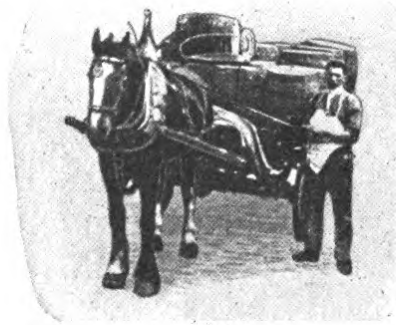


GUIDE BOOK.

THE Brewery of Arthur Guinness, Son & Co., was founded about the year 1759 by members of the Guinness family who bought the brewing plant of a Mr. Rainsford. Up to 1825 the trade was almost entirely local, from that time, however, trade commenced to increase in England, and the year 1860 marked the beginning of the large foreign trade, which has caused the name of Guinness to be known in all quarters of the globe. To show the great development of the business it may be stated that the amount sold in 1913 was 36 times as much as in 1840, and the duty paid was 1-10th of the whole amount paid in the United Kingdom.

The process of manufacture of Guinness's Stout will be described as the Visitor proceeds on his tour. Suffice it to say that the constituents

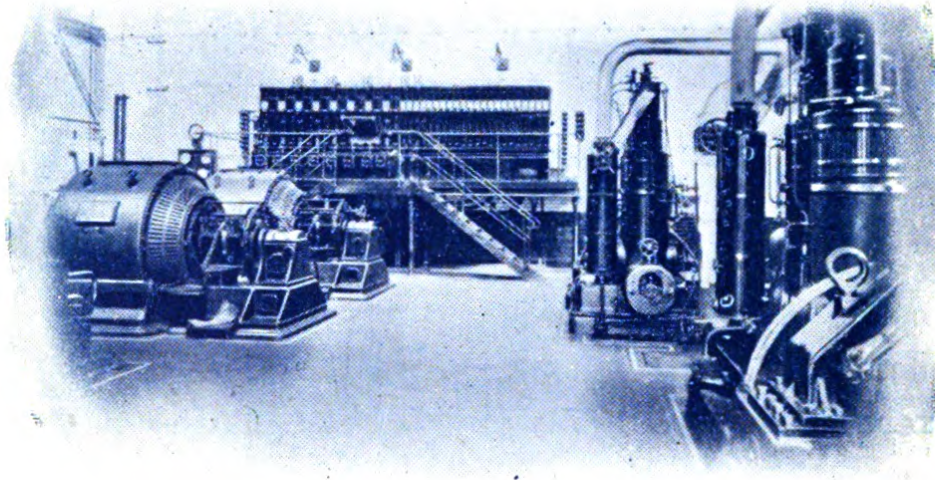
consist solely of the following: Pale Malt, a certain amount of Roast Malt or Barley, to which is due the brown colour of the Stout, and Hops. The water for brewing purposes comes from the springs which feed the upper level of the Grand Canal, in County Kildare; the water for cooling purposes from the Company's own well. The total amount of water used by Messrs. Guinness in a year is as much as 800,000,000 gallons.



TOUR.

SECTION I.

THE Visitor enters by No. 1 Gate at the East of the long range of Offices and Brewery buildings that extend over a frontage of 840 feet on the south side of James's Street; on his right, are Engineers' offices and Fitters' shop, and beyond these Cash offices, Directors' offices, etc. He first reaches the "Brewery Yard," a large Court Yard, bounded by Brewery buildings: on the East by the Old, or No. 1 Brewery and on the West by the New, or No. 2 Brewery. The old Brewery has been developed gradually from a small beginning, and has been added to for more than a century, to meet the increasing trade; it is, consequently, more straggling than the new Brewery, built in 1878 on a far more symmetrical plan, which has allowed for the large additions which have since been made. For this reason the Visitor is shown the new Brewery, to enable him to grasp the details of the process, as far as the Brew House is concerned, more comprehensively and with less fatigue. It must not, however, be forgotten, when thinking of quantity, that the old Brewery produces as much as 5,000 barrels of Stout daily.

