

Practical Notes on Invalid Feeding.

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X.—TEA, COFFEE AND COCOA.

The beverages above named play an important part in dietetics, and so universal is their use that they are often regarded as food. Analyses show that they contain very little material which will build tissue or supply energy, so that their value depends upon other properties, which cause them to be classed as food adjuncts rather than food. Their action is that of a drug rather than a food, and should be understood, to prevent ill results following their use in the sick-room.

Tea consists of the dried leaves of an evergreen shrub of the *Camellia* family which grows in China, India, and Ceylon. During the year the plant sends out four "flushes" of new leaves, which are picked with great care, and which yield different varieties of tea according to the season at which they are picked. The leaves are spread out and withered, and then rolled to become soft. If black tea is required, the leaves are allowed to slightly ferment before being sun-dried, and finally "fired" in a furnace. In making green tea the fermentation is omitted, with the result that the contained tannic acid is more soluble than in the case of black tea. Green tea is seldom used now, as it was found in the past that its use was attended by nervous symptoms.

The most important constituents of tea are tannic acid, theine (an alkaloid principle), and a volatile oil, to which the flavour is due. This latter is most abundant in new tea, and has such an intoxicating effect that the Chinese never use tea until it is more than a year old.

Tannic acid is an astringent, and exercises a retarding effect upon the digestion of proteids, by neutralising the peptic ferment. It is also supposed to act upon the connective tissue of meat in a similar way to the action of tannin on hides, and so surround each muscle bundle with a hardened layer of gelatine, which resists the action of the gastric juice. For these reasons the custom of "high" tea is condemned, but such teas are less harmful in the case of smoked or salted meat than when fresh meat is used. Tannic acid also prevents the action of saliva on starch.

Theine is the principle to which the stimulating properties of tea are due. By its use the activity of the brain is increased and wakefulness produced. It has a soothing action upon the nervous system, and removes the feeling of fatigue. It has been held to act as a proteid sparer, so that less food is required when taken with tea than when taken without, but Dr. Richet, in his "Dictionary of Physiology," states that all experiments tend to

prove that caffeine (theine) increases rather than diminishes tissue waste.

Both theine and tannic acid are soluble in boiling water, so that it is impossible to make tea which contains the one substance only. They differ in the rate at which they are dissolved, the theine being the more readily acted upon. Tea which has infused for five minutes shows a proportion of 2½ per cent. of theine, against 2¾ per cent. in tea which has infused ten minutes. Hence the increase of theine in the longer period is of small amount. On the other hand, tea which has infused five minutes shows a proportion of 11 per cent. of tannic acid, against 14 per cent. in tea which has infused for fifteen minutes.

To prevent the injurious action of tannin the tea should be freshly infused. If it cannot be used at once, it should be drawn off into another teapot, or the leaves should be removed in the strainer which is found inside an "anti-tannic" teapot.

The following directions should be observed in making tea. The water should be freshly boiled, and should be of medium hardness. If too hard, the infusion will not be perfect; if too soft, such as rain-water, a bitter principle will be extracted. The former condition can be remedied by the addition of a pinch of carbonate of soda to the leaves before the water is added, but for the latter defect there is no remedy. The teapot should be filled with boiling water, and should stand until the pot is quite hot before being emptied. A teaspoonful of tea for each person, with a teaspoonful "for the pot," should be placed in the hot teapot and allowed to stand a second or two, to allow the leaves to uncurl in the moist heat. The boiling water should then be poured on the leaves and the infusion used quickly. When sugar is added, the nutritive value of the tea is increased without undergoing change. The action of milk is less simple, for the casein of the milk precipitates the tannic acid. Its action can be plainly seen in the dark curd which hangs round the cup when tea has been "stewed."

Tea dilates the superficial blood-vessels, and brings about a grateful feeling of warmth after exposure to cold. It also induces perspiration, so that a contrary effect is produced when the body is heated, owing to the loss of surface-heat giving rise to the sensation of coolness.

Idiosyncrasy plays an important part in the use of tea and coffee, but the former is better borne by most people in health than is the latter. In ill-health, the tea favours flatulence, and the tannic acid often proves irritating to the mucous membrane of the stomach, and particularly when it is empty. It is best avoided by persons suffering from nervous disorders and from digestive troubles. In moderation it is attended by good results in healthy people, but its excessive use produces nervous tremblings, irritability, and wandering thoughts.

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