

FOOD AND ITS ADULTERATIONS.

By J. BAKER EDWARDS, Ph. D., F. C. S.

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TEA, COFFEE, AND CHICORY.

Dr. Johnson confessed himself to be "a hardened and shameless tea drinker," who for twenty years "diluted his meals daily with the infusion of this fascinating plant," "whose kettle had scarcely time to cool," who "with tea amused the evening, with tea solaced the midnight, and with tea welcomed the morn."

Tea and coffee were introduced into Europe about the same time from different quarters of the globe—tea from China and coffee from Arabia—and it is singular that whilst the British public and the Anglo-Saxon race generally have with common consent given a verdict in favour of tea, so as to give a consumption of more than 2 lbs. per head per annum for the population of the United Kingdom, and whilst it has also been well received in Holland and Russia, yet the population of France, Prussia, and Germany and the Eastern nations prefer coffee and chocolate, and consume from fifty to one hundred times as much of these beverages as of tea.

In Russia tea is flavoured with lemon, instead of cream and sugar, whilst in Germany it is common to add cinnamon or vanilla.

In 1664 the East India Company presented 2 lbs. 2 oz. of tea to His Majesty, and it appeared at the royal table not as a beverage, but in the form of a dish of tea leaves, with pepper, salt, and butter like spinach, but was found so tough that nobody could eat it. Tea gardens and coffee shops were soon after established, from which tobacco smoke was jealously excluded—these became the "gossip centres" and the "casinos" of the period. At the coffee shops an orator was engaged to spout on the subjects of the day, whilst at the tea gardens a band played to lead the dance.

A few years after Theobroma, the food of the gods (first introduced into Europe by the Spaniards from Mexico) came into general use under the name of cocoa, or chocolate, and gradually assumed an important place amongst national beverages.

It has been amongst the triumphs of chemical discovery to find that each of these popular diets contain an identical active principle called "Theine," possessing the properties of an alkaloid, and in many respects resembling quinine.

Since the introduction of these beverages a new style of diet has generally obtained amongst the Anglo-Saxon race, which has greatly aided civilization and which has materially assisted its literature, science and general intellectual progress.

The beef and beer diet of Elizabeth's reign nourished poets, actors, warriors, statesmen and orators of a high order of intelligence, it is true; but the reign of Victoria will be still more celebrated by the achievements and discoveries of tea and coffee drinkers and tobacco smokers of the 19th century. That the unnatural waste of nervous tissue caused by extraordinary mental exertion requires an auxiliary in the form of restorative stimulus, is generally admitted, and the increased application of brain work to ordinary business required by the present age, causes the want of this kind of auxiliary food, or stimuli, to be generally felt. This needful food is furnished by a numerous class of ALKALOIDS. A very similar alkaloid to Quinine has been found in the nervous tissues themselves by Dr. Beuce Jones, which has the same properties. These restoratives, however, should always be regarded as medicines rather than as diets, whether they affect chiefly the nervous or the physical system. Excessive tea drinking destroys the digestive power of the stomach and causes it to reject solid nutritious food. Excessive smoking or chewing also impairs the digestive organs and causes an unnatural irritability of the mucous surfaces. Alcohol, in the same way, is to a certain extent tolerated by the system, but beyond this it is a poisonous irritant to the human stomach [See "Park's Hygiene"—an excellent modern treatise.] It appears to be well established on the highest military authority that even the physical extremes of heat and cold can be best endured by large bodies of men without the use of alcoholic stimulus, and that this power of physical endurance can be promoted by the use of warm stimuli, such as tea and coffee. The evidence is also in favour of the use of tobacco as a stimulant under conditions of exposure to cold and on long marches; and whilst abundant proof exists as to the advantage derived from the choice of warm beverages in preference to raw spirits, the habitual but moderate use of tobacco in smoking, appears from the military statistics to be consistent with the highest degree of vigour and physical efficiency.

It is therefore greatly to be regretted that whilst an improved morale attends the substitution of tea, coffee and tobacco for the heavy stimuli of porter and rum, we do not thereby escape from the frauds of adulteration, nor can we find ourselves landed on any purer platform of commercial enterprise. Tea, coffee and tobacco are thoroughly well adulterated—not less so than beer, wines and spirits; whilst, however, every adulteration of the alcoholic beverages increases their toxic properties, the tendency of adulteration in the case of these vegetable productions is chiefly to dilute them and to stimulate the palate rather than to affect the nervous system. In this respect the frauds of the tea dealer compare favourably with those of the liquor dealer.

