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Group Research & Development Centre,
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THE ANATOMY OF TOBACCO IN RELATION TO FILLING POWER

(Report No. RD.1651 Restricted)

SUMMARY AND RECOMMENDATIONS

The anatomy of tobacco in various states has been studied with the aim of improving our understanding of the mechanisms of tobacco expansion processes. First, a study of the anatomy of tobacco in the living state has been made to provide a basis on which to make subsequent comparisons. The volume of tobacco in this state sets an approximate limit to any increase in effective volume which might be achieved in expansion processes for cured tobacco.

During flue-curing, both lamina and stem shrink to approximately 1/7th of their initial volume. Lamina shrinks mainly in thickness, whereas stem shrinks in both width and thickness during curing, and these are the dimensions most worthy of study in expansion processes.

The increase in lamina thickness in various expansion processes has been measured using scanning-electron microscope photographs of the edges of pieces of treated and untreated lamina. For the Airco-DIET process, 100-200 pieces were measured using photographs of the ends of cigarettes, but for the other treatments, 7 pieces of lamina were mounted and photographed separately. The DIET process increased lamina thickness

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2.2 times on average, which corresponds to an increase in effective volume of approximately 2.9 times. The G13 and G13C processes, and soaking in water followed by freeze-drying, increased lamina thickness approximately 2.9, 1.8 and 2.8 times respectively.

The amount of expansion in water of lamina from the bottom of the plant is greater than in lamina from the top of the plant. It is recommended that the possibility of applying expansion processes principally to lower leaves should be investigated.

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