther extracting the oleic acid, again placed in hydraulics, and removed to a second pressing-room, heated by steam to 120 degrees. After undergoing this process of hot-pressing, the mats are taken to the stripping-bench (shown in the foreground of the Engraving), where the cake is stripped from them. This material is next conveyed to the boiling-house (No. 2), where it is placed in vats, and again reduced to a liquid state, by the application of steam, conveyed through coiled pipes into the vats.

The stearine has by this time reached a sufficient state of purity to be manufactured into candles, and is therefore conveyed to the candle moulding department (No. 3). Each of the moulding frames has fitted to it a box containing eighteen reels, and upon every reel are wound sixty yards of plaited cotton wick. The ends of these wicks are passed through eyes at the top of the moulds, and are held above the upper part of the moulding-frame by a set of forceps. The moulding-frames being wicked, are passed along a railway through a closet heated by steam pipes. The heating of the moulds is taken from the French method, which was invented at the time the use of arsenic was declared illegal in France. The rationale of the exploded arsenic process was explained to us thus: When the moulds were used cold, it was the practice to pour in the candle material (stearic acid) at a high heat (2400), to prevent its being instantly and irregularly congealed, by coming in contact with the cold metal of the moulds. During the long time which this heated material required for solidifying, it crystallized, causing the candles to have a speckled, unequal surface; a small quantity of arsenic was therefore added, which, by combining with the stearic acid, prevented the crystals forming. In the present process, which has entirely superseded the arsenic one, the warming of the moulds has

removed the necessity of heating up the material, which, therefore, is poured in almost at its congealing point; and the mould being at the same temperature, the material hardens into one uniform mass, before any crystallization can take place.

The moulding frames, winch (prior to this digression) were described as being wicked, having become sufficiently warm by passing through the heated closet, are raised by a lever to the tilling machine. The liquid material runs into the moulds and fills them and then the frame is pushed upon a carriage and transferred to another line of railway, along which it passes to the candle-drawing machine. The operation of this machine is a very interesting part of the process. A set of ramrods, provided with a spring catch, which lays hold of the mould-tops, pushes them with the candles attached through the moulds (as pellets are driven through a popgun), and thus by a single operation draws one set of candles, and wicks the next set.

The candles just drawn are held down by a spring catch, and the wicks cut off evenly by a traversing circular knife. These operations are repeated with great rapidity. In each set of the moulding frames, constituting a candle-machine, there are, when first cottoned, ninety-two miles of wick; therefore, supposing the six machines which we saw at work were started simultaneously, above 500 miles length of candles would be made in exhausting one single wicking of the machines! The candles, as they become released from the moulds by the drawing machine, are conveyed in boxes to the Packing Department (see No. 4), where they are put up in sealed packets with marvelous rapidity. So great is the expertness, arising from the constant repetition of any process, that, whatever be the number of candles required for the packet, those who are engaged in this operation take from the bulk, with remarkable precision, the exact quantity necessary.

In the Packing department are finished the "Night Lights," when received from the moulding-rooms. We were surprised to find this establishment making all the popular night-lights; for from hence emanate the Belmont, Child's, and the Albert Night-Lights.

While this large Establishment is supplying the public with cheap mediums of light, it is also setting a good example to other manufacturers by conducting its business without annoying its neighbors by smoke. It is an old saying, that "cleanliness is next to godliness;" but in practical denial of this we cite the proximity to England's Primate of the thousand-and-one murky, smoke-heaving chimneys of those Lambeth bone-burning, cat-gut drawing, and manure-making nuisances, which poison the atmosphere of its vicinity. Mr. Mackinnon needs no better argument in support of his bill for abolishing smoke from chimneys than the contrast between the nuisances alluded to and the chimneys constructed by the Candle company. Viewed from the river, they appear to belong to some unoccupied factory ; so much, unfortunately, has the presence of smoke become associated with the notion of a brisk trade; but once within this busy scene, and Mr. Mackinnon would find that these four apparently idle chimneys are discharging weekly, by night drill by day, from Monday morning to Saturday night, the entire combustible products of 160 ton of fuel, in furnaces of more than a thousand-horse power! He would also find that both Juckes's and Hazeldine's furnaces, which at e employed, besides consuming the smoke as fuel, are feeding themselves with the

refuse coal of the London market, at a price per ton much below that paid for the ordinary steam coal.

Our readers will be surprised to learn, that there are in active operation the following auxiliaries, to the staple manufacture of this establishment: a laboratory, engineers, carpenters, tin men, copper smiths, and weaver shops, forges, a cooperage, a sealing-wax manufactory; and, though last, not least, a steam printing-machine! The principal part of the buildings in which these multifarious occupations are carried on are of corrugated iron, by which precaution they are rendered nearly fire proof. In addition to this foresight, copious supplies of water, with hose ready fixed, are kept in reserve at various points of the works. We were particularly struck with the cleanly and healthy appearance of the numerous hands employed, which may in some degree be attributed to the agreeable odor of the manufactured material, when compared with the nauseous fumes arising from tallow; and, upon the whole, rarely have we visited a manufactory which afforded us so much pleasure as our day at Belmont.