A SHORT NOTE ON FACTORIES AND TEA MANUFACTURE.

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In the course of visits to various tea factories in an advisory capacity certain features have presented themselves as worthy of consideration. They will not be dealt with at length in this short note but I feel that some service will be done by focussing attention on these points.

1. CLEANLINESS IN FACTORIES.

The idea that the growth of certain organisms should be fostered in the factory is still prevalent, although it has been shown again and again that cleanliness is the first essential in teamaking. I cannot stress too strongly the necessity for maintaining every room and machine in a factory as clean as possible. Withering lofts should be cleaned regularly, while the rolling machinery and sifters should be especially watched. No leaf should be allowed to remain wedged in the battens of the rollers, the feed box, or the mesh of the roll breaker. A careful inspection of these parts of the machinery will reveal whether the cleaning has been properly carried out or not.

The drains and floor of the rolling room should be scrubbed clean, and the rolling and fermenting rooms should not be used as storerooms in any way. Where humidification is resorted to, the rolling and fermenting rooms must be opened up at the end of the day's work, so as to dry the floors and the walls, and also sweeten the room. If this is not done it is very difficult to prevent the growth of moulds and the development of taints in the teas.

Jute hessian has in the past been looked upon as the cause of factory fires but recently it has been suggested that the *tea fluff* is a more likely cause, since it enters into the lofts and settles in the cracks

of the pine boarding. If this fluff is ignited in any way it will smoulder until fanned into combustion by the fans or some other agency, and then starts a fire in the boarding. How far this is correct it is difficult to say, but the danger can be minimised by an occasional clean out of the lofts, drying room, and bulking chamber.

The outside of the factory should also be kept clean, and should not bear evidence to the excellence or otherwise of Ceylon betel, or the amount of coarse leaf thrown out of the tats.

The trolleys, sacks, or receptacles used for fermented leaf need particular attention to keep them clean and sweet.

2. FIRING MACHINES.

Care should be taken that the stoves are functioning properly, and that the tubes are in good condition, otherwise taints may be developed in the tea as a result of smoke entering the drying machine, and a cracked tube is a dangerous source of fire.

Firing machines need a very large volume of air for the fire of the stoves and considerably more for the fans. It is, therefore, absolutely essential that the fans of the drying machines can get all the fresh air they need. It is, therefore, necessary to see that this supply of air is available, and when the stove of a firing machine is fixed in the firing room this room must have plenty of openings to allow the air to enter. When the loft fans are used for withering still more air is required, and yet a common fault is trying to work a drying machine in a closed room. If the fans cannot get all the fresh air they need they will re-circulate the exhaust air, the drying room will become very hot, and bad firing will result.

In this connection the writer considers that the firing stoves should not be inside the drying room but should be separated from the room by a wall, thus preventing the possibility of re-circulating the exhaust air, the risk of ashes getting into the tea where firewood and coal are used and also minimising the risk of fire.

There is no proper provision made in Ceylon factories for the escape of the exhaust air of the driers from the factories. At the risk of causing some controversy I venture to suggest that this is a fundamental error in planning and construction that requires very careful consideration, especially when new factories are being built. At present this air has to find its way out of the factory the best way it can, through the windows or via the roof, and in many factories these conveniences are by no means sufficient. It would be far better if a properly arranged flue was arranged to remove the exhaust air directly out of the factory when not used for withering. If this is done drying rooms will not be so hot and stuffy and better firing conditions will result.

Another fault seen is when the exhaust duct of the drier is too near the floor of the loft above. This damps down the fan capacity and also results in bad firing conditions. Sometimes the exhaust air is deflected by such an arrangement towards the stove, and is re-circulated through the machine. It also heats up the loft above and gives bad withers in that loft.

3. FANS USED FOR WITHERING.

These fans must also have plenty of free air, otherwise they will draw it in through any leaks in the factory and this may have very bad effects. (See "Moisture in Made Tea".) They may also affect the proper working of the drier fans if they are starved for air, and cause endless firing trouble in this way. When fans are used to boost air through the lofts care must be taken to ensure that the exit for the air is sufficient to allow free exit, otherwise fan efficiency will be lost and stuffiness in the lofts will result.

