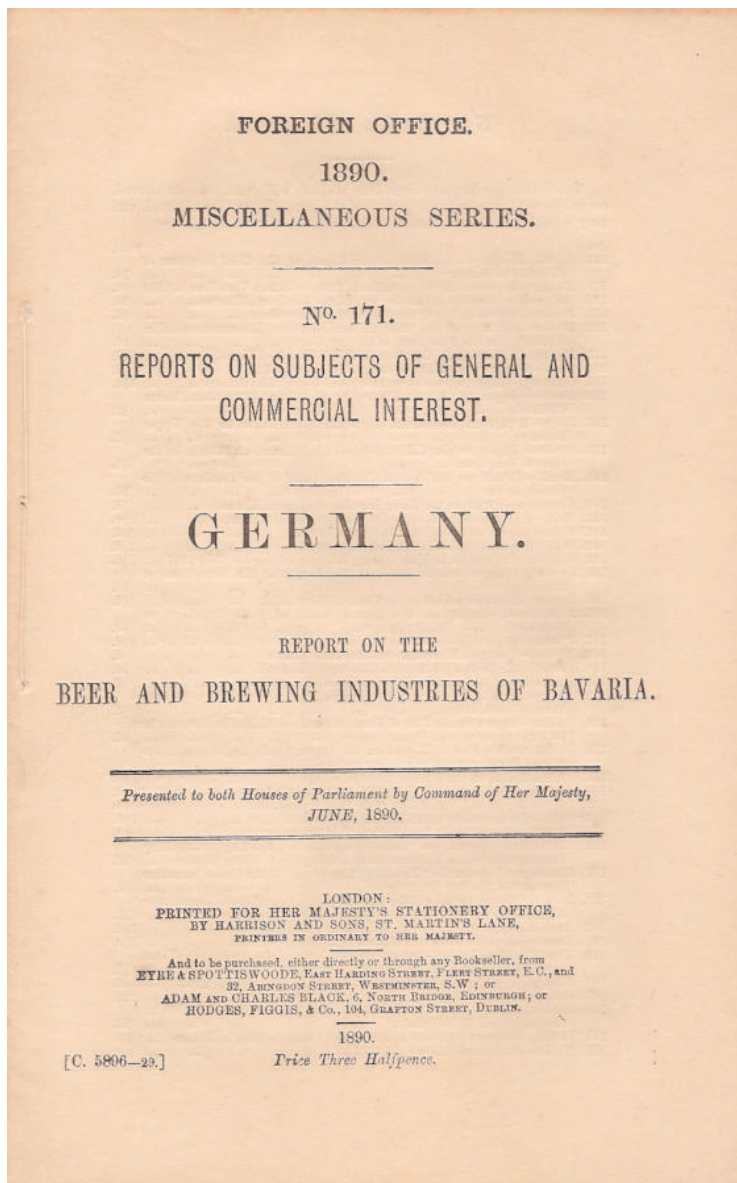

REPORT ON THE BEER AND BREWING INDUSTRIES OF BAVARIA

MR HELYAR



Mr. Drummond to the Marquis of Salisbury.

My Lord, *Munich, June 2, 1890.*

I HAVE the honour to transmit herewith enclosed a report drawn up by Mr. Helyar, second Secretary to Her Majesty's Legation; on Beer and the Brewing Industry of Bavaria.

It is a very complete and interesting report, drawn up with great care; and I feel sure will be appreciated by all engaged in the trade, and as a reference by others.

I have, &c.
(Signed) VICTOR DRUMMOND.

Report on the Brewing Industry and Beer in Bavaria.

Brewing has always been one of the most important Bavarian industries, but of late years its development has attained vast proportions. The celebrity of Bavarian beer is of recent origin, and is due to the great efforts and improvements of Sedlmayer and others. In 1819, for instance, the Bavarian malt-tax only produced 4,000,000 marks (198,000*l.*), while in 1868 the proceeds had risen to 10,000,000 marks (495,000*l.*)

The production of beer in Bavaria in 1868 was as follows:-

Number of Breweries	Tap or Common Beer	Lager Bier	Fine Beer	White Beer	Total
5,091	Hectolitres. 3,385,002.7	Hectolitres. 3,385,002.7	Hectolitres. 76,894.4	Hectolitres. 268,332.7	Hectolitres. 7,569,248

Amount of malt-used, 3,909,458.5 hectolitres. The following comparative table shows the production of

beer in Bavaria and in all Germany up to date, and the percentage which the former bears to the latter:-

Year	Bavaria	Germany	Percentage
1872	10,905,836 Hectolitres	32,944,700 Hectolitres	33.1
1873	11,256,208	36,988,553	30.4
1874	12,079,760	38,193,874	31.6
1875	12,084,910	38,935,530	31.3
1876	12,347,153	38,857,073	31.75
1877-78	12,205,377	38,269,023	31.8
1878-79	12,122,483	37,434,638	32.3
1879-80	12,152,732	37,183,976	32.6
1880-81	11,826,764	38,497,196	30.6
1881-82	12,341,574	39,035,473	31.6
1882-83	12,112,567	39,250,448	30.9
1883-84	12,265,412	40,785,208	30.7
1884-85	12,608,528	42,287,074	29.8
1885-86	12,665,665	41,770,311	30.3
1836-87	13,096,237	44,988,200	29.1
1887-88	13,704,817	47,001,628	29.1
1888-89	13,525,791	47,602,939	28.4
Average for 17 years	12,311,860	40,052,499	30.72

Amount produced per head of population in Bavaria, 2.47 hectolitres; Germany, 0.91 hectolitres. Amount produced per each brewery, Bavaria, 1,827 hectolitres; Germany, 1,846 hectolitres.