The competition between tea, coffee and chocolate has almost ceased, except as a national taste, upon the declaration that

each contains a similar alkaloid, producing like effects upon the nervous system, associated with volatile oils, fixed oils and starchy matter in various proportions, so that each forms a delightful substitute for the other under the various circumstances of health, sickness, or active exertion in which we may demand their aid.

But chemistry has extended our knowledge beyond this point and shown us that Theine is found in a large number of plants belonging to different natural orders, and that if we fail in obtaining a sufficient supply of coffee berries, or tea leaves, we may resort to the leaves of the raspberry or strawberry plant, or of the sive or the holly, or the Ledum, Melaleuca, Leptospermum and Gaultherium, or to the leaves of the Coffee shrub itself, which forms an excellent coffee-tea, which is preferred by the inhabitants of Sumatra to the infusion of the Coffee berries. All these and many more known leaves will yield us warm infusions of Theine—which is the true physiological desideratum.

It may be well worth consideration whether some of these leaves containing Theine may not be commercially available to vary our beverages with palatable and economical results.

Unfortunately, however, our dealers do not look at the subject from this point of view. The consumer wants an infusion of theine. The trader wishes his customer to believe that what he sells is genuine Chinese tea.

Therefore, instead of introducing a new article with the same active principle and similar restorative powers, he seeks to confuse the palate of the tea-drinker, who assists him in this confusion by the use of milk and sugar, so as to make his cup of beverage a "fancy drink."

As a rule the public do not know the taste or flavour of good tea. This is only attained by long practice by the skilful tea-taster, who can thus by an educated and clean palate, and the use of simple infusions in water, judge of the strength, quality and flavour of a sample of tea. This commercial value depends chiefly on delicate aroma, derived from the flowers of the tea-plant, or from other flowers which are gathered with them, and which form a delicate but meretricious standard of value.

In the main, however, the tea-taster in China becomes a good judge of the alkaloidal value of the tea. As in the case of wines, however, the popular taste is vitiated, and demands roughness rather than delicacy of flavour. This depends on the presence of Tannic Acid, which has a rough leathery flavour, and some essential oils which give its fragrance—the former is readily supplied from the leaves of many plants, and the latter can be added artificially.

The teas of commerce contain an average of about 2 per cent. of Theine. Fine qualities of green tea contain as much as 6 per cent.

Having no smell, and scarcely any taste, it does not affect the taste or flavour of the tea—the latter depends wholly upon the Tannic Acid and the Aromatic Oils. There are several plants which are largely used in Brazil and other localities as substitutes for tea. The Paraguay holly, for example, is largely used in Brazil, and has an aroma similar to tea; it is more exciting than Chinese tea, producing a kind of intoxication, and inducing, when used in excess, delirium tremens. This must be partly due to the volatile oils which it contains, as the percentage of Theine is only 1.25. A very large quantity is collected annually in Paraguay. It is chiefly consumed in South America.

The tea plant has been successfully cultivated in Japan, and although less delicate in aroma, it contains a good percentage of Theine, and less of the exciting essential oils, and is less subject to adulteration than Chinese teas.

The Japan tea should, however, be much longer infused to develop its flavour, and may even be boiled with advantage.

In Sumatra, COFFEE LEAVES form the only beverage of the population. They are fragrant, and contain about 1½ per cent. of Theine. The infusion with boiling water is stronger than tea and more nutritious, as much soluble matter being taken up from the leaves as from coffee berries.

It is so highly esteemed in Sumatra that it is a matter of surprise that it is not more largely imported into Europe, as it would be much cheaper and much better than the ordinary qualities of tea.

LABRADOR TEA is the name given to the dried leaves of *Ledum latifolium*, and *Ledum palustre*; plants which grow on the borders of swamps and of lakes on this Continent, and in the north of Europe. It also contains Theine, Aromatic Oil, Tannic Acid, but is more narcotic than Chinese tea. The latter is, however, very powerful when fresh, and is never used until it has been dried for twelve months. Infusion of fresh tea leaves causes delirium; the peculiar essential oils in Chinese tea are, therefore, neither necessary nor desirable.

Whilst so many plants are known which yield excellent and agreeable substitutes for tea, and which possess the same physiological properties, it seems a great pity that these should be neglected by the public—whilst, under the name of tea, they are really buying worthless mixtures of the commonest leaves which give a rough flavour, but yield no alkaloid. The more common adulterations are shown in the illustrations presented, but it is a matter of some trouble and of patient examination to identify these leaves after cut into small fragments and rolled up. The microscope, however, assists in the identification of the leaves. The leaves of the oak, the beech, the plane, the poplar, the willow, &c., may contain

some Tannic Acid, which gives roughness to the flavour, but no Theine or Aromatic Oil, for which tea is so highly esteemed. The adulteration of tea by such means is, therefore, highly fraudulent, and admits of no excuse. The practice is, however, very extensive both in China and in London—the leaves of the Camellia and of the Chloranthus being principally used in China, and an article is also there manufactured under the very honest name of "Tie tea,"—this is very ingeniously rolled up from clay and tea dust, and then "faced" with colouring matter and gypsum, to imitate green tea. In London, Mr. Phillips, the Chemist to the Inland Revenue, reports that eight large factories in London, and several in the country, were employed in re-dying exhausted tea-leaves, which they purchased at 2d. or 3d. per lb. from hotels and clubs, and made up so as to mix with genuine tea. Similar large factories have been detected and seized in Liverpool and Manchester.

