

The second session of the Conference began its sitting on the 16th July at 8 A. M. with Mr. F. R. Hemingway, I. C. S., in the chair. This session was as well attended as that on the previous day.

Talk on Adulteration.

Shortness of notice and absence from the station prevented me from promising to do more than talk upon this subject, making no pretence to deal with it at all fully, as this would require reference to the steps taken in other countries to combat the evil and to the legislation which has there been found necessary.

In general, adulteration may be taken as the admixture of foreign substances with one of specific characteristics, with the object of illicit gain by the sale.

It is most commonly practised in the case of natural products and we may differentiate broadly between such products as are mainly used as foods and those which find their market for Industrial purposes. The practice is to be condemned in whichever class the product falls, but with food-stuffs especially the effect may be so far-reaching that unless some check can be devised, the mass of the population, least able to bear any lowering of quality owing to their economic condition, may seriously suffer and in its own interest the state will be compelled to protect the people, as has been attempted in most progressive countries, by special legislation defining the offence and fixing penalties.

Of course with all natural products there are many qualities of what is admittedly one kind of produce and it is of this variation that the profiteer attempts in the first instance to take advantage. In markets in which any product is largely dealt the qualities are differentiated and valued accordingly, in fact are classified, and it is common when the market for the highest quality is dull, for such material to be degraded by admixture with poorer qualities so that it may sell to the best advantage.

This is business but cannot be said to be adulteration in the strict sense. Whether it is good business or not depends upon whether the immediate purchaser is the ultimate consumer.

A grosser form of degradation, and one falling within our definition of adulteration is, when a product from another source of the same general but not of the same specific characteristics, is used in admixture, and this is, I think, the most general form which adulteration takes. According to the produce in question, seeds, grains, fibres and solid materials in general, it is more or less readily detected by the practised buyer or by simple tests, but where liquids are in question, (Oils, essences, juices, gums) the characterisation of the adulteration and its extent may require delicate and exact expert examination.

The grossest kind of adulteration, of course, is that which aims at increasing the weight for sale by incorporating materials of different sources and characteristics. The expert buyer does not suffer by this as to him it is recognisable at sight. It is only the general public (compelled to buy what is offered to it and with no special knowledge to assist it) which is the milch cow. Its safeguard in general has been the general fixation of what have come to be recognised as Trade Standards and in countries where specific legislation upon adulteration has been enacted, we find the courts dealing with cases which turn upon question of quality, by reference to expert business men as arbitrators, and many disputes are also settled by reference to individuals appointed by the Chambers of Commerce on account of their intimate acquaintance with special materials and Trade Customs.

With foodstuffs however the extreme limits of quality with reference to specific contents are generally fixed by the Acts embodying the legislation and in case of doubt it is only for the analyst to determine the nature and extent of adulteration and the court to fix the penalty. The difficulty which arises then, is to decide upon the guilty party, but the penalties have had a tendency to become sufficiently severe and cases of harmful adulteration of foodstuffs, are, I am confident, much fewer than they were, and the legislation has been distinctly beneficial.

For industrial purposes the variations in quality may be much wider without doing serious harm, but for the maintenance of the reputation of a manufacture it may be essential to use only specific raw materials and in such cases absolute purity is insisted upon. Then as we know, different qualities of one and the same natural product find markets for quite different purposes and it may be just as important for some manufacture, that adulteration should not be made with a higher grade product than it requires, as it is that no lower grade product should be added, and it is a general practice in such cases to buy upon contract with reference to a fixed sample.

Thus far, I have dealt with the subject on purely general lines and have made no reference to specific materials or cases. To do so, at all fully, would be impossible within the time at our disposal, but we have all met with instances of this pernicious practice and as consumers are sufferers.

As a chemist I must differentiate between the treatment of a product with the object of rendering it useful for some special purpose, the nature and quantity of the added material being decided upon by a trained mind thoroughly conversant with the object to be attained and the means to be employed, and the blind admixture of foreign substances by people who have no real knowledge of the nature of the various materials or of the purposes to which they are ultimately put.

