

# MANIPULATION

**The Story of Imperial Tobacco and its  
Cigarettes**

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*PHYSICIANS FOR A SMOKE-FREE CANADA  
MÉDECINS POUR UN CANADA SANS FUMÉE*

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## Table of Contents

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<b>FOREWORD</b> .....	<b>1</b>
Background.....	1
Sources of information .....	1
Bibliographical note.....	2
<b>MANIPULATING TOBACCO, SMOKE AND SMOKERS: THE STRUCTURE OF TOBACCO INDUSTRY RESEARCH AND MARKETING</b> .....	<b>4</b>
Head office and happy foot-soldiers: BAT, Imperial Tobacco and their employees .....	4
The marriage of research and marketing: .....	6
Cigarette engineering: the secret science.....	8
Group R&D professional staff numbers .....	8
Future Technical and Specialists meetings will be organized according to the following schedule: .....	9
Building a research agenda through gentle and not-so-gentle persuasion.....	10
The marketing challenge: selling addictive poison.....	11
Phase 1, the 1950s, 1960s and 1970s: better living through chemistry.....	14
Phase 2, the 1970s and 1980s: the tar derby.....	18
Phase 3, the 1980s and 1990s: light, mild and other deceits.....	24
Phase 4: Into the 1990s: in search of the holy grail .....	31

## FOREWORD

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### BACKGROUND

On 8 May 1998, the State of Minnesota reached a historic settlement with the tobacco industry.<sup>1</sup> One of the many terms of the settlement which were favourable to public health was the agreement extracted from the tobacco industry to place nearly all the tobacco industry documents produced during the trial discovery proceedings on the public record. This resulted in some 40 million pages of documents becoming public: 33 million at a document depository in Minnesota and another 7 million at a depository in Guildford, England. The Guildford depository is in the offices of British-American Tobacco (BAT) and is exclusively documents from the operations of BAT and its affiliates.

The flow of previously secret tobacco industry documents into the public domain started as a trickle in 1989 and 1990 at a trial in Montreal. It grew into a river during the 1990s as a result of both tobacco industry leaked documents and documents disclosed through a series of liability actions in the United States during the 1990s. With the Minnesota settlement, the flow of documents has turned into a flood. The documents cited in this paper are but a teaspoonful of this flood, drawn from the tea-cup's worth of material accessed to date.

### SOURCES OF INFORMATION

Information for this paper is drawn principally from documents selected by Physicians for a Smoke-Free Canada from the Guildford depository in March 1999. Imperial Tobacco Limited sells 70% of the cigarettes smoked in Canada and is an affiliate company of British-American Tobacco. The Guildford depository therefore has special relevance to tobacco control in Canada.

BAT has not made the 7 million pages of documents at Guildford available electronically, but most of the approximately 10 000 pages selected in March from the depository are now available on the World Wide Web, including all of the Guildford documents referred to in this paper. These documents can be consulted at <http://www.tobaccopapers.org>.

Initially, most of the 33 million pages of documents in the Minnesota depository could be accessed only at the depository site. However, the settlement agreement stipulated that the documents were to be made readily available. To comply with the agreement, tobacco companies have been making more and more of the documents electronically available on tobacco company websites. The Brown and Williamson site has special relevance to Canada<sup>2</sup>. These tobacco company websites are also a valuable source of information for this paper. Many of the documents are also available in readily accessible and searchable form at a website managed by Michael Tacekofsky, <http://www.tobaccodocuments.org>.

In 1988, Canadian tobacco companies contested the newly-adopted *Tobacco Products Control Act*. At the trial that followed in Montreal in 1989 and 1990, many tobacco industry documents became public. Some of these will also be referred to in this paper. While these documents are not on the World Wide Web, they are publicly available at the Canadian National Clearinghouse on Tobacco and Health in Ottawa.

Many other previously secret tobacco industry documents are also publicly available. Most of these became available during the 1990s in the United States and are of special relevance to that country. They became available through a series of leaks from tobacco industry sources and various liability trials. While they are not a major subject of this paper, they are a valuable source of supplementary information, and most are available in electronic form on the World Wide Web. They are spread across dozens of websites, but electronic references to all of these websites can be found at a master tobacco website, the Tobacco Bulletin Board Service, <http://www.tobacco.org>.

#### **BIBLIOGRAPHICAL NOTE**

Most of the tobacco industry documents referred to in this paper are internal letters, memos and other documents that were never intended for publication. Most do not lend themselves to normal standards of scientific referencing. Moreover, public access to most of the documents is available only at the depositories in Minnesota and Guildford, and on the World Wide Web. Since most readers will not be able to visit either Minnesota or Guildford, the World Wide Web

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<sup>1</sup> To see the full text of this settlement agreement, visit website <http://www.rkmc.com/settlement.pdf>

<sup>2</sup> Brown and Williamson website: <http://www.bw.aalatg.com>

will be the *only* way that most readers will be able to access these documents. The reference system used in the document is therefore constructed to provide ready electronic access to the documents cited.

Readers of the World Wide Web version of this paper will simply be able to click on a key word or phrase in the citation of a particular document, which will take them directly to the document in question. Readers of the printed version of this paper will find a short citation to each electronic document in footnotes. The footnotes will show a World Wide Web address (URL) and an unambiguous reference to the document cited. In most cases, this will be the Bates page number range of the document cited, followed by the exact Bates page number of the citation. Bates page numbers are sequential numbers assigned to the thousands or even millions of pages of documents produced in a legal proceeding. If Bates numbers are not available, but the document is electronically available on a website, the URL will be given, along with some other unambiguous reference to the document.

Still other documents referred to (principally those from the 1989-90 trial in Montreal) will not be available on the World Wide Web, but will be available at the National Clearinghouse on Tobacco and Health in Ottawa, or other libraries and institutions. For these documents, full references will be supplied in footnotes.

## **Manipulating tobacco, smoke and smokers: the structure of tobacco industry research and marketing**

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### **HEAD OFFICE AND HAPPY FOOT-SOLDIERS: BAT, IMPERIAL TOBACCO AND THEIR EMPLOYEES**

British-American Tobacco Company (BAT) is a global corporation. While Philip Morris sells more cigarettes than BAT, BAT has more cigarette brands and more manufacturing operations in more countries than any other tobacco company. So, by these latter criteria, BAT is the largest cigarette company in the world. Its Canadian affiliate, Imperial Tobacco Limited (ITL) is most certainly the largest in Canada. ITL supplies 70% of the cigarettes sold in Canada: its two leading brands (Player's and du Maurier) dominate the market.

The operations of BAT and ITL are therefore of special interest to Canadians. BAT also directs ITL's American cousin, Brown and Williamson. Both Brown and Williamson and BAT were defendants in the Minnesota law-suit, and documents from both operations were opened to the public by the Minnesota settlement agreement. The veil of secrecy that previously shrouded the operations of BAT and ITL is slowly being lifted.

What is being revealed is a fascinating story of just how these companies manage to keep selling an addictive and dangerous product of questionable purpose to millions of Canadians.

Selling cigarettes requires a powerful command of both marketing and product research – these are both complex undertakings, requiring highly educated and highly skilled people. A first hurdle faced by corporate managers is therefore how to attract such people, keep them, and keep them motivated to research and market a product that most people with the required skills would regard one with no redeeming social value. Policy laid down at BAT's Chairman's Advisory Council No. 2, held in Hot Springs, Australia in 1976 sets forth the general approach:

Because there is sensitivity in respect of our products per se we should be particularly vigilant in ensuring that we remain beyond reproach with respect to the ordinary duties both to consumer and to our workers. For example, we should be particularly sensitive to industrial hygiene factors, environmental noise, ordinary industrial toxic hazards, etc.

In general we should maintain our companies in the public mind as socially useful and responsible – as suppliers, as buyers, as employers, etc.<sup>3</sup>

In the research and marketing departments, this general policy translated into more specific action to encourage and reward creativity, just as long as this creativity was directed to the challenging problem of selling more cigarettes. A select group of researchers and marketers from affiliate companies, including ITL, were invited to The Montague Arms, in Beaulieu, Hampshire, England to a joint R&D/marketing conference in 1984. Instructions to participants from the BAT Group Research and Development Centre (GRDC) included the following:

You should feel free to be as creatively free-ranging as possible in your product type proposals. Technical constraints usually apply to the realisation of any innovative notion, but they should be regarded as open for discussion and not as existing and binding.<sup>4</sup>

Such openness was only within the confines of the company. It was recognized that employees might be quizzed about their work at social gatherings. As early as 1962, BAT issued explicit instructions for Heads of Departments to pass on to employees about what to say, and what not to say about the tobacco business to friends, acquaintances and the press.

It is thought desirable that responsible members of the staff should be provided with a short list of points on the smoking and lung cancer question as a guide to them when the matter arises in private conversation. I enclose a copy of the note prepared for this purpose numbered 19.

As you will see, the note does not set out to refute the causal hypothesis but does raise a number of points which call for further research. It is not intended that the staff should use the note to initiate conversations on the subject but they should have sufficient information to enable them to deal with the matter in a reasonably informed and responsible manner should it crop up. If the press approach any member of the staff on this subject the questioner should, as in the past, be referred to me as official spokesman of the Company.

We do not wish the note to fall into outside hands and it is therefore being given a restricted distribution to Heads of Departments. You are asked to pass on the points contained in the note to such members of your staff as you consider should

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<sup>3</sup> <http://www.tobaccopapers.org/documents/psc39.pdf>, Document: pp. 110069859-896. Citation: p. 110069867.

<sup>4</sup> <http://www.tobaccopapers.org/documents/psc60.pdf>, Document: pp. 100501581-783. Citation: p. 100501679.

have the information. This should be done either verbally or by circulating the note and ensuring its return to you.<sup>5</sup>

There followed three closely written pages of the now-familiar tobacco industry party line.

Subsequently, Mr. McCormick, the British author of the above memorandum, commended the Canadian tobacco industry for applying the “party line” in a public forum in 1963.

The Canadian Minister of Health called a Conference in Ottawa on November 25<sup>th</sup> and 26<sup>th</sup> to consider the whole smoking and health question and, prior to the Conference the Canadian Tobacco Industry submitted a brief which sets out very well the scientific evidence that contradicts or does not support the anti-smoking charges.<sup>6</sup>

Recognition of the importance of employees, and what they might or might not say, continued well past the 1960s. Here is citation from a 1979 corporate marketing document.

Induction training with new recruits, and re-training of existing staff should be expanded so as to include skills in publicity, so that they may be effective ambassadors of the company, whenever necessary.<sup>7</sup>

#### **THE MARRIAGE OF RESEARCH AND MARKETING:**

The close link between research and marketing was well-recognized within BAT. It was clearly recognized that marketing should drive research, and not the other way around. This was eloquently expressed on many occasions in the documentation for the 1984 R&D/Marketing conference. A Canadian participant observed:

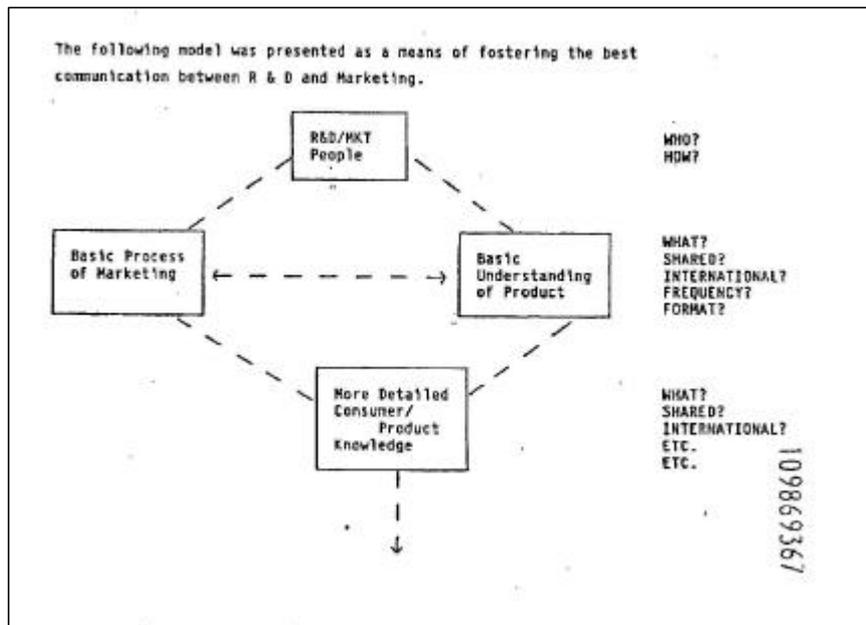
Forcing new brand development into a premature marriage with product technology will quickly see us selling what we can make instead of what people want to buy.<sup>8</sup>

<sup>5</sup> <http://www.tobaccopapers.org/documents/psc45c.pdf>, Document: pp. 100427855-858. Citation: p. 100427855.

<sup>6</sup> <http://www.tobaccopapers.org/documents/psc45f.pdf>, Document: pp. 100427884-888. Citation: p. 100427884.

<sup>7</sup> <http://www.tobaccopapers.org/documents/psc45b.pdf>, Document: pp. 100427839-854. Citation: p. 100427841.

<sup>8</sup> <http://www.tobaccopapers.org/documents/psc60.pdf>, Document: pp. 100501581-783. Citation: p. 100501841.