It might be supposed that the high price of tea, and the large duty imposed upon it, would be the chief temptation to the practice of adulteration. But it is not so. The temptation lies in the difficulty of tracing the fraud to the real perpetrators, and the general fact that it is no one's business to expose the offence and to punish offenders.

The Inland Revenue department (Imperial) has been a great protection to the public in the matter of teas as imported, but it fails to reach retail frauds. In the case of coffee, which is but half the price of tea, an equal amount of ingenuity has been exercised in the determination to cheat the public, and the public palate has followed the lead of the ingenious adulterator in this as in other cases. When roasted dandelion root and chicory root were used to adulterate ground coffee, the public accepted the admixture as an improvement, just as they formerly accepted the addition of hops to malt liquor, and as they still accept the addition of alum to whiten bread.

And when Chicory was legalized in Great Britain and competition required still further aid to reduce the price of ground coffee,—roasted beans, lentils and mahogany sawdust were used to cheapen the chicory. Experience shows that adulteration has no limits, no bounds, no conscience; that a mere shadow of profit, such as 1 per cent. or less, induces deviation from integrity, wherever the practice is once admitted,—and this social parasite which infests our daily commerce illustrates practically the force of the old adage that—

"The biggest fleas have little fleas
Upon their backs to bite 'em,
And little fleas have lesser fleas,
So on—ad infini!"

(To be Continued.)

BIRD'S EYE VIEW OF PARIS.

As the siege of Paris is now progressing with deadly earnestness, and most unlikely to terminate except by the destruction of the city or the capitulation of its defenders, the "bird's-eye view" which we publish this week will prove of interest to the readers of war news by enabling them to follow the course of the war fiend in his destructive advance upon the beleaguered capital of France. On other pages will be found a Key to the view and an Index to the key by which the position and the names of the most prominent objects in the city may be readily discovered.

VIEWS IN TORONTO.

THE UNITARIAN CHURCH.

This edifice, one of the finest specimens of ecclesiastical architecture to be seen in the Ontario capital, stands on the west side of Jarvis St., above Crookshank St. The locality is somewhat removed from the more frequented part of the city, and for this reason this elegant church is less known and less admired than it deserves to be. It is built of white brick, in the long pointed Gothic style. Its length is 85 feet, with a width of 50 feet, forming a parallelogram, which includes the body of the church and the vestibule. The church was erected in 1854, and in the fall of that year it was occupied by the members of the Unitarian creed, who had hitherto held their services first in an old wooden church on George Street, and then, pending the construction of the new church, in a room in the Ontario Hall. On Christmas Eve, 1865, the Jarvis Street Church was fired by an incendiary and very much damaged. It was repaired as soon as possible, and now presents, both internally, and externally from the front, a very handsome appearance. In making the repairs after the fire, the inside of the walls were painted in imitation of cut stone, the ceiling was divided into frescoed panels, and a blank window behind the pulpit was renewed in fresco. The pews on the ground-floor of the church are capable of seating 300 persons, but with the addition of such galleries as the structure would admit, it is calculated that the seating power could be raised to 500. In the basement of the building is a neat and capacious Sunday school-room. The entire cost of the church, inclusive of the price of the building lot, was \$10,000.

THE RICHMOND STREET WESLEYAN METHODIST CHURCH.

This large church, though a plain, unassuming building, without other ornament than a massive portico, is known as the Cathedral of Methodism in Upper Canada. It is built of plain brick, but presents a most substantial and not unimposing appearance. It stands on the south side of Richmond Street, a little to the west of Yonge. The church was erected in the years 1844-5, and was opened for divine service on the last Sabbath in June, 1846, by the Rev. Dr. Rieley. The main building is 85 by 65 feet, built after the plan of the St. James Street Church in this city, with some slight modifications. The cost of the original structure was \$16,000, but since its erection the trustees have added vestry and classrooms on the south front, making an additional cost of \$4,000. This, with the cost of the ground, raises the total cost of the church to \$23,400. The Richmond Street Church will, it is