

Co-operation and conflict in the management of a health scare: the work of the Tobacco Industry Research Committee, 1953-1964

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Abstract

This paper examines the response of the American tobacco companies to the health scare surrounding tobacco harm between 1953 and 1964, through an analysis of the operations of the Tobacco Industry Research Committee (TIRC). We consider the reasons for the TIRC's establishment and subsequent conduct in the context of a series of external pressures which built up on the tobacco industry prior to, and during, the period in question. These include the increase in deaths from cancer which had occurred during the first half of the twentieth century, accumulating epidemiological evidence suggesting that tobacco use was harmful to health, progressively more grave statements that were being made by public health bodies and scientists to the same effect, falling sales of cigarettes and faltering stockholder confidence. We consider the TIRC's contribution to restoring confidence in tobacco products, what motivated scientific advisors to sit on, and resign from, its Scientific Advisory Board and the legitimacy of the argument that the controversy surrounding tobacco harm continued until the mid-1960s.

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1 Introduction

This paper examines how an industry responded to a major health scare concerning its sole product during the early years of that scare. It focuses on the operations the Tobacco Industry Research Committee (henceforth TIRC), the organisation founded by the American tobacco companies, warehouse and growers' associations at the end of 1953 following a series of warnings concerning tobacco's potential to harm health.

We view the founding and operations of the TIRC in the light of a series of external pressures which were brought to bear on the tobacco industry prior to, and during, the period that we study. These include the steady increase in deaths from respiratory cancer that had occurred over the first half of the twentieth century, accumulating published epidemiological and other scientific evidence suggesting that tobacco use was harmful to health, progressively more grave warnings given by scientists, the US Public Health Service and related groups to the same effect, falling sales of tobacco products and holders of tobacco stocks exercising 'exit options' in response to the adverse publicity. Against this backdrop, we assess some of the major initiatives taken by the TIRC in an attempt to restore public confidence in tobacco. These include its public relations strategy, its process of retrieval and review of scientific literature relating to tobacco use and health, its appointment of independent scientific advisors to a Scientific Advisory Board and the establishment of its own research programme into tobacco harm.

The research presents a case study of the inter-relationships between science, business and wider society in the early days of a health scare, when relevant scientific evidence about harm is still accumulating and views within the scientific community and wider society are divided. In so doing, it contributes to the existing body of literature studying the health scare surrounding tobacco during the 1950s and 1960s and the wider literature exploring links between scientific discovery, business and society.¹ Although the specific subject matter - tobacco - has received widespread attention in the epidemiological and historical literature, business historians have been less interested in exploring the strategies adopted by the tobacco industry in response to health scares. Significant exceptions are the works of Munoz and Courtwright, who assessed the advertising strategies of the tobacco companies, the former from the 1880s to the 1930s and the latter from 1950.²

Our main sources are the tobacco industry documents released under the 'Master Settlement Agreement' of 1998, signed by the Attorneys General of 46 US states and the four largest US tobacco companies.³ We also refer to trial testimony and depositions (also available through the Master Settlement Agreement), judgments in recent tobacco-related lawsuits and the John W. Hill documents held by the State Historical Society of Wisconsin.⁴ To complement these, we refer to time series data for the accumulation of epidemiological knowledge indicting tobacco, the share price of some of the major tobacco companies and per capita cigarette consumption, to describe the relationships between the accumulation of scientific knowledge and the response of holders of tobacco stocks (on the supply side of the market) and smokers of cigarettes (on the demand side).

This paper is one of a series of three to result from our research, the other two being a review of the epidemiological evidence concerning tobacco that was in the possession of the TIRC and the US Public Health Service and related groups as it accumulated during the 1950s and early 1960s⁵ and a Bayesian model of the accumulation of the ‘weight’ of epidemiological evidence held by these groups during the same period.⁶ These papers found that the epidemiological evidence-base possessed by the organisations was very similar, but the interpretations of the evidence made by the TIRC’s Scientific Director and the US Public Health Service and related groups differed significantly: the former maintained throughout the period that the link between smoking and disease remained unproven; the latter gave increasingly strong warnings to the contrary.

The paper is organised as follows. In section 2 we review some of the recent scholarly literature that is relevant for our work and present the main sources of data that relate to our study. Section 3 discusses the events leading up to the formation of the TIRC and Section 4 considers in detail its operations. Section 5 discusses our results in the light of the existing literature and the strengths and weaknesses of the research. Section 6 concludes.

2 Background

The release of internal tobacco industry documents has spawned a large scholarly literature examining the tobacco story across a range of subject disciplines. In the medical literature, Barnes et al. and Glantz et al. have been highly critical of the American tobacco companies’ conduct, arguing in learned journals and the book, ‘The Cigarette Papers’, that the companies were culpable of ‘hiding the truth’ about tobacco harm⁷ and that they adopted sophisticated legal and public relations strategies to avoid liability in claims for negligence brought by plaintiffs with smoking-related diseases. Their focus has been on industry conduct and public health policy, particularly since 1971, when the companies first put health warnings on packets of cigarettes, and has explored the extent to which the tobacco companies were aware of the problems associated with secondary smoke inhalation.