Coming down to 1875 there were 6,524 breweries at work, viz., 5,125 for brown beer, producing 11,809,772 hectolitres; and 1,399 for white beer, producing 270,037 hectolitres.

N.B.- The Pfalz paid no malt-tax till June, 1878, and is, therefore, omitted before that date.

In 1876 there were 6,725 breweries at work, viz., 5,191 for brown beer, producing 12,158,096 hectolitres; and 1,534 for white beer, producing 283,366 hectolitres.

To make the comparison in the above table a fair one, about 600,000 hectolitres should be added to the yearly production before 1878 to represent the Pfalz, and 300,000 hectolitres for the same reason for the first six months of 1878.

Turning to the statistics of exports and imports, the following comparative table shows the increase which has taken place, the destination of the export, and the origin of the import, &c.:-

Year	Export	Import
1874	.. Hectolires	11,005.00 Hectolires
1875	255,971.00	24,152.00
1876	267,651.00	33,208.00
1877	571,331.59	43,778.03
1878	616,117.03	22,332.26
1879	645,000.00	39,900.01
1880	748,221.75	34,386.72
1881	890,363.84	36,676.61
1882	988,292.23	34,594.94
1883	1,106,281.68	39,307.07
1884	1,245,214.43	42,920.87
1885	1,381,382.28	40,014.02
1886	1,574,777.21	42,514.05
1887	1,679,525.93	41,659.67
1888	1,860,603.70	42,402.72
1889	2,018,812.28	51,052.62

Proceeding more into detail, the small Bavarian import classifies itself as follows, beginning with 1877:-

Year	From North Germany	From Württemberg, Baden, Alsace-Lorraine, &c.	From Foreign Countries
1877	1,618.15 Hectolitres	22,620.15 Hectolitres	19,540 Hectolitres
1878	3,652.44	4,090.82	14,589
1879	8,896.09	22,318.92	8,685
1880	9,379.04	25,007.32	2,464
1881	8,953.27	25,475.34	2,248
1882	10,032.56	22,801.38	1,761
1883	10,715.82	27,218.25	1,373
1884	12,377.56	29,102.31	1,441
1885	9,319.20	29,527.82	1,167
1886	8,436.73	32,839.77	1,238
1887	7,296.96	32,719.71	1,647
1888	6,384.39	33,629.33	2,389
1889	7,684.19	40,930.43	2,438

The Bavarian export may be divided as follows:-

	To North Germany		To Württemberg, &c.		To Foreign Countries	
	With Drawback	Without Drawback	With Drawback	Without Drawback	With Drawback	Without Drawback
	Hectolitres	Hectolitres	Hectolitres	Hectolitres	Hectolitres	Hectolitres
1877	426,076.97	3,955.68	44,974.03	26,587.48	65,694.28	4,042.88
1878	443,265.45	7,213.25	64,456.88	33,060.14	65,623.42	2,493.02
1879	462,414.04	1,580.71	122,735.07	2,177.54	55,551.77	864.73
1880	520,884.81	1,542.34	144,123.54	949.74	80,324.94	396.38
1881	608,499.93	1,277.96	172,682.09	854.69	105,764.31	284.86
1882	679,223.07	1,223.43	180,042.09	926.14	126,565.08	311.79
1883	783,779.16	1,280.51	191,821.73	841.09	128,267.03	291.02
1884	910,696.57	1,337.09	191,488.94	936.04	140,669.39	301.88
1885	991,607.04	1,401.35	206,906.33	795.81	175,609.48	310.43
1886	1,149,925.67	1,525.99	232,639.52	908.44	183,429.77	350.04
1887	1,237,748.06	1,468.43	252,729.78	948.53	186,275.31	355.82
1888	1,411,390.81	1,472.02	270,973.97	944.82	175,501.79	320.29
1889	1,527,455.86	1,405.16	289,483.88	870.09	189,264.61	326.72

The statistics of the last five years are as follows in fuller detail.

In 1885 there were 5,369 brown beer breweries, using 5,510,885 hectolitres malt, and producing 12,414,197 hectolitres brown beer; and 1,618 white beer breweries, using 56,229 hectolitres malt, and producing 245,908 hectolitres white beer, making a total production of 12,665,665 hectolitres.

In 1886 there were 5,341 brown beer breweries using 5,746,550 hectolitres malt, and producing 12,841,946 hectolitres beer; also 1,638 white beer breweries, using 56,783 hectolitres malt, and producing 248,169 hectolitres white beer, making a total production of 13,090,115, not counting the small, outlying “enclaves” of Ostheim, Königsberg, &c.

1885 and 1886 were good years for the brewing trade. The barley harvest had been favourable, consequently the prices of barley and wheat were relatively low. Hops, too, were plentiful and cheap. Production, there-

fore, took place under the most favourable circumstances. The demand for home consumption on the other hand shows a decline, and this tended to keep down production.

In 1887 there were 5,321 brown beer breweries, using 6,050,735 hectolitres of malt, and producing 13,461,786 hectolitres of beer; also 1,649 white beer breweries, using 55,704 hectolitres of malt, and producing 243,031 hectolitres of beer, making a total production of 13,704,817 hectolitres. Besides this, 438,748 hectolitres of the so-called “Nach bier” were produced. The year was a good one for the large breweries, and production and export increased; but loud complaints were made by the small breweries of diminished consumption in the country, particularly in winter, and of the exorbitant percentage of profit asked by inn-keepers, &c.

In 1888 the following table shows the amounts of malt used and beer produced, and the number of private and communal breweries and brewing companies.

	Number	Malt used	Amount of Beer Brewed
Private breweries	4,718	4,621,821 Hectolitres	10,228,523 Hectolitres
Brewing companies	52	1,048,161	2,319,880
Communal breweries	536	342,476	758,000
	5,306	6,012,458	13,306,403
White beer breweries	1,625	51,446	213,757
Total	6,931	6,068,904	13,520,160

426,735 hectolitres of the so-called “Nach bier” was also brewed.

Besides these, there was one vinegar factory, embodying 74 hectolitres of malt, and paying 296 marks malt tax.

In the 536 communal breweries, 6,434 authorised and licensed persons at different times during the year brewed beer. This makes up the nominal total of brewers to 12,829. It must also be mentioned that the Bavarian “enclaves” in Coburg and Saxe Weimar (Ostheim, Königsberg, &c.), possessed, in 1888, eight private, and

10 communal brown beer breweries, employing 1,417 hectolitres malt; and 813 hectolitres malt respectively, and producing a total of 5,631 hectolitres beer.

The scarcity of fodder produced a lively demand for it by products of brewing at the end of 1888. But, on the other hand, where brewers had to buy horse fodder, they had to pay higher prices.

In Oberbayern complaints continued, respecting the increased malt tax and competition, and trade continued to fall-off.

In Niederbayern business was less than in 1887. Consumption of beer suffered from the rainy season, and from the competition of an abundant fruit crop.

In Oberfranken the year 1888 was prosperous, and business increased. In hops a rapidly increasing business was done, and the good quality of hop beer has secured for it a largely-increasing export trade in North Germany, and even abroad.

In Fürth business was good, and the year a favourable one.

In Unterfranken generally only the minority of breweries secured good profits through careful management. The general business was poor, and the Franconian barley inferior in quality.

In the Palatinate trade was good, and the demand for beer increased, only checked, however, by the rainy season.

The following Table shows the Principal Figures for the Year 1889.

	Number of Breweries	Malt used	Amount of Beer Brewed
Private	4,665	4,820,817 Hectolitres	10,618,706 Hectolitres
Brewing companies	60	1,233,707	2,710,332
Communal	535	333,789	735,804
Together	5,260	6,388,313	14,064,842
White beer breweries	1,621	50,831	212,228
Total	6,881	6,439,144	14,277,070

Besides this 430,230 hectolitres of so-called "Nachbier" were brewed. There were also two vinegar factories using 75 hectolitres of malt.

The following Table shows the Proportions in which Malt was used by the Different Breweries in 1888, as Compared with 1889.

			Number of Breweries	
Malt used in Hectolitres			1888	1889
Up to 100			8,128	7,941
From	100 to	200	1,450	1,474
"	201	300	676	644
"	301	500	718	678
"	501	700	377	415
"	701	1,000	378	363
"	1,001	2,000	590	568
"	2,001	5,000	371	385
"	5,001	10,000	79	91
"	10,001	20,000	33	43
"	20,001	50,000	19	20
Over 50,000			10	10
Total			12,829	12,632

In the above comparative table we see that while the number of brewers using up to 500 hectolitres of malt decreased from 10,972 in 1888, to 10,737 in 1889, the number of brewers using upwards of 500 hectolitres of malt increased from 1,857 in 1888, to 1,905 in 1889. The same causes were in operation as in 1887 to produce this result.

The year 1889 was the most favourable on record for Bavarian brewers. A good harvest of barley, and a super-abundant one of hops, combined with a good demand both at home and abroad to make the year an exceptional one. The diminution in the number of small breweries continues. They increased up to about 1880-81, but since that date have regularly declined until 1889. The total number of breweries is no more than in 1889, although the total output has increased by 13 per cent. in the 12 years. The steady demand for export of Bavarian beer, chiefly in North Germany, continued, and there are no present apprehensions of falling-off. The process of the swamping of the small breweries by the large ones is not peculiar to Bavaria, and has been going on throughout Germany. Van der Planitz showed that in five years alone, 2,100 small breweries ceased to exist from similar causes throughout Germany, and this was principally the case in Prussia and North Germany.

Munich stands at the head of Bavarian beer production, export, and consumption. At the beginning of the centu-

ry it already possessed 72 small breweries, while in 1876 there were only 28 large breweries for brown beer, but these produced more than one-tenth of the whole of the Bavarian brown beer, the greater portion being consumed in Munich itself,

PRODUCTION OF BROWN BEER IN MUNICH, &c.

	Hectolitres
1874	1,213,291
1875	1,238,738
1876	1,269,457
Consumption in 1876	1,074,384
Nüremberg in 1876 also brewed a total of	450,158

The Munich consumption in 1876 amounted to 5.56 hectolitres per head per year, the highest in the world. But as foreigners in Munich are not reckoned, the true figure was somewhat lower. In Vienna the consumption was 2.96 hectolitres, in London 2.54 hectolitres, in Berlin 2.4 hectolitres, in St. Petersburg 0.67 hectolitres, and in Paris 0.14 hectolitres, at the same date.

The following from another source are the figures of the consumption per head per annum in Munich, as compared with all Germany from 1872 to 1889 inclusive. Foreigners in Munich are reckoned.

Year	Munich	All Germany
1872	4.03 Hectolitres	1.01 Hectolitres
1873	4.33	1.13
1874	4.37	1.14
1875	4.45	1.15
1876	4.51	1.15
1877-78	4.46	1.13
1878-79	4.66	1.09
1879-80	4.11	1.10
1880-81	5.46	1.31
1881-82	5.67	1.39
1882-83	5.43	1.36
1883-84	5.44	1.39
1884-85	5.51	1.42
1885-86	5.56	1.41
1836-87	5.63	1.48
1887-88	5.89	1.58
1888-89	5.79	1.54
Average of 17 years	4.93	1.28

The following table shows the steady rise in the production, export, and consumption of brown beer in Munich in the last ten years:-

Year	Malt Used	Brown Beer Produced	Import	Export	Consumption in Munich
	Hectolitres	Hectolitres	Hectolitres	Hectolitres	Hectolitres
1879	619,076	1,361,967	30,279	254,540	1,137,706
1880	602,496	1,325,491	24,119	284,979	1,064,631
1881	671,769	1,477,892	20,691	369,906	1,128,677
1882	707,179	1,555,794	13,164	429,886	1,139,072
1883	709,863	1,561,699	13,251	499,890	1,075,060
1884	803,573	1,767,861	8,120	652,560	1,123,421
1885	958,548	2,108,806	5,865	864,762	1,249,909
1886	1,057,121	2,325,666	6,006	1,049,605	1,282,067
1887	1,164,438	2,561,764	5,998	1,173,124	1,394,638
1888	1,242,062	2,732,536	8,619	1,264,035	1,477,120
1889	1,330,510	2,927,122	5,996	1,327,477	1,605,641
Total	9,866,635	21,706,598	142,108	8,170,764	13,677,942

By another calculation, not reckoning foreigners, the consumption per head per annum in Munich was, in 1879, 5.10 hectolitres, and in 1888, 5.31 hectolitres. In the latter year, however, exhibitions and a royal anniversary fête increased the consumption. The proportion of foreigners in Munich is always varying, rendering the returns only approximative. It will be observed that since 1879 the export from Munich has increased five-fold, while the consumption has only increased a little more rapidly than the population. Munich has the lion's share of the beer export of Bavaria. In 1869 the Munich export was: only 26,507.2 hectolitres, and in 1872 only 59,467.1 hectolitres; thus the export in the 20 years, 1869-89; multiplied 500-fold. The principal Munich exporters are G. Pschorr, G. Sedlmayer (Spatenbraü), the largest in Munich, and the Löwenbrauerei (also largely for white beer). Kulmbach, Erlangen, and Nuremberg also export largely.

The large Munich breweries do not produce more than 2.1 hectolitres beer from each hectolitre malt although the official calculation is 2.24 to 1. The reason given is that the public demands from the Munich breweries a good and relatively strong beer, and that beer for export in particular must be strong in quality.

In 1888 the Munich breweries did a good business and showed an increase both within and without the city bounds, in spite of the cool rainy season. The activity of the building trade contributed to this.

In 1889 the favourable season contributed to a large increase in production, consumption and export.

Consumption per head was roughly, 5.35 hectolitres. In 1889 there were, in Munich district (not the city):-

	Number	Malt	Brown Beer Produced
Private breweries	184	1,085,748 Hectolitres	2,327,000 Hectolitres
Communal "	2	512	11,160
Brewery companies	12	584,440	1,324,025

White beer is also considerably drunk in Munich, and throughout Bavaria, but only by the lower classes. Memmingen is the great centre of white beer production. In the district of Memmingen, 89,727 hectolitres white beer was brewed in 1888; and in the district of Munich only 35,872 hectolitres. These districts comprise the whole neighbourhood round the respective towns.

Malt tax (Raumsteuer or Malzaufschlag). - Revenue is raised from beer in Bavaria by the tax on malt, the barley or malt being measured, the principle being similar to that in force in Great Britain. By the Malt Tax Law of 1868, a tax of 2 marks 20 pf. (2s. 2d.) per hectolitre, was laid on malt used in brewing. A corresponding drawback was granted on beer, exported from Bavaria. By the law of October 31, 1879, this was changed into a tax of 6 marks (5s. 10½d.) per hectolitre malt for brewing, while 4 marks (3s. 11d.) per hectolitre was laid on malt used in the manufacture of vinegar. Malt used for other purposes went free. A proportionate drawback was allowed on beer exported abroad.

Under the new law of December 8, 1889, a tax of 6 marks (5s. 10½d.) per hectolitre malt for making either beer or vinegar is levied up to a total of 10,000 hectolitres used, and 6 marks 25 pf. (6s. 1½d.) on from 10,000 hectolitres to 40,000 hectolitres, and 6 marks 50 pf. (6s. 4¾d.) on all amounts over 40,000 hectolitres. Thus a brewer who consumed say 45,000 hectolitres malt would pay 6 marks on 10,000 hectolitres, and 6 marks 25 pf. on 30,000 hectolitres, and 6 marks 50 pf. on the last 5,000 hectolitres, total 280,000 marks. Breweries already existing which did not brew over

6,000 hectolitres malt in 1888, only pay 5 marks (4s. 10¾d.) per hectolitre on the first 2,000 hectolitres malt used.

The above-mentioned provisions pre-suppose that a hectolitre of beer corresponds to rather more than 2 hectolitres of malt.

Malt not intended to make either beer or vinegar is duty free.

The new regulations came into force on January 1, 1890.

The transit duty from German States is 3 marks 25 pf. (3s. 2½d.) per hectolitre beer, and 6 marks 50 pf. (6s. 4¾d.) per hectolitre of broken malt for making beer or vinegar. Drawback on beer in casks or bottles going out of Bavaria, either abroad or to the other German States, is 2 marks 60 pf. (2s. 6½d.) per hectolitre brown beer, or 1 mark per hectolitre white beer. Brown beer, however, from a brewery producing from 12,000 to 60,000 hectolitres beer, receives 2 marks 75 pf. (2s. 8½d.) per hectolitre drawback; and brown beer from a brewery producing over 60,000 hectolitre beer receives 2 marks 85 pf. (2s. 9½d.) per hectolitre drawback. On the other hand, brown beer from a brewery only paying reduced tax, receives 2 marks 10 pf. (2s. 1d.) per hectolitre drawback on the first 2,700 hectolitres exported. The drawback is paid per bottle both on imported and on Bavarian malt. No returns are possible as yet under the new law, but under the late law the various receipts were in 1887-88:-

	1887	1888
	£	£
Gross receipts	1,799,142	1,793,411
Deduct for drawback	219,837	232,931
Leaving	1,579,305	1,560,480
Add receipts from transit duty from other German States	6,407	6,406
Entrance duty on above	392	528
Total	1,586,104	1,567,614

Without criticising the new malt tax law it may be observed that although brewers are said to be satisfied with the drawback allowed, the effect has been that the price of beer in Munich has been raised. The graduation of the tax is hardly likely to encourage the large brewers.

The following comparative table shows the proportion borne by the receipts from beer in Bavaria to the similar receipts in all Germany, and the amount of tax on each hectolitre of beer in both:-

Year	Receipts from Beer		Percentage of A to B	Amount of Tax on each Hectolitre of Beer Brewed	
	A - Bavaria	B - All Germany		Bavaria	All Germany
	£	£		<i>s. d.</i>	<i>s. d.</i>
1872	844,758	1,996,152	42.3	1 7¼	1 2¾
1873	914,700	2,254,418	40.6	1 8¼	1 2½
1874	925,561	2,256,521	40.3	1 7¼	1 2½
1875	957,305	2,341,674	40.8	1 7½	1 2½
1876	980,724	2,376,630	41.2	1 7½	1 2¾
1877-78	981,374	2,368,487	41.4	1 7¾	1 2¾
1878-79	968,670	2,290,187	44.4	1 7¾	1 2¾
1879-80	1,057,867	2,391,945	44.2	1 10	1 3½
1880-81	1,413,266	2,874,005	49.1	2 6½	1 6
1881-82	1,464,477	3,068,748	48.3	2 7	1 7
1882-83	1,427,142	3,018,492	47.3	2 6¼	1 6½
1883-84	1,435,635	3,100,734	46.3	2 6¼	1 6¼
1884-85	1,461,625	3,183,128	45.9	2 6¼	1 6¼
1885-86	1,481,881	3,196,024	46.3	2 7½	1 6½
1836-87	1,511,078	3,400,850	46.0	2 6	1 6
1887-88	1,591,034	3,547,591	44.2	2 7½	1 6½
1888-89	1,572,832	3,614,926	43.5	2 8	1 6¼
Average	1,233,463	2,791,142	44.3	2 1¼	1 4½

NOTE. - The Pfalz is omitted up the middle of 1878, when the malt tax was introduced there.

ley and hops, a few words on the results of recent years are necessary.

Barley and Hops. - The excellence of Bavarian beer being largely dependent on the quality of Bavarian bar-

Barley. - The following table gives the barley harvest in bushels per acre since 1880:-

Year	Bushels per acre.
1880	29.046
1881	26.883
1882	30.179
1883	26.677
1884	29.149
1885	28.325
1886	28.531
1887	26.574
1888	28.84
1889	-

Taking the most recent years, the barley harvest of 1885 was good in quality though not specially abundant. That of 1886 was slightly larger in quantity though not so good in quality. The quantity however being sufficient, no great rise in price took place. The harvest of 1887 gave excellent results as to quality. The barley however was hard, in consequence of the dry heat, and this caused difficulties in bruising the malt. A rise in prices followed as soon as the poor prospects of the 1888 harvest came into view, and the fine 1887 barley was eagerly bought up. The harvest of 1888, though injured by the floods and rainy season, was an average one in quantity, though inferior in quality to that of 1887. An export of barley to North Germany took place, owing to the comparative failure of the barley harvest there. The price of barley in Munich in 1888 varied from 78s. to 88s. per cwt., or from 24s. to 28s. per imperial quarter. In 1889 the barley harvest was a good one, especially as to quality, but not over abundant. The price of barley continues in consequence relatively high.

Hops. - Bavaria stands at the head of all the hop countries in mass of production, and very nearly at the head in quality. The great increase in hop cultivation, trade, and consumption of late years dates from 1855-60. There were cultivated with hops, in 1863, 42,627.9 acres; in 1876, 45,540.5 acres; and in 1888-89, 62,516.3 acres. The worst recent harvest was in 1882, 2.9 cwt. per acre; and the best that of 1885, 4.09 cwt. per acre.

In 1887 the harvest was 3.52 cwts. per acre - a good harvest. 1887 hops in demand. In 1888 the harvest was 2.96 cwts. per acre - poor harvest, rise in price of old and good sorts. Inferior sorts unsaleable. In 1889 the harvest was 5.2 cwts. per acre - surpassing even the good year 1885.

The price of hops in Munich in 1888 varied as follows:-

Common country hops, from 80s. per cwt. in the spring, to 260s. per cwt. in October; lager bier hops, from 150s. per cwt. in the spring, to 380s. per cwt. in October; finest lager bier hops, from 280s. per cwt. in the spring, to 600s. per cwt. in October. The hops had been greatly injured by bad weather during the year.

From statistics kindly furnished by Dr. Pott, the average hop harvest of Bavaria for several years past stood at 216,480 cwts., being about 4.16 cwts. per acre, and the average consumption in Bavaria at 78,720 cwts., leaving 137,760 cwts. for exportation at an average price of 166s. per cwt., producing over 1,000,000*l.* for the country. But the variations from the average are great. See the following table:-

Provinces	Acres in Hops	Average Yield	1888 Yield	1889 Yield
		Cwts	Cwts	Cwts
Mittelfranken	29,652	106,272	108,240	135,792
Niederbayern	11,119	57,564	53,136	66,912
Oberbayern	8,648	41,328	41,328	48,216
Oberfranken	7,413	29,520	26,568	41,328
Oberpfalz	3,459	12,876	10,332	18,695
Unterfranken	988	3,936	3,936	4,920
Schwaben	741	2,952	3,247	3,247
Rheinpfalz	494	3,148	3,542	3,345
Total	62,513	256,696	250,329	322,456

The amount required for home consumption in 1889 being 108,240 cwts., this leaves 214,216 cwts. available for exportation abroad.

Bavaria is the largest exporting country, and next to England, the largest producing country, the former producing in 1889 as we saw 322,456 cwts. from 62,516 acres, while England produced 497,904 cwts. from 56,833 acres. In England, therefore, a much greater quantity of hops per acre is produced, though the quality is as a rule not equal to the Bavarian. Bavaria produces some 47 per cent. of the whole German hop harvest, 31 per cent. of the production of the continent, some 22 per cent. of that of all Europe, and 20 per cent.

of that of the world. Mittelfranken produces the best sorts (including Spalt) and nearly half the hops of Bavaria. Spalt town alone owns 2,000,000 hop poles. Nüremberg again shares with London and New York the chief position among the world's hop markets.

It is in quality that the Bavarian hops excel. Professor Lintner placed the Bohemian hops first in the world (Saaz, Auscha, Dauba) then those of Neutomyschl, then the Bavarian hops (Spalt, &c.), and fourthly the English hops (East Kent, &c.). Experience, however, has modified this estimate. The following very carefully classified table is by Dr. Pott, President of the Bavarian Hop Association:-

Market Prices. October 30, 1889

		Shillings per Cwt	
1. Hops from the town of Saaz in Bohemia, and the town of Spalt in Bavaria and immediate neighbourhood	} Saaz	130	140
	} Spalt	125	130
2. Country round Spalt, Kinding, and Saaz		72	120
3. Wolnzach, Au, and the lighter kinds of Spalt country		62	85
3A. East Kents, Goldings		80	100
4. Hallertau, Auschaer red lands, Styria, and the best lands in Württemberg and Baden		40	65
5, 6, and 7, inferior kinds		..	

Over-production of hops throughout the world in 1889 clearly exists. Dr. Pott estimates the amount required for brewing in a medium year throughout the world at 1,615,236 cwts., and the average production of hops at 1,694,054 cwts., leaving an overplus of 78,818 cwts., or 4.88 per cent. In 1888, on the other hand, the production of hops, 1,563,182 cwts., was 52,054 cwts., or 3.37 per cent. below this medium demand, while in 1889 the production of 1,954,716 cwts. was 339,480 cwts., or 21.02 per cent. above the same standard. With this excess, Bavaria, with its 214,216 cwts. surplus of hops has to contend. It is considered that the fine quality of her hops will enable her to do so, and to successfully meet the United States, the second largest exporter, with its 118,080 cwts. surplus of hops in the English market, owing to the inferior quality of the American hops. Dr. Pott considers that in spite of all attempts in various parts of the world to introduce improved hop culture no

hops are being, or are likely to be, produced which in any degree approach in quality the finer Bavarian and Bohemian sorts, and that if Bavarian cultivators will take warning by the lesson of over-production now before them, and continue to pay the greatest attention to quality, while cautiously abstaining from increasing the hop area, except here and there under favourable circumstances, there is little danger for the future of Bavarian hop production.

Summary. - The continually and rapidly increasing production of brown beer in Bavaria is shown to grow at a rate far exceeding the natural increase of population. Taking an average of 17 years (1872-89) we found an average production of 2.47 hectolitres per head per annum. In 1880 the production had fallen to 2.24 hectolitres per head, but in 1885 it rose to 2.33, and in 1889 to about 2.57 per head. The immense exports to North

Germany sustains and augments the production; the latter, indeed, would be impossible without the former. This export has trebled in 10 years, and at present there are no signs of a falling-off even in the rate of increase. The production of beer in North Germany has, indeed, increased very largely of late years, but without prejudice to Bavarian beer, which maintains its popularity. 1877-78 were poor years, but the percentage of Bavarian production was as high in 1886 as in 1873, thirteen years earlier, and although in the period 1874-84 an actual diminution of 0.6 per cent. took place, this was much more than recovered in 1884-89.

Consumption in Bavaria seems only to keep pace with the natural growth of the population, which is hardly surprising, as the consumption is higher than in most countries. I have seen the consumption per head per annum for an average of years stated at 2.14 hectolitres.

The following are the latest figures procurable:-

In 1880	2.10	hectolitres	per	head	per	annum.
" 1885	2.09	"	"	"	"	"
" 1889	2.21	"	"	"	"	"

1889, however, was an exceptional year.

I have already alluded to the decline of the small, and growth of the large breweries. In 1880, for instance, there were 5,152 private, 355 communal, and 17 shareholding breweries, while in 1889 there were only 4,665 private, 535 communal; and 60 shareholding breweries, showing a diminution of 264 breweries (or since 1879, 284) entirely in the private breweries in 9-10 years. Some regret this gradual disappearance of the small breweries, killed by the large breweries by a slow process of strangulation, and think that the growth of the latter does not entirely compensate for the loss of the former. Still, the prosperity of the industry as a whole increases, and, what is of most importance, the quality of the product improves. The complaints from the districts when the small breweries languish and die out are that the public is becoming particular and fastidious and difficult to please, a clear proof that a higher standard of quality is being enforced.

The fine hop and barley harvests of 1889 of course gave a great impetus to brewing, although the price of barley was not as low as brewers wished.

The Bavarian brewer has hitherto successfully met his Austrian and North German rivals in the markets of North Germany, and there seems no immediate danger threatening his ascendancy; but as taste in beer is largely a matter of fashion, it would be unsafe to predict that Bavarian beer will always keep intact its present position. Bavarian hops again may suffer a temporary check from the over-production of last year, but the product stands on the sure basis of first-rate quality and ample quantity.

Annexed is a translation of a paper by Dr. Holzner on Bavarian beer production, which he has kindly forwarded.

In conclusion, I beg to acknowledge with many thanks, valuable assistance from Mr. Cadogan, Dr. Kahn, and especially Dr. Pott, to whom I am largely indebted for facts and figures.

ANNEX.

The Bavarian Brewing Industry, by Professor Holzner.

(Translation.)

Different kinds of beer are brewed in Bavaria. Each kind is divided into several minor varieties. One division is beer by fermentation with head yeast, and another beer by fermentation from below. Of the latter kind, called in Bavaria brown beer, the varieties most in repute are Culmbacher beer, and the so-called Bavarian lager bier.

The Culmbacher is a heavy beer. The specific gravity of the wort is 1,069 to 1,072. A somewhat larger quantity of hops is added in boiling the wort, viz., about 1.4 kilo. (3 1/10 lb. nearly) hops to 1 hectolitre of malt. Culmbacher is divided by its colour into dark and bright Culmbacher beer. The colour of the dark beer is obtained by using roasted malt. In consequence it has a somewhat bitter and burnt taste like that of dextrin.

The most famous Bavarian beer is that brewed at Munich. It is the chief representative of Bavarian beer. The specific gravity of the wort is about 1,056. Only 0.5 to 0.7 kilo. (1 1/10 lb. to 1 55/100) of the finest hops is added to 1 hectolitre of malt. The attenuation (with

water) is comparatively small, as also the acidity. Munich beer consequently tastes somewhat sweet and viscous.

Good Bavarian beer when poured out makes a foam somewhat like cream, which does not entirely disappear for some time. On account of the high percentage of carbonic acid the taste is refreshing and pleasant.

Bavarian beer first attained its wide renown in recent years. The history of the development of the Bavarian brewing industry stands in very close relationship with that of English brewing. In the year 1787 John Richardson published his proposals for new improvements in brewing, and the description of his newly discovered instrument. On these proposals was immediately based a method through which the English brewers were able to improve their business. Richardson's little book was not unnoticed in Germany; in 1788 Wittekop translated it. But shortly afterwards commenced the wars of France against the nations of the Continent, and particularly Germany. When Napoleon I. was at last taken prisoner, art, science, and industry were destroyed in Germany. Even the excellent book of Poupie, the Bohemian brewer, had become forgotten. It is true that Hermbstädt, in 1814, published the second edition of his book, "Chemical Principles for the Brewing of Beer," but it was little read, since the younger generation had had no school teaching during the war.

It was only in the third decade of this century that scientific men once more arose in Germany who undertook the analysis of beer on the basis of purification from adulteration, &c. - Zenneck, in Stuttgart; and Fuchs, in Munich. Men were still wanting, however, who would make the business of fermentation their study.

In Bavaria and Austria a change now took place. Two young brewers, Gabriel Sedlmayer, senior (who still lives), of Munich, and Anton Dreher; senior (now dead), of Schwechat, near Vienna, went into foreign countries in order to make themselves acquainted with the condition of the brewing industry elsewhere. In 1833 they visited England, where they took note of the careful preparation of malt and the use of the saccharometer. After their return home they applied the English methods to the preparation of beer by fermentation from below.

Since they were now in a position to estimate exactly the results of their labours at each stage of the process of brewing, whilst other brewers did not trouble themselves with forecasting results, they achieved immense financial success. Shortly after setting up in business, they substituted machinery for manual labour. They were the first to build ice-cellars. Deiglmayer, Sedlmayer's nephew, the manager of Dreher's breweries, invented ice-wagons (1867), and Sedlmayer's sons were the first to introduce the refrigeration of cellars by ice-machines.

Sedlmayer and Dreher employed English saccharometers. In 1838 Kaiser, the deceased professor of the Polytechnic School in Munich, constructed a "Procentaracometer," which is still much used. The deceased Professor Balling constructed at the same date in Prague his well-known saccharometer, and laid down formulæ based on the English process of dilution with water, by which all quantities are represented in percentages of weight. (The Saccharometrical Test of Beer and Brandy. Prague, 1846.)

While Sedlmayer was forming thorough practitioners, Kaiser was holding theoretical lectures, which were attended during the period 1838-1871 by more than 1,000 pupils. In the High Agricultural School at Schleissheim, near Munich, discourses on the preparation of beer were given from 1830 downwards. When this school was transferred to Weihenstephan in 1852, the lectures were continued at the latter place, and, in 1865, a separate section for the study of brewing was established there. Dr. Lintner, senior, and Dr. Holzner, among others, still teach there. The "General Journal of Brewing" is the organ of this school, and is highly thought of even in England. At the conference of German brewers in 1876 at Frankfort, an experimental scientific brewery was established in Munich; Dr. Reischauer was at the head of it till 1877, and from that date Mr. Aubry has been the director of the establishment.

In Austria the progress of brewing was materially assisted by the fact that Balling's saccharometer was introduced for weighing the wort, in order to calculate the excise, just as the densimeter was introduced for the same purpose in Great Britain in 1880. By this means brewers were and still are compelled to weigh and to measure the wort. To this circumstance is owing the fact

that brewing in Austria came into bloom earlier than in Bavaria. In Bavaria this sort of indirect encouragement was not forthcoming, but instead, thereof, another circumstance came much to the aid of the industry in this country.

In Bavaria since the year 1516 only germinated grain, i.e. malt, could be used for the preparation of beer. The excise, as is well known, is based on the volume of malt. The Bavarian brewer must not think of employing other vegetable products and substitutes. Thus he loses no time in the study of the preparation of such substitutes. He turns his whole attention to the improvement of the preparation of malt, to the boiling process and fermentation. Friends as well as foes of the system of taxing raw materials and half-prepared materials are agreed in this that the malt tax in Bavaria was and still is the greatest stimulus to the progress of brewing. In Austria the increase of production is taxed, while for the Bavarian brewer the receipts from the overplus is a pure untaxed profit; while for the last 10 years brewing in Austria has not made much further scientific progress, the preparation of beer in Bavaria has been even more and more perfected. This result has also contributed to the fact that the Austrian brewers have taken too little account of consumers' tastes. As Bavarian beer was not so widely known outside Bavaria, Pilsner beer stood high in public esteem. This beer is almost colourless, highly fermented, and is based on a large percentage of hops. The specific gravity is about 1,049. Consequently the beer is thin, bitter, and has a taste of wine. Now, although foreign (*i.e.* non-Bavarian) countries prefer, as a rule, the sweeter more viscous and less fermented Bavarian beer, the Austrian brewers continue none the less to brew for exportation very clear and highly fermented beer.

But the English brewers, too, have made the mistake of underrating the competition of beer fermented from above. Quite recently, as is well known, a commencement has been made with the brewing of lager bier in Great Britain. Brewers from Germany have been brought over for some of the English lager bier breweries (*e.g.*, at Tottenham, Glasgow, &c., &c.). It may be feared, however, that these and other lager bier breweries in Great Britain desirous of brewing Bavarian beer in Munich style, will have to pay dear for their apprenticeship, for the English climate is totally different from that of Bavaria. The art-of brewing good

Bavarian beer lies above all in the proper application of the drying process. This consists, as Professor Holzner explained at Weihenstephan in 1878, first in the drying, and, secondly, in the roasting of the malt. Experience has shown that the drying must be effected at a comparatively low temperature, and also with a certain degree of moisture, which cannot be precisely given in figures. If drying is carried further and then the malt roasted, the beer is not viscous (or full in the mouth). If the malt is roasted before the necessary dryness is reached, the beer is poor, and tastes disagreeably. On the other hand, classes of lager bier less viscous than that of Munich are easier to brew.

The North German brewers are the most active and dangerous competitors of the Bavarian brewers. In Berlin an experimental brewery has been built at a cost of 460,000 marks (23,000*l.*). The Prussian Government pays half, and the Association of North German Brewers the other half.

In Bavaria, at Weihenstephan, on the other hand, only laboratory experiments can be made, which cannot have the same practical importance.

The brewing of Beer can only be accomplished in Bavaria with water, malt, hops, and yeast. The addition of any other substance during or after the brewing is punished as falsification by fine or imprisonment. Even the addition of compound parts of the beer, such as alcohol or water, after the beer is brewed is punished as falsification. It is this fact as well as the favourite taste which has procured for Bavarian beer so wide a market. In 1888 there were used 6,012,458 hectolitres malt for the brewing of brown beer (fermented from below), and 51,446 hectolitres malt for brewing white beer (with head yeast). By official statements there were brewed therefrom 13,306,403 hectolitres brown beer, and 213,757 hectolitres white beer. The consumption in the country itself was 11,662,034 hectolitres, and as the population was about 5,500,000, the consumption per head was about 2.14 hectolitres. The taxes amounted to 5.84 marks (5*s.* 10*d.*) per head, and 2.72 marks (2*s.* 8½*d.*) per hectolitre beer drunk in Bavaria.

Beer being the universal drink of the people throughout Bavaria, it is quite a rarity to find anyone drinking his small glass of brandy.

