

TEA CIDER

C. H. GADD.

At various times in the local Press there have been references to a beverage termed Tea Cider, and it is my purpose this afternoon to explain briefly what that beverage is, and why the T. R. I. has interested itself in the subject.

During times of depression, producers naturally view their excessive stocks with concern, and have recourse to various methods to reduce them. Excess stocks may be destroyed, as is said to have occurred with coffee, or committees may be set up to consider new uses for the product, as with rubber. The methods, however, which make most appeal are those which lead to a greater consumption of the product by increasing both the number of consumers and the amount used per head. Hence the prevalence of such slogans as "Eat more bananas" or "Drink more tea".

No one here, I am sure, will deny the excellence of tea as a beverage, but we should all be surprised if it were offered at the next St. Andrew's dinner. Lest there be any misapprehension, I do not suggest that there is any likelihood of our friends from north of the Tweed forsaking their national beverage, in order to help to reduce our tea stocks by taking to Tea Cider. But I do suggest that by offering other tea beverages, in addition to that in the form so well known, there is an increased possibility of giving greater effect to the "Drink more tea" slogan, even in those countries where tea is much used.

What then is Tea Cider? It may be described as a pleasant, slightly acid, effervescent and refreshing drink made from a sweetened infusion of tea. It has a bouquet and flavour of its own, and bears no resemblance to the commonly known tea beverage. It somewhat resembles the cider made from apples, and so has been called Tea Cider.

In all probability, Tea Cider is a drink which has not been evolved in a Chemist's nor a Biologist's laboratory. How it originated we do not know. Its origin appears to be lost in history or mystery, but one can imagine it having been discovered accidentally, approved, and preserved, though not quite on parallel lines with Lamb's story of the origin of Roast Pork. It is, however, not a new drink designed especially for the depression. According to

Dinslage and Ludoff it was introduced into Germany about 1911, presumably from Mitau, Courland, in Russia. Its introduction into Mitau is within living memory, and there it is said to have been introduced by sailors. But whence the sailors got it, we do not know. Judging from the names by which the ferment is popularly known in Germany—for instance Japanese, Manchurian and Indian tea fungus—it probably derives from the Orient. In Java it is said to have become a popular drink among the inhabitants; this appears to be due largely to the activities of a certain gentleman's chauffeur who has taken a very active interest in the distribution of the ferment. He is reputed to receive as many as 200 applications a day for the ferment for brewing the cider.

The ferment appears to be homogeneous mass, but actually it is a mixture of organisms of which, in my opinion, only two are of importance. One is a yeast (*Saccharomyces Ludwigi*) and the other a bacillus (*Bacterium xylinum*). The actual identity of the yeast does not matter materially, as good Tea Cider can be brewed with cultures containing other yeasts than this particular one, (*Saccharomyces Ludwigi*). *Bacterium xylinum* appears to be more important as it is the action of this particular bacterium, working on the products of fermentation brought about by the yeast, which gives rise to the characteristic flavour and odour of Tea Cider.

As the ferment is a mass of living organisms it obviously cannot be made by mixing together ingredients from a Chemist's store. It can only be obtained from existing cultures. The Tea Research Institute is now in a position to supply the culture on application.

The process of manufacture of Tea Cider is simple. All that is required is a tea infusion prepared in the usual way, using $1\frac{1}{2}$ ounces to 2 ounces of tea to a gallon of boiling water. The leaves must be strained off and 10 per cent sugar added, i.e., 1 lb. to 1 gallon of infusion. This is placed in a wide mouthed vessel and allowed to cool.

When cool, the ferment is added and the vessel covered to keep it dustproof but not airtight. During this process the sugar is attacked by the yeast and converted into alcohol and a gas (CO_2). The latter escapes, but the alcohol is worked upon by the bacterium to produce acetic acid and other compounds. It is the combination of these actions which gives the characters of the cider.

The infusion is at first sweet but this sweetness disappears as the sugar is broken down. At the same time an acid flavour begins to develop owing to the activities of the bacterium, so there is a transition from sweetness to sourness. If a slightly sweet drink is preferred the brewing is stopped earlier, whereas it is continued longer if a dry, or slightly acid, flavour is required. For most people, the right stage is just as the sweetness disappears but before a pronounced acid flavour is evident.

It is quite impossible to lay down any hard and fast rule regarding the length of time the brewing should take, as it depends largely upon temperature and the activity of the ferment. As a rule the higher the temperature, within limits, the more active is the ferment. The optimum period for brewing has to be determined for each set of circumstances. This however is an easy matter; it is purely a question of tasting the brew at intervals after the first day. At St. Coombs the process takes from 2-3 days, at higher elevations it may take longer, while at lower elevations a shorter time will suffice.

When the infusion has attained the right flavour, it is filtered through a double thickness of linen, such as a table napkin, and placed in bottles. The bottles should be completely filled and securely stoppered. If corks are used they must be tied down.

The activity of the bacterium is stopped by the bottling which excludes the air, but the yeast continues to work. As the bottles are securely stoppered the gas produced by the yeast's activities, is unable to escape, and so an effervescent drink is produced. A few days in the bottles is usually sufficient; the cider, however, will keep well for a month or two. It is advisable to keep the cider in a cool place, otherwise there is a risk of the bottle bursting, owing to the pressure of gas inside. If on opening, the cider is found to be flat, the fault will usually be found in a leaky stopper.

It is also possible to prepare an excellent vinegar from a sweetened tea infusion. One proceeds exactly as though tea cider is being prepared, but instead of bottling the brew after 2 or 3 days, it is allowed to remain in the open vessel for about a month. Then the vinegar should be strained, boiled and bottled. Acetic acid, or vinegar, prepared in this way may possibly be useful for coagulating latex in the preparation of rubber. If our friends of the Rubber Research Scheme have not already seen a note to this effect in the local Press, we will make them a present of the information.

