

SMOKING AND HEALTH

The object here is to consider B-A.T. policy on research into health aspects of cigarette smoking. The observations made are intended as a basis for discussion around a central theme of research policy.

I understand that the present policy for the United Kingdom is that all research work concerned with health and smoking is done on an Industry basis as far as possible and that all immediately relevant information is communicated to the Industry no matter how it is obtained. For example, I understand it would be contrary to this policy for biological research to be carried out on a Company basis.

If this statement and interpretation of current policy is not correct this serves to underline the first need - that the policy shall be clearly formulated and communicated. If there has been a change in policy, or if it is more fluid than has been indicated, it underlines the need for some provision for continuous interpretation and the flexible development of our research policy. I suggest that research policy should, in fact, be reviewed once or twice each year in some representative manner which relates it to a practical programme:- a research policy committee?

The accumulating evidence for the influence of smoking on health now clearly threatens the future of the Industry. The evidence for the causal influence of smoking on lung cancer rests largely on statistical epidemiological studies and by more general consideration against the whole background of medical science. This evidence is supported to a minor extent by mouse-painting experiments. For the effect of smoking on circulatory disease the evidence is more directly experimental, but as far as lung cancer is concerned I think it would be wise to plan our future policy on the assumption that the statistical evidence will become stronger year by year.

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Faced with this problem the Industry can react in several ways. For examples:

1. The companies involved can attempt to elucidate and to solve the problem of producing a completely safe cigarette by scientific research.
2. The situation itself can be utilised to promote short term speciality sales or to reorient smoking habits.
3. The companies can increase, redirect or widen their advertising and public relations activities.
4. Individual companies can diversify financially, commercially and technically.

Apart from the last of these, I understand the present policy is aimed to contribute along all these lines on an Industry basis and, particularly, for example, to eliminate exploitation of the situation by companies promoting short term objectives with health claims. B-A.T., however, is operating outside the U.K. and it is legitimate in any case to consider whether there are alternatives to the present policy. Research work can be used and is being used in connection with the pursuit of all these lines, and clearly the same experimental work can be used in certain circumstances to pursue different commercial objectives. For convenience these approaches are considered separately.

1. The question to be answered here is whether B-A.T. could or should do more on direct research into the health problem, or whether we should stimulate additional work or an expansion of current work being carried out by T.M.S.C. As mentioned above, it is considered that the mouse-painting experiments play only a minor part in the case against smoking, and I think that this evidence is likely to become less important rather than more. At present it looks likely that Harrogate can refine the mouse-painting technique and, in the absence of anything more promising, our support for the current work planned there is fully

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justified. It is likely that they will be successful in refining this technique and in this event there will be immediately a big demand for their animal test services. It would be very easy to plan a useful programme of tests based even on our present knowledge of the components of cigarette smoke. If it is considered essential to contain all mouse-painting experiments at Harrogate, then I think we could make a case immediately for planning this extension considerably. There are some things, however, we would like to see done as quickly as possible - for example, the examination of the phenols as possible co-carcinogenic agents, or the immediate production of low B.P. cigarettes. If it were agreed to do these, should this extension of activity be carried out elsewhere than Harrogate? The answer need not necessarily affect the general policy but would mean that we could speed up the work. For example, if resources in Canada were used we could fairly quickly obtain some information on some specific fraction of tobacco smoke. By the time then that Harrogate had refined their technique we would have some answers that stood a 50% chance of being acceptable to us in the light of the Harrogate refinement. All this assumes, however, that mouse-painting is important. My own view is that it might be worthwhile as a short term project which can be pursued quite quickly, but that if funds are limited it would not get the highest priority. All experiments based on mouse-painting in the absence of a good deal of further biological work are bound to be a long way removed from the central problem of producing a cigarette safe for man. There is a great gap involved in the interpretation of evidence related to animal skin tumours and cancer of the lung in man.

Meanwhile, there is still a considerable amount that can be done. Ideally, we would like to establish further biological tests before considering a programme based on smoke. For example, tests for carcinogenicity in other animals, co-carcinogenicity and tests for irritation, for example, could be investigated by techniques other than animal experiments and that these techniques (possibly tissue culture for example) might best be utilised away from Harrogate. In this event

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the question whether tests are best done on an Industry basis or on a Company basis should be resolved on the grounds of expediency. In either case, even the broad current policy need not be violated.

It might be suggested that our current Company facilities should be immediately redirected towards the central problem. I think that this suggestion has some merit but it should be clearly understood that most of the research work being carried out at Southampton is as much directed towards health as towards any other problem. Much of our present programme of work is aimed to understand the factors involved in the combustion characteristics of cigarettes and their relation to the chemistry of smoke. The present programme can be bent a little in some directions with advantage to cover phenols, polycyclics, aldehydes, etc., but generally I think there is no part of the present research programme which should be neglected. If it were decided that the health question has become more urgent than I would recommend extending our present work rather than replacing it with anything else. We could, for example, with advantage double our benzpyrene assay facilities and also increase our general facilities on gas chromatography. I think that we could usefully increase the effort by 3 or 4 graduates which would increase our revenue expenditure by about £30,000 per annum. Coupled with this we should require to utilise further modules in the building and, if we were not to affect our other programme, this would mean an increased capital expenditure of around £10,000 in the first year. If it were decided to make animal testing immediately available on an independent basis, this could be used within our programme to an extent, I would guess, of around £10,000 in the first year.