4. DRIER THERMOMETERS.

Too often one sees the thermometers placed some distance away from the drying part of the machine instead of directly under the bottom tray of the drier. The thermometer should be placed in such a position that it will record the temperature of the air actually coming in contact with the tea, and not the air some distance away. In the writer's opinion the bulb of the drier thermometer should be placed in the middle centre just below the bottom tray. This can be easily arranged in the case of a mercury in steel thermometer by fixing a bracket to the side of the drier or else by using a special thermometer bulb. Now that proper attention is being given to exhaust temperatures it is advisable to have either a second thermometer for this purpose or else to fix double recording thermometers. It is not quite clear as yet, however, where this thermometer should be fixed, as there are two possibilities. It may be fixed above the leaf on the top tray where it should record 115-125°F, or else it may be fixed above the second tray where it should record 135-145°F. It is easily got at in the top tray but it is subjected to large variations in temperature, especially in machines of the tilting tray type when the first tray is tilted on to the next, and the top tray runs empty while it is being filled. The bulb of the thermometer then meets a hot current of air and records high temperatures. When the top tray is filled with leaf the temperature drops but the usual recording thermometer is not sensitive enough to record the lowest temperature resulting from the cooling effect of the fresh leaf. The tendency is, therefore, to show a higher temperature range than is really the case. A thermometer placed above the second tray is not liable to such large variations and should therefore give a more accurate record of the temperature conditions meeting the freshly-fed leaf.

In endless chain machines, on the other hand, the thermometer should record a steady temperature if placed a few inches above the leaf but just short of the end of the first tray, i.e., before it tilts over to the next tray.

One enterprising firm at least supplies their machines with mercury in steel dial thermometers, and these instruments are very good, but I still do not understand why the instruments are not fixed in such a way that the firing cooly can see his temperature conditions without moving from the feeding platform. There is no reason why these thermometers should not be fitted with a length of tube connection so that the dial is placed in a prominent position near to, and immediately in front of, the feeding cooly. Such thermometers are easily obtainable and should replace the present stem thermometers which are often placed in positions where it is almost impossible to read them.

5. AUTOMATIC FEEDERS.

It is a pity that the depth of the spreading is not controllable by means of a gauge which records the thickness of spreading. It is necessary to vary the thickness of spreading for the different dhools and a gauge on the spreader adjustment would simplify the spreading considerably. Perhaps the makers will pay attention to the development of such a control.

6. DRIER FALLS.

A certain amount of tea falls through the machine and over the end of the trays during the passage of the leaf through the drier. This "fall tea" sometimes appears in the discharged tea as undried pieces of tea, but fortunately this fall is not very great and generally the moist pieces complete their drying in the hot heap of discharged tea. This fall may be considerable while the first trays are passing through the machine and is then discharged before the rest of the tea passes through the machine. It is advisable to return this fall for further drying.

The other drier fall collects on the floor inside the machine, and remains there for varying periods. This fall tea should be removed as often as is practicable, otherwise it will be overfired and a big proportion of the tea will be spoilt. The quantity of this fall tea varies considerably from machine to machine and may be more than 20% of the tea fired. It becomes overfired as a result of being exposed in a dry condition to the hot air entering the machine, and the manufacturers of tea driers should make some effort to reduce this fall tea if it cannot be completely eliminated.

7. STORAGE OF TEA AFTER FIRING.

It is not practicable everywhere to pick over the leaf and sort the tea on the day of manufacture, and even if this is done the tea fired in the afternoon must be carried over to the next day. A good idea I have seen is to have special airtight bins made purposely for the storage of the ungraded tea overnight. The importance of properly constructed boxes at least for this purpose will be fully realised on reading the article on moisture in tea.

8. FACTORY FLOORS.

These should be kept in a good state of repair otherwise grit and sand will find their way into the tea. Badly kept floors are also very difficult to keep clean.