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STUDIES IN TRANSFER AND PYROLYSIS PROCESSES
THE STEAM-VOLATILE PHENOLS IN SMOKE
PART I

REPORT NO. RD.249-R

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SUMMARY AND CONCLUSIONS

A series of cigarettes containing different types of tobacco has been smoked and the fraction containing the steam-volatile phenols examined. From the work to date it is concluded that:

- 1) The phenols present are qualitatively similar. In each case the major phenol produced is phenol itself.
- 2) The production of phenol from flue-cured tobacco is greater than that from fermented or Burley tobaccos. Stem tobaccos are low producers of phenol with Burley stem producing less than Pool A CRS.
- 3) When the smoke deposited on the tobacco owing to filtration is subsequently re-pyrolysed, the phenols present are transferred into the main-stream and make a small contribution to the yield of phenols per cigarette. The non-phenolic materials in the deposited smoke, however, do not produce significant amounts of phenol on pyrolysis.
- 4) Differences occur in the filtration of smoke by the cigarette rod:
 - i) Burley cigarette - the filtration of phenol and nicotine is identical.
 - ii) Flue-cured cigarette - the phenols are selectively filtered relative to nicotine. The reasons for this observation are not known.
- 5) Increasing the moisture content of the tobacco causes a reduction in the yield of phenol per cigarette. Over a moisture range likely to be encountered in practice, however, the effect is only small. It is tentatively suggested that the production of phenol is not greatly altered but that the reduced delivery is partly due to an increase in filtration by the cigarette rod.
- 6) Initial experiments suggest that chlorogenic acid is an efficient pyrolytic precursor of phenol.

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