BREWERY HISTORY

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A VISIT TO THE FIRST LAGER BEER BREWERY IN LONDON

The following three pieces are taken from the Brewers' Guardian *and relate to the establishment of England's first purpose built lager brewery.*

Lager Beer Brewery Company, Limited.

This company proposes to establish a brewery or breweries, capable of producing every kind of beer. It was registered on 17th ult., with a capital £500,000, in £1 shares. The subscribers are :-

	Shares
H. Schroder, 11, Southwark-street, hop merchant	1,000
H. Johnson McCulloch, C.E., Hortone House, Camden-road	1,000
William C. Armstrong, 5, St. Alban's-place, St. James	1,000
William McCulloch, 178, Gresham House	500
Colonel Henry Hopkinson, 104, Cromwell-road	100
Balthar de Reichel, K.C.M., 15, Old Cavendish-street	100
H. Allbutt, 2, Stockdale-avenue, Bruton, law-student	1

The number of directors is not to be less than 5, nor more than 15; the subscribers are to appoint the first; qualification-capital to the nominal value of £500; remuneration, £1,500 per annum.

The Brewers' Guardian. 1 March 1881. p.72.

Lager beer in England

For many years the adoption of the German system of brewing has been firmly advocated in this country by a few who have made themselves practically acquainted with the many merits of the beer produced by it; but yet the system has never been acclimatised here, for, independent of any question of popular taste, the production of this beer involved the erection of plant and appliances not to be found in our English breweries, and the demand for German-brewed beer was not large enough to justify any brewer in entering on so hazardous an undertaking as its manufacture in this country. In 1873 the International Exhibition at Vienna opened the eyes of thousands of our countrymen to the virtues of Austrian beer, and later in the same year Dr Graham, in his admirable lectures on brewing, delivered before the Society of Arts, brought the German and Austrian systems prominently before the brewers of this country. Still our brewers listened in it doubting spirit, and no real effort was made to introduce the system. Statistics were compiled to show the enormous quantities of beer consumed by the Germans, Bavarians, and Austrians, and the enormous progress of lager beer brewing in the United States was instanced, as indicating a superiority of be German over the English ales. References were also made to our export trade in beer, and conclusions were drawn unfavourable to the English-brewed beer, for there was, undoubtedly evidence of stagnation, if not of decline, in our exports, and the advocates of German brewed beer asserted that this product was gradually supplanting our own. In spite of all this there are no signs that German-brewed beer is being consumed to any extent in this country, for a reference to our customs' returns proves that the import of foreign beer are

still infinitesimal when compared with our home manufacture; thus the declared value of all beer imported into this country in 1877 was only £28,803; in 1878 it had fallen to £26,102; and in 1879 it was still only £28,135. Presumably the whole of these imports were from Germany, the consumption of German-brewed beer must still be most insignificant. In spite of this, it cannot have escaped the attention of most of our readers that lager beer is more often met with in our retail establishments than was the case a few years since; a few enterprising traders have succeeded in pushing the article, and thus the ornamental beer-fountain from which it is drawn has become a common object in our restaurants. The price at which this beer is retailed, namely, threepence a glass, is in itself prohibitory, and therefore its consumption is chiefly amongst those who occasion ally taste it as a curiosity or a luxury, or else among the German community resident in this country, who cannot resist the attraction of what is to them home-brewed.

