OUTBREAKS OF FIRE IN SMOKE HOUSES.

BY

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Considerable correspondence has taken place during the previous year and recently in relation to outbreaks of fire in smoke houses and our advice on the problem has been sought by Insurance Companies, Agents and Managers of rubber estates. Such fires usually result in the complete destruction of the smoke house and contents so that one is only able to theorise on the probable causes.

In the writer's opinion, however, there is little doubt that the principal cause of such outbreaks of fire is the ignition of accumulated inflammable gases which are retained in the smoke house when the ventilation is insufficient.

Inflammable gases may be produced from the wood fuel used in the fire boxes by (a) insufficient ventilation of the fire boxes (furnaces) resulting in dry or destructive distillation of the wood as in the manufacture of charcoal: (b) possible seepage of water into the fire boxes, such water being converted into steam which reacts on any red hot charcoal producing "water (producer) gas" which is inflammable. The accumulation of such inflammable gases then occurs owing to insufficient ventilation of the smoke house.

Formerly and possibly at the present time on a few estates, charcoal has been prepared in the fire-boxes of smoke houses for use in the producer gas generators used for driving a factory gas engine.

Such a practice should be deprecated since, in the preparation of charcoal from wood, large quantities of inflammable gases are also produced. If the ventilation of the smoke house is inefficient, these gases will accumulate and may be ignited spontaneously by a spark from the fire.

It is suggested that any type of furnace in which the ventilation is poor, resulting in the incomplete combustion of the wood and the formation of charcoal, is a source of danger.

The above is the most probable cause of such outbreaks of fire.

On low lying wet areas, where the fire boxes are constructed below ground level, the second possibility exists, viz. the seepage of water into the fire boxes and the formation of "water or producer gas" by the production of steam and its reaction on red hot charcoal. Some years ago, the writer was asked to report on two such outbreaks of fire in two smoke houses of similar design erected on a flat low-lying coastal estate.

In each case, spontaneous combustion, resulting in an explo-

sion, had occurred, so that nothing remained of the smoke houses or their contents to confirm the theory.

It is also a fairly common practice to dry and smoke virgin scrap and lower grade rubber in smoke houses; in many cases the scrap is spread over the floor of the storey in which the sheet is hung. It has been suggested that such rubber contains inflammable products. This is, however, incorrect. Scrap rubber is similar to sheet and is not more easily ignited. There is however a danger that small pieces of scrap may drop on the fire boxes and become ignited, but this danger is remote.

The spreading of layers of scrap grades on the floor of the storey in which the sheet is hung will however definitely impede ventilation and cause an accumulation of inflammable gases in the lower storey in which the fire boxes are situated. For this reason the drying of scrap in this manner must be deprecated.

The ventilation of a number of smoke houses depends entirely on air which enters and escapes through crevices in the walls and under the eaves of the roof, which is unsatisfactory.

Every smoke house should be provided with suitable inlets for air, near the bottom of the walls and with exit ventilators in the form of a jack-roof or chimney ventilators at the highest point of the roof, so that there is a regular flow of air and combustion gases from the fires, from the lowest to the highest point of the building, with no impedimentation to such flow, except that caused by the sheet rubber which is being smoked.

It is preferable in the first instance to have an excess of such inlets and exits, which can be closed wholly or partially after suitable tests have been made in relation to the rapidity of drying and smoking of the rubber.

In addition, the fire boxes must also be ventilated so that the combustion of the wood fuel is complete but not too rapid.

It appears probable, however, that, sooner or later, smoke houses will be constructed so that the drying of the rubber by heat and the smoking will be separate but simultaneous operations —drying being effected by means of hot water or steam pipes which can be controlled and which results in a great economy of fuel—and smoke, if required, being provided by a separate smoke pot. In such types of houses, hot air-drying without smoking, for the production of air-dried sheet can also be effected. Such a procedure will eliminate fire-risks. Investigations on these lines are in progress. The importance of efficient ventilation of drying and smoke houses, in relation to satisfactory and rapid drying, economy of fuel and reduction of fire risks may be emphasized.

Note:—Since the above was written, a planter has informed us that on entering his smoke house on one occasion, he actually saw a layer of blue flame just below the floor of the second storey.