

constitutes the recipe. A neighboring brewery, in days of old, added a man, rubber boots and all; but one is led to believe that the result was not a howling success, as the prescription was not repeated. The boiling then proceeds merrily from two to three hours, after which the concoction is run off into tanks furnished with false bottom plates, called hop vacks. The aforesaid fluid is strained and run through an elaborate system of cooling refrigerator pipes into the cooling tanks on the floor below. Subsequently yeast is added to aid the process and fermentation sets in. A beautiful, snowy, billowy froth, like cotton batten, a foot thick in appearance, forms upon the surface. This gives place to a thick head of brown yeast, which is ultimately removed by an automatic contrivance called a parachute.

During the fermentation process, carbonic acid gas is given off in great quantities. So much so, that any light held above it is extinguished, and one could comfortably commit suicide by a prolonged inhalation of the fumes. The final course of racking and storing, speaks for itself.

The head brewer of an establishment is essentially a big man; for, upon his shoulders devolves the responsibility of the institution (from the beery standpoint). He generally has under him one or two assistants, in the form of articulated pupils (they prefer to be called that, as "apprentice" is so plebian, you know). These young gentlemen are treated "with deference due," by the employes, and employ their time in analysis, making miniature mashies in test tubes, watching the development of yeast germs under the microscope, testing the color, and smoking cigarettes. For this purpose (barring the latter), an up-to-date laboratory is provided. Nothing is left to luck or haphazard. Brewing is a science, and is operated on scientific principles first, last and all the time. Fremlin's brew their beer by the aid of gas furnaces, manufacture their own ice, and operate their own dynamos for lighting purposes.

There is the usual wilderness of empty barrels incidental to a brewery, together with the rosy-cheeked, capacious-vested sturdy sons of Albion, who play baseball with the same, stack them up, wash them, "smell" them and other detail work. Another little army is to be encountered in the 15,000-barrel capacity vaults, filling orders, etc. Nine coopers (the prince of trades) are given constant employment manufacturing kegs, barrels, hogsheads, etc., and an average weekly output of two hundred and forty casks, not to speak of the cripples and compound fractures that they have to patch up. The keg factory is located in one of the oldest buildings of Maidstone, and was at one time a Catholic chapel. Regularly every year, the Kent Archaeological society pays this building a visit, lament regarding the desecration, and promptly bury their grief-stricken faces in a tankard of six-ply X.

Quite a contrast to the old building are the stables adjoining, which are up-to-date, and house some forty-five horses that individually tip the beam at two thousand pounds or more, and would make three of our western cayuses!

Of course the Inland Revenue collects duty from brewers, according to the amount turned out; despite the fact that

America has the reputation over here for being a great place for "boodle," I noticed that Mr. Revenue officer was well looked after regarding the comforts of this life, in the form of a cosy office, and a mug handy. Further investigations would doubtlessly have revealed the presence of a cigar box.

In having a pleasant chat with Mr. J. W. Johnson, the store's manager—who by the way, has seventeen letters after his name, contributes to a couple of well-known, religious, American journals, and is a prominent Wesleyan. I learned that the firm would not tolerate bad language, bulldozing, or, in fact, any un-Christianlike spirit of any description, nor would it have an atheist or callous individual around the premises. The men are well looked after, provided with coffee every morning in the lunch and reading room, and, to use Mr. Johnson's own words: "If anyone under me gets into financial difficulties or seems to be going astray, I just invite him to have a private cup of tea with me and we talk the matter over in a quiet way."

Mr. R. J. Fremlin, the head of the firm, is a financial power for good among the various sectarian denominations in Maidstone, and is at present building a handsome stone church, in place of a temporary one, wherein he reads the lessons on Sundays. Mr. Cooke, the business manager, further has been identified with Sunday school work for a score of years. And when one comes to enumerate the local preachers, teetotalers and various others, who sit around in that "beery" structure, reading their Bibles at noon hour, words all.

"What's in a name?" As a high class curio, Fremlin's is unique. Not five hundred yards from the brewery, as we left it that day, lay a condemned wretch, spending his last few miserable hours of life in company with the death watch in his cell. In a fit of drunken frenzy, he had kicked out his paramour's brains—and the brewers still read their Bibles. But then, you know, they do not manufacture beer to be consumed in public houses, as we were informed time and time again, during our peregrination of discovery. Thus does humanity value their consciences. Long live Britain, Beer, and Bibles!

GEO. E. CARPENTER.

### PURITY OF WATER AND ICE.

The question of chemical analysis as a definite test of the purity of ice or water having been raised in the action of City Inspector Greenwald in condemning ice from the ponds of Mr. John A. Hill, six miles south of the city, upon a bare chemical analysis of the water, the following letter by Prof. Kingsbury, instructor in chemistry at the University of Utah, to Mr. Hill, is interesting and timely reading on the subject:

UNIVERSITY OF UTAH, March 16, 1897, Mr. John A. Hill:—Dear Sir:—No one can always positively state, according to my judgment, whether water is injurious to health or not, from the results of a chemical analysis. The same is true with respect to a microscopical examination and also a bacteriological examination.

It is possible that there may be disease germs in water and the chemical analysis fail to show any appreciable

amount of organic matter. Again the chemical analysis may show considerable organic matter and there may not be a single disease germ present in the water. The chemical analysis will determine many times whether the organic matter in the water is of vegetable or animal origin, but not always when there is no chlorine or only a trace of the substance present the organic matter discovered is, with all probability, of plant origin. When on the other hand considerable chlorine and even nitrates are found, animal matter may be in the water or it may not. The formation through which the water runs may be highly impregnated with common salt or other chlorides and also with nitrates accumulated from other sources than animal matter, so that these substances, chlorine and nitrates, may have no bearing on the organic purity of water whatever. If, however, there is a large quantity of chlorine and nitrates in the water under consideration and none or merely traces in water from adjacent surroundings, these substances would then be an evidence of the organic matter being of animal origin. Animal matter in water, even, is not positive evidence of the water being bad.

Much has been done in regard to ascertaining the hygienic condition of water. The amount of organic matter in water that might prove detrimental to health has been carefully considered and to my mind with not perfectly satisfactory results even up to the present time. Notwithstanding this, a decision has been reached which is generally recognized and upon which chemists today partly or wholly interpret the results of their chemical examinations. The organic matter is determined generally by what is called the ammonia process and the results interpreted as follows by Wanklyn, who is recognized by many as authority on this subject.

When the water yields no albuminoid ammonia, it is considered organically pure; if the water gives less than .05 part of albuminoid ammonia in 1,000,000 parts it may be regarded as quite pure; if the water gives .05 parts of albuminoid ammonia in 1,000,000, together with a considerable amount of free ammonia it is more or less suspicious; if water yields more than .1 part of albuminoid ammonia in 1,000,000 parts, it is very suspicious and if the albuminoid reaches more than .15 part in 1,000,000 the water should be condemned. Professor Mallet claims that it is not possible to decide absolutely upon the wholesomeness or unwholesomeness of a drinking water by the mere use of any of the processes of analyses for the estimation of organic matter, or its constituents. He goes still farther and states "that in judging the sanitary condition of the water not only must such processes be used in connection with the investigation of other evidences of a more general sort, as to the source and history of the water, but should even be deemed of secondary importance in weighing the reasons for accepting or rejecting a water not manifestly unfit for drinking on other grounds. There are no sound grounds on which to establish such general standards of purity as have been proposed, looking to exact amounts of organic carbon or