It is not our present object to discuss the respective merits of English and German beers; those who have visited Germany and have tasted the beer of the country on the spot, and who have seen the manner in which it is retailed, and the attention bestowed by every retailer on his customers, and who also have carefully watched the temperate habits of this great beer-drinking people, cannot but speak in praise of German beer. Powerful writers in our Press have advocated German in preference to English beer, and the substitution of the former beverage for the latter has even been proposed as a means of settling the so-called Temperance problem. As a further step in this direction it is now proposed to establish an enormous lager beer brewery in our midst. A joint stock company has been formed, with a capital of £500,000 in £1 shares, for the purpose of establishing "a brewery capable of brewing every kind of lager beer, especially German, Austrian, and Bavarian, of a cheap, light, and refreshing nature." A site has been chosen in the neighbourhood of London, and it is stated that a plentiful supply of water of the desired quality is there to be obtained. The low price of shares, combined with a species of cooperation, is held out as an inducement to the public to take part in the new venture, and as an earnest on the part of the directors, it is announced that they and their friends are prepared to take up 75,000 shares in the company. It is stated that the cost of producing beer in Germany is 23s. per barrel, and allowing for all charges, the cost of producing German beer in England will not exceed 36s. per barrel, and that it may be sold in England at 60s. per barrel, whereas the higher priced-English beer sells at from 84s. per barrel. We incline to the opinion that the promoters of this company have over-estimated the cost; if beer such as is brewed in Germany is to be produced in this country it ought to cost far less than 36s. per barrel, and it must retail at prices far lower than 60s., otherwise it will never supersede existing kinds of beer. One of the merits of German beer in Germany is its cheapness, and if it is to be successfully introduced here, it can only be done by supplying it at a low price.

The lager beer Brewing Limited, comes into existence on the presumption that a demand is waiting to be supplied. There are, however, great doubts on this point, for the imports of German beer scarcely support the view on which this presumption is based. But the promoters of this new company no doubt rely also on creating a demand for lager beer in this country, and although at first sight it may appear that the new venture is likely to be a competitor with existing breweries, we cannot help thinking that anything which promotes the consumption and sale of beer must be good for the brewing trade. If a demand for lager beer should arise, existing brewers ought to be able to cope with it; the new company may be a pioneer in a new system of brewing, but, depend upon it, it success attends its efforts, it will not long retain a monopoly. Our trade contains many enterprising members, eager to extend their business, and if the brewing of lager beer will effect this, the necessary plant and arrangements will soon be added to existing breweries.

The taste of the public is subject to strange changes. It is not many years ago that breweries existed in London engaged solely in the production of black beers; now ales have largely supplanted porter, and no brewery producing black beers only could long exist. In like manner the heavy saccharine beers of the past have almost disappeared, and have been succeeded by light, pale and bitter ales of great delicacy and flavour. In the present day beers are brewed at gravities so low, that brewers in the last generation would have pronounced their production an impossibility. It may be that the last twenty years of the nineteenth century will see lager beer-brewing successfully introduced into established in this country, and the ale of Old England superseded by it German rival. More remarkable changes in tastes have

been known, and therefore the brewing trade should be prepared.

The Brewers' Guardian. 15 March 1881. pp.77-78.

A visit to the first lager beer brewery in London

Some eighteen months since a writer in this journal ventured to predict that before the end of the present century, lager beer brewing would be introduced and successfully carried out in this country; and there are now good grounds for believing that this prediction will be verified, but at a much earlier date. As a matter of fact, lager beer is now being produced in our midst, and in the present article we propose to describe a very large and important lager beer brewery, which has just commenced operations, A careful student of trade statistics cannot have failed to notice that our imports of beer have been gradually increasing; in 1879 they were only 7,183 barrels, in 1880, they rose to 10,742 barrels, and in 1881 to 13,945 barrels; at the present they cannot be less than at the rate of 20,000 barrels per annum. Such a quantity, small as it is compared with our home production, is large when we consider the obstacles in the way of this trade; the kind of beer that is imported is not like, and not to be compared with, that brewed in this country, it is an altogether different article, and it is conveyed here under very great difficulties and at very great expense; it has therefore to be retailed at an almost prohibitive and fancy price. If such a beer could be brewed on the spot, the experience of the last few years proves that a very large demand for it would arise. It is not, therefore, a matter of surprise; that joint stock companies should have appealed to the public for funds to carry out and develop this new industry; unfortunately in many instances such companies have been formed by person having no practical acquaintance with the subject, and under such circumstances they were naturally destined to fail. One company however, is of a very different character. The Austro-Bavarian Lager Beer Brewery and Crystal Ice Factory is an association of German capitalists and practical men, who believe that lager beer is a beverage which only requires to be sold at a moderate price in this country to ensure an enormous demand, and they have, therefore, with the steady determination which is characteristic of the Teutonic race, set up in our midst a magnificent brewery for the production of lager beer. As this kind of beer can only be brewed with the aid of large quantities of ice, they have further combined with the brewery a gigantic ice manufactory. A suitable site, covering a space of no less than 8 acres, was secured at Tottenham, with good road and railway communication, and with a plentiful supply of water. German architects, German artisans, and German engineers were set to work, and thus, in this great brewing country, a monster brewery has been erected, built upon plans altogether foreign to our own, using foreign malt and hops, and adapted to an altogether different system, and to the production of an entirely different kind of beer. The machinery and appliances, from the large steam-engine to the smallest detail, have been imported from the Continent, having been principally supplied by the great brewery engineering firm of Noback Bros. & Fritze, of Prague. Not only the Directors and the General Manager, but even all the employés in the brewery, from the "braumeister" down to the ordinary labourers, are all German, and it is altogether strange in walking through the huge buildings to hear nothing but a foreign tongue spoken. Feeling sure some particulars of this novel and important brewery would be interesting to our readers, we obtained permission to visit it, and now produce a short description of its main features.