The medical literature has used the tobacco story to consider how attitudes towards the emerging discipline of epidemiology changed during the 1950s and 1960s and to debate the issue of when it became ‘accepted’ within the medical and wider community that tobacco use was harmful to health.⁸ Throughout the period we study, one of the tobacco companies’ main arguments, supported by the views of statisticians such as Fisher and Berkson,⁹ was that the statistical *associations* between tobacco use and ill health that were being reported by epidemiological investigations could not *prove* causality. There resulted a ‘controversy’ regarding whether or not tobacco was harmful to health, which some have argued was resolved as early as the mid-1950s and others as late as 1964.

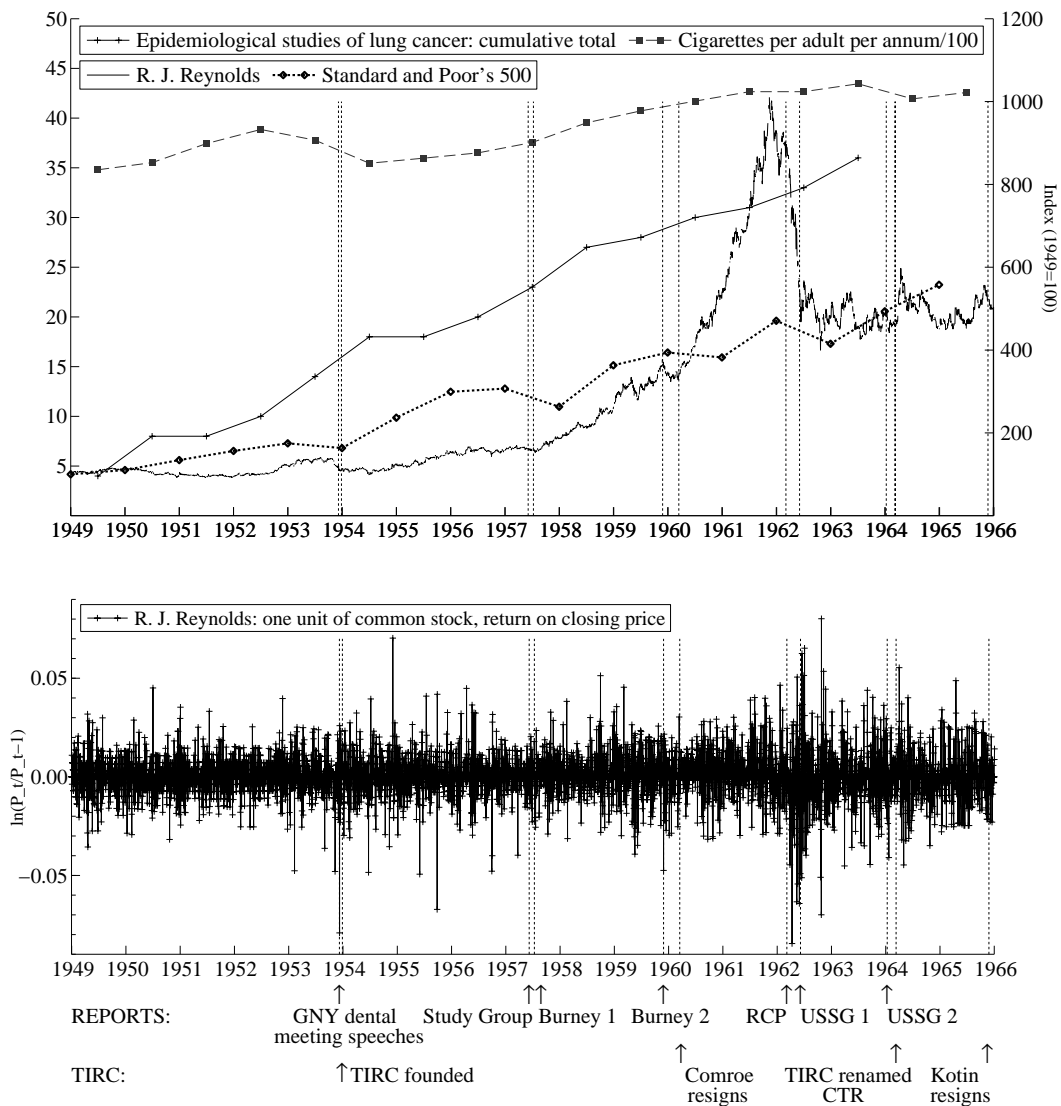
This matter is of importance in tobacco-related court cases today, when establishing whether a plaintiff with lung cancer was sufficiently well-informed about the risks of smoking during the 1950s and 1960s, and whether tobacco companies had an

obligation to warn consumers of their products, are important factors in determining culpability. In the United States, the 2006 Racketeer Influenced and Corrupt Organizations (RICO) judgment concluded that the ‘overwhelming medical and scientific consensus’ that smoking cigarettes causes disease had been established by the early 1950s.¹⁰ The appeal in the case of *Bullock v. Philip Morris, USA, Inc.*, viewing the facts ‘in a light most favourable to Bullock’, stated that ‘scientific and medical professionals in the United States and worldwide generally agreed by the late 1950’s that cigarette smoking cause lung cancer, after several epidemiological studies reached that conclusion.’¹¹ In Scotland in 2005, Lord Nimmo Smith judged that, by 1964, the general public in the United Kingdom was ‘well aware’ of the view that smoking could cause lung cancer.¹² However, Talley et al.¹³ argue that the matter was not resolved until 1964, with the publication of the U.S. Surgeon General’s Advisory Committee report, ‘Smoking and Health’.¹⁴

Attention has also been paid to the involvement of scientists in advising the tobacco industry and the ethics of their acceptance of industry funding for their research. Much of the existing literature in this area is post-1970 work,¹⁵ although recent research by Berridge has sought to explain why attitudes to industry funding changed over time.¹⁶ This is important for our work, since the TIRC saw the appointment of independent scientists to its Scientific Advisory Board, which was tasked with running its own programme of research into tobacco harm, as a key element in its operations.