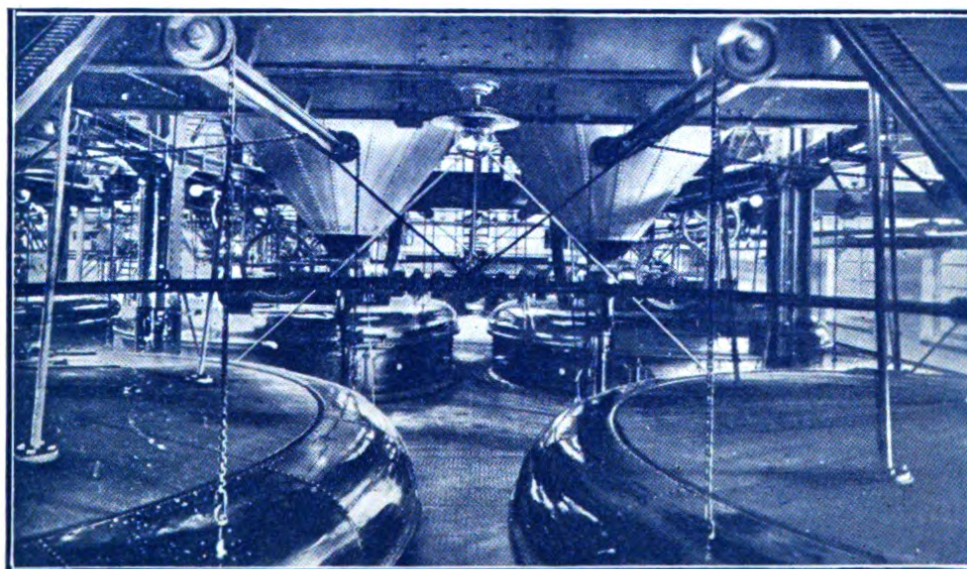


ELECTRIC POWER STATION.

Proceeding southward across the Yard, the Visitor passes the Running Shed where the locomotives are housed (of which there are 20, of horse power from 15 to 40); behind this is the electric generating station, containing dynamos capable of delivering a total output of 1,800 kilowats for supplying the required power to the different driving motors and lights. The tall chimney which carries off the smoke of the boiler house is 160 feet high, and constructed of iron, lined with brick.

The Visitor now enters the basement of the Brew House proper—the first vessels to meet the

eye are the Underbacks, designed to hold the sweet liquor known as Wort which percolates through from the vessels immediately above, and constitutes Stout in the first stage. By ascending the stairs the Kieve or Mash Tun Stage is reached. These circular vessels, 24 in number, and each capable of containing 200 barrels of malt, are, perhaps, amongst the most important in the Brewery, for in them the extraction from the malt of the necessary constituents for making Stout takes place. The process is briefly as



MASH TUNS FOR MALT

follows:—The malt, which has been ground the day before into the large Hoppers above the Mash Tuns, is let down gradually at an early hour in

the morning through the slide at the base of the Hoppers into the cylinders, which command the Mash Tun: here it is met by an ascending stream of hot water. Inside the cylinder are rakes that revolve at a high speed and mix malt and water together. The mixture, of the consistency of porridge, pours into the Mash Tun until the Malt Hopper is emptied. Inside the Mash Tun is another set of rakes, known as the carriage, which travels round the edge of the vessel by means of a rack and wheels, for the purpose of further mixing and levelling the malt. As soon as this preliminary process is completed, the liquor is drawn off, through the slotted plates forming the false floor of the Mash Tun, into the Underbacks beneath. After a second mash hot water is poured through revolving sprinklers on to the top of the malt, and continues falling and percolating through for about 10 hours. By this time the constituents soluble in water and necessary for the manufacture of Stout have been extracted,—the remainder consisting of husk, and the compounds insoluble in water, such as ash, carbohydrates, nitrogenous matter, etc., invaluable for cattle feeding, is removed at the end of the day to the Grains Depôt, and either sold at once to dairymen and farmers, or dried by a process of evaporation for purposes of storage and transport.