The interdependence between marketing and research was explained at a 1984 BAT joint conference for marketing and R&D. (PSC 69)

At a conference of the BAT Research Policy Group in Montreal in 1989, one participant wryly observed:

Experience demonstrates that the meticulous engineering of the market positioning of such innovation is as important as the care devoted to the product's physical design. In its absence invention becomes simply sort of a circus trick – a technically clever and often vivid demonstration of virtuosity, serving no useful purpose.<sup>9</sup>

It was also recognized that in an environment where marketing opportunities were becoming more and more circumscribed through bans and restrictions on advertising, product characteristics would assume greater importance.

...with the increasing loss of communications media the product will have to support the brand more and more...<sup>10</sup>

Accordingly, research and marketing will be examined together in the remainder of this section.

<sup>9</sup> <http://www.tobaccopapers.org/documents/psc57.pdf>, Document: pp. 401058418-425. Citation: p. 401058424.

<sup>10</sup> <http://www.tobaccopapers.org/documents/psc60.pdf>, Document: pp. 100501581-783. Citation: p. 100501728.

## CIGARETTE ENGINEERING: THE SECRET SCIENCE

Tobacco product research and development is a complex undertaking. Its leading practitioners hold advanced degrees in chemistry or related sciences and have years of experience in their profession. Tobacco scientists, with very few exceptions, work inside the tobacco industry, and little of their work is known outside their companies.

Within BAT, however, research and development activities are structured in order to foster and encourage global scientific debate, information sharing and exchange among company scientists all around the world. Scientific exchange is specifically encouraged through corporate policies and structures, formal and informal meetings and other formal and informal means of communication.

A 1976 policy statement sought to maximize sharing of information on research among all the affiliate companies.

Marketing and consumer research, manufacturing improvements and product development techniques and methodology should be exchanged freely. Although the bigger facilities in the operating companies might be expected to make bigger inputs, the size of these facilities is in proportion to company sales, weighted for market sophistication, and all companies will therefore benefit appropriately.<sup>11</sup>

The structure of R&D within BAT is designed to further reinforce the spirit of intra-company global teamwork. At the centre is the Global Research Development Centre (GRDC) in Southampton, familiarly known within the company as “the Centre”. Affiliate companies in Canada, the United States, Brazil and Germany also house substantial Research and Development Departments. In 1990, BAT employed over 400 research and development professional staff world wide.<sup>12</sup>

GROUP R&D PROFESSIONAL STAFF NUMBERS		
	1989	1990
U.K.	101	101
U.S.A.	91	99
Germany	51	51
Brazil	106	107
Canada	45	45

<sup>11</sup> <http://www.tobaccopapers.org/documents/psc39.pdf>, Document: pp. 110069859-896. Citation: p. 110069882.

<sup>12</sup> <http://www.tobaccopapers.org/documents/psc59.pdf>, Document: pp. 401058538-556. Citation: p. 401058541.

Senior representatives of each of these five departments met regularly as the Research Policy Group. One notable meeting of this group took place in Vancouver in 1989.<sup>13</sup> A favourite form of communication was research meetings of various descriptions. These took place frequently and covered many subjects. In a period of eight months in 1989 and 1990 nine technical and specialist meetings were planned.<sup>14</sup>

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FUTURE TECHNICAL AND SPECIALISTS MEETINGS WILL BE ORGANIZED  
ACCORDING TO THE FOLLOWING SCHEDULE:

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1.	Product Testing	Southampton	Dec 89
2.	ETS External Programme	Canada	Nov 89
3.	Flavour	Germany	4 Q 90
4.	Product development incl. Ammonia technology, filters, sidestream, etc	U.S.A.	Mid 90
5.	Tobacco Biotech	Europe	4 Q 90
6.	SRG	Copenhagen	Oct 89
7.	SRG	Canada	Apr 90
8.	Fundamental Research Review (incl. CORESTA position)	Southampton	Mar 90
9.	RPG	Germany	Jun 90

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In keeping with the policy of information sharing within the global company, each of the five R&D divisions shared its internal research papers on request with all the others. Each of the five divisions also prepared a summary of its activities and shared these reports with the others on a regular basis. ITL in Montreal produced progress reports semi-annually, including the one for July – December 1993.<sup>15</sup>

The Canadian research and development department was regarded as exemplary within BAT. The head of GRDC wrote this in a 1983 trip report.

I found that striking changes have occurred in the last eighteen months under the new Vice President, Dr. P J Dunn – aided very significantly by the secondment from GR&DC of Dr. S R Massey as Research Manager.

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<sup>13</sup> <http://www.tobaccopapers.org/documents/psc54a.pdf>, Document: pp. 401058290-425.

<sup>14</sup> <http://www.tobaccopapers.org/documents/psc64.pdf>, Document: pp. 401096829-843. Citation: p. 401096831.

<sup>15</sup> <http://www.tobaccopapers.org/documents/psc8.pdf>, Document: pp. 402415168-217.

We have, in fact, just received Canada's Work Programme for 1984-86 which runs to 185 pages. Hopefully, this document will inspire B&W and Australia to produce the equivalent – which would then mean that the five CAC Companies and GR&DC would all have a fully documented and circulated Programme.<sup>16</sup>

#### **BUILDING A RESEARCH AGENDA THROUGH GENTLE AND NOT-SO-GENTLE PERSUASION**

Formal communication, through correspondence, trip reports and other means, was also regularly exchanged between “the Centre” and the affiliate companies. Sometimes it bore an approving tone, like this 1976 letter from BAT CEO P. Macadam to ITL CEO Paul Paré.

As we discussed at Chelwood , I quite accept the conclusions of your further deliberations after Hot Springs.

There is no point in pursuing the matter if you cannot see a positive result.<sup>17</sup>

Sometimes the tone was more disapproving as in the views of A.L. Heard, a senior BAT UK scientist, expressed in a 1990 trip report on Ames tests being carried in the Montreal laboratories.

By contrast the work on biological activity currently confined to Ames test is without foundation (other than as a simple screen).<sup>18</sup>

Demonstrating consensus among the principals in the operating companies was also an important team-building strategy, as demonstrated by these extracts from a 1981 memorandum addressed from one BAT UK scientist (Dr. M. Oldman) to another (Mr. A.L. Heard).

The content has been checked out with Erhart Kohn [Germany] and Pat Dunn [Canada] and their comments incorporated.

I am sure that we can count on Bob Gibb's [Canada] general approval...

On this occasion I am convinced of the commitment of the principals (Kohn, Dunn and myself) to achieve a genuine international integration of effort.<sup>19</sup>

<sup>16</sup> <http://www.tobaccopapers.org/documents/psc71k.pdf>, Document: pp. 109874670-685. Citation: p.109874673.

<sup>17</sup> <http://www.tobaccopapers.org/documents/psc39.pdf>, Document: pp. 110069859-896. Citation: p. 110069892.

<sup>18</sup> <http://www.tobaccopapers.org/documents/psc32.pdf>, Document: pp. 401103335-338. Citation: p. 401103338.

The closed nature of the tobacco science community and the frequent international meetings also spawned informal communication and friendship which also probably served to improve working relationships as well.

We thoroughly enjoyed every minute in every place, but our vote for the best of all is the area around Lynton, and we are most grateful to you for pointing us in that direction.

Please don't fail to give us a call whenever you're in Montreal. We'll enjoy seeing you.<sup>20</sup>

BAT's internal tobacco science research community also had a need for a de facto in-house university. A 1979 document entitled "What ITL expects from GRDC" stated:

An important and needed contribution from GRDC as it exercises this role, is to serve as a sort of Group tobacco science university, i.e. the source of scientific information peculiar to the tobacco industry which is not obtainable from educational systems or other readily available sources.<sup>21</sup>

While publication of some of the company scientists' work was allowed and even encouraged, much of it stayed within the confines of the company. For example, a Canadian-based researcher requested permission from GRDC to publish 5 papers. This was the decision:

The paper on depth of insertion for various cigarettes seems to confirm the Kozlowski type ideas for low delivery products and could be problematic. I think it is unwise to publish any findings of our studies on smoking behaviour on any smoking products.

In summary, I recommend publishing only papers 1, 2 and 3. Will amplify if necessary next week in Montreal.<sup>22</sup>

#### **THE MARKETING CHALLENGE: SELLING ADDICTIVE POISON**

Skills in tobacco marketing, unlike skills in tobacco chemistry, are transferable into and out of the tobacco industry. So the world of tobacco marketers is not as closed as that of tobacco chemists. But it is still far from an open discipline, with most of

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<sup>19</sup> <http://www.tobaccopapers.org/documents/psc43.pdf>, Document: pp. 105399669-673. Citation: p. 105399670-671.

<sup>20</sup> <http://www.tobaccopapers.org/documents/psc1c.pdf>, Document: pp. 102687045-047. Citation: p. 102687045.

<sup>21</sup> <http://www.tobaccopapers.org/documents/psc68.pdf>, Document: pp. 109841963-965. Citation: p. 109841963.

<sup>22</sup> <http://www.tobaccopapers.org/documents/psc71e.pdf>, Document: pp.109874611-626. Citation: p. 109874611.

its strategies, research and techniques remaining within the walls of each company, including BAT. And tobacco marketers faced challenges peculiar to the tobacco industry. In a structured creativity conference held in 1984 participants were handed a list of prime product issues and constraints that they would have to deal with in devising product development and marketing strategies. Among these were:

Only 15% of the tobacco available in a cigarette is actually used (as drawn and inhaled smoke) by the smoker.

Cigarettes produce a large amount of debris and smell.<sup>23</sup>

Moreover, the companies' own scientists concluded that tobacco created dependence:

The majority of smokers are to some extent dependent on smoking but that behavioural, social and psychological factors may be as important as those of a pharmacological nature.<sup>24</sup>

(4) In view of the known toxicity and the strong association of smoking and disease I believe any attempt to increase the smoking habit is irresponsible.

*In 1976, BAT's senior scientist, Sidney Green, spoke internally against increasing smoking.*

In trying to sell cigarettes, marketers faced further adversity. They would have to contend with the views of Dr. S.J. Green, a leading scientist within the company, expressed in 1976:

In view of the known toxicity and the strong association of smoking and disease I believe that any attempt to increase the smoking habit is irresponsible.<sup>25</sup>

<sup>23</sup> <http://www.tobaccopapers.org/documents/psc60.pdf>, Document: pp. 100501581-783. Citation: p. 100501682.

<sup>24</sup> <http://www.bw.aalatg.com>, Document: pp. 650015112-650015304. Citation: pp. 650015115.

<sup>25</sup> <http://www.tobaccopapers.org/documents/psc30a.pdf>, Document: pp. 110067843-848. Citation: p. 110067845.

To compound the fact that the product was wasteful, dirty, smelly, addictive and poisonous, marketing restrictions were multiplying around the world, removing many of the tools of the marketer's trade.

An overview of the progressive trends in restrictions on advertising up to 1990, derived from the predictions of Marketing Advisers, concludes that the prospects are poor for the following reasons. It is estimated that among the 50 most important BAT markets, the number completely free of all bans and restrictions will have diminished from 8 (in 1979) to 2, and that those with complete bans on all media will have increased from 8 to 22. Among the remainder, there will be, over the period, an increase in the number of media banned or restricted in various ways.<sup>26</sup>

But tobacco marketers seem to thrive on adversity. The more obstacles on the course, the more they relish the chase.

What we must do, and over which we have obvious control, is to develop plans and take appropriate action well ahead of the bans or restrictions we anticipate. Alternative means of communication and related strategies must be sought and established.<sup>27</sup>

... it should be remembered that governments can produce markets by endorsing a particular aspect of the cigarette, e.g., charcoal filters.<sup>28</sup>

The various constraints and opportunities were assessed by Imperial Tobacco in 1974. They concluded that their marketing department had to be reorganized to meet the challenges. Here is how Donald Brown, a senior ITL marketing official (later to become ITL's CEO), described the changes.

Well, we were, up until that point in time, had a long track record of losing market share and we reviewed our whole attitude toward the marketplace and concluded that since cigarettes are all sold for the same price and virtually have the same product structure – sorry, profit structure, that it didn't mean – we really didn't care which brand people chose as long as they chose our brand. So we viewed the brand management structure as creating internal competition and therefore inefficiencies. So we went to what we referred to as a central planning structure whereby we addressed the market as a whole and strategically placed brands in various parts of the market to address market opportunities and avoid overlap or internal competition. Essentially, that's the reason for the change.<sup>29</sup>

<sup>26</sup> <http://www.tobaccopapers.org/documents/psc45b.pdf>, Document: pp. 100427839-854. Citation: p. 100427840.

<sup>27</sup> <http://www.tobaccopapers.org/documents/psc45b.pdf>, Document: pp. 100427839-854. Citation: p. 100427854.

<sup>28</sup> <http://www.tobaccopapers.org/documents/psc33.pdf>, Document: pp. 110069675-681. Citation: p. 1100696677.

<sup>29</sup> Brown RD, Testimony. Quebec Court of Appeal, Montreal. Case Numbers 500-09-001296-912 and 500-09-001297-910. 1991. Joint Record, Volume 8, p. 1128.

Research and marketing were organized to meet the challenges of making and selling cigarettes in the increasingly hostile environment of the 1960s to the 1990s. In the following sections we will examine how they did it and how well they did.

### PHASE 1, THE 1950s, 1960s AND 1970s: BETTER LIVING THROUGH CHEMISTRY

In the 1950s and early 1960s cigarettes were much simpler than they are today. Here is how they were described by Taj Hirji, a UK-based BAT researcher, in a 1982 presentation.

These 'real' cigarettes, as they are sometimes affectionately called, were plain cigarettes with the blend being all important. These cigarettes had:

- low permeability paper
- high deliveries
- good taste and flavour.<sup>30</sup>

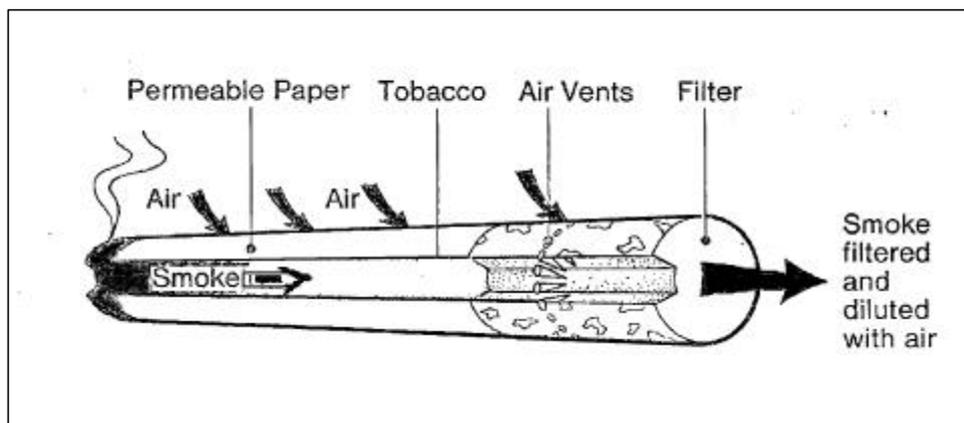
But in the 1960s, things began to change. In the same paper, Taj Hirji describes the first change.

The first major change in the design of the cigarette was introduced for the convenience of the smoker and rightly so. This was the introduction of the filter tips so that the tobacco bits would not get into the smoker's mouth and that his lips would not stick to the cigarette. That this innovation reduced the cost of the cigarettes for the manufacturer (filters in general being cheaper than tobacco) only speeded up the introduction. But filters, to start with, were not introduced for their delivery reductions potential and were low pressure drop filters which did not complicate the control procedures. By the mid 60s, 50% of the U.K. market was accounted for by filter-tipped cigarettes.<sup>31</sup>

Filter cigarettes caught on equally quickly in Canada, and for much the same reasons. With the publication of the major reports on smoking and health in 1962 in the United Kingdom and 1964 in the United States, both governments and manufacturers were under pressure to do something to respond to the health scare. The tobacco industry had two major strategic responses in the 1960s and 1970s. One was make cigarettes that were safer, and the other to make cigarettes that **appeared** safer. Here is how it was expressed in the minutes of a BAT research conference held in 1968, as amended by Dr. R.A. Sandford, one of the participants.

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<sup>30</sup> <http://www.tobaccopapers.org/documents/psc76.pdf>, Document: pp. 102393928-946. Citation: p. 10293942.



*The first slide from a 1982 BAT conference on Tobacco Combustion describes the modern cigarette.*

It was also recognized that there are two types of health products possible and that they should be distinguished.

Health image (health reassurance cigarette) such as low tar–low nicotine cigarette which the public accepts as a healthier cigarette and

Health-oriented cigarette which has minimal biological activity; for example, one which would yield a near zero reading in the mouse skin painting test.<sup>32</sup>

A great deal of effort was expended from the 1960s to the 1980s to produce “health-oriented” cigarettes, but with little success. There was even less success in selling them. Much more success was had with “health image” cigarettes. The remainder of this section will examine some of the work around “health-oriented” cigarettes while the following section will examine some of the early successes with “health image” cigarettes.

The Canadian tobacco industry explained its commitment to the health-oriented approach in a presentation to a Minister’s conference in 1963.

The Royal College of Physicians report states that the substances in tobacco smoke that may be injurious to health have not been identified. It is, of course, in the best interest of the tobacco industry to continue to seek any such substances and if any be found, to remove them. Vigorous research to this end has been undertaken and will continue.<sup>33</sup>

<sup>31</sup> <http://www.tobaccopapers.org/documents/psc76.pdf>, Document: pp. 102393928-946. Citation: p. 10293942.

<sup>32</sup> <http://www.tobaccopapers.org/documents/psc48a.pdf>, Document: pp. 100427930-962. Citation: p. 100427930.

<sup>33</sup> <http://www.tobaccopapers.org/documents/psc45f.pdf>, Document: pp. 100427884-888. Citation: p. 100427887.

Was the Canadian tobacco industry sincere in this assertion that research was directed at finding ways to reduce harmful substances? Perhaps so. But there were other views within Imperial Tobacco. At a BAT conference in England on smoking and health the previous year, Dr. R.M. Gibb, Head of Research and Development for ITL at the time had this to say (as paraphrased in the minutes of the meeting):

We really needed some means of knowing not what the facts were but what people thought the facts were. On the question of how to sell a gimmick, certainly on the Canadian market you stated what you thought people wanted to be told and you made money by doing so.

...

Mr. R.M. Gibb pointed out that the industry had made one very obvious reaction to the health question in that filters had been put on all over the world at various levels of filtration, but nobody seemed to know whether this had the desired effect and it was not a very easy thing to find out.<sup>34</sup>

A vast number of biological research projects were undertaken by BAT from the 1960s to the 1980s. The results, however, did little to improve public health. The situation was summed up in the minutes of a 1982 research meeting, held in Montebello.

Despite intense research over the past 25 years, the biological activity of smoke remains a major challenge.<sup>35</sup>

Major effort was expended in painting tobacco smoke condensate on the backs of mice and other rodents. But the research results did not point the way towards a safer cigarette. Quite the opposite.

An internal 1980 research paper concluded:

Cigarette smoke is believed to exhibit primarily [cancer] promotor activity (mouse skin painting and long-term animal inhalation studies would tend to support this view), however even if cigarette smoke contains only a low level of [cancer] initiator potential there is a need to assess this factor.<sup>36</sup>

A short time later mouse-painting experiments were discontinued. In 1981, a Canadian researcher reported:

<sup>34</sup> <http://www.bw.aalatg.com>, Document: pp. 650344433-492. Citation: pp. 650344474 and 650344483.

<sup>35</sup> <http://www.bw.aalatg.com>, Document: pp. 512107222-243. Citation: pp. 512107227.

<sup>36</sup> <http://www.bw.aalatg.com>, Document: pp. 650031856-880. Citation: pp. 650031878.

This is the first report of mutagenic activity in sidestream smoke and deserves to be repeated by us or another laboratory interested in the mutagenic activity of tobacco smoke.

*In 1981, ITL's Montreal Laboratories made the first report that sidestream smoke was mutagenic.*

Due to a policy decision to stop long-term mouse skin painting tests, BAT, Southampton will not be doing the above long-term test on this series, and a comparison with mutagenicity will not be possible.<sup>37</sup>

Mouse skin painting might have fallen out of favour, but there was still promise that Ames tests for mutagenicity would yield results which were meaningful indicators of cancer-causing properties. The ITL R&D division did much of the work on the Ames tests. However, the results invariably showed that cigarette smoke – including second hand smoke - was mutagenic.

A clear dose-response relationship has been obtained between the total nicotine alkaloid (TNA) content and mutagenicity of the smoke condensates obtained by the Ames test.<sup>38</sup>

... all three calculation procedures enable the same conclusion to be drawn, viz., that mainstream and sidestream smoke condensates from flue-cured tobacco cigarettes are similar in terms of Ames mutagenicity.<sup>39</sup>

A biological conference in 1984 reviewed progress in using the Ames test to assess the biological activity of tobacco smoke. The sensitivity of the test was not questioned – but the wisdom of using this information was.

Cigarette brands can be readily distinguished. This is in contrast with the early mouse skin painting results. An unfortunate side-effect is that sensitivity increases the probability of an Ames League Table appearing. A further unfortunate examination is that, to date, it is not uncommon for BAT brands to have a higher result than those from the opposition.<sup>40</sup>

The newer ventilated ('light') cigarettes were shown by the Ames tests to be more mutagenic, a finding that indicated possibly greater cancer-causing potential.

<sup>37</sup> <http://www.bw.aalatg.com>, Document: pp. 682012184-191. Citation: pp. 682012188.

<sup>38</sup> <http://www.bw.aalatg.com>, Document: pp. 682633402-403. Citation: pp. 682633403.

<sup>39</sup> <http://www.bw.aalatg.com>, Document: pp. 682633408-414. Citation: pp. 682633411.

<sup>40</sup> <http://www.tobaccopapers.org/documents/psc69.pdf>, Document: pp. 109869352-369. Citation: p. 109869357.

Ventilation brings about an increase in mutagenicity which with Canadian cigarettes was not significant. German cigarettes however showed a significant increase.<sup>41</sup>

Despite the fact that internal research had indicated that nicotine may be mutagenic and cocarcinogenic, nothing further was going to be done about it.

Although the cocarcinogenic effect of nicotine is still unresolved, no further action is proposed.<sup>42</sup>

Of course, in internal documents, the need to tread carefully in reporting findings of internal studies on the health effects of cigarettes was recognized. After talking to his North American colleagues in Montreal and Louisville in 1979, Dr. L.C.F. Blackman, head of GRDC, noted a number of points that would help yield positive support for GRDC from the North American affiliate companies. Among them was the following:

We have become more 'politically sensitive' in the areas of smoking and health, e.g. reporting of 'nasties' and biological studies generally. ('Remember what pays all our salaries'.)<sup>43</sup>

Of course, the best way of avoiding having to report on biological studies would be to stop doing them. And that is what happened. Studies examining carcinogenesis and mutagenesis would fade away in the 1970s and 1980s, and disappear almost completely by the 1990s. In the meantime, there were products to be developed and markets to be conquered.

## **PHASE 2, THE 1970s AND 1980s: THE TAR DERBY**

In Canada and the United Kingdom, the tobacco industry convinced governments that publishing tar levels of cigarettes in "league tables" or on cigarette packs should be by voluntary agreement. Limited epidemiological evidence available at the time suggested that some reduction in hazard could occur if tar levels were lower than the 25-35 mg per cigarette that prevailed at the time. Public health authorities therefore looked favourably on the printing of tar levels on packages as

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<sup>41</sup> <http://www.tobaccopapers.org/documents/psc69.pdf>, Document: pp. 109869352-369. Citation: p. 109869357.

<sup>42</sup> <http://www.tobaccopapers.org/documents/psc69.pdf>, Document: pp. 109869352-369. Citation: p. 109869358.

<sup>43</sup> <http://www.tobaccopapers.org/documents/psc101.pdf>, Document: pp. 109841972-989. Citation: p. 109841984.

a way of achieving the public health objective of reducing hazard: consumers could find and choose the lower yield products.

This worthy public health reasoning was laudable, but naïve. The tobacco industry had, and still has, a diametrically opposed objective, to sell as many cigarettes as possible. Moreover, they had, and still have, a near monopoly on tobacco science. While public health authorities saw publication of tar figures as a means to a public health end, tobacco scientists saw it differently. They saw a challenge. How could they publish tar numbers, make lower tar products and still achieve the business objective of selling lots of cigarettes? As we shall see, no effort was spared by the tobacco industry in meeting this challenge, and meet it they did. More cigarettes were sold. Along the way, however, public health objectives were subverted.

We have already seen that there was little meaningful internal work undertaken on the health hazards of products beyond identifying that such hazards existed. Failing to act on this knowledge (or even share it with governments and the public) was not the only way in which public health was compromised.

Smokers may have chosen 'light' cigarettes because they thought they represented a health advance, but history (and industry documents) show otherwise. The introduction of light cigarettes can be seen to have made the cigarette market larger than it otherwise would have been in three ways – by inducing more people to smoke, fewer people to quit and more people to restart. From the documents, it is clear that Imperial Tobacco paid attention to all three, and succeeded to some extent in encouraging more people to start smoking and in reducing or delaying quitting.

However, all of our data and especially starting rates among people over the age of 15 suggest that starting is up since the '76 launch of 'lights'.<sup>44</sup>

We have evidence of virtually no quitting among smokers of these brands, and there are indications that the advent of ultra low tar cigarettes has actually retained some potential quitters in the cigarette market by offering them a viable alternative.<sup>45</sup>

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<sup>44</sup> <http://www.tobaccopapers.org/documents/psc93.pdf>, Document: pp. 102686857-870. Citation: p. 102686861.

<sup>45</sup> Response of the market and of Imperial Tobacco to the smoking and health environment. Imperial Tobacco Ltd., p. 2 (15102). Montreal Court of Appeal, Case Numbers 500-09-001296-912 and 500-090001297-910. 1991. Joint Record, Exhibit Number AG-41. Volume 76, pp. 15101-15110.

We must better understand short-term quitters (taking account of information available from B&W) and what brands they restart with and why.<sup>46</sup>

There clearly were markets for low-yield cigarettes and their possible health hazards were not going to block their development. Only technical challenges remained, and BAT R&D was equal to the challenge. The first technical challenge on the road to lower yield products was to create them. Until the mid-1960s, yields were typically in the 25-35 mg range. Publication of tar tables and/or tar yields on packages created a powerful competitive incentive to lower tar levels. Researcher Taj Hirji summarized the situation.

So then, we had to produce cigarettes to satisfy not only the smoker but also the various national governments. This started the trend towards lowering the deliveries. For example, between 1965 and 1970 when the first tar and nicotine league table was published in the U.K., the sales weighted tar delivery dropped from 31 mg to 24 mg (22% drop) and currently the sales weighted tar delivery is running around 16 mg.

Filters were now being used for their delivery reduction potential. Thus from being an inactive part of the cigarette, filters became an active component of the cigarette. Higher pressure drop filters were now being employed and the movement from using high denier filament to lower denier filament started. Papers with higher permeability were being used and in order to get even lower deliveries, tip ventilation was introduced.

Thus from manufacturing a cigarette in which the blend was largely the only active part and its subjective attributes being the most important aspect to be ensured, we moved to a product which had four active components.<sup>47</sup>

Research to modify blends, paper, filters and tipping paper was vigorously pursued in BAT laboratories around the world, including in Montreal. Some flavour for the research they conducted is provided in these excerpts from a 1971 annual report of the Montreal research laboratories.

Object: To reduce the Canadian tar levels of du Maurier K.S. to 20 mg whilst maintaining smoke nicotine yields and decreasing irritation.

...

Object: To examine the effects of Ecusta High Porosity paper, at three different porosities, on the smoking characteristics of Matinée tobacco.

...

Object: To reduce Canadian Tar levels of Player's Filter cigarettes to 20 mg or lower and to maintain a nicotine

<sup>46</sup> <http://www.tobaccopapers.org/documents/psc69.pdf>, Document: pp. 109869352-369. Citation: p. 109869362.

<sup>47</sup> <http://www.tobaccopapers.org/documents/psc76.pdf>, Document: pp. 102393928-946. Citation: p. 10293942-943.

level of 1.3 – 1.35 mg without perceptibly altering the subjective smoking characteristics.<sup>48</sup>

Tip ventilation was an important means used to reduce tar deliveries. Early ventilation techniques were unsophisticated, using pins to punch holes in the filter during the manufacturing process. This technique was described by one researcher as “... unprofessional and lacking in control but it has been used extensively on successful brands.”<sup>49</sup> Sophistication increased rapidly, however. Quickly, the whole industry moved to invisible laser perforation. The same researcher described the more sophisticated process.

The filter tips on completed cigarettes are perforated by a laser beam built into the tipping attachment. This method of ventilation can cover a range of 10%-80% with reduced variability compared with cigarettes produced from pre-ventilated materials.

The use of tip ventilation is increasing world-wide and can now be regarded as a normal cigarette design feature. It is in use on commercial cigarettes covering a range of 0.1-17.0 mg tar.<sup>50</sup>

The efforts to produce lower tar cigarettes produced results. An Imperial Tobacco internal market trend report showed that the ‘average’ tar rating (known in the industry as ‘sales weighted average tar yields’) declined from 17.0 mg per cigarette in 1973 to 13.5 mg per cigarette in 1981.<sup>51</sup>

A BAT research employee, N. Davis, visited ITL in 1981 and summarized Canadian product development.

They feel that their product range covers all consumer needs (more completely than the competition).

Their view is that the main change over the next few years will be a steady increase in the proportion of ventilated cigarettes. At the end of 1980 12% of ITL’s products were ventilated. All the major brands will be ventilated by 1983, taking the total to 50%.<sup>52</sup>

Globally, BAT was engaged in a full-scale tar derby to beat the competition to ensuring that every market nook and cranny was filled with a new lower-delivery product from BAT. In 1979, instructions were issued from BAT headquarters to

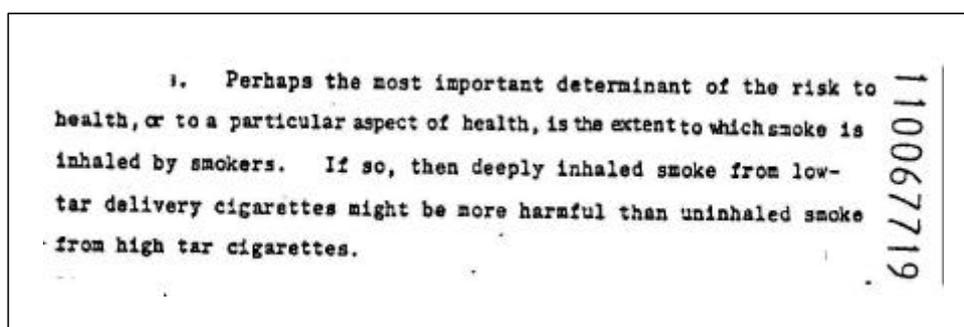
<sup>48</sup> <http://www.bw.aalatg.com>, Document: pp. 650364741-650364839. Citation: pp. 650364802-811.

<sup>49</sup> <http://www.tobaccopapers.org/documents/psc72.pdf>, Document: pp. 100575014-062. Citation: p. 100575046.

<sup>50</sup> <http://www.tobaccopapers.org/documents/psc72.pdf>, Document: pp. 100575014-062. Citation: p. 100575046.

<sup>51</sup> <http://www.tobaccopapers.org/documents/psc93.pdf>, Document: pp. 102686857-870. Citation: p. 102686861.

<sup>52</sup> <http://www.tobaccopapers.org/documents/psc93.pdf>, Document: pp. 102686857-870. Citation: p. 102686861.



*Twenty years ago, a BAT senior scientist warned that because low-tar cigarettes are inhaled more deeply, they might be more deadly.*

offices around the world to embark on a crash programme of tar reduction. The following reasons were given:

In view of mounting concern and action on health issues by Governments and international organizations such as WHO, UNCTAD, etc. and, indeed, likely competitive response, it is essential that our export and locally manufactured products should yield acceptable deliveries both in the eyes of public organisations, and in the interests of reassuring smokers themselves. These deliveries should be available at levels which do not put our international brands at risk in the event of League Table publications, or other forms of publicity which may be generated at national or international levels. Furthermore, publicity which highlights differences between export and local deliveries, to the detriment of the latter, is likely to increase, and could well have an increasingly adverse effect on the total BAT business.<sup>53</sup>

There followed specific instructions to reduce tar yields of various brands by amounts ranging from 2 mg to 10 mg.

Imperial Tobacco was particularly successful in selling lower tar products with an eye to catching smokers who would rather 'switch' than fight their addiction. Dr. L.C.F. Blackman, head of GRDC, commented on this success in his report of a 1979 visit to Canada.

General agreement that ITL success in new launches (seven consecutive above 0.5% market share) is the result of intensive effort to identify 'meaningful market segments', i.e., gaps or opportunities for switching.<sup>54</sup>

BAT and ITL could sell low-tar products that gave the appearance of being healthier, or at least less hazardous. But were they really? The question vexed at

<sup>53</sup> <http://www.tobaccopapers.org/documents/psc50a.pdf>, Document: pp. 100428068-077. Citation: p. 100428068.

<sup>54</sup> <http://www.tobaccopapers.org/documents/psc101.pdf>, Document: pp. 109841972-989. Citation: p. 109841979.

least a few industry scientists. Dr. F.J.C. Roe, a scientific consultant to BAT UK offered some reflections on the subject in 1978.

Perhaps the most important determinant of the risk to health or to a particular aspect of health is the extent to which smoke is inhaled by smokers. If so, then deeply inhaled smoke from low-tar delivery cigarettes might be more harmful than uninhaled smoke from high tar cigarettes.<sup>55</sup>

Dr. R.M. Gibb, head of the Research and Development Division at Imperial Tobacco in Montreal was also concerned by this important question and expressed a number of his concerns in a 1975 letter to his colleague at BAT, Dr. S.J. Green.

...To some 'modified cigarette' means 'safer cigarette.' To others, 'modified cigarette' means 'changed in response to current governmental pressures.' viz. Lower tar and nicotine, low nicotine, low CO, etc.

...

I do not know what the Guideline 'Research into and development of new products is the key strategy to solving the smoking and health problem' is supposed to mean. I do not think it will ever be 'solved' but R&D can do some of the things needed to help cope with it.

...

PRODUCT DEVELOPMENT (to cope with current governmental S&H pressures)

This is what our management really expects R&D to do. Things like marketable low tar and nicotine cigarettes, marketable innovations like programmed filter, heat shrink filter, etc. Essentially a 'numbers' game with innovation in the means to control tar and nicotine. In Canada we also will be expected to achieve a gradual reduction in tar and nicotine across the board from the top down, at a pace no faster than the government pressure requires.

...

The question as to whether such cigarettes are really safer does not matter, although privately even our Health people wonder whether low tar and nicotine cigarettes are a good idea.

...

DEVELOPMENT OF A SAFER CIGARETTE

Is this really a Group R&D objective? If so, what is meant by "safer" and is the definition credible in the minds of fair-minded informed critics of smoking?

Apart from some rankings of a few different kinds of smoke by mouse skin painting, which have not given any useful clues about how to design a safer cigarette (other than to use those formulations that rank better by this test) are we not really at square one in this task?<sup>56</sup>

<sup>55</sup> <http://www.tobaccopapers.org/documents/psc23.pdf>, Document: pp. 110067715-723. Citation: p. 110067719.

<sup>56</sup> <http://www.bw.aalatg.com>, Document: pp. 500006650-500006657. Citation: pp. 500006650-655.

Tar values (as measured on machine tests) could be lowered. Market segments could be filled. Cigarettes could be sold. But scientists worried that the low-delivery cigarettes were not demonstrably less hazardous. As it turned out, the market researchers spotted another worrisome trend. By the early 1980s, growth in the low-tar segment had stalled. New strategies would be needed to keep selling cigarettes.

### **PHASE 3, THE 1980s AND 1990s: LIGHT, MILD AND OTHER DECEITS**

Canadian marketers faced some special constraints that narrowed options compared to other markets.

There are no international brands.

The Canadian market is a uni-taste market. With the exception of menthols, it is almost entirely flue cured Virginia.

All Canadian cigarettes cost the same...<sup>57</sup>

The market for lights had reached a plateau and Imperial had to find out why in order to protect its market. Although most Canadian smokers agreed that smoking was dangerous for anyone, and smokers wished that they weren't smoking, Imperial had found 'lights' a successful way of keeping them in the game.

Pre-lights, these concerned consumers had a limited range of options open to them – essentially quit or cut down.

...

Fortunately for the tobacco industry, neither of these two approaches proved very successful for smokers. In 1976, although 41% had tried to quit and 26% were ready to give it another go, the actual rate of quitting 'within the past 6 months' was fairly stable at a little less than 2%. Fewer than this made it to a year. Despite the vast numbers of smokers trying and intending to cut down, the claimed rate of daily usage rose from 20.5 to 21.1 cigarettes a day (1971-76). Our calculated daily usage rose from 21.1 to 23.8 cigarettes per day (1971-76).<sup>58</sup>

Lights introduced in the 1970s did not lead to overwhelming health advances, real or perceived.

A brand like Medallion (1 mg K.S.), positioned to be 'synonymous with ultra mildness', condemned by 99.2% as 'smoking air' manages to achieve only 5.9 on 'health' on a 9

<sup>57</sup> <http://www.tobaccopapers.org/documents/psc60.pdf>, Document: pp. 100501581-783. Citation: p. 100501588.

<sup>58</sup> <http://www.tobaccopapers.org/documents/psc60.pdf>, Document: pp. 100501581-783. Citation: p. 100501583-584.

point scale. Light brands have not, apparently, been the smoking and health panacea that their success might lead us to expect.<sup>59</sup>

### ***Total Product Design***

What was to be done? As early as 1976, reference had been made to total product design as a research objective to square the circle of marketing needs and product development. It was described this way:

Aim: The advancement of technical knowledge necessary to combine the component of cigarettes to produce predictable effects.

...

To this end, it is necessary to understand the ways which are available for controlling the production, composition and filtration of smoke in any required direction.

It is necessary to find out what effects are important in consumer terms.

...

There is also increasing pressure from many authorities to measure and report the delivery of increasing numbers of smoke constituents, either on the packet or in league tables.

...

The concept of total product design is now well known.<sup>60</sup>

Well known or not, the concept would not actually come into widespread use for another ten years, by which time it would no longer be known by the same name. But the simultaneous manipulation of all product and marketing variables to sell more cigarettes would become the predominant form of doing business in BAT, including ITL, during the 1980s and 1990s.

Dr. P.J. Dunn, Vice-President of Research and Development at ITL, was quick to understand the concept. He hosted an initial conference bringing together the marketing and research branches in 1984, reminding delegates why they must work closely together:

He restated his opening comments that we sell brands that are made up of image, advertising and product and that R&D/Marketing group must focus on a balance of these areas, without taking one area out of context relative to the total. It is in

<sup>59</sup> <http://www.tobaccopapers.org/documents/psc60.pdf>, Document: pp. 100501581-783. Citation: p. 100501591-592.

<sup>60</sup> <http://www.tobaccopapers.org/documents/psc30b.pdf>, Document: pp. 110067849-862. Citation: p. 110067857.

this way that we can better identify and successfully meet our consumers' needs.<sup>61</sup>

Dr. Dunn had previously formulated some ideas on all of the product variables that could be examined. He summarized them in 1983 as 18 suggestions under the title, "Making the smoke work harder". Some of the topics he listed included:

- Sensory effect
- Impact and taste
- The pH in smoke
- Free and bound nicotine ratios
- What factors control human ability to change T/N ratios?
- Policy on elasticity and/or human perception of mouthful of smoke relative to standard machine delivery.<sup>62</sup>

### ***The Elastic Cigarette***

Of the ways identified by Imperial Tobacco's chief scientist, Pat Dunn, to make the smoke work harder, two merit special attention – elasticity and nicotine. Elasticity was the ability to give the smoker more than the league table value promised. The technical definition of elasticity, given in a 1993 ITL research report, follows:

If the tar delivery increases in direct proportion to the increase in puff volume, the product is inelastic (i.e. elasticity = 1), while if the tar delivery increases faster than puff volume, elasticity > 1.<sup>63</sup>

The effect of elasticity would be to make it even easier for smokers to get higher yields of nicotine and other constituents than shown on the packages. There was little doubt that this was 'cheating' the league tables. Consequently, making cigarettes elastic would require some elastic morality. In 1984, ethical concerns were raised by a BAT researcher (David Creighton):

Is this an ethical thing to do? People who buy an 8 mg product expect to get 8 mg. ... If a declaration that this product is elastic is made (which is the honest thing to do) then it could upset the apple cart.<sup>64</sup>

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<sup>61</sup> <http://www.tobaccopapers.org/documents/psc69.pdf>, Document: pp. 109869352-369. Citation: p. 109869369.

<sup>62</sup> <http://www.bw.aalatg.com>, Document: pp. 512107064. Citation: pp. 512107064.

<sup>63</sup> <http://www.tobaccopapers.org/documents/psc8.pdf>, Document: pp. 402415168-217. Citation: p. 402415194.

<sup>64</sup> <http://www.tobaccopapers.org/documents/psc60.pdf>, Document: pp. 100501581-783. Citation: p. 100501670.

Another participant at the same meeting, Mr. G.O. Brooks, less preoccupied with ethics, proposed that the best solution would be to cheat without appearing to do so.

However, we should strive to achieve this effect without appearing to have a cigarette that cheats the league table. Ideally it should appear to be no different from a normal cigarette thus reducing the likelihood of a competitive challenge. It should also be capable of delivering up to 100% more than its machine delivery. I have chosen this ratio because I believe that anything more than this would lack credibility from a consumer's point of view. Thus an 8 mg product capable of delivering 15-16 mg would allow the current full flavour smoker to continue to smoke with reassurance but no loss of pleasure.<sup>65</sup>

It did not take long to resolve the moral dilemma around elastic cigarettes. Elastic cigarettes were thought to involve elastic morality in June 1984. Less than a month later we learn that elastic cigarettes – and elastic morality – had been accepted by the company as good business practice.

From a research and product development viewpoint, the proposition of designing a cigarette of high taste to tar ratio, which responds positively to human smoking behaviour has been agreed to be acceptable. This is necessary if we are to explore and understand what consumers are seeking from the cigarettes they buy.

...

The marketing policy concerning this type of product is not clear but it is believed it will depend largely on the degree of elasticity in the design and how overtly this elasticity is achieved. The consensus is that small improvements in elasticity which are less obvious, visually or otherwise is likely to be an acceptable route.<sup>66</sup>

It was also recognized in 1984 that product solutions, like more elastic cigarettes, would take on more importance as advertising restrictions continued to grow. It would be necessary, however, to keep fooling the machines in order to overcome current legal constraints.

Smokers have disappointed us in that they have not chosen to smoke twice as many 10 mg cigarettes if they changed from 20 mg products. Thus in order to reinforce the primary pleasures of smoking, I have proposed to make it easier for smokers to take what they want from a cigarette which might well have a low delivery when smoked by machine which overcomes current

<sup>65</sup> <http://www.tobaccopapers.org/documents/psc60.pdf>, Document: pp. 100501581-783. Citation: p. 100501729.

<sup>66</sup> <http://www.bw.aalatg.com>, Document: pp. 650377652-853. Citation pp. 650377654, 650377655.

legal constraints and to enhance the sensations from the first few puffs.

I expect more restrictions to be applied to the freedom of tobacco companies to promote and advertise their products, so that the contribution of image to the total offer will tend to fall. In this case the actual smoking qualities of the product in the pack and the design and quality of the packing have to be even more important than it is now.<sup>67</sup>

Research and development departments were then challenged to see if elastic products could be produced. Their own experiments showed that machine smoking parameters did not correctly estimate actual smoking behaviour. Studies in the United Kingdom<sup>68</sup> and Canada<sup>69</sup> in 1984 and 1995, respectively, produced very similar results among people smoking their own brands of cigarettes. Imperial Tobacco discovered that smokers inhaled more smoke more frequently than the standard machine settings. The average smoker inhaled more smoke with each puff than the machine setting (the machine was set at 35 ml, but British smokers inhaled 40 ml and Canadians 47 ml). The average length between puffs was also shorter than the machine setting of 58 seconds (42 seconds in the U.K. and 41 seconds in Canada).

Another happy observation made on the road to more elastic cigarettes was that the lower-tar/lower-nicotine cigarettes made from money-saving expanded tobacco were even more elastic:

It is noticeable that as the deliveries reduce, the elasticity tends to increase. This is not an unexpected result since it is believed that both ventilation and expanded tobacco contribute to elasticity and the levels of both these factors increase as we go lower in deliveries.<sup>70</sup>

A graph shown at a 1984 nicotine conference showed that the lower the leagueable tar rating, the higher the relative kick delivered to the smoker. The actual relative nicotine delivery to smokers increased exponentially as daily nicotine availability (number of cigarettes smoked per day times machine deliveries of

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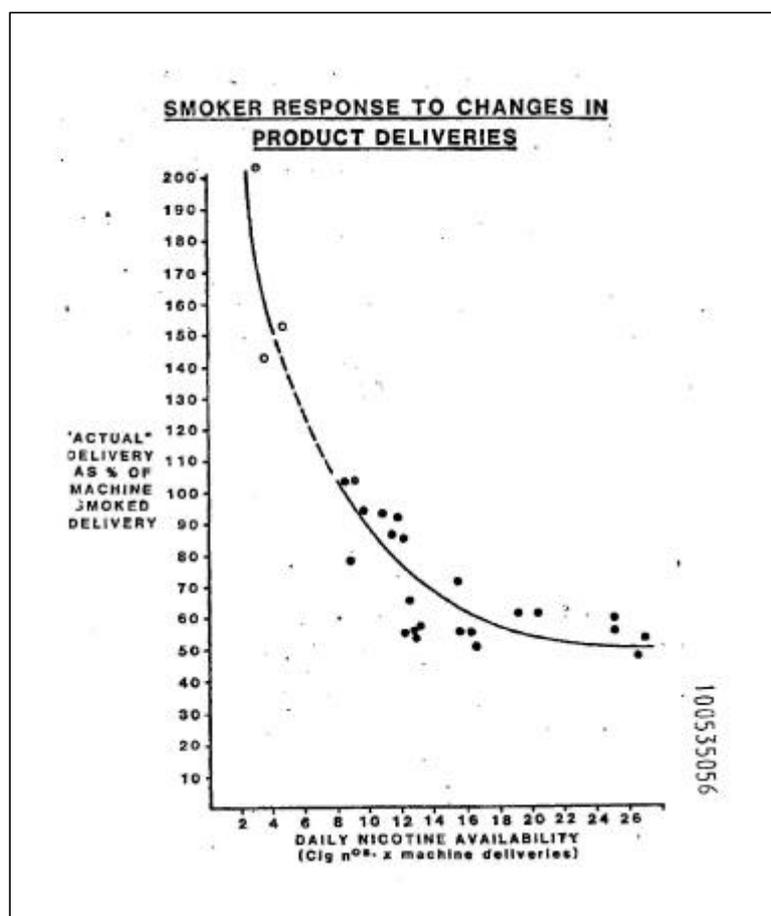
<sup>67</sup> <http://www.tobaccopapers.org/documents/psc60.pdf>, Document: pp. 100501581-783. Citation: p. 100501710.

<sup>68</sup> <http://www.tobaccopapers.org/documents/psc76.pdf>, Document: pp. 102393928-946. Citation: p. 10293929.

<sup>69</sup> <http://www.bw.aalatg.com>, Document: pp. 566628451-464. Citation: pp. 566628457.

<sup>70</sup> <http://www.tobaccopapers.org/documents/psc76.pdf>, Document: pp. 102393928-946. Citation: p. 10293930.

BAT discovered that smoking-machine tests produced significant underestimates of the dose actually delivered by low-nicotine cigarettes.



nicotine) decreased. For the lowest availability (2 mg per day), smokers were actually getting 200% of delivery predicted by standard nicotine deliveries.<sup>71</sup>

There were two possible approaches to giving smokers more 'sensation' for less tar:

- a) make a fixed weight of smoke work harder
- b) to design more 'elastic' cigarettes<sup>72</sup>

But smokers don't like having to puff too hard, so designers were reminded that

...the consumer must be able to achieve this 50 ml puff with the same level of effort as he is used to on his conventional product.<sup>73</sup>

<sup>71</sup> <http://www.tobaccopapers.org/documents/psc138.pdf>, Document: pp. 100535033-207. Citation: p. 100535056.

<sup>72</sup> <http://www.tobaccopapers.org/documents/psc76.pdf>, Document: pp. 102393928-946. Citation: p. 10293931.

### ***The not-so-secret ingredient: Nicotine***

Nicotine manipulation was also recognized to be of critical importance at the 1984 structured creativity meeting.

High on the list of consumer needs is nicotine, which I believe to be the main motivator and sustainer of smoking behaviour. Without nicotine in sufficient quantity to satisfy the needs of the smoker, the smoker can (a) give up altogether, (b) cut back to a low purchase level, (c) keep switching brands.<sup>74</sup>

BAT discovered that increasing elasticity was one way that they could increase the nicotine that reached the brain (i.e. “bioavailable” nicotine). Because of the different ways in which the lower-delivery ventilated cigarettes burned, when tar levels went down, nicotine would go down relatively less. When assessed in terms of human smoking behaviour as opposed to machine smoking behaviour, the tar/nicotine ratio would be even lower. Not only that, some types of nicotine were found to have a higher impact. Free nicotine (also known as unbound or unprotonated nicotine) was more easily absorbed.

Here are some salient observations that researcher B. Hauser made about ways to deliver more and better nicotine at a 1984 nicotine conference in Southampton.

Products with nominally equivalent nicotine deliveries are assessed as having greater impact if the ratio of free to bound nicotine is increased relative to each other.

...

In terms of product design parameters the use of increasing filter ventilation tends to increase the ratio of free to bound levels of nicotine; the associated filter pressure drop also contributes to this effect. Increasing paper porosity however tends to have the opposite effect to filter ventilation, in addition there are other design parameters that can effect the ratio of free to bound nicotine. In addition, where the smoke velocity is increased by human smoking behaviour this will have the effect of increasing the free : bound nicotine ratio.

These studies indicate how the level of free : bound nicotine levels can be used to modify products through strength perception.<sup>75</sup>

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<sup>73</sup> <http://www.tobaccopapers.org/documents/psc76.pdf>, Document: pp. 102393928-946. Citation: p. 10293930.

<sup>74</sup> <http://www.tobaccopapers.org/documents/psc60.pdf>, Document: pp. 100501581-783. Citation: p. 100501700.

<sup>75</sup> <http://www.tobaccopapers.org/documents/psc138.pdf>, Document: pp. 100535033-207. Citation: p. 1005351346.

Imperial Tobacco and other BAT companies discovered that they could make cigarettes that were elastic and gave smokers satisfactorily high levels of nicotine. The companies could deliver on their marketing promise of satisfaction in a light cigarette.

These cigarettes would be light in name only. Only the smoking machine would get low tar and nicotine yields from such cigarettes. Most smokers would get more tar and much more nicotine than listed on the package. The companies had learned from earlier mistakes. This time smokers would not have to change the way they smoked. Unlike their experiences with early low-tar cigarettes, smokers would not have to perceptibly suck harder on their cigarettes or alter their behaviour in other ways to get the satisfaction they wanted.

Changes in the product should be minimal as far as the smoker is concerned. Thus any innovations should not be intrusive in either appearance, feel or smoke performance. As a rule of thumb, changes of less than 20% are not noticeable to the untrained consumer.<sup>76</sup>

By June 1984, it had been determined that lighter-but-equally-satisfying cigarettes could be made. Still, there was a nagging ethical question. Would it be the right thing to do? Would it be all right to sell cigarettes that were deliberately designed to deliver higher yields than shown on the package? Regardless of whether it was the right thing to do or not, it was done. Research on such products was accepted as policy by July 1984. Making and selling such cigarettes became explicitly part of BAT policy and Canadian tobacco markets by 1989.

#### **PHASE 4: INTO THE 1990s: IN SEARCH OF THE HOLY GRAIL**

Instrumental in the policy evolution and eventual policy shift that would occur was a project proposed by Imperial Tobacco – Project Eliminate, Modify, Neutralize (EMN). It was developed in 1985 and presented to senior BAT staff in 1986.

With EMN, ITL wanted to develop a comprehensive, long-term approach that would expand the market. The minutes of this meeting merit extensive citation.

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<sup>76</sup> <http://www.tobaccopapers.org/documents/psc60.pdf>, Document: pp. 100501581-783. Citation: p. 100501703.

## 1. BACKGROUND

### Rationale

I.T.L., in presenting their concept, believe that many of the constraints currently operating on the tobacco industry would be removed if it were not for the Smoking and Health issue. For example, as a result of the anti-smoking lobby, taxation is increasing and consumption is falling, and young smokers are declining in number. Politicians are not unhappy with these trends. Issues related to Product liability also constrained the industry and all such issue related to Smoking and Health.

### Opportunities

I.T.L. stated that if we could remove Smoking and Health pressures the industry would stabilize and then grow. Productivity and market share were likely soon to 'plateau'.

### Objective

To work towards the discovery of a 'safe' cigarette, 'safe' in the eyes of those who say that the current cigarette is 'unsafe'. Such an objective is, in I.T.L.'s view, market oriented (in that it would expand the market) but is not marketing-oriented, i.e. concerned with short term targets.

### Business Aspects

Any return on investment that led to an increase in smoking should be high.

The potential complexity of the project made it difficult for (non-tobacco) competitors to enter.

### Strategy

Briefly the project is related to a programme of research related to a three tier approach:

1. Eliminate (undesirable chemicals identified by Regulatory bodies) and test for biological activity. A broader interpretation is that noxa would be reduced to threshold levels deemed acceptable.
2. Modify (the cigarette).
3. Neutralize (by vitamins etc.).

which in turn relate to four research areas:

1. Smoke Chemistry – reduction of toxic components
2. Biological Tests (short and long term)
3. Epidemiology
4. Mechanisms of Disease Production

I.T.L. believe that this calls for a Fundamental Research approach (attempting to acquire knowledge that others do not have), but at this stage, have not developed the Research Programme – (Phase 2).<sup>77</sup>

<sup>77</sup> <http://www.tobaccopapers.org/documents/psc89.pdf>, Document: pp. 109875253-263. Citation: p. 109875260-261.

Prior to the meeting, two veteran tobacco scientists, Dr. F.J.C. Roe and Dr. R.E. Thornton provided comments on Project EMN<sup>78</sup> to the new coordinator of GRDC, Mr. Alan Heard.<sup>79</sup> Both were negative in tone, questioning the feasibility of Project EMN. Dr. Thornton participated in the review meeting. Given the negative reviews and Dr. Thornton's participation in the meeting, it is perhaps not too surprising that Project EMN did not receive ringing endorsement from headquarters.

#### CONCLUSIONS

It appeared that there was common ground between the aims of 'EMN' and the R&D strategy for the BATCO Group. However, differences were apparent in:

The BATCO approach is to monitor the scientific literature and statements of regulatory authorities, with a response in line with management's perception of the situation. This contrasts with the all-encompassing approach foreseen by ITL.

The goals for the BATCO programme were typically defined on a five year 'rolling-over' programme which is flexible and is always addressing the latest developments. Longer term goals cannot be defined (those 'selected' today will inevitably change). This contrasts with the work foreseen in Canada (possibly up to 15 years or an even longer time scale).

Further consideration should be given to these issues in the 1986 Research Conference in Sydney (September).<sup>80</sup>

The young Turks from the regions had been sent packing, their project consigned by their bosses in headquarters to that bureaucratic purgatory from which few projects ever return – "further consideration".

Subsequently the British head office would pour even more cold water on ITL's proposals to research safer cigarettes, and even the top brass were involved. BAT's chief executive officer (Patrick Sheehy) wrote to IMASCO's CEO (Purdy Crawford) in December 1986 with a blunt statement of rejection:

We do not believe that there is a sufficiently high chance of a successful outcome to justify committing the very large scale of resources that would be necessary to pursue the direct but arguably over-simplistic approach which your people are proposing. That is why I cannot support this line of research.<sup>81</sup>

<sup>78</sup> <http://www.tobaccopapers.org/documents/psc89.pdf>, Document: pp. 109875253-263. Citation: p. 109875253-259.

<sup>79</sup> <http://www.tobaccopapers.org/documents/who119.pdf>, Document: pp. 501585131-208. Citation: p. 502585175.

<sup>80</sup> <http://www.tobaccopapers.org/documents/psc89.pdf>, Document: pp. 109875253-263. Citation: p. 109875263.

<sup>81</sup> Minnesota depository. BATCO select documents. Box 14. File Number J1755B. pp. 101432832-833.

Now it seemed like Project EMN was really dead. But eventually, some aspects of ITL's research would survive "further consideration" and even the "kill" letter from one CEO to another. One key idea from Project EMN would return in another form a few years later.

Mr. Heard was favourably impressed with at least one key idea in Project EMN, either at the 1986 review meeting or later. He favoured "products that are perceived to be improved by those who criticize our current products". However, even though he participated in the 1986 review meeting, his favourable views were not reflected in the minutes of that meeting, but were expressed clearly in a paper he wrote in 1989, for presentation to the Research Policy Group, meeting in Vancouver in September. The paper is entitled "Strategies for Product Innovation" and is cited here *in extenso*.

The cigarette business is clearly in need of Product Innovation if its classical product life is to be extended. Whilst minor innovations such as new brands (based on imagery rather than product or on minor product changes (deliveries, flavours, physical dimensions) can influence market share, they do not address the fundamental issues facing the smoker – or those who influence the smoker.

In 1985, I shared my simple view of the marketing/technical challenge facing the industry. At that time, I identified 'Lost Ground' as the area that should be addressed by the R&D function of our Group. I was referring to the ever-growing sector of 'quitters, or 'reducers'. I still believe that, to at least arrest the decline of use of our product, we must consider major product innovations.

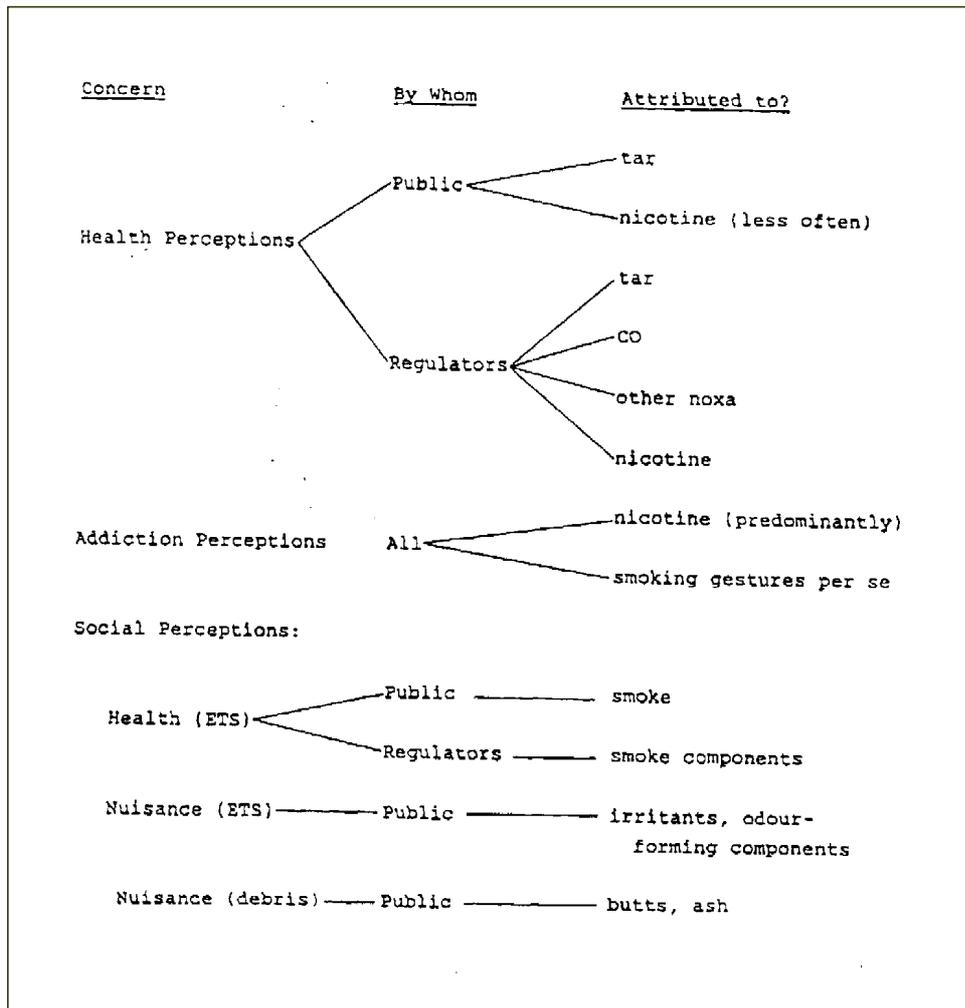
Whatever our personal beliefs about our product may be, we must detach ourselves and see the product from the eyes of consumers and regulators. We have to respond to their perceptions of cigarettes and smoking.

Echoing the objectives of ITL's project EMN of 1986, we need to create products that are perceived to be improved by those who criticise our current products.

What are these perceptions? Based on the statements of Regulatory bodies or on the growing mass of consumer data now being gathered on our product, it is possible to summarise as follows.

Cigarettes are perceived as pleasurable and satisfying but also as unhealthy, socially unacceptable, addictive and expensive. The negative perceptions, once predominant in the developed world of North America and Europe, are now more widely held, as anti-smoking factions gain ground. If we are to respond we need to identify those characteristics of our product that are perceived by our regulators/consumers as 'negative', and reposition them, where possible.

BAT coordinated international research efforts through Alan Heard. In 1989 he outlined the pressures on tobacco companies.



We need Product Innovations that address regulatory concerns and which achieve worthwhile improvements in the view of key regulators.

Despite the fact that Regulators hold generally negative views on cigarettes and some have implied the factors of cigarette design that are 'at fault', there is a general tendency for Regulators to purely claim that 'smoking is bad' and not enter into positive discussions on how features of the product might be 'improved' in a product sense.

The challenge is as much in the direction of encouraging regulators to enter a dialogue on Product modification as in actually achieving modifications technically. We need to identify how this can be done internationally.

**Competitors Experience of Innovation**

What lessons can we learn from previous attempts at product modification/innovation in our industry? RJR philosophy with Premier was to go for the 'wonder solution' – the product with no

negative perceptions (although they could only communicate the smoke-free characteristics). Favor, by Advanced Tobacco Products, was even more extreme. It sought to deliver nicotine and flavours but no aerosol whatsoever.

The failure of both of these radical product innovations provides some important lessons for BAT. Firstly, the products failed to deliver the pre-requisite of any innovatory cigarettes – a satisfying smoke in terms of taste, flavour and other organoleptics. Secondly, the products were seen as mechanical devices – embarrassing to use and difficult to dispose of. Thirdly, in trying to reach too far these products came under regulatory challenge on the grounds that they are not cigarettes, according to the accepted definition.

Despite the failure of Premier, the product development and performance characteristics were shared with the scientific community and there is little doubt that RJR's attempt to tackle the issues was very well performed in a scientific sense. Unfortunately for the industry in general, the impressive data particularly of a biological/toxicological nature, sets hitherto unthinkable standards. Furthermore, without resort to such extreme designs as Premier or Favor, there is little hope of cigarette technology achieving smokeable products with data close to those of Premier.

The overall conclusion of the Premier (and Favor) experience is that attempts to make major inroads into the negative perceptions:

1. necessitate completely new technology.
2. lead to radically different products which do not meet consumer basic requirements for a cigarette.
3. lead to products that risk definition of not being a cigarette.
4. draw too much media/regulatory reaction at an early stage.

Premier and Favor are probably the most extreme of cigarette innovations. Their common characteristic was that they sought to address all the principal negatives, with the exception of addiction. By contrast, such products as 'Vantage Excel' and 'Chelsea' have more modest targets, viz., sidestream reduction and aromatisation respectively. With 'Next' PM may be thought to be addressing simply the addiction issue. More generally, the gradual reduction of tar and nicotine deliveries have also addressed one (very largely) negative perception, personal ill-health. In each of these examples the innovators have not only limited the number of issues addressed but have taken an incremental approach 'improving' key dimensions of the product. They have also retained the conventional form of a cigarette in these innovations.

Despite the relatively limited horizons, the success of most of these innovations has been modest. Low delivery products have had the greatest success largely because they have had regulatory backing, but have made limited progress due to lack of taste and satisfaction; they are not universally accepted as a valid means of reducing the health associations of smoking. Sidestream-reducing products fail mainly because of inferior performance (taste, ash) but perhaps because they offer insufficient benefit. NSM and the other tobacco substitutes failed

totally – they addressed the specific perceived negative of biological activity but failed to win both the regulatory support (which was essential in view of their huge public profile) and consumer interest. The consumer needed some reassurance to switch to a chemically-treated product.

Based on the total experience of innovative products to date, the conclusions are:

1. Follow regulatory directions and seek regulatory support.
2. Go for worthwhile but stepwise improvement.
3. Avoid overtly technological products.
4. Recognise that no compromise on current standards of acceptability of smoke will be tolerated by consumers.

### **A Possible Strategy for Alternative Products**

Assume:

1. A product offering a response to the perceived negative aspects of smoking (S&H, social, etc.) will significantly alter the decline in cigarette consumption.
2. A product offering the characteristics of Premier (no tar, no biological activity, no sidestream) is needed but the technological approaches available are unacceptable.
3. A product offering a solution to the addiction issue would also offer a potential market but no valid approach has been identified.
4. Over the next ten years it may be that new technology emerges enabling traditional positive characteristics to be retained in a Premier type product.

In the meantime our Strategy should be:

- (i) We should follow product modification directions implied to date in the various regulatory publications and reflecting consumer attitudes determined by research.
- (ii) We should involve selected regulatory bodies in our ideas for product modification and in our progress towards targets.
- (iii) Establishment of a plan to promote the positive aspects of nicotine and to challenge any negative perception (including addiction) should be considered.
- (iv) Specifically, we can expect to achieve:
  - (a) tar reduction at normal nicotine.
  - (b) tar quality improvement (and reduction in biological activity).
  - (c) reduction of 'other noxa'.
  - (d) reduction of sidestream and yield and irritation.
  - (e) reduction of CO.
 although working within traditional formats of cigarette construction and smoking styles.
- (v) Target reductions for these parameters should be agreed against set timescales.

- (vi) Nicotine reduction per se (cf. Next) should be discounted as a major route for development – the addiction arguments are weak and to respond through nicotine reduction would be to remove the pleasure and taste characteristics of smoking. (If Next shows that a small segment of the market will settle for such a product, we have a technological base to compete – but the opportunity will be small.)
- (vii) We should aim to introduce modified products in stages:
  - (a) to prevent unacceptably abrupt changes in taste, etc., character.
  - (b) to prevent focussing media interest highly on such modifications.

to allow market response to be clearly assessed – so often concept response is not matched by product response.
- (viii) Since no compromise on taste, etc. will be made by the consumer, any product modification should meet acceptable standards without any disclosure of so called technical benefits!

In practice, we are tackling, through Project Greendot, Day and Nova, practically all the product modification implied or recommended in past reports of Regulatory Bodies. We are also assembling the technologies that underpin our product response to consumer concerns.

...

We now need to ensure co-ordination of these projects and to develop a dialogue with selected regulatory bodies.<sup>82</sup>

Two other background papers presented at the same meeting presented similar views to those of Mr. Heard on the inadvisability of developing products based on nicotine alone. One paper pointed out that pharmaceutical companies were covering this field.

Except for the problem of 'image' of nicotine (it is a drug; without it, it would be difficult to argue that smoking is addictive) there is presently no justification for its removal. Nevertheless, we do not want a product based on nicotine alone; the pharmaceutical companies are covering this field quite adequately.<sup>83</sup>

The other background paper was a BAT policy statement entitled "Company Guidelines on Novel Products Incorporating Nicotine," dated 19 July 1989.

It should be noted that less clearly defined concerns militate against the likelihood of success of products delivering nicotine and little else. These are:

<sup>82</sup> <http://www.tobaccopapers.org/documents/psc57.pdf>, Document: pp. 401058418-425. Citation: p. 401058418423

<sup>83</sup> <http://www.tobaccopapers.org/documents/psc54.pdf>, Document: pp. 401058290-322. Citation: p. 401058313.

- a) Nicotine by itself would fail to be accepted as a new active ingredient for a mass consumer product when examined against current standards for defining 'dangerous' or 'hazardous' substances.
- b) Products in which tobacco base is an insubstantial part of the whole would fall outside the special criteria defining tobacco goods in some parts of the world. Although such criteria are restrictive they are also to a degree protective.
- c) The delivery of nicotine, more or less by itself, renders any such product susceptible to criticism or comparison with any future findings of toxic concern attached to nicotine, allegations which might be more difficult of proof of effect when nicotine is merely one, if substantial, component of a very complex mixture.<sup>84</sup>

Mr. Heard, as Group Coordinator of Research and Development, was the highest ranking BAT official with full-time responsibilities for R&D. As would be expected, the 1989 Research Planning Group observed the first two rules of bureaucracy when considering Mr. Heard's proposal (Rule #1: The boss is always right. Rule #2: see Rule #1.).

The broad aims of the Product Innovation Strategy were agreed and our current new product technology portfolio of (Greendot(I-III), Day, Coaxial and Nova) was considered appropriate to realising the aims of this proposed strategy.<sup>85</sup>

Or is the boss always right? It turns out that in large organizations, even the bosses have bosses. The citation above is taken from a 12-page version of the minutes marked "draft". However, Brown and Williamson lawyers, who were not at the meeting, were to later edit the minutes from 12 pages to 3. Readers can examine both versions in the document referenced above.

Here is how Jeffrey Wigand, who was at the meeting and subsequently fired from Brown and Williamson, described the excisions in a deposition given in Mississippi as part of the Castano liability trial.

Q: And what did they eliminate, the stuff that said cigarettes were harmful?

A: They eliminated all reference to anything that could be discovered during any kind of liability action in reference to a safer cigarette. Statements were made that anything that alludes to a safer cigarette clearly indicates that other cigarettes

<sup>84</sup> <http://www.tobaccopapers.org/documents/psc54.pdf>, Document: pp. 401058290-322. Citation: p. 401058316.

<sup>85</sup> <http://www.tobaccopapers.org/documents/psc64.pdf>, Document: pp. 401096829-843. Citation: p. 401096838.

are unsafe, and it, furthermore, would acknowledge that nicotine is addictive.<sup>86</sup>

Here is how the expurgated version of the minutes described the decision regarding Alan Heard's presentation.

A presentation was made pertaining to objectives for product innovation, but agreement was not reached.<sup>87</sup>

In the brave new world of Brown and Williamson management and lawyers, "broad aims... were agreed" became "agreement was not reached." By 1991 BAT management was to exert even more control over the company research agenda. The scientists would be hard-pressed to find room in the program for projects that they thought important.

### ***The Centre takes over***

Alan Heard was the man in the middle, caught between his fellow scientists and his management colleagues. He had secured the agreement of his scientist colleagues for a new product innovation strategy, only to have it scuttled when history was rewritten by lawyers and managers. Ever the loyal soldier, he sought to fulfil management's wishes, while still respecting the wishes of his scientist colleagues. In 1989 and 1990 there was much to-ing and fro-ing between GRDC and the Tobacco Strategy Review Team (TSRT), BAT's central policy-making body. Mr Heard made several presentations to TSRT in those two years. He had to satisfy management's desire for more competitive products that would sell more, while doing his best to preserve as much as he could of the research program favoured by the scientists. Management, however, held more high cards. In fact, many of the ideas in Alan Heard's Product Innovation Strategy presented in Vancouver did conform to management's wishes. These ideas would survive and be given high priority. Preserving normal to high levels of nicotine in cigarettes would be a favoured idea. Catering to the interests of regulators was not favoured by management and would be relegated to low priority status. The strategy, revised until it conformed to the wishes of management, was finally accepted by the TSRT in 1990.

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<sup>86</sup> Hilts P.J. *Smokescreen: The truth behind the tobacco industry cover-up*. Addison-Wesley. New York. 1998. p. 158.

<sup>87</sup> <http://www.tobaccopapers.org/documents/psc64.pdf>, Document: pp. 401096829-843. Citation: p. 401096830.

As a result of the new strategy, scientists doing fundamental research in the regional laboratories in Canada, the United States, Australia, Germany and Brazil found themselves benched. The fundamental research activities previously practised in all research centres were being centralized in Southampton, U.K. The regional scientists were to focus on applied research. This restructuring that led to Dr. Jeffrey Wigand's famous disaffection with Brown and Williamson had no discernable effect on Imperial Tobacco's Montreal lab.

Management also made sure that the main focus of fundamental research was not on 'healthier' cigarettes, but on more competitive ones. Of particular concern to BAT was keeping its international brands (like Lucky Strike and State Express 555) from being corralled by the Marlboro Man's ammoniated technology. Management's decisions were set in an apparently bland statement in the minutes of the November 1990 TSRT meeting.

...Mr. Heard said that there had been a change of emphasis with greater priority now being given to providing the scientific basis for improved product design. As a result, less priority was being given to regulatory issues and to speculative work on innovative products. The proposed allocation of effort was:-

(a) Smoke Quality Improvement	35%
(b) Innovative Products	20%
(c) Regulatory Issues	28%
(d) Environmental Issues	17%

After discussion, it was agreed that the proposed allocation of effort and the total budget of £3.885 million plus £0.296 for the Scientific Research Group projects were acceptable.<sup>88</sup>

All of the changes in the research programme were summarized in a presentation given by Mr. Heard in March, 1991 in Rio de Janeiro.

#### 1991 FRC PROGRAMME

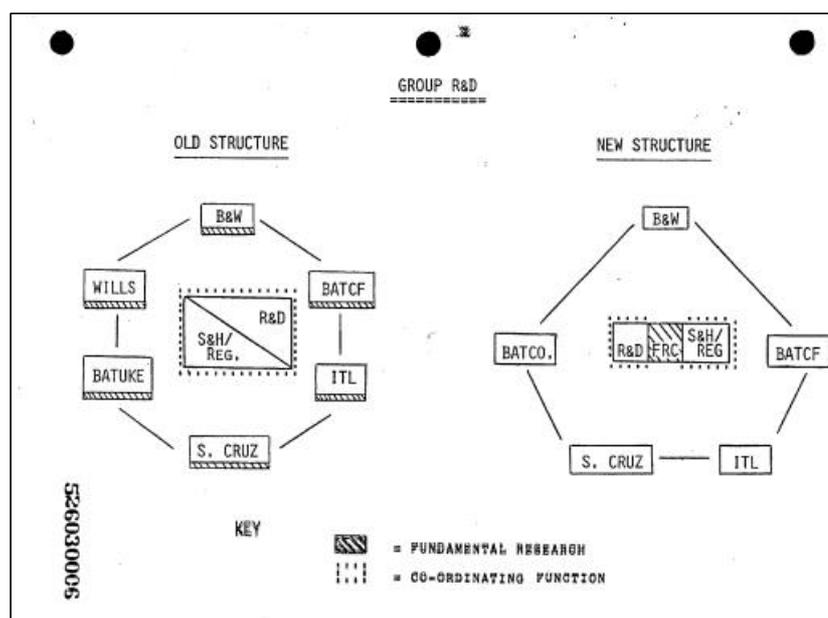
Original programme – considerable emphasis on:

- regulatory-driven projects (responding either to current or anticipated pressures)
- innovative concepts.

Latest programme – emphasis has significantly changed.

<sup>88</sup> <http://www.tobaccopapers.org/documents/who14.pdf>, Document: pp. 202205519-540. Citation: p. 202205523.

*In 1989, Fundamental Research was removed from branch-plants like Imperial Tobacco in Montreal, and centralized in Southampton.*



- Products superior to competition (particularly PM) is clear group priority – now reflected in FRC [Fundamental Research Centre] programme.

Other major change – product innovation.

- Priority on research for niche markets relegated in importance. Projects aimed at radically different cigarettes (c.f. Premier) shelved.

Business objectives:

1. Increased competitiveness through smoke quality improvement.
2. Increased competitiveness through innovative products.
3. Enabling company to operate under increasingly restrictive regulatory pressures.
4. Enabling company to operate under increasing environmental concerns.

...

Tobacco Modification

Historically, Southampton R&D has sought tobacco treatments that reduce the subsequent formation of minor compounds of interest to regulators.

Now broadened opportunities sought, through similar treatments, to maximize the formation of compounds which improve the subjective quality of smoke.<sup>89</sup>

<sup>89</sup> <http://www.bw.aalatg.com>, Document: pp. 526030006-0027. Citation: pp. 526030008-16.

It would be fair to conclude from these remarks that attempts to make products safer (as requested by regulatory authorities) were to be de-emphasized in favour of making superior products that would sell more, with little or no regard to the health hazards involved. BAT managed to produce products that were more and more saleable in both the 1980s and 1990s. But the new policy made this objective easier to achieve in the 1990s. Never did they make products for which safety could be guaranteed. The key difference was that, before 1990, product safety was a worry and a factor to be considered in much of the company's research. After that date, such concerns almost entirely disappeared as researchers concentrated on carrying out fundamental research aimed at developing more competitive products, products that would outsell the competition.

In 1984, company researchers wrestled with the ethics of covert changes to cigarette construction. By 1989, this strategy was proposed as official company policy. ("Since no compromise on taste, etc. will be made by the consumer, any product modification should meet acceptable standards without any disclosure of so called technical benefits!" – Mr. A.L. Heard, Vancouver, 1989). By 1991, it was approved as company policy.

Into the 1990s, concerted efforts were made to produce cigarettes that were significantly different, but whose differences could not be discovered by the smoker. One of the research projects under the new policy is Project Greendot. Here is how Mr. Heard described an application of this research in 1991

#### GREENDOT PRODUCT APPLICATION

OBJECTIVE: To produce a low tar (4 mg) product which has improved smoking performance over current commercial 4 mg products.

#### METHODOLOGY EMPLOYED:

- lower tar/nic ratio: 7 : 1 (or 5 : 1 excluding humectant)
- low rod density: - approx. 200 mg/cc
- improved 'front end' mechanics: - through filter used
- lower biological activity: - humectant dilution of smoke
- greater perceived taste (at given delivery level)<sup>90</sup>

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<sup>90</sup> <http://www.bw.aalatg.com>, Document: pp. 526030006-0027. Citation: pp. 526030019.

In 1993, the documents show that the Montreal laboratories of ITL were seeking to further increase 'elasticity'; using experimental with tobacco rods made to du Maurier Ultra Light K.S. specifications at densities ranging from 20 cg-27 cg/cc.

It has been suggested that one way of increasing product elasticity at a given pressure drop is to increase filter pressure drop and reduce tobacco rod pressure drop.

...

A second potential approach to achieving elasticity is to use the Gap filter.

...

The Gap cigarettes were more elastic than the controls at 70 ml puff volume.

...

Further work will include the examination of on-line laser perforated gap cigarettes and smoking behaviour study of these cigarettes.<sup>91</sup>

In the light of the new policy direction for the 1990s, it is reasonable to assume that research on elasticity would continue, leading eventually to more elastic products being brought to market.

Were cigarettes now being made and marketed in Canada developed as a result of the new R&D policy? The answer is very likely, but a definitive answer cannot be discovered from the documents made available so far. Only a few documents prepared after 1994 are available, because the Minnesota settlement agreement only covered documents up until the time of discovery proceedings in the Minnesota trial, 1994. A definitive answer will therefore have to wait until a time when more recent BAT and ITL documents are made publicly available and subject to independent review.

We have seen that product modifications carried out in BAT over the last three decades have all had the effect of manipulating public health objectives for low-yield cigarettes into something quite different than was originally intended. They have become a way of keeping people smoking and fooling them into thinking their light and mild cigarettes are less hazardous than they really are.

Because there is no control condition, a definitive evaluation of the extent to which public health objectives have been achieved will never be possible. Nevertheless, some trends in major indicators can be assessed.

*As Southampton takes control of research activities, it refocuses global research efforts to competing with Philip Morris and the Marlboro man. Less significant will be the development of cigarettes likely to be desired by government regulators – i.e. those less likely to harm smokers.*

● ORIGINAL PROGRAMME - CONSIDERABLE EMPHASIS ON:

- REGULATORY-DRIVEN PROJECTS (RESPONDING EITHER TO CURRENT OR ANTICIPATED PRESSURES)
- - INNOVATIVE CONCEPTS.

LATEST PROGRAMME - EMPHASIS SIGNIFICANTLY CHANGED.

PRODUCTS SUPERIOR TO COMPETITION (PARTICULARLY PM) IS CLEAR GROUP PRIORITY - NOW REFLECTED IN FRC PROGRAMME.

●

026600009

● OTHER MAJOR CHANGE - PRODUCT INNOVATION.

PRIORITY ON RESEARCH FOR NICHE MARKETS RELEGATED IN IMPORTANCE. PROJECTS AIMED AT RADICALLY DIFFERENT CIGARETTES (C.F. PREMIER) SHELVED.

● BUSINESS OBJECTIVES:

1. INCREASED COMPETITIVITY THROUGH SMOKE QUALITY IMPROVEMENT.
2. INCREASED COMPETITIVITY THROUGH INNOVATIVE PRODUCTS.
3. ENABLING COMPANY TO OPERATE UNDER INCREASINGLY RESTRICTIVE REGULATORY PRESSURES.
4. ENABLING COMPANY TO OPERATE UNDER INCREASING ENVIRONMENTAL CONCERNS.

●

026600009

● 3. TOBACCO MODIFICATION

HISTORICALLY, SOUTHAMPTON R&D HAS SOUGHT TOBACCO TREATMENTS THAT REDUCE THE SUBSEQUENT FORMATION OF NINOR COMPOUNDS OF INTEREST TO REGULATORS.

●

NOW BROADENED - OPPORTUNITIES SOUGHT, THROUGH SIMILAR TREATMENTS, TO MAXIMISE THE FORMATION OF COMPOUNDS WHICH IMPROVE THE SUBJECTIVE QUALITY OF SMOKE.

There can be no doubt that public health progress has been made over the last thirty years. Smoking prevalence declined from nearly half of adults in the mid-1960s to under one-third, declining more rapidly among men than among women. Cigarette consumption per adult nearly halved from the mid-1960s to the mid-1990s, falling from over 4000 cigarettes per adult to just over 2000 per adult. While this progress has been encouraging, it is also true that tobacco companies have about as many customers and sell about as many cigarettes as they did in the 1960s. Even though rates of smoking and tobacco consumption have fallen, because of population increases, the absolute numbers of smokers and cigarettes sold have changed little in three decades. There were 6.5 million smokers in Canada in 1965 and 6.9 million on 1996. 53 billion cigarettes were consumed in 1965, and 52 billion in 1996.

<sup>91</sup> <http://www.tobaccopapers.org/documents/psc8.pdf>, Document: pp. 402415168-217. Citation: p.

One measure of public health success is the percentage of people who have successfully quit smoking, known as the quit ratio, and defined as the ratio of former smokers to ever smokers, expressed as a percentage. Encouragingly this indicator increased from 36% in 1981 to 55% in 1990, but has since stabilized, falling back to 50% in 1996. Of course, many hypotheses can be advanced for why the quit ratio is no longer increasing. One that clearly merits further study is the extent to which cigarettes perceived as light and mild have retained people as smokers who might have otherwise quit.

Another phenomenon associated with the rise of highly engineered cigarettes has been the rise of adenocarcinoma of the lung, one of four different kinds of lung cancer. The others are small cell, large cell and squamous cell cancers. Adenocarcinoma is the kind that attacks the deepest reaches of the lung. At the time of the first U.S. Surgeon-General's report in 1964, adenocarcinoma was relatively rare among smokers and its relationship to smoking was uncertain.<sup>92</sup> Eighteen years later, the 1982 Surgeon-General's report on cancer and smoking noted a rise in adenocarcinoma and concluded that all four types of lung cancer, including adenocarcinoma, were caused by smoking.<sup>93</sup> None of the four forms of lung cancer offers much hope of effective treatment or cure, with the squamous cell type offering only fair prospects. The prospects for the others, including adenocarcinoma, are poor to nil.<sup>94</sup>

Recent trends in adenocarcinoma of the lung among men and women have been assessed in a 1999 report prepared for Health Canada.<sup>95</sup> Adenocarcinoma is the most common form of lung cancer among Canadian women, and still increasing. Among Canadian men, it is now the second-most common form and the only one of the four kinds for which incidence is increasing (See graphs).

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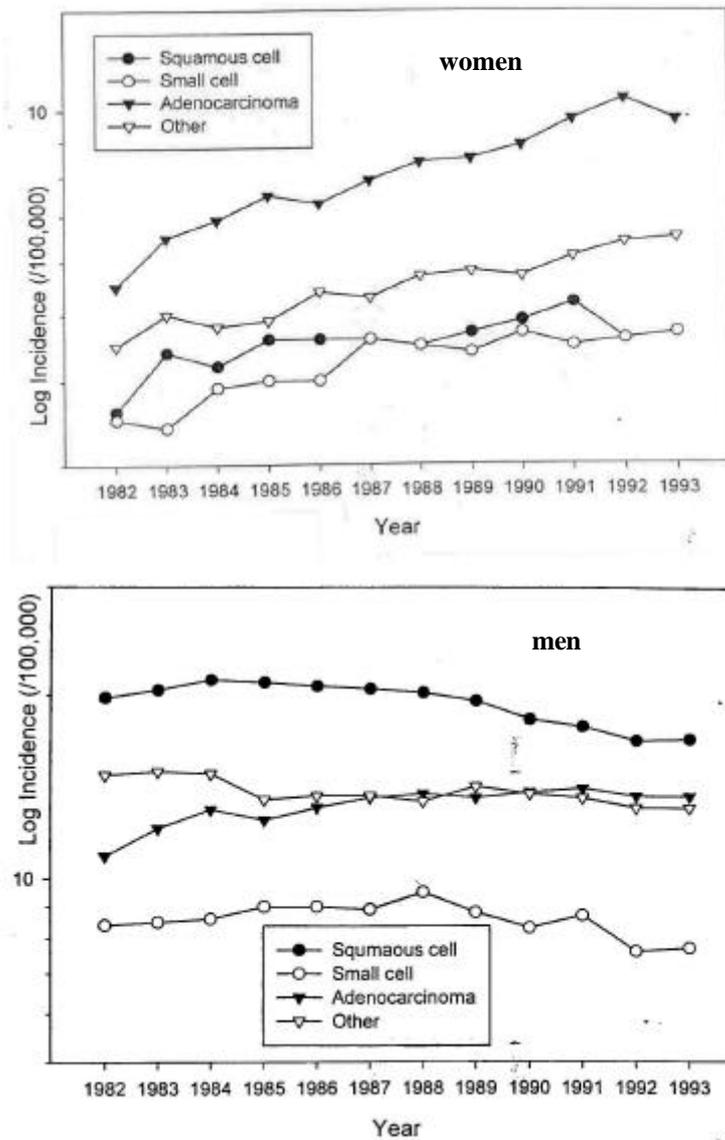
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<sup>92</sup> U.S. Public Health Service. *Smoking and Health. Report of the Advisory Committee to the Surgeon General of the Public Health Service.* U.S. Department of Health, Education and Welfare, Public Health Service, Center for Disease Control. PHS Publication No. 1103, 1964.

<sup>93</sup> U.S. Department of Health and Human Services. *The Health Consequences of Smoking: Cancer. A Report of the Surgeon General.* U.S. Department of Health and Human Services, Public Health Service, Office on Smoking and Health. DHHS Publication No. (PHS) 82-50179, 1982.

<sup>94</sup> Beauchamp, G. *Le cancer du poumon, la cigarette et le chirurgien.* Quebec Court of Appeal, Montreal, Case Numbers 500-09-001296-912 and 500-09-001297-910. Exhibit Number AG-157. Joint Record, Volume 178, pp 36655-693, 1990.

<sup>95</sup> Birkett, N. *Temporal trends in adenocarcinoma at selected sites.* Prepared for Bureau of Cancer, Laboratory Centre for Disease Control, Health Canada, Ottawa, February, 1999.



The author of the report carefully reviewed all the scientific literature published to date on the subject and concluded:

In summary, adenocarcinoma is causally related to smoking with a strong suggestion that the use of filter cigarettes and deep inhalation increase the risk.

...

There is strong and consistent evidence that the incidence of adenocarcinoma of the lung has been increasing steadily over the last thirty years.<sup>96</sup>

<sup>96</sup> Birkett, N. *Temporal trends in adenocarcinoma at selected sites*. Prepared for Bureau of Cancer, Laboratory Centre for Disease Control, Health Canada, Ottawa, February, 1999, p. 55.

The widespread use of highly engineered cigarettes that involve the deep inhalation of small particles has probably resulted in a previously relatively rare and deadly form of lung cancer becoming more prevalent among men , and the most prevalent among women.

Imperial Tobacco scientist, Dr R.M. Gibb expressed concern about the potential dangers of filter cigarettes as early as 1962.

Mr R.M. Gibb pointed out that the industry had made one very obvious reaction to the health question in that filters had been put on all over the world at various levels of filtration, but nobody seemed to know whether this had the desired effect and it was not a very easy thing to find out.<sup>97</sup>

BAT scientific consultant, Dr F.J.C. Roe foresaw the dangers of deep inhalation in 1978.

Perhaps the most important determinant of the risk to health or to a particular aspect of health is the extent to which smoke is inhaled by smokers. If so, then deeply inhaled smoke from low-tar delivery cigarettes might be more harmful than uninhaled smoked from high-tar cigarettes.<sup>98</sup>

In 1989, the Research Policy Group of company scientists recorded the following proposal in the unexpurgated “draft” minutes of their Vancouver meeting.

In addition, work in the following areas was considered to merit consideration:

...

examination of trends in various sub-types of lung cancer.<sup>99</sup>

But it was not to be. The possible examination of trends in various sub-types of lung cancer fell victim to the exacto-knife of the Brown and Williamson managers and lawyers, who were not at the meeting, but who edited the minutes from 12

<sup>97</sup> <http://www.bw.aalatg.com>, Document: pp. 650344433-492, Citation: p. 650344483.

<sup>98</sup> <http://www.tobaccopapers.org/documents/psc23.pdf>. Document: pp. 110067715-723, Citation: p. 110067719.

<sup>99</sup> <http://www.tobaccopapers.org/documents/psc64.pdf>. Document: pp. 401096829-843, Citation: p. 401096833.

pages to 3. The expurgated version contains no specific mention of “examination of trends in various sub-types of lung cancer.”

ITL and its parent company BAT ignored the warnings of all these company scientists. They proceeded full speed ahead to develop products that would sell – filter cigarettes and their successors, highly engineered cigarettes that favoured deep inhalation. Never did they test to see if these might create new health dangers to the companies’ customers, addicted smokers. And their customers reaped the whirlwind – adenocarcinoma – an increasingly predominant, and deadly, way to get lung cancer.

Public health progress might have been more rapid, had product manipulation by the tobacco industry in order to sell more cigarettes not occurred. Cigarette engineering, as practised over the last three decades in Canada has probably been a significant brake on reducing the number of smokers. Even the hope that lower yield cigarettes would be less hazardous remains largely unfulfilled. Smokers compensate for lower yields, and tobacco companies oblige them by making it easier for them to do so. A disturbing probable consequence of product manipulation has been to cause a formerly rare but deadly form of lung cancer – adenocarcinoma – to grow from relative rarity to the number two form of lung cancer among Canadian men and the number one form among Canadian women.

Discovering the truth about tobacco products has enabled us to see the extent to which tobacco products are being manipulated in Canada and elsewhere. Achieving accelerated and effective public health improvement through changes to tobacco products is possible, but it will not be easy. It will start by finding a way for public light to shine - systematically and continuously - on tobacco industry practices. The road to further public health improvement through product regulation will begin with discovering more truth about tobacco products.