

TO: MR. D. S. F. HOBSON.

A critical appraisal of B.A.T. research and development programmes is due now and no doubt considerable pruning will prove desirable. Before doing this, however, it would be useful to have your reaction to some specific proposals. These are proposals to strengthen the R. & D. team and proposals for major development projects such as the non-tobacco or all reconstituted tobacco cigarette or possibly the ARIEL Smoking Device. This note is concerned only with proposals to strengthen the team.

In Appendix I are listed a number of apparently disconnected findings which have appeared over the last year or so. They suggest to us that we are approaching the point where some significant advance in smoking and health may be made. The main purpose in these proposals is to put ourselves in a position from which we can move rapidly as further developments indicate the right direction.

We propose the following appointments should be made as soon as possible:

- (a) A scientist skilled in medical science to assist in the direction of bioassay work and the study of the reaction of smoke on smokers.
- (b) An experienced psychologist either as a consultant or full-time.
- (c) A scientist skilled in bacteriology to study the microbiological flora which can grow on tobacco and tobacco products.

Our reasons for each of these proposals are set out in more detail in Appendices II, III and IV. These proposals in themselves would lead to increased revenue expenditure of about £25,000 p.a.

SJG/BGM
2nd March, 1967.

APPENDIX I

SMOKING AND HEALTH : SOME RECENT FINDINGS

1. The Harrogate result that the 24-hour condensate has a greater mouse skin effect than the neutral fraction contained within it shows that the carcinogenic effect of smoke is not simple. It may well be a combination of initiators and promoters, a hypothesis that is well founded on other experimental evidence.
2. The carcinogenic effect of smoke condensate on mouse skin cannot be accounted for by the presence of the benzpyrene known to be there.
3. Folie B, a methyl-cellulose bound sheet, is markedly less carcinogenic to mouse skin than the condensate from cigarettes made from the same tobacco.
4. The spraying of nitrates on tobacco markedly reduces the mouse skin carcinogenic effect.
5. Addition of nicotine to known carcinogens, or to smoke condensate has no effect on the mouse skin carcinogenic effect.
6. There has been significant progress in understanding why people smoke and opinion is hardening in medical circles that the pharmacological effects of nicotine play an important part and that these effects on balance may be beneficial.
7. Methods have been worked out by which the ratio of nicotine to tar can be increased and it has been shown for at least one brand that this ratio can be increased by lowering the tar without adversely affecting consumer preference.
8. Our understanding is growing of the factors influencing the rate of absorption of nicotine by smokers both in the mouth and the lung and of the relationship between rate and site of absorption.
9. Selective filtration of certain smoke components can be carried out. Our understanding of the basic mechanisms involved has been significantly improved.

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APPENDIX I

10. Progress is being made in identifying the substances responsible for the irritant effects of smoke.
11. A promising start has been made to the very difficult problem of measuring taste and relating organoleptic factors to objective measurements.
12. A non-tobacco smoking material has been made from cellulose and nicotine which although some way from being smokable gives smoke significantly less carcinogenic to mouse skin than natural tobacco.
13. The ARIEL Smoking Device is smokable, would probably be safer to smoke than an ordinary cigarette and manufacture now appears feasible.
14. There is evidence that under some conditions tobacco can sustain pathogenic bacteria. There is growing awareness of the possible danger from mould decomposition products.

APPENDIX II

APPOINTMENT OF SCIENTIST SKILLED IN MEDICAL
SCIENCE

Work on the psychopharmacology and pharmacology of nicotine is accelerating. There is now no doubt that nicotine plays a large part in the action of smoking for many smokers. It may be useful, therefore, to look at the tobacco industry as if for a large part its business is the administration of nicotine (in the clinical sense). Two important lines of research are immediately obvious; are there alternatives to nicotine? and is tobacco the best commercial source of nicotine? However, these need not concern us here. The main objective of our research is to make the administration of nicotine better by:

- (a) Reducing undesirable physiological side effects.
- and (b) Making the administration pleasanter or more convenient.

There are, however, two broad classes of nicotine administration which are currently sold:

- (a) Absorption of nicotine in the mouth.
- (b) Absorption of nicotine in the lung.

These are represented, though not exclusively, by two broad classes of smoking articles:

- (a) Non-inhalable.
- (b) Inhalable.

Since the (notionally) non-inhalable - pipes and cigars - are associated less with the worst physiological side effects there is a good case for giving some consideration to non-inhalable cigarettes. Marketing such products would need special care since they would almost certainly be associated with worse side effects if wrongly used by inhalers.

Most cigarettes are dual purpose, aimed for use by smokers who inhale as well as by those who do not. But the elimination of side effects and the accomplishment of the main purpose of nicotine administration - whichever way it is looked at - involve extending and improving our understanding of the basic physiological factors. For study of side effects extensive bioassay facilities are necessary, for the rest, laboratory investigation is already under way. The work of the T.R.C. is, of course,

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APPENDIX II

directly relevant. In all this work, however, our whole approach is unnecessarily limited by the absence from our team of anyone trained in medical science.

The recognition of the biological basis of smoking and particularly the publicised side effects means that physiological testing has become a permanent part of the tobacco industry. If we are quick to realise this we can probably get permanent advantage from the situation. The massive type of mouse skin test ought properly to be left on a contractual basis but if we can move away from these massive tests towards more enlightened procedures with a higher technical content we could with great advantage undertake biological research and testing ourselves. There would be some advantage in saving or earning foreign currency but the main advantage in so doing would be to retain for ourselves the knowledge and experience necessarily developed in any research programme and, of course, to retain the key staff.

The possibility of bringing such knowledge and experience - along with the chemical and psychological expertise we should have - to bear on 'taste and smell' product problems is quite exciting. This is a field of science in its infancy and to get in on the ground floor would improve our competitive chances both in the tobacco industry and beyond.

APPOINTMENT OF EXPERIMENTAL PSYCHOLOGIST

There appear to be four recognisable types of smoking behaviour (Tomkins Amer. J. Pub. Health Dec. 1966): Habitual smoking, smoking producing enhancement of desirable feeling or emotions such as enjoyment and excitement, smoking producing a decrease in undesirable feelings such as anger, fear and shame, and finally addictive smoking. These recognisable types of smoking behaviour can be explained in terms of one or more of several reasons why people start smoking or continue to do so:

- (a) Psychopharmacological action of nicotine.
- (b) Conditioned reflex.
- (c) Sensorimotor aspects
e.g. "Something to do" "occupational movement" etc.

If this analysis is correct, important conclusions can be drawn with respect to marketing. It is also a fair assumption that there will be no unique solution to problems of cigarette design. A good deal of pre-market judgement on the sensory testing of new brands must also be reconsidered. Starting with taste and flavour assessment the work of a research psychologist in our industry could obviously be far reaching. We had Dr. Harper as a consultant psychologist for some time and he was very stimulating and encouraging but limited entirely to sensory testing. A psychologist with a more experimental-clinical approach would have been more useful, in particular in replacing subjective sensory tests by other objective tests. It is this type of psychologist we now wish to engage.

APPENDIX IV

APPOINTMENT OF BACTERIOLOGIST

In addition to taste and flavour and elimination of side effects some evidence is accumulating that the whole basis of tobacco processing should be reconsidered from the viewpoint of processing material which can, under some conditions, sustain pathogenic bacteria and moulds with possibly harmful pyrolysis products. It would appear wise that a man skilled in bacteriology should be recruited to R. & D.E. and given the initial task of studying the microbiological flora on tobacco and tobacco products and if necessary advising what modifications or precautions should be introduced into various manufacturing operations.