Passing by the Mash Tuns, and viewing on the way the case that contains samples of the malt and hops, which, as stated before, are the sole constituents of Guinness's Stout, the Visitor is conducted to the Copper, or Boiling Stage. The Coppers, of which there are 12, capable of holding 650 barrels apiece, are heated by smoke-consuming chain furnaces. The wort, or sweet liquor from the Mash Tuns, is pumped to these Coppers, and hops are added through the trap door above and mixed with the boiling wort. When sufficiently boiled the hops and wort are run out together into vessels called hopbacks, fitted with a straining or false floor, which retains the hops, but allows the liquor to be drawn off: this liquor is then pumped to high-level vessels, while the hops are returned to the coppers by elevators and boiled again with weaker wort, the whole boiling eventually being mixed in the right proportion for the day's brew.

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❧ FERMENTING. ❧

SECTION II.

RETURNING across the Mash Tun Stage the Visitor is now conducted across a bridge over Portland Street, into the new Fermenting House—a truly remarkable building, built in 1907. Its height is 125 feet, its length 170

feet, and its breadth, 151 feet; and 200,000 cubic feet of concrete, 2,000,000 bricks, and 3,650 tons of steel work were employed in its construction. The 16 Fermenting Tuns have each a capacity



FERMENTING HOUSE (Exterior).

of 1,550 barrels, and the total capacity of the house is equal to 208,000 gallons daily, or 65,000,000 gallons per annum. The hot wort is conveyed from the high-level vessels through a large pipe into

this Fermenting House. Before reaching the Tuns, the large wooden vessels in which it is fermented, it passes over Refrigerators, which are believed to form the largest cooling plant of this kind in the world, and then receives the yeast, which is added to cause the necessary fermentation. As soon as the fermentation is completed in the Tuns—a period of two or three days—the wort is pumped to open vessels for the purpose of cooling, and also for the skimming-off of the yeast, which during fermentation reproduces itself about 15 times. A certain quantity of this yeast is kept in a cooled vessel for the fermentation of the next day's brew, and the remainder is pressed and dried, in which state it forms a valuable feeding material. When the Stout has been sufficiently cleared of yeast it is run to storage Vats, which the Visitor is now shown.

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❧ STORAGE. ❧

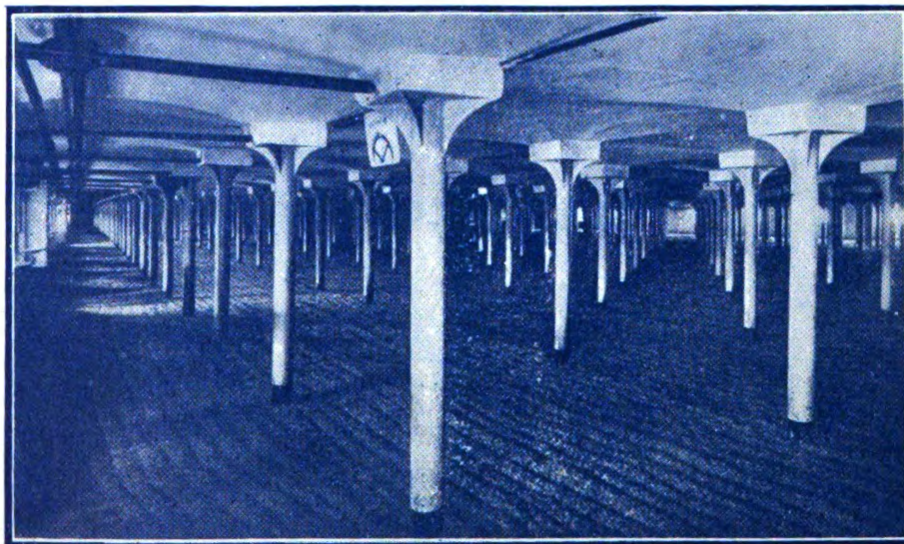
SECTION III.

CROSSING Robert Street, by a bridge, the route continues through the Vat Houses.