The ferment itself which forms a film on the surface of the brew is apparently not without its uses. In Germany, a company (The Auer Company) grows the film solely for use in the manufacture of artificial leather goods, such as gloves, bookbindings, and fancy goods. If this industry proves the success hoped for, we may see a severe depression amongst the bagworms who, (*vide* the editorial of the last *Tea Quarterly*,) are producing material for that class of goods.

To return now to our main topic, you will realise from the little I have said of the chemical processes which take place during preparation, that Tea Cider contains alcohol, but the quantity is, however, very small. It is rarely that the amount exceeds one per cent. If a potent drink is required, I am afraid that the spirit has to be added to it. I am informed that rum makes a good 'dilutant'. The presence of alcohol, even in so small a quantity, brings the sale of the Tea Cider under the Excise Laws. This is unfortunate, because it prevents our aerated water manufacturers from putting on the market a wholesome, refreshing drink.

It should, however, be borne in mind that Tea Cider is easily and cheaply prepared in the home. In Java, where it has achieved a considerable degree of popularity, Tea Cider is mainly home brewed though it can also be readily purchased too. Personally I am of the opinion that home brewing should be encouraged.

I am not advocating the illicit preparation of intoxicants; it would require some stretching of the imagination to class a well-brewed tea cider as an intoxicant. Where this beverage is best known, it has been preserved for its reputed medicinal qualities and not for its very doubtful ability to produce inebriation. Though Tea Cider may have medicinal values which possibly can be substantiated, it is as a wholesome, refreshing beverage that I advocate it.

If you are interested in the possibilities of this little-known method of preparing a tea beverage, I have a number of samples of the ferment for distribution this afternoon. If there are not enough to go round, samples will be posted as soon as they can be prepared to those leaving their name and address. Having obtained a sample and a copy of instructions for its use, don't throw them away. Make tea cider and distribute your culture to others. It is quite easy to start new cultures from fresh cider; the more cultures there

are in use, the more tea will be used in the preparation of this tea cider. It may interest you to hear that I have received my first request from America for a culture this week. People want a new drink; why should not it be Tea Cider?

DISCUSSION

Mr. Stanley Howard asked how Dr. Gadd obtained such a clear cider. He had been making tea cider for some time but always obtained a thick sediment in it. He filtered through thick linen.

Dr. Gadd replied that in the laboratory he used filter paper or blotting paper for filtering the cider before bottling. There was always a certain amount of sediment formed after bottling but that could not be avoided as it was due to the growth of yeasts which produced the gas to aerate the cider.

Mr. Bruce Foote asked whether the colour of tea vinegar which had been recommended for the coagulation of rubber latex would be deleterious for the purpose.

Dr. Gadd replied that he had not carried out any experiments on the coagulation of rubber latex with the tea vinegar. He had shown that an excellent vinegar could be made very cheaply from tea, but he would prefer to leave to the Rubber Research Institute the investigations of its application in the rubber industry.

The Chairman said that Dr. Gadd had mentioned Java in his account of tea cider. In Java they used tea cider because the people, like the Malays, had a great prejudice against drinking anything of an intoxicating nature, like palm toddy. In Ceylon they had not that prejudice and they had toddy, which was a common drink fermented somewhat like tea cider. This cost about 20 cents a gallon, and contained about 6 per cent alcohol. He did not think, therefore, that there would be a great demand in Ceylon for tea cider with its 1 per cent alcohol. He considered that it would be useful to the tea industry if tea cider became popular amongst the masses.

Dr. Gadd said that tea cider would compare quite favourably with toddy as regards cost, as a gallon could be made from 1½ ounces of tea and 1 pound of sugar which would not cost more than 20 cents, the price mentioned for toddy. But he certainly had to give way to toddy as regards its alcohol content.

The Chairman said that it was his pleasant duty to propose a hearty vote of thanks to the two gentlemen who had read such interesting papers to them that afternoon. In the case of Dr. Evans, it had been a very great pleasure to him to listen to all the interesting points he had made in connection with the manufacture of tea. They were very sorry to lose Dr. Evans and they would not only accord him a hearty vote of thanks but wish him a successful career elsewhere. In the case of Dr. Gadd, he had made his observations with very piquant phrases. He hoped that a market would be found for tea cider, if not in Ceylon, in America from where Dr. Gadd had already received his first request.

Mr. R. C. Coombe said that before concluding their deliberations it fell to him on behalf of the Board of the Institute to express their appreciation of the really good attendance. At their Conference two years ago, they had a record attendance, but he thought that afternoon's just beat it. He would say that it gave them encouragement to carry on, and he was quite sure it was a great tribute to Dr. Norris and his Staff for the work they had done since they met two years ago. Several of them, including their Director, had expressed their regret at losing the services of Dr. Evans. Speaking on behalf of the Board, he desired to associate himself with those remarks. Since Dr. Evans joined them, he had whole-heartedly co-operated in every way possible in the endeavour to work out many of the very difficult problems they had to face in connection with tea manufacture in the present day. He (the speaker) had been a tea planter for over 40 years, but he did not hesitate to say that he still knew very little about tea manufacture.

He was sure he was expressing the opinion of all present when he said that they wished their Director a really good holiday at Home. He was leaving them next week on well-earned leave and during that time, he had told them, he was going to endeavour to obtain another officer to fill Dr. Evans' place. He felt sure that Dr. Norris would not let them down in that respect.

In conclusion, he again thanked them for their attendance and he hoped they would go on showing confidence in the T. R. I. which, he asked them to believe, deserved their support.