On entering the brewery-yard one is struck not only by the imposing character of the present buildings, but also by the extent of the intervening space, which allows for very considerable enlargements of the existing plant. At the entrance is a small but compact building used as the present offices of the company, and opposite to this is a fine weighbridge, by Pooley and Son, of Liverpool. In the centre of the premises is the main building, comprising the malting floors, malt kiln, malt and hop stores, and also the mash tuns and other plant used in preparing the wort; beyond this and completely detached, except by a wort pipe, is another building, in which are placed the cooling and fermenting rooms, and in vaults underneath are the cellars, in which the "lagering" of the beer takes place; this building also includes an enormous ice store. On the extreme left of the yard is another large building containing the boilers and also the enormous ice machinery, to which we shall refer later on. To the right of the entrance is an extensive range of stabling. All the buildings we have at present referred to are new, and have been erected for their present purposes, but the premises include a large range of residences now occupied by the employés of the company, but destined

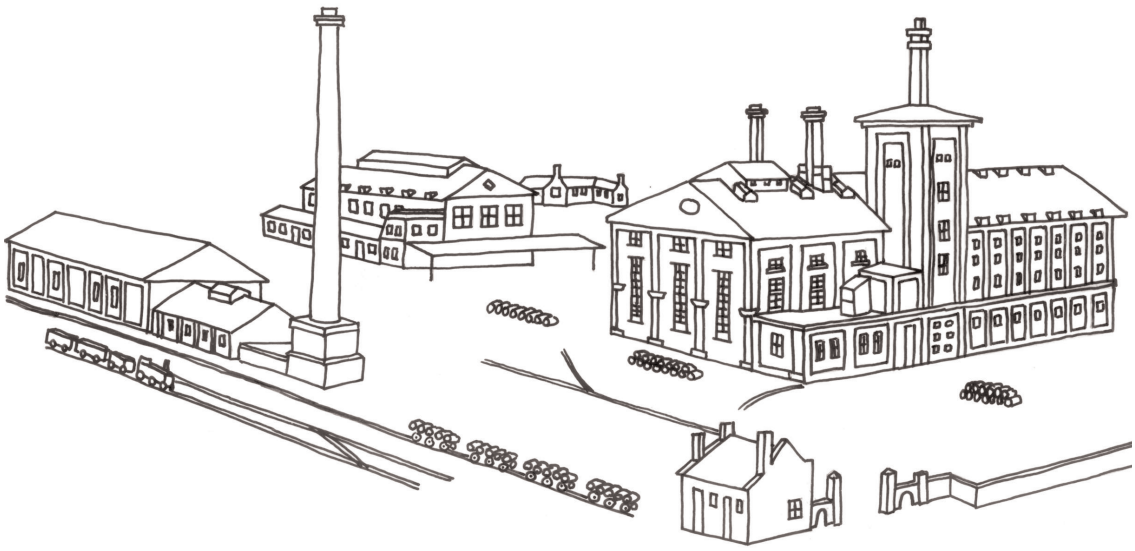

Figure 1. Sketch of an advert printed for the International Health Exhibition, 1884, showing the Austro-Bavarian Lager Beer Brewery and Crystal Ice Factory, Limited. Sketch: T. Holt.

at some future time to be converted into a German club, and the grounds around the brewery will then also be laid out and fitted up as a "biergarten," in the Continental style.