There is one relevant biological test which might be developed quite quickly: the Dalhamn technique for measuring ciliary inhibition. The chances of success here appear to me to be fairly high and I think this should certainly be developed somewhere and cigarette smoke investigated in this connection. If we were to break with the present policy concerning animal tests I would recommend that serious

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consideration should be given to undertaking this work at Southampton. This would involve recruiting a physiologist and support staff. Assuming this were agreed and there were no local obstacles, I think it would represent quite a big step forward. The presence of a physiologist among us and a viable, however small, physiological programme would enable us better to formulate the centralised research problem and thus play a better part in the direction of the work, whether carried out by the Industry or the Company. This suggestion would increase revenue expenditure by around a further £15,000 per annum, and would require capital expenditure around £30,000.

Although I certainly have very little knowledge of T.M.S.C. and the Harrogate experiment, I have the impression (which could be quite wrong) that something much more creative should be organised. This appears to me to require two organisational changes; first the direction should be on a permanent basis and second there should be a suitable budget with some freedom to operate inside it.

Underlying our whole approach to this question is the tacit assumption that there will be discovered a technical situation which can be remedied within the framework of the present business. For this reason, of course, work on FCL and solvent extraction is directly relevant. However, it may be found ultimately that there is in fact no small fraction or individual component of cigarette smoke which can be indicted but that the whole smoke or perhaps nicotine itself is harmful. In these circumstances quite clearly some thought should be given to the broader aspects of the smoking habit and what is likely to replace it. It is certainly insufficient, in my opinion, for any tobacco company at the present time to rely for its future on scientific research into smoking and health.

2. In present circumstances there is bound to be considerable short term activity with respect to modified cigarettes. This need not be considered as entirely on a gimmick level. A low benzpyrene cigarette could be produced quite quickly; the work we are doing on filters and on filter-tow in particular will give us some control over

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the smoke; the work on filling power is also relevant. We could then, without making health claims and with commercial advantage, move quite readily into this field. We are currently investigating the differences in the chemistry of the smoke from pipes, cigars and cigarettes, and the present intention is to continue this line and to investigate the effect of the shape of pipes, etc. I think it would be wrong to redirect much of the effort we are making in this direction at present. Although we could, for example, speed up our work on extracted stem or expand it into a general consideration of "irritation" at this level, I do not think irritation by smoke constituents can be tackled on a long term research basis until a suitable biological test has been developed, but we could probably do something empirical using "taste and flavour" techniques. This tacit acceptance of the essential conclusions from the statistical evidence seems to me to be a sensible and useful approach and to be complementary to our main research and development theme.

3. Whatever use is made of the facts by the Company or the Industry, it is our job to state the position as objectively as we can. I think there is little point in reproducing experimental work if we consider it creditable. There is still a possibility, however, that physiological benefits may be demonstrably associated with smoking. Any newsworthy technical achievement in any field can also be used in this connection. When Lucozade came under pressure Beechams most successfully countered proposed legislation by announcing their penicillin discovery (for the second time!).

4. The direct contribution of research to diversification is generally outside the scope of this note but the emphasis and urgency can best be understood by clearly appreciating the size of the central problem. It is also relevant to point out that a significant increase in research effort in any field is likely to result in a bonus, unpredictable though it may be, which could be commercially exploited. For example, in recent years perhas the major commercial advance in

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pharmacy has been associated with the administration of drugs by inhalation. The planned administration of drugs by using cigarettes would bear examination. Again, work on the physiological effects of nicotine might well lead to analogous therapeutic possibilities. But any bonus, however big, is insufficient in itself to justify the research programme.

If it were decided to extend considerably research in the health field, on whatever basis, one of the difficulties if not the prime difficulty would be obtaining suitable qualified staff. It is worth a thought that in certain circumstances financial diversification could be used to provide incidentally^a ready-made nucleus of a biological research unit which could be redirected towards our own problems.

The total expenditure on research in the tobacco industry is relatively small. Present difficulties are forcing the industry towards a more technical basis. While I would expect the industry to spend large sums on diversification and on public relations, increased expenditure on "health" research would not appear unreasonable and would begin to measure up to the problem.

In summary, any policy changes or developments can only be considered against the whole background of Company activity but, if it were decided as a matter of policy to enlarge the research effort on smoking and health, I would suggest the following:

- i) The resources of Harrogate should be planned for considerable extension immediately.
- ii) The T.M.S.C. programme should be extended and the laboratories put into a position for creative work by giving the directing staff permanent positions and a suitable budget.
- iii) The work of R.& D.E., Southampton, should be expanded to accelerate work particularly on phenols, polyphenols and polycyclics.
- iv) On the short term level the study of the influence of stem and stem extracts on taste and flavour could be speeded up without increased expenditure.

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- v) If the B-A.T. policy were modified to allow biological work on a Company basis I would recommend that we use outside animal testing on low B.P. cigarettes immediately.
- vi) In the event of such a policy change I would recommend that we tackle ciliary inhibition at R.& D.E., Southampton.

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APPENDIX

List of current work at R.& D.E. directly relevant, i.e. excluding FCL and FPI.

<u>Job No.</u>		<u>Estimated Annual Expenditure</u> £000	
2013	Taste factors and chemical composition	2	
2061	(Completed) Fermentation survey	0.5	
3100	Whole project	40	
3200	Whole project	25	
3311	Carbonylic ompounds	}	
3312	Basic		
3313	Aroma		
3315	Phenol assay		15
3331 } 3312 }	Chemical basis for sensory test		
3340	(In part) Taste and flavour of whole smoke		
4146	Extraction of stem	4	
4231	Sand blasting paper		
4234	Hollow mouthpieces		
4261	Filter tow		
4262	Chemical testing of filter tows	15	
4412	Sensory difference testing	5	
5006	Polysaccharides	4	
5013	Pectins	3	

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