The storage capacity of these houses is 260,000 hogsheads of 52 imperial gallons, and include about 190 Vats of varying sizes; the

latest built contain 1,700 hogsheads each—in other words, four of these Vats would supply a glass of Stout to every one of the $4\frac{1}{2}$ million inhabitants of London. They are made of English oak, and hooped with over half a mile of iron hoops.

Adjoining the Vat Houses is the Malt Store, known as Robert Street Malt Store, built of red brick, and capable of storing 1,000,000 bushels of malt; yet, large as this quantity seems, it is somewhat less actually than one-sixth of what the Brewery uses in a year.



MALT HOUSE (Malt Growing on Floor).

Near the Malt Store are the Stables, but as nearly all the horses are at work in the daytime,

this part of the Brewery is not included in the Visitor's route. The horses, however, may often be seen drawing their loads in the city. The heavy horses are specially purchased as the soundest and most powerful of their kind in the United Kingdom, many of them being prize-winners.

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SECTION IV.

THE Brewery is composed of three levels —upper, middle, and lower—the upper being on the South side of James's Street, and the middle and lower on the North side; communication between them has been made by two tunnels under the street. The Railway Tunnel is on the corkscrew principle, with a gradient of 1 in 39, and, during the descent of 25 feet, makes two complete circles, one under the other, before crossing the road. The Passenger Tunnel is approached by a flight of steps, and is perfectly straight. Through the Passenger Tunnel run the pipes which convey all the Stout from the upper to the lower level,

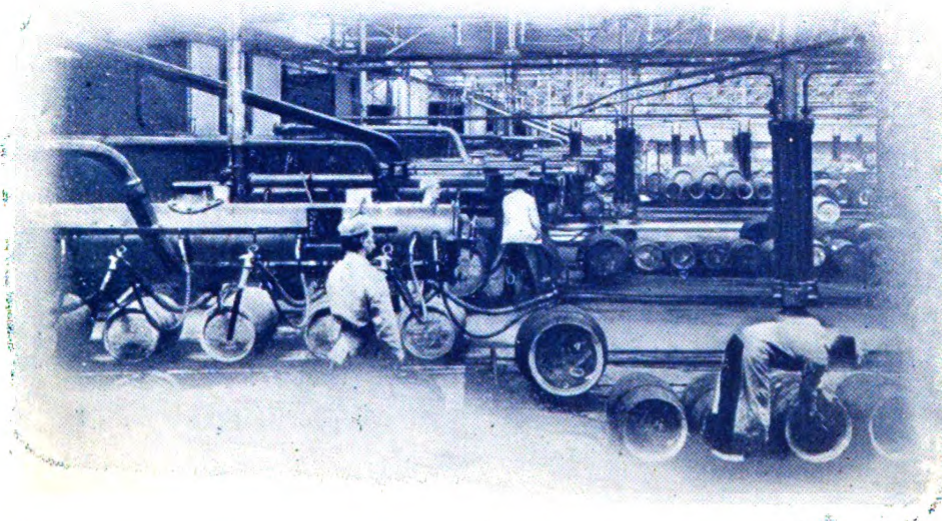
to bring it to the casks. After leaving the Tunnel, the Malt House of Cooke's Lane is passed on the left. The Barley, from which the Malt is made, is as much as possible Irish, the balance being made up of English and Scotch, and a certain amount of Foreign. The total output of these Maltings is approximately one-fifteenth of the Brewery requirements in a year. Proceeding down a flight of steps under the railway embankment, the Visitor arrives at the Cleansing Shed where from 16,000 to 20,000 returned empty casks are washed and sterilised daily. They are then examined and must be passed as thoroughly sweet and staunch before being filled again.

The Cooperage, next reached, consists of three divisions, Saw Mill, Making Shop, and Repairing Shop, together with Branding Rooms. Each cask is branded with its particular number and the name of the Company before being put into trade.