Having given a description of the general plan of this remarkable brewery, we will now describe in detail the different portions of the plant. The main building includes, as we have stated, a complete malthouse, which is constructed on an altogether different principle to our English maltings. The barley, having been cleaned and sorted by some well-constructed machines adapted to these purposes, is conveyed by means of elevators to the upper portion of the barley store, and is there carried along specially-constructed tubes by means of archimedean screws, and evenly distributed over the whole surface of the floor through openings in the tubes referred to. From this floor the barley is let down as required into the steeping vats, which, unlike those met with in English maltings, are constructed of cast iron ; they are circular in form and conical at the bottom, so that the steeped barley slides down towards the aperture at the bottom. There are two of these steeping tanks. The barley is not allowed to remain for any lengthened period with a large excess of water, but the latter is frequently changed, and in this way sufficient moisture is imparted to the grain without dissolving out any of its precious constituents. The moistened barley is elevated from under the steeping tanks to the top floor. where it is put into little two-wheeled waggons, which are then placed on the lift and lowered down to the germinating floors ; the principal malting floor is in a vault below the surface of the ground, and is made of tiles well cemented together, the walls and ceiling being all of brickwork, with occasional air inlets, the whole being lighted by gas. There are two malting floors, and they jointly are capable of producing 12,000 cwts. a year, that is about eighty quarters a week. Whilst on the floor the malt has to be frequently sprinkled with water, to make up for evaporation. When germination has proceeded far enough, the malt is conveyed to the kiln, which is constructed altogether different to those on the English principle ; it is made with two floors, and the green malt is first spread out in a tolerably thick layer on the upper floor, and when most of the moisture has been expelled, the malt is shovelled out through an opening in the side, and falls on to the lower floor. The dome over the upper floor is a beautiful specimen of brickwork, and at the top is a chimney shaft, the opening of which can be easily regulated from the inside. The lower floor, like the upper one, is made of wire network, which allows a

free passage for the heated air. The kiln is constructed so that the heated products of combustion circulate through a considerable length of horizontal piping o£ large diameter, placed in a chamber called the "sow;" an abundant but regulated supply of air enters this chamber, and, being heated by coming in contact with these horizontal flues, passes upwards, first through the lower floor, then through the upper floor, eventually escaping with the aqueous vapour from the malt through the opening in the dome. The arrangement of this kiln and flues is in accordance with a recent patent of Messrs Noback & Fritze, and is said to produce a very superior quality of malt. At one end of the main building are placed the mash tuns and the various appliances used in the production of the wort. The screened malt is carried in measured quantities to the malt rolls, which are made of steel, and are quite smooth ; the grist falls into hoppers arranged as waggons running on rails, which can thus be easily moved on one side when filled, and be brought back to the opening over the mash tun as required. The grist falls into a mashing machine of ingenious construction, where it meets and is intimately mixed with the liquor, and the pasty liquid then runs into the mash tun ; this is constructed of iron, and is fitted with elaborate rake machinery ; in this vessel, the "dickmaische," as the Germans call it, takes place, and from here the mash runs into the "dickmaische" copper, where it is boiled; in this vessel some arms revolve, having chains hanging from them, which effectually prevent any charring of the mash at points where the heat is greatest. The wort is their pumped to the wort or clarifying tun, which is of the same capacity, and similar, to the first mash tun, but without the elaborate rake machinery; this wort tun is provided with a false bottom, and is fitted with some eight or ten pipes at different parts, each terminating in a cock, so that the brewer can run off the wort only from those parts of the tun where it flows bright. The wort then flows into the wort copper, where it is boiled with the hops, and afterwards runs into the hop-back, and eventually is pumped away across the brewery-yard to the cooling and fermenting rooms, which are in a separate building. The pumps used here are rotary, which are preferred to the ordinary plunge pumps, and they are worked by a very beautiful little engine, which also works the grist mill, as well as the grain-cleaning machines, the elevators, &c. The boiling in the mash copper and in the wort copper is effected by direct fire heat, as Continental brewers generally consider that boiling by steam fails to impart the proper flavour to the wort, and is in every respect an inferior system. Great attention has been paid to the setting of these coppers; an expert was brought all the way from the Continent to plan and arrange the flues around these two coppers, and, judging by the experience already gained, he has performed the work with great skill. The furnaces for the coppers and for the malt kiln are in close proximity, and can be attended to by the same stoker.