As we shall argue in this paper, the fact that controversy continues today over the matter of when it might have been ‘reasonable’ to conclude that tobacco use is harmful is perhaps not surprising given the diverse range of groups and individuals who, during the 1950s and early 1960s, were faced with interpreting the evolving scientific evidence-base. What may have been regarded as ‘conclusive evidence’ by one group or party might not have been by another. Further clouding these attempts to assess the state of knowledge will have been the obligations of different organisations and individuals (such as maximising returns to tobacco stockholders or safeguarding the public health) and the incentives faced by them (such as potential conflicts of interest introduced by independent scientists accepting payments from the tobacco industry).

To frame our discussions, we make frequent reference to Figures 1 and 2, which show some key data relevant for our work and some of the key events in our analysis. Figure 1(a) plots the accumulation of epidemiological evidence suggesting that smoking caused lung cancer, based on our series constructed from the listing of prospective and retrospective studies in the 1964 US Surgeon General’s Advisory Committee report ‘Smoking and Health’.¹⁷ Also plotted are series for the consumption of cigarettes per adult per annum in the USA, which we use to examine the demand side of the cigarette market, indices of the closing price of one unit of common stock in one of the major tobacco companies of the day, RJ Reynolds, and the closing level of Standard and Poor’s 500 index (both set such that the index on 1st January, 1949, equals 100), between 1949 and 1965. We chose to explore and plot the series for Reynolds because, during the period in question, this company became the leading cigarette company in the US in terms of sales: by 1960, it accounted for 32.2 per cent of the 475.5 billion cigarettes sold



Figures 1(a) – upper – and 1(b) – lower: the major series and events discussed in the paper. Figure 1(a), left scale: cumulative total of retrospective and prospective epidemiological studies concluding that smoking causes lung cancer (source: United States Department of Health, Education and Welfare. Public Health Service, 1964); consumption of cigarettes per adult per annum in the United States (total divided by 100, source: Centre for Disease Control (1994)); right scale: index of closing price of one unit of common stock in RJ Reynolds, adjusted for 2-for-1 stock splits in 1959 and 1961 (source: www.reynoldsamerican.com/Investors/stockPriceHistory); Standard and Poor's 500 year end closing price (source: www.economagic.com/em-cgi/data.exe/sp/sp04) (1/1/1949 = 100 for both series). Figure 1(b): return on one unit of common stock in RJ Reynolds.

Events: 'GNY dental meeting speeches': speeches by Wynder and Ochsner, 8/12/53; 'Study Group': report of the Study Group on Smoking and Health, 7/6/57; 'Burney 1': Surgeon General Burney's statement of 12/7/57; 'Burney 2': Surgeon General Burney's statement of 28/11/59; 'RCP': UK Royal College of Physicians report 'Smoking and Health', 7/3/62; 'USSG 1': announcement of establishment of the Surgeon General's Advisory Committee on Smoking and Health, 7/6/62; 'USSG 2': report of the Surgeon General's Advisory Committee, 11/1/64; 'TIRC founded': founding date of the TIRC, 28/12/53; 'Comroe resigns': resignation of Comroe from the Scientific Advisory Board of the TIRC, 16/3/60; 'TIRC renamed CTR': TIRC renamed 'Council for Tobacco Research - USA, Inc.', 11/3/64; 'Kotin resigns': resignation of Kotin from the Scientific Advisory Board of the TIRC, 26/11/65.

in the US.¹⁸ It is noteworthy that not one of the epidemiological studies reviewed by the Surgeon General's Advisory Committee concluded that smoking was not harmful. Equally noteworthy is the strong performance of RJ Reynolds stocks, relative to the Standard and Poor's 500 index, between 1954 and late 1961. Figure 1(b) plots the daily return on one unit of common stock in RJ Reynolds, calculated as the natural logarithm of the ratio of the closing price on trading day t to that on the previous trading day.

At the bottom of Figures 1(a) and 1(b) we list some of the major events to which we refer: statements and reports from scientists and the U.S. Public Health Service and other groups suggesting that tobacco use was harmful to health, the formation of the TIRC, resignations of scientific advisors from its Scientific Advisory Board and the renaming of the TIRC as the Council for Tobacco Research (CTR), which took place on 11th March, 1964. Figure 2 plots the highs and lows for the stock prices of three of the major US tobacco companies - RJ Reynolds, Philip Morris and American Tobacco - for the same period.