The making of new casks goes on principally during the Winter months, when the Coopers are not so busy as in the Summer at tightening the hoops, staunching, and preparing the casks for

trade. The output of new casks is approximately 1,500 per week, the average life of a cask being 12 years.

From the Cooperage *via* the West Loadin Loft, from which the various kinds of Stout are despatched in drays and lorries to the customers, the Visitor reaches the Racking Room. In this large building the Stout, which has flowed all the way from the upper level in pipes, is filled into

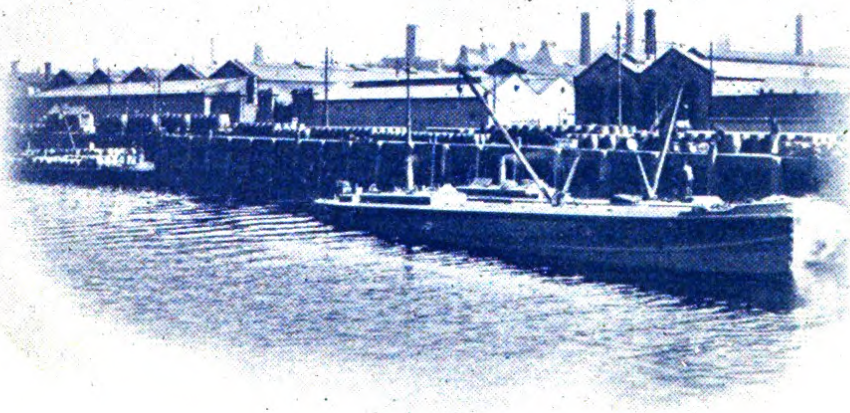


CASK FILLING DEPT. (Racking Engines).

casks. There are 13 retorts, capable of filling 19,000 casks varying in size from 8 gallons to 104 gallons in the day of eight hours. These retorts

are fitted with a simple arrangement by which the man in charge can tell at a glance when each cask is filled.

From here, the Sampling Room, which practically marks the end of the tour, is entered, and samples of the three different sorts of Guinness's Stout offered to the Visitor—"Foreign" Stout for export to foreign countries; ordinary Double Stout, generally called Extra Stout; and Single Stout, generally called Porter. Outside the



JETTY AT VICTORIA QUAY.

enclosure of the Racking Room and across the street is the Jetty, from which the Company's barges carry the casks to the Cross-Channel steamers at the North Wall.

SECTION V.

Forwarding Department.

HORSE and MOTOR DELIVERY.

In addition to about fifty horses for town work the Brewery possesses a fleet of 20 steam wagons and 20 petrol motor lorries with trailers for delivering consignments within a radius of 15 miles: these, with their trailers carry up to ten tons apiece.

Consignments for country districts in Ireland are loaded in railway wagons on the Brewery premises; from 150 to 250 wagons are loaded daily.

RIVER TRAFFIC.

There are twelve steam barges, each of which can carry 70 tons, for conveying consignments to the steamers at the docks for shipment to England and Scotland.

CROSS-CHANNEL STEAMERS.

Three Cross-Channel steamers, carrying about 500 tons each, are used for direct delivery to important centres.

The following statistics may be of interest:—

The area of the Brewery covers over 50 acres.

To supply the raw material required in one year in the Brewery it is necessary to cultivate 180,000 acres of barley, and 8,000 acres of hops.

The sales in 1914 were 104,578,000 gallons; more than two gallons per head of population in the United Kingdom.

The amount of Beer Duty paid for the financial year of 1918 by Messrs. Guinness was £2,234,726, but the sum now paid (Aug. 1919) to the Commissioners of Excise and Customs for Duty amounts to as much as £25,000 per working day—equivalent to over £5,000,000 sterling in a year.

The number of Bottle Labels (3 inches approximately in length) issued daily, if put end to end, would reach from Dublin to the Isle of Man, and the total number, 568,775,550 issued in 1914 would stretch nearly 27,000 miles, or more than round the world.

The total number of staff and employees is 4,090, and taking into account the families of the clerks and workmen, about 12,000 persons are dependent on the Brewery for their support.

October, 1919.