A qualified chemist specialising in oils, for instance, is faced with the problem in the lubricating of a piece of machinery, from the moving parts of which the oil disappears quickly, and no oil of sufficient body can be found to meet the purpose. He is quite within his sphere in adding some thickener to reduce the fluidity of the oil under its working conditions and if the demand for such an oil is great to place the mixture on the market. It is not permissible, however, for a general dealer in oils to sell as Olive oil, for instance, an olive oil to which groundnut oil has been added, for, in many cases, olive oil is used for purposes for which groundnut oil is not suitable

and the purchaser would be defrauded. Linseed oil is another oil which is used for very specific purposes and the admixture of any of the common oils would interfere seriously with its value.

As an example of adulteration by persons who had no knowledge of the ultimate destination of an oil I cannot do better than refer to a case which created a big stir some few years ago. In Germany a large number of mysterious cases of poisoning occurred and by investigation the authorities came to the conclusion that the poisoning was caused by two kinds of Margarine or Butter—substitute which were selling largely in the districts affected. In every case, the sufferer had partaken of one or other of these margarines and the makers realising their responsibility, but unable to account for the trouble, requested the Government to make a thorough investigation. Government Chemists went through the whole process, carefully testing all materials, and came to the conclusion that the cause of poisoning was Chaulmoogra oil.* The records of sales indicated that

*We are indebted to Mr. C. Tadulingam, F. L. S. for the following note on Chaulmoogra oil [Ed].

The true chaulmoogra oil is obtained from the seeds of *Tarakogenos Kurzii*, King; a tree 40 to 50 feet high, of the forests of Sylhet, Chittagong and Burma, with large woody globular fruits of about the size of an orange. It was long supposed to be the product of *Gynocardia odorata*, R. Br. (*Chaulmoogra odorata*, Roxb) an allied plant of Sikkim, Chittagong, Assam and one of the false chaulmugras. This mistake was discovered in about 1899 from seeds received in Europe and the correct botanical source of the chaulmoogra seed was then finally determined. The oil is recommended to be used internally and externally in cases of leprosy and other skin diseases and the treatment is said to meet with some success. It is first administered in 5 to 10 minim doses and gradually increased to 30 to 60.

The other false chaulmoogra is *Hydnocarpus Wightiana*, Bl. of the same family to which the other two belong viz., Bixineae, locally known as *Maravatti* in Malayalam and *Nivadimuthu* in Tamil. This is a tree indigenous to the Western Peninsula from South

the affected lots of margarine were made from oil bought by the two firms from one and the same dealer in Hamburg, and it was found that this dealer had still some of this oil in stock. It was from a consignment shipped from India and was found to contain Chaulmoogra oil—an oil so far as I know only obtainable in India. No one conversant with the requirements of an oil for food purposes would have mixed in Chaulmoogra oil and the result of the adulteration in this case was to seriously affect the market for Bombay oil. I myself have been in an oil mill in India where the proprietor admitted that if he were required to deliver a certain quantity of a given oil by a certain date and had not the required quantity ready he got over the difficulty by mixing in any other oil which he was pressing at the time.

A big firm of shippers here, with which I have had to deal, have told me that they only ship oil in consignments obtained from individual pressers and that only thus can they control and guarantee their qualities. To buy from middlemen would be to render themselves liable for oils which when they reached the overseas market would be condemned and they would have no redress against their supplier.

It is the importance of a "Reputation" which so many small dealers in India ignore. Without a reputation and a pride in seeing that it is maintained, no really big business can in the long run be maintained.

Within my own experience I have come across the case of crude but genuine Bees Wax being bought by dealers and sent to Calcutta for "refining." It has been returned for sale in the district in which it was obtained, but the "refining" had consisted in the adulteration with 50 per cent. or more paraffin wax. A traveller here once appealed to me personally for a certificate as to the quality of wax he was

Concan to Tranvancore along the coast ranges. In the West Coast districts oil obtained from the seeds of this plant is used generally for lamp burning and also medicinally. In Bombay and some portions of the Madras Presidency this is said to have been used with satisfactory results as a substitute for chaulmoogra oil, but unfortunately the seeds are not an article of commerce.

importing and hoping to sell to dyers, ghee-makers and others. This product was white paraffin wax and my certificate was that, if I heard of him selling it to the people specified I would place the matter in the hands of the police and try to get him convicted of false representation and fraud. To think of Paraffin wax being used as a ghee substitute may be astounding; but here in India food products capable of replacing ghee are rejected upon sentimental and religious grounds, but a material like a mineral wax, of no food value whatever and even directly harmful can be, and is used to, adulterate ghee, and because it cannot be detected either by sight taste or smell it passes, and no one is brought to book.