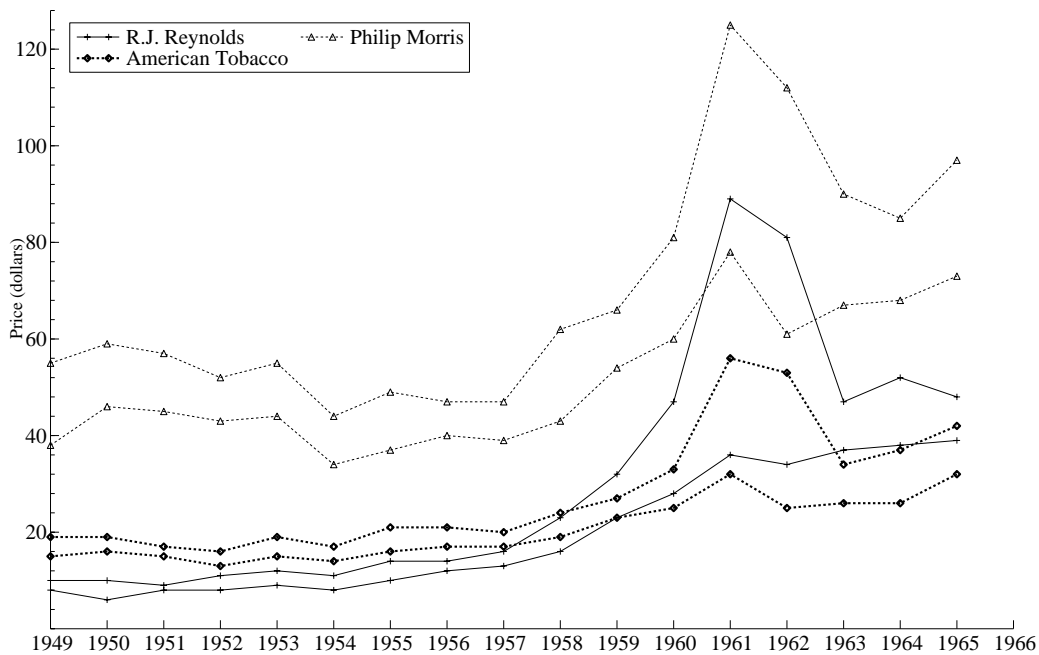


Figure 2: approximate highs and lows, in dollars, of the stock prices of three of the largest US tobacco companies, 1949 – 1965 (series are adjusted for stock splits).

Sources: RJ Reynolds: 'Current review of the cigarette industry', Dean Witter & Co. (legacy.library.ucsf.edu/tid/dip23a00 (1949-62)) and www.reynoldsamerican.com/Investors/StockPriceHistory.aspx (1963-65); Philip Morris: 'Current review of the cigarette industry', Dean Witter & Co. (1949-62) and 'Philip Morris Incorporated', Harvard Business School, 1971 (legacy.library.ucsf.edu/tid/ydf/42e00 (1963-65)); American Tobacco: 'The Cigarette Industry', HM Wooten, 1956 (legacy.library.ucsf.edu/tid/mqo93e00 (1949-55)) and 'Investornews', Francis duPont & Co, February 1966 (legacy.library.ucsf.edu/tid/kzr55f00 (1956-65)).

3 The formation of the Tobacco Industry Research Committee

The late nineteenth and early twentieth century had witnessed a massive increase in tobacco consumption - especially cigarettes - amongst citizens of the USA. Average consumption per adult per annum was around 620 in 1920, rising to around 3,500 by 1950.¹⁹ Cigarettes had become a mass market product in the late nineteenth century, following the invention of the Bonsack cigarette machine in the 1880s, which reduced the unit cost of producing cigarettes (they had previously been rolled by hand) and made them accessible to all.²⁰

Accompanying the rapid increase in prevalence of cigarette consumption were increasing mortality rates from cancer, especially lung cancer, amongst adults in the USA. In 1900, of the ten leading causes of death in the United States, cancer and other malignant tumors ranked eighth - well behind pneumonia, tuberculosis, diarrhoea and heart disease. By 1940, cancer had become the second leading cause of death.²¹ The change was not merely the result of a decline in deaths from other causes, but was also a reflection of the fact that, between 1900 and 1960, the number of deaths from cancer had increased, from 3.2 per 100,000 of the population in 1930 to 14.1 by 1950.²² Figure 3 charts the increase in death rates for all cancers and respiratory cancers between 1900 and 1950.

Anecdotal evidence suggesting that tobacco was harmful can be traced to opinions and case studies reported in the medical literature and elsewhere going back at least two hundred years,²³ but the early twentieth century witnessed a growing body of epidemiological, experimental, pathological and other evidence to this effect. Figure 1(a) shows how retrospective and prospective epidemiological studies concluding that smoking caused lung cancer accumulated during the 1950s and early 1960s, from a total of just four studies, all of them retrospective, in 1949, to 36 by 1963.

