

Strictly Confidential

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CIGARETTE SMOKE RESEARCH

Brief for Meetings of Chairmen and Scientific
Advisers of U.K. Home-Trade Manufacturers with
the Medical Profession.

1. What we have come to talk to you about is the subject of cigarette smoke condensate (commonly called 'tar') in the light of the views that you and we expressed at the time of the 1962 R.C.P. Report, and in the light of the subsequent experimental work carried out at our laboratories at Harrogate, and the resultant research by tobacco manufacturers into the modification of cigarettes.
2. In 1962 the T.R.C. started work at Harrogate with the following general objectives:-
 - (a) to develop and use biological tests which are indicators of carcinogenic and irritant effects, and then
 - (b) to identify the smoke or smoke condensate components that might be responsible for any such effects.
3. For the purpose of this work the T.R.C. accepted as a working hypothesis the validity of the contention that tobacco smoke can contribute directly to lung cancer.
4. The first main biological tests to be developed were designed to show the response of mouse-skin to the application of cigarette smoke condensates and smoke condensate fractions from typical U.K. flue-cured plain cigarettes.
5. In this work we recognise that mouse-skin tests with smoke condensates suffer from certain experimental limitations. First, no account can be taken of the effects of very volatile smoke constituents; and second, the time interval that must elapse between production and application of the smoke condensate is long compared with the time interval that elapses between the lips and the lungs of a cigarette smoker.
6. These mouse-skin experiments had also the specific objectives (so far as these experimental limitations allowed) of:-
 - (a) verifying that cigarette smoke condensate mouse-skin carcinogens were stable and non-volatile, and
 - (b) investigating the possibility that 'tar' carcinogens might be artifacts of storage.
7. Other tests that have proved much more difficult to develop include:-
 - (a) The effects on animal lungs of inhaled smoke.
 - (b) The effects on animal lungs of cigarette smoke condensate applied by injection and by intratracheal intubation, and
 - (c) A test for assessing the ciliastatic effects of cigarette smoke by the use of rabbit trachea.

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8. By 1964 there were indications that 'tar' was an important source of cigarette smoke condensate mouse-skin carcinogens. This suggested the development, in manufacturers' laboratories, of commercially acceptable filter cigarettes with substantially less 'tar' than conventional plain cigarettes.
9. The first step towards the objective of reducing 'tar' was achieved by filtration and blending techniques; and commercially-acceptable filter cigarettes (yielding about 40% - 50% less 'tar' per cigarette than conventional U.K. plain cigarettes, and about 30% less than the main U.K. filter cigarette brands) have now been included in the Harrogate mouse-skin painting programme to test their specific mouse-skin carcinogenicity.
10. Experiments are also being carried out with additives to filters, and other means of 'tar' reduction are being continuously investigated.
11. If the Medical Profession, having examined the completed results of the Harrogate mouse-skin tests (including the tests on cigarettes with lower 'tar') recommend that the manufacturers should market cigarettes modified in this way, and tell the public that the tar yield of these cigarettes is lower, the manufacturers will act accordingly, and as soon as they can.
12. Some such cigarettes are already on the market, and the volume is being increased; but they have not so far been announced as lower tar brands, because the manufacturers do not feel that they can make such an announcement unless the medical profession say that there is some merit in doing so.
13. Moreover, if a real demand were created at this moment it could not yet be satisfied. The reasons for this are that trade leaf stocks do not contain sufficient quantities of the types required for a modified cigarette of this kind. Rhodesian tobaccos have a particular part to play in this connection; and although overall stocks of Rhodesian tobacco in the U.K. may last for perhaps 18 months or two years there is a shortage of the grades of tobacco that are especially suitable and there is obvious uncertainty about future supplies.
14. We believe, however, that we could within the next year or thereabout (provided the Rhodesian problem is solved) be in a position to market acceptable filter cigarettes (for the majority of smokers if need be) with a 'tar' reduction of 40-50% compared with conventional U.K. plain cigarettes and of about 30% compared with the main filter U.K. brands. We also believe that we could then be in a position to tell the public that these brands yield less tar. We think, however, that if we announced this too early we could very easily cause so great a dislocation of the market that we would merely have brought about a demand we could not satisfy.
15. In the meantime there will be the following developments:-
 - (a) The full report of the Harrogate mouse-skin application experiment should be ready for submission to a scientific journal around July/August 1966, and copies will be given at that time to a number of members of the Medical Profession.
 - (b) Sufficient results of tests of smoke condensate from filter cigarettes yielding reduced 'tar' will be available by early 1967.

- (c) Similar results of tests in connection with the incorporation of an additive to filters should be available by mid-1957.
16. In advance of the publication of the Harrogate mouse-skin application report we can say:-
- (a) That the results show:-
- (i) There is a dose response relationship with all the materials tested; that is, the yield of tumours increases with the quantity of material applied.
 - (ii) The 'tar' component contributes substantially to the mouse-skin carcinogenicity of 24-hour old smoke condensate.
 - (iii) The neutral fraction accounts for practically all the activity of the 'tar'.
- (b) That the report has revealed the following new information:-
- (i) The mouse-skin carcinogens in cigarette smoke condensate are stable.
 - (ii) These carcinogens are not artifacts produced only on aging.
 - (iii) The semi-volatile constituents of cigarette smoke condensate do not add greatly to the mouse-skin carcinogenicity of the non-volatile constituents commonly called 'tar'.
17. Research work continues on the possible effects of many other constituents of cigarette smoke, such as volatile irritants.
18. Research also continues by fractionation techniques developed at Harrogate, into identification of the fraction or fractions of the 'tar' to which mouse-skin carcinogenicity may be attributable and which it might ultimately be possible to eliminate or reduce selectively in cigarette smoke.
19. We thought it proper at this stage to seek the views of medical men on the relevance, in the human context, of filter cigarettes that are acceptable to those who are going to smoke, but that yield substantially less 'tar' to the smoker.

J.A.C./H.R.D.
24th May 1966.