The destruction of the reputation of the product of a whole country is no light matter, and unscrupulous dealers in the hurry to get rich quick do not consider the harm which they may be doing to their fellow countrymen, for the lost reputation is not easily regained and a crop which was the mainstay of a whole people may get into such disfavour in the world market that there is a no demand for it except at ruinously low prices.

We have heard something recently of Tinnevelly Senna and the adulteration which has caused it to be a drug on the market-- or at least a quality of a much desired drug for which there is *no* market, and the mention of Tinnevelly brings to one's mind the case of Tinnevelly cotton. "Tinnevellies" is a standard name, as well known in the world's markets as Sea Island, Egyptian, Broach, or any other. The name represented a cotton of definite characteristics, well adapted for spinning qualities of yarn for which there is a good demand. Could anything be more foolish than for the growers in the district which gives its name to cotton, for the sake of a little extra gain, mixing in with their crop another plant which gives a cotton of inferior characteristics, but a heavier producer and thus for a year or two making a little more money.

When that degraded cotton reaches the mills it will be found unsuited to the spinning of the qualities expected, and in future spinners would not risk paying the normal prices and growers would

of necessity be forced to take the low prices at which alone the mills would be prepared to take the cotton on account of the risk.

The watering of cotton is less serious perhaps, because it is a more readily detected and cruder form of adulteration but it is somewhat of a surprise to see the photograph of a two inch pipe delivering water at full bore to a spray which plays upon cotton before pressing and baling. I have referred to a few typical instances, but illustrations could be found in the case of almost every natural product and the question is, what can be done to diminish this practice and protect the people. Manifestly by legislation a Government could define the position and indicate penalties in specific cases, but no Government I think could really successfully take action unless it were backed by the general opinion of the people and in this country it is to my mind extremely important, that there should be the development of a strong public opinion unreservedly condemning all such malpractices and ensuring that any legislation will be welcomed and that the necessary "Standards" and analytical reports of competent men will be accepted and when convictions are obtained and penalties inflicted that the culprits shall be made to feel their greatest punishment is the loss of the respect of their fellowmen.

F. Marsden.

Discussion :—

Mr. M. R. Ramaswami Sivan enquired, if the Lecturer, or any one else in the audience, could give information regarding the balls of mud which are so frequently found in bags of Nellore rice. They are often of the same size and shape as the rice itself, and possess the same specific gravity. He had been told of the existence of a small machine by which these balls are made and added to the rice (Laughter). He wished to know if the adulteration were made by the middlemen (Laughter).

We are inclined to think that these balls of mud come from the threshing floor. When the paddy is passed through the hulling machine, the pieces of mud naturally get reduced to the shape and size of the finished rice [Ed].

The President observed that he had heard of the existence in Egypt of Scientific chambers where the art of adulteration was systematically carried on.

The Cocoanut and its importance to Malabar.

Malabar has been rightly called The Land of the Cocoanut palm. The most ubiquitous tree in the District, the whole land is studded with it. Her coast is pre eminently the seat of the cocoanut industry in India. She has given it her own name (the word Nalikera by which it is popularly known being derived from the word Kerala), and two of its most important commercial products have been christened in her tongue. Her Copra and Coir have acquired a worldwide reputation, and are much in demand in foreign marts. The commercial importance of cocoanut to Malabar may be gauged from the fact that from the export of this product alone she derives more than a million sterling annually. Even apart from this, its value as an article of domestic use cannot be over estimated. One wonders how much it enters into the daily life of her inhabitants. Life in Malabar would indeed be different without its presence.

It is difficult to say whether the tree is indigenous to the District. According to Alhoaso de Candole its most ancient home is the Eastern Archipalego, from whence it was introduced into India about three thousand years ago. It exists in Malabar today only as a domestic plant, fond of human voice and contact; as a forest tree it exists rarely, if at all, though it is said that it is sometimes self sown.

It will give us some idea as to the actual area under cultivation if I say that it will be difficult to find even a single *paramba* in the whole District, except perhaps certain places in South Malabar, without at least one cocoanut tree in it. And the area is every year increasing. Not satisfied with planting *parambas*, the people have taken to converting paddy fields into cocoanut gardens, and clearing