1950 and 1952 have often been regarded as two key years in the story. In 1950, Doll and Hill, of the UK Medical Research Council,²⁴ and Wynder and Graham, writing from the Department of Surgery, Washington State University School of Medicine and Barnes Hospital, published the results of two case-control studies which suggested that lung cancer was strongly associated with smoking.²⁵ In 1952, Doll and Hill published a final report of their work, endorsing their preliminary findings.²⁶ This research was picked up in the popular press in the United States: in 1950, the Reader's Digest published an article entitled 'How Harmful are Cigarettes?',²⁷ followed by 'Cancer by the Carton' in 1952.²⁸ Media reaction to these events was credited with leading to the first drop in cigarette sales for over two decades. Figure 1(a) shows how per capita cigarette consumption was affected, falling from around 3900 in 1952, to 3800 in 1953.²⁹

The end of 1953 also witnessed a sharp fall in the value of tobacco stocks, something which was not reflected in the US stock market in general³⁰ and which was described as a matter of 'grave concern' by the tobacco industry leaders.³¹ On 9th December the stocks of the big five tobacco companies dropped nearly four percentage points in one day, carrying them to new lows for the year.³² Figure 1 illustrates what

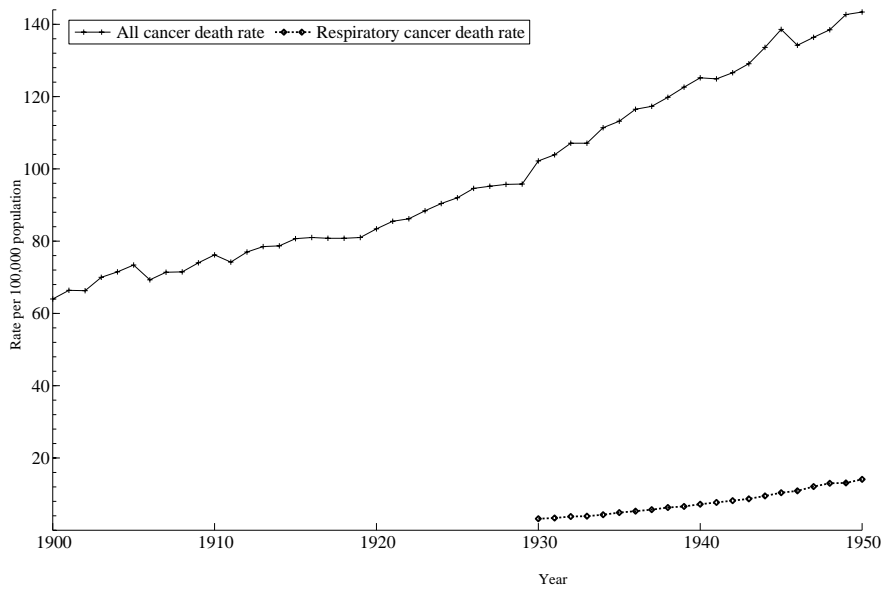


Figure 3: death rates per 100,000 from all cancers and other malignant tumours ('All cancer death rate') and respiratory cancers (death registration states, 1900 to 1932; United States, 1933 to 1960). Source: Grove and Hetzel (1968).

happened to stocks in RJ Reynolds, which fell from \$41.13 on 8th December to \$38.00 on 9th December, \$39.00 on 10th December and \$38.63 on 11th December. Volumes of RJ Reynolds stocks traded were 27,600, 31,700 and 23,700 on the 9th, 10th and 11th December respectively, compared with a 1953 average prior to 8th December of approximately 3,400.³³ Figure 1(b) shows that the -0.079 return on the closing price between the 8th and 9th December was the second-largest day-to-day fall in the price of RJ Reynolds stocks for the period of our study, only surpassed by the -0.085 return on 9th April, 1962, which occurred a month or so after publication of the report by the UK Royal College of Physicians.

It was on December 10th and 11th 1953 that Paul M. Hahn of American Tobacco sent telegrams to the presidents of the other US tobacco companies and suggested they should meet to consider action to deal with the negative publicity.³⁴ This they did on 14th, 15th and 28th December in New York. The presidents concluded that 'the public nature of the charges against the industry necessitated public action and that the advice and guidance of public relations counsel not previously associated with the industry should be obtained.'³⁵ Yet the industry leaders faced a conundrum: American anti-trust legislation prohibited the setting up of a joint industry committee,³⁶ so how could the leaders provide a collective response to the problem whilst avoiding anti-trust action? The solution was the formation of the TIRC.³⁷

The launch of the TIRC was announced on 4th January, 1954, in a full-page advertisement placed in 448 newspapers across the USA entitled 'A Frank Statement to Cigarette Smokers.' In it, the TIRC stated that an interest in people's health was 'a basic responsibility, paramount to every other consideration in our business.'³⁸ On 25th January, 1954, a statement concerning the origins, purpose and proposed functions of the TIRC

was tendered by Hahn to the Attorney General of the United States.³⁹ The statement claimed that the purpose of the TIRC was to ‘aid and assist research into tobacco use and health, and particularly into the alleged relationship between the use of tobacco and lung cancer, and to make available to the public factual information on this subject.’⁴⁰ In April 1955, the TIRC stated that its major purposes were research and public relations and that its job was:

‘to maintain a balance between the two and to continue to build soundly so that at all times Research and Public Relations complement each other. In that way we intend to assume the mantle of leadership and, ultimately, to create a condition where the public will look to the TIRC for answers rather than to others.’⁴¹