The fermenting and lagering cellars are placed in another extensive building, altogether detached from the rest of the brewery premises. The wort arrives by the pipe across the yard, and at once flows into the coolers ; there are four of these, and they are constructed of iron, and, being very large, the wort is exposed in a very thin layer to the cooling and oxidising action of the atmosphere. This cooling room, which is of large dimensions, is fitted with some very neat and ingenious louvre blinds; they are constructed entirely of iron, and are vertical; they are easily opened and closed by a simple handle, and are altogether superior to the clumsy wooden horizontal louvre boards usually met with in English breweries. From the coolers the wort passes into an adjoining apartment containing two splendid Lawrence's refrigerators; these are constructed with all this firm's latest improvements, and are each capable of cooling 50 barrels an hour, and are the only machines of English make, except the boilers, in the whole of the brewery. As the wort has to be cooled down much lower than is usual in our breweries, iced water is pumped through the corrugated capillary tubes, and in this way the wort flowing over the refrigerator is readily brought down to 38° F. The cooled wort then passes to the fermentation cellar, and is run into the vats ; there are 88 of these, each holding about 20 barrels. The temperature of the cellar is kept at about 42° F. by a range of piping, through which iced water continually flows; there are about 4,500 feet of these cooling pipes in the cellar, and it is curious to observe how they are all covered with a thick layer of ice, formed by the deposition of the moisture from the vault, which soon freezes in a snow-like crust; these cooling pipes not only serve the purpose of keeping down the temperature of the vault, but they remove all moisture from the atmosphere, and thus effectually check the formation and growth of mould and fungi on the exposed surface of the fermenting vats. On entering this vault the visi-

Figure 2. The last remaining part of the Austro-Bavarian Lager Beer Brewery and Crystal Ice Factory, Limited. Photograph: Tim Holt.

tor does not fully realise the great difference in temperature from the external atmosphere, on account of the extreme dryness of the air, but the cold is made manifest by the way in which the breath at once yields a cloud of condensed aqueous vapour. The yeast used in this brewery is, of course, of the bottom fermentation kind, and at present is entirely imported from some of the most celebrated German breweries; after a time, however, sufficient seed yeast will be produced on the spot, and it is anticipated that there will be a ready sale for the surplus, as bakers will give the preference to this over the top yeast produced by English brewers at their high fermenting heats. After the first day or two of the fermentation, the wort throws up a white cauliflower head such as is usually seen in our own breweries, but by the eighth day this breaks down and nothing but a dense brown scum is seen, the bulk of the yeast falling to the bottom. Each fermenting vat is fitted with a thin flat attemperator constructed by placing two sheets of tinned copper close together; iced water is occasionally passed through these, and in this way the temperature of the fermenting worts is kept down and regulated. As soon as the principal fermentation is completed, the beer is run into a back, and is thence pumped to the lager cellars; the pump used for this purpose is ingeniously constructed, for whilst in continuous motion, it, by a simple arrangement of valves, simply pumps the beer into the back again, when the workmen in the lager cellars does not let it flow into the vats there; in this way any undue pressure on the connecting pipes is obviated. The range of "lager" cellars are most extensive, and are built at a lower level than the fermenting cellars. There are eight distinct vaults, each capable of holding forty "lager" vats of about forty-four barrels capacity; these vats are piled up in double tiers. The temperature of the lager cellars is kept down to about 34° F. by a plentiful supply of ice. The time occupied in this period of secondary fermentation and the "lagering" of the beer is from three to four months, by which time the beer is in a perfect condition for consumption. We ought to mention that the whole of the vats were, like the rest of the plant, imported from Germany ; they are some three or

four hundred in number, and are from the well-known cooperage of Wellhoeffer, of Frankfort-on-Maine.

Another and a most interesting department of this remarkable brewery remains to be described: we allude to the ice factory, which is placed, together with the boiler-house, in a detached building. The boilers are three in number, by the Chadderton Iron Works, and one of them is fitted with McDougall's patent stoker which uses up all small coal. Next to the boilerhouse is the engine-room, in which there is a splendid 120 horsepower engine, by the Maschinen Fabrik, of Augsburg. This engine, by the ease with which it works, its symmetry, and the high finish of all its parts, compares favourably with those of our best makers. This engine is used principally for working the magnificent ice machine, which is constructed on the well-known principle of Professor Linde, of Wiesbaden. Space will not allow us on the present occasion to give a full description of this interesting machine; we must therefore simply state that cold is produced by the evaporation of ammonia, the vapours of which are condensed again, so that practically there is no loss in the operation. The vessel in which the evaporation of the ammonia takes place is surrounded with a solution of salt, which is thus reduced to a temperature 20° below freezing, and this is then connected with an immense tank, in which innumerable oblong cells made of iron and containing pure water are immersed; these cells are arranged in rows, and the salt solution at about 10° F., is kept in a continual state of motion around them. In less than twenty hours the water in these cells is converted into solid blocks of transparent ice. Over this huge freezing tank a travelling crane works, and by simply pressing a lever handle a horizontal bar descends, and catching hold of a whole row of these cells lift them out of the tank. The travelling crane then carries them from over this tank to a smaller one containing hot water, into which they are bodily lowered to loosen the ice; they are then lifted out again and are lowered on to a long hinged support, which by their weight turns over and shoots the blocks of ice on to an inclined plane, whence it is conveyed trucks running on a tram line across the yard to the ice store which is at the back of the fermenting cellars. On entering this vast ice-store, which is capable of holding some 2,000 tons of ice, and is now nearly filled, one might imagine oneself in the polar regions; the thousands of oblong blocks of ice have amalgamate themselves under pressure into huge mountains of ice, and the effect is simply astonishing. To return to the ice factory, we may state that the present plant is capable of producing no less than fifty tons of ice a day, and it is a marvellous sight to see the ease with which this is done, and the beautiful appliances which are so completely under control. The company are prepared to supply ice at prices far lower than the natural product can be obtained for, and there is no doubt an enormous demand will soon arise. Our brewers who have occasion to control their fermentations in the warmer months of the year will do well to bear this fact in mind.

We must not omit to mention that a well has been specially sunk for the purposes of this brewery, and is yielding a constant supply at the rate of seven barrels a minute ; this well is 350 feet deep, an the water is rased by a powerful pump, placed in close proximity to the boiler-house. The chemical composition of the water has been found peculiarly suited to the production of lager beer, as it is very similar to the famous Pilsen water. It is also very curious that at two different levels two distinct qualities of water are obtained: at the greatest depth the water is hard and specially adapted to brewing purposes, whilst nearer the surface another quality is obtained, which is very soft, and is just what is required for malting purposes.

In the present article we have merely given some particulars of the construction and arrangement of this novel and remarkable brewery; at some future time, when the brewing operations, which have only just commenced, are in full work, we hope to have another opportunity of visiting it, with a view of describing the system of; brewing there adopted, which must be interesting in the extreme to English brewers, who, whilst finding much that is opposed to their old-established ideas, will, no doubt, realise the fact that we in this country have not a monopoly of knowledge, either practical or theoretical, in all that pertains to the art of brewing.

There is, perhaps, one other thing which we may be allowed to mention. A bottle of lager beer has been confidentially shown to us, and we must admit that its brightness and clearness really surpasses everything we have hitherto seen about beers. It favourably compares with English beer as regards settlement, of which not a trace is to be seen at the bottom of a bottle of lager beer. We cannot form an opinion yet as to its taste,

because it has not yet been kept long enough to be "lager beer."

In conclusion we have to express our thanks to the courteous manager, Herr Rhens, and to the able "braumeister," H. Palm, for giving us the opportunity of inspecting this brewery, and for furnishing us with a mass of valuable information concerning tile; arrangements and plant to be seen there.

The Brewers' Guardian. 10 October 1882. pp.302-4.