NOTES UPON THE DESIRABILITY OF FIXING BY ANALYSIS SOME
STANDARDS OF VALUE FOR BEER BASED UPON THE QUALITIES
USUALLY SOLD IN LARGE TOWNS.

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Read before the Society of Public Analysts at Dublin, 19th August, 1878.

THAT some definite standards both of strength and composition should be recognised for beer sold in the ordinary manner by retail, is I think, not only simply desirable, but absolutely necessary. A few considerations will convince us it is also possible.

In order to show that it is desirable I will describe the state of things as existing in Manchester, which may be taken as a fair example of a large town. Some months ago I received several samples of beer, which in due course, I analysed. I subsequently ascertained what price had been paid in each case, and found, to my great astonishment, that even in a large town like Manchester, the public obtained at the various places, widely different value for their money. I have estimated the value of these beers, taking as a basis the amount the Government would allow as draw-back if each brewer were to export instead of selling in the home market. This drawback or allowance on export, as you will probably be aware, is based upon the assumption that each degree of original gravity of the beer indicates a given quantity of saccharine matter used by the brewer. Well, I found that while one part of Manchester got excellent value for its money in the shape of beer, deserving of a drawback of $71\frac{1}{4}$ -pence, other parts of the same town had to be content with beers worth varying amounts, down to the lowest at $45\frac{1}{2}$ -pence. I give with this a table of details resulting from analyses of these beers, and it will be observed that not only does the original gravity of each differ, but the amount of alcohol in these beers varies considerably, the most costly beer not having by any means the highest amount of alcohol. This I need not say disposes of the rather original method devised by some gentleman for ascertaining from the amount of alcohol present how much water had been added to finished beer. A beer brewed from a very much smaller quantity of malt, say than Bass's pale ale, can by fermentation be made to contain much more alcohol than is found in Bass's.

As only three qualities of beer are recognised by the general public in the large towns in England, I would suggest that it would be quite possible without seriously restricting the freedom of trade, to enact that these three qualities should be (within certain limits) of certain definite original gravities, and as they are already well-known by the prices at which they are sold, I submit that the possibility of the course I propose is self-evident.

In looking over the table appended to this, which table will I hope show the *raison d'être* of the title of this short paper, I wish particularly to direct attention to some apparent discrepancies in the total mineral matter other than sodium chloride, which was found per gallon. Thus, although the mineral matter in some cases decreases or increases in quantity as the beer is of a lower or a higher gravity, still this rule does not hold good, and it is found that a beer having an original gravity of 1066·4 has more mineral matter per gallon (excluding NaCl) than the beer of 1069·0 original gravity. This serious irregularity prevents our estimating the value of a beer, or its freedom from added water by the ash alone. As no doubt the members of the Society are aware the use of sugar is permitted in brewing, and it is to the use of varying quantities of sugar

with the malt in brewing, that these irregularities in the quantity of mineral matter in a beer are due. However, a low ash is fairly good evidence that a beer is not entirely made from malt. I have tried several methods for making an accurate determination of the value of a beer by analyses.

The data required are :—The original gravity, (which also gives in the specific gravity of the extract, the percentage of solid matter); the total ash; the sodium chloride; the phosphoric acid; and the ammonia produced when the beer is Wanklynized. This method of estimating the nitrogenous compounds in solution in the finished beer was used by me some two years ago, and was used simultaneously by several scientific brewers. The results obtained I have not published for two reasons, the main one being that I did not obtain permission from the brewers at Burton to publish my results, and the other is that my results were in many points necessarily incomplete. However, the phosphoric acid found and the ammonia produced by Wanklynising will fairly indicate the malt used, and the ash will indicate within certain limits the amount of sugar used. In any beer analysis it is obvious that a knowledge of the water used in brewing is absolutely necessary.

Regarding the use of bitters other than hops, I may, as I have already done, point out that the Government specifically refused, when asked three years ago, to define beer as malt and hops. To obtain such a change it is necessary that not only the public analyst but the general public should work, and then, and not till then, will a satisfactory result be arrived at. I must apologise for the incompleteness of this paper, and hope, before long, to forward the results of a series of analyses of genuine malt worts made into finished beers.

No.	GRAVITIES OF			Acetic Acid per cent.	GRAINS PER GALLON.			ALCOHOL.			Original Gravity.	Real Value expressed by amount of Duty paid in pence, <i>d.</i>
	Beer.	Distillate.	Extract.		Total Mineral Matter.	Mineral Matter other than salt.	Salt.	By Weight per cent.	By Volume per cent.	Percentage of Proof Spirit.		
1	1009.6	991.21	1018.1	0.18	364.8	254.8	110.0	5.00	6.22	10.97	1056.8	71.25
2	1008.2	991.60	1016.5	0.16	197.0	185.0	12.2	4.76	5.92	10.42	1053.0	66.5
3	1007.1	991.33	1015.6	0.15	233.0	214.5	18.5	4.92	6.14	10.80	1053.4	66.4
4	1007.9	991.68	1016.0	0.13	179.5	173.0	6.6	4.71	5.85	10.32	1051.7	64.8
5	1004.6	991.82	1012.3	0.17	200.2	172.6	27.6	4.62	5.76	10.14	1047.6	59.9
6	1005.2	992.03	1018.0	0.15	219.1	194.5	24.6	4.50	5.61	9.86	1047.0	59.2
7	1009.7	994.80	1014.8	0.17	203.0	131.0	72.0	2.80	3.56	6.25	1035.76	45.5
8	1005.0	990.72	1014.0	0.18	233.0	184.4	48.6	5.31	6.61	11.62	1055.22	69.2

Percentage of extractive matter excluding the ash. By Balling's tables with correction as applied by Thudichum and Dupré in wine analysis.

1.	2.	3.	4.	5.	6.	7.	8.
3.567.	3.631.	3.300.	3.552.	2.541.	2.666.	3.175	2.883.