4 The operations of the Tobacco Industry Research Committee

Hill and Knowlton Inc., a New York City-based public relations firm, was appointed to formulate the public relations strategy of the TIRC.⁴² At the January 1954 meeting of the TIRC, the precise duties of Hill and Knowlton were set out as being:

‘to make available to the Committee such information as they may gather that is pertinent to the Committee’s objectives, to handle correspondence and inquiries . . . and to release only such matters in response to such inquiries as shall be determined and formulated by the Committee and to carry out editorial research and disseminate information to the public.’⁴³

The importance of public relations was underlined by the composition of the TIRC: four members of the original committee of twenty one were employees of Hill and Knowlton.⁴⁴

As part of the public relations strategy, Hill and Knowlton, together with the TIRC, organised the publication of a number of booklets and newsletters for distribution across the United States. One of the first of these, released on 14th April 1954, was entitled ‘A Scientific Perspective on the Cigarette Industry’. This was essentially a compendium containing quotations and statements by 36 ‘distinguished cancer authorities’.⁴⁵ It had a general press distribution of 15,000 and was sent to 176,800 doctors, general practitioners, specialists and deans of medical and dental colleges. It seems to have set the tone of press statements and reports to come: viewed against the full body of scientific literature available at the time, it appears to be highly selective in its choice of content, arguing, in essence, that the case against smoking in relation to lung cancer was unproven.⁴⁶ Major themes used to support this argument included the line that statistical relationships cannot *prove* causal ones, epidemiological studies could be based on non-representative samples and that no causative carcinogenic agent had been found in cigarette smoke.

Regular publications produced by Hill and Knowlton for the TIRC followed. ‘Tobacco News’, a quarterly publication with a circulation of about 70,000, was

‘designed to show the positive contributions of tobacco and the tobacco industry to national and local economies, to the social graces and to the comforts and relief of tensions of this nation and the world. It will show tobacco as the friend of all - rich and poor, high and low.’⁴⁷

Tobacco News argued that tobacco made a vital contribution to the US economy and, as such, was a major asset to the country. It was sent to news desks, editors, publishers, columnists, radio and television, business, opinion leaders and so on.⁴⁸

A second regular publication, Tobacco and Health, first published in October 1957,⁴⁹ was distributed to doctors, dentists, science writers, editors and publishers.⁵⁰ Its first issue had a print run of 350,000,⁵¹ rising to approximately 536,000 by April 1959.⁵² Whereas Tobacco News stressed the *economic* importance of tobacco, Tobacco and Health focused on the health issues surrounding tobacco and claimed to provide a ‘balanced view’, by acknowledging and disseminating less publicised work which did not support, or tended to refute, the charges against tobacco. Our survey of the contents of Tobacco and Health reveals that the reports contained therein all, without exception, threw doubt on the link between smoking and lung cancer and the ‘findings’ were, in the very large majority of cases, not published in peer-reviewed journals. Where publications were named, they tended to be in the local press in the USA.

A third publication, printed annually from 1956, was the Annual Report of the Scientific Director. This presented to the public the TIRC’s view of the tobacco-health problem and was sent to the press and ‘selected lists’ of doctors, scientists, public health officials and education establishments.⁵³ It contained a general assessment of the evidence concerning tobacco harm and detailed information on the research program and projects funded by the TIRC. These annual reports are reviewed in detail in Forster et al., who concluded that their content was not faithful, at least in an objective manner, to the TIRC’s stated aim of making factual information available to the public.⁵⁴ That is, although factual information was released to the public through the reports, it was used to highlight the ongoing ‘controversy’ surrounding tobacco harm and, as such, was not representative of the information relating to the tobacco-health issue possessed by the TIRC as a result of its programme of literature retrieval and review.

4.1 Internal literature retrieval and review

The American tobacco companies had been monitoring the scientific literature prior to the scares of the early 1950s.⁵⁵ From at least the early 1940s, and throughout the following decades, American Tobacco and RJ Reynolds, operating independently of each other, collected scientific literature and built their own separate libraries cataloguing the medical literature which surveyed links between lung cancer and smoking⁵⁶ by employing dedicated teams of researchers to collect the literature on the carcinogenic effects of tobacco inhalation.⁵⁷ Advice in 1955 stated:

‘a comprehensive review of the literature as of this date indicates that the following conclusions are sufficiently well documented to withstand thorough scrutiny and any attempts to question their authority . . . a statistical

association between heavy cigarette smoking and increased risk to the development of lung cancer does exist . . . carcinogenic material can be demonstrated experimentally upon analysis of the combustion products of cigarettes.’⁵⁸

It went on to say:

‘in the complex biological phenomenon of lung cancer, scientific agreement is not only lacking but actually controversy more accurately describes the situation . . . the almost universal recognition that cancer is rarely the result of a single factor serves to question the soundness of any concept of causation.’⁵⁹

The TIRC recognised from the outset that ‘the regular and thorough screening of scientific literature relating to tobacco and health matters was basic to research, public relations and related activities.’⁶⁰ A TIRC library was organized to collect not only existing scientific research papers on the subject of tobacco and health, but also to screen new scientific publications for possible articles of interest, to catalogue and file them.⁶¹ The library functioned solely for the use of the Committee’s scientific staff, the Scientific Advisory Board, and the needs of those in the tobacco industry; it did not open its shelves to the general public.⁶² By 1968 it was claimed that the library received 129 scientific publications, ten publications abstracting the literature and information on the monitoring of 2,500 US and foreign journals carried out by the Philadelphia College of Physicians.⁶³ When asked in 1960:

‘[w]ould it be fair to say, sir, that one of the reasons for the policy of collecting scientific and medical literature covering cigarette smoking and its effect upon human beings was to be able to determine whether or not smoking is fit and safe for human consumption or whether it is harmful to the human body?’⁶⁴

Hahn was to answer: ‘[i]t is probably fair to say that that was one of the purposes, but I would say the principal purpose was to know everything that we could possibly know about the product that we were making and selling.’⁶⁵

Two major internal documents, produced by Hill and Knowlton, summarised the state of the scientific literature on tobacco and health. A document known as ‘A working reference catalog’, published in August 1955, listed scientific literature published prior to 1st August 1955.⁶⁶ From July 1956 onwards, scientific articles were abstracted and then compiled each month into a publication known as the ‘Current Digest of Scientific Papers Relating to Tobacco Use’ (hereafter ‘Current Digest’)⁶⁷, which was sent to TIRC members. Hill and Knowlton claimed that the Current Digest provided ‘the fundamental source of information for story ideas for the lay press, when desirable, and for supplying specific information on stories relating to tobacco and health or TIRC.’⁶⁸

Distribution of the Current Digest was extremely limited. Such was the sensitivity of the document that a note was sent to members of the TIRC in 1956 reminding them that:

‘[t]he CURRENT DIGEST is prepared for use only by members of the TIRC, their authorized personnel and the Scientific Advisory Board. Because of possible misinterpretation by others of the purpose of this DIGEST, no wider distribution is advised.’⁶⁹

Independent advisors to the TIRC who sat on its Scientific Advisory Board only received the publication on request and were told that its contents were highly confidential. Thus, in 1958, Hoyt, Executive Secretary of TIRC, wrote to one of the advisors, Paul Kotin:

‘I would like to admonish you that this is put together strictly as an internal document and should be retained for your use only, as it could be misinterpreted by people choosing to do so.’⁷⁰

Forster et al., in their review of the TIRC’s literature retrieval and review process as it related to retrospective and prospective studies investigating the relationship between tobacco use, six cancer sites and cardiovascular diseases, found the process to have been unbiased and reasonably comprehensive, in so far as no major epidemiological studies appear to have been ‘missed’ by the TIRC library, whilst those studies that were reviewed appear to have been reviewed faithfully. Further, the operation appears to have been impressively responsive for the times: from 1956 onwards, the TIRC was providing, through the Current Digest, summaries of published epidemiological studies to its members within an average of 2.3 months of date of publication.⁷¹

4.2 The Scientific Advisory Board of the TIRC

As well as tracking the scientific literature, the tobacco companies had been conducting private, in-house research on tobacco and health for many years before the health scare of the 1950s. According to Hill and Knowlton:

‘they [the tobacco companies] believe that when we [Hill and Knowlton] are acquainted with all of the scientific and factual material in the hands of companies, we will agree that the major problem is to disseminate information on hand rather than to conduct new research.’⁷²

Hill and Knowlton disagreed with this position and advised the companies to sponsor additional research.⁷³ The tobacco companies took this advice and created the Scientific Advisory Board (SAB), on which sat a number of independent scientific advisors, to award grants to independent researchers to conduct research into the tobacco-health problem.⁷⁴ Legal counsel for the tobacco companies was later to argue that the goal of investigating claims concerning smoking and health and the means of accomplishing this goal, that is, the funding of independent research, reflected responsible corporate conduct.⁷⁵

In this section we consider the work of the SAB through an analysis of a range of primary source materials. Of these, the minutes of its meetings and the attachments giving details of grant applicants and decisions proved invaluable. For the historian, minutes of meetings are, invariably, dry and tell us little about the details of discussions or indeed any conflicts of opinions. In the case of the SAB, however, there are numerous occasions when appendices to the minutes do give such details.⁷⁶ In reading these accounts, what we believe becomes apparent is that, over time, some of the independent scientific advisors became increasingly concerned about their role in an organisation so closely linked to the tobacco industry. Misgivings existed as to the relationship between the SAB and the TIRC, the objectives of the SAB as well as its research grant activities. Ultimately, these misgivings appear to have been sufficient to cause resignations from the SAB.

Records suggest that the TIRC struggled to appoint members of the scientific community to the SAB.⁷⁷ The initial intention was to appoint a Scientific Research Director, who would then recommend SAB members. When no such person could be recruited to fill that role,⁷⁸ the order was reversed and the decision was made to appoint the SAB membership first.⁷⁹ This meant that the TIRC had to hand-pick potential SAB members. The selection of candidates fell under the remit of three TIRC agencies: the Industry Technical Committee (made up of the research directors of the tobacco company members), Hill and Knowlton and the TIRC Law Committee.⁸⁰ In effect, the active search appears to have been carried out by John Hill of Hill and Knowlton. The Industry Technical Committee screened prospective candidates and the Law Committee cleared them.⁸¹ The records do not appear to reveal the requirements for SAB membership when it was formed. In November 1963, however, they were set out as follows:

- ‘1. Scientific skill in biostatistics, biochemistry, biology and clinical medical research.
2. Executive skill in administration, finance, office management and coordination of elements in its program.
3. Access to current and published scientific literature with skill in summarizing the results and in maintaining a strong library.
4. Literary skill in presenting orally or by other means to science writers, interested groups and individuals, both scientific and lay, information on the objectives, program, attitudes and achievements of TIRC or its successor.’⁸²

Eventually, letters of invitation to join the board were sent to nine scientists deemed by the TIRC to be well known for their work in various fields of research. Acceptances were obtained from seven.⁸³ It was claimed that the two who did not accept were connected with the National Cancer Institute and, as government employees and for policy reasons, felt they should decline the invitation.⁸⁴ In 1954, two other scientists joined the SAB⁸⁵ and a third joined in 1958.⁸⁶ Joining the independent scientific advisors on the SAB were the Chair of the Industry Technical Committee, the Chair, Executive Secretary and Associate Scientific Director of the TIRC and a representative of Hill and Knowlton.⁸⁷

By 1958, the SAB consisted of scientists with expertise in a range of disciplines: Professor Richard Bing was a Cardiologist, Professor McKeen Cattell a Pharmacology specialist, Professor Julius Comroe a Lung Physiologist, Leon Jacobson a Professor of Medicine with special interests in cancer, Dr. Paul Kotin and Professor KM Lynch were pathology specialists, Dr Clarence Cook Little was a mammalian geneticist and a former President of the body which subsequently became known as the American Cancer Society,⁸⁸ Dr. Stanley Reimann was the Scientific Director of a Cancer Research Institute, Dr. WF Reinhoff, Jr. a surgery specialist and Emeritus Professor Edwin B. Wilson an expert in statistics and epidemiology. All appear to have been from distinguished institutions.

Eventually, Dr Little was chosen to chair the SAB. In 1957, Little described himself as ‘not a doctor of medicine. I am a biologist interested in the origin and nature and future prevention of cancer.’⁸⁹ Little was described by the TIRC as being ‘an ideal and eloquent spokesman by virtue of his natural ability, background and nature’, who ‘actually enjoyed the challenge of representing an open-minded point of view, on any platform, versus biased or unproven claims of anti-tobacco people.’⁹⁰

Questions arise about the extent to which the scientific advisors had working knowledge of the health issues surrounding tobacco use. Our analysis suggests that only one (Kotin) had written peer-reviewed papers on the health implications of tobacco use at the time the committee was formed, including co-authored papers in 1954 on the occupational factors involved in lung cancer and in 1955 on air pollution as a potential factor in lung cancer.⁹¹ Kotin’s published work never identified tobacco smoking as a significant risk factor. In terms of our research and hence to the best of our knowledge, none of the other members of the SAB had worked on, or had expertise in, the precise area of the health implications of smoking. In 1963, Little was to claim:

‘[i]n the selection of a Scientific Advisory Board and in the acceptance of the nomination by that Board of a Scientific Director, it was clearly shown that the attitude of the TIRC was to pick scientists *interested broadly* (our italics) in the origin and nature of the diseases (*sic underline*) implicated and in the evaluation of smoking as a possible (*sic underline*) factor, not as a proven one.’⁹²

The independence of the SAB rested on several fronts. Firstly, it did not conduct research itself. Its declared role was ‘to support research by independent investigators into questions of tobacco and health.’⁹³ Secondly, the independent scientists given research grants were ‘assured complete freedom in doing their work and disclosing the results.’⁹⁴ Finally, the SAB was ‘given complete freedom of action and decision to develop and direct a broad, long-range research program into questions related to tobacco use and human health’ by the TIRC.⁹⁵

We believe the evidence suggests that, during the period covered by this research, the scientific advisors on the SAB were committed to what they believed to be the promotion of independent and unbiased research into the relationship between tobacco

usage and health. For some, there was an acknowledgement that there was an *association* between tobacco smoking and lung cancer. Their desire appears to have been to explore whether or not the relationship was a *causal* one. In a particularly frank exchange in an SAB meeting in August 1957, Kotin is reported as saying:

‘ . . . if he were asked if smoking could cause l.c. (*sic*) he would have to say yes but he didn’t know under what circumstances or in what degree; that the human, in his daily living, was subject to a multiplicity of exposures, many of which could be related to cancer genesis – given the proper genetics. He didn’t know the relative importance of smoking and that is what we need to know. Just what is the role of smoking and other stimuli in the cause of l.c. (*sic*) . . . ? ’⁹⁶

While other members were less explicit at that meeting than Kotin, the records indicate an awareness of an association, and a general desire to explore the exact nature of that association and the identification of other contributory factors.

Public statements and press releases issued by the TIRC about the SAB led to disputes over the SAB’s work.⁹⁷ The scientific advisors raised, from its first meetings, objections and reservations about the relationship between the SAB and the TIRC. The tensions related, in essence, to the commitment of the scientific advisors to unbiased, independent research and what many of them felt was the biased stance of the TIRC in denying that any causal relationship between smoking and lung cancer existed.⁹⁸ The scientific advisors were unhappy that inferences from TIRC press releases were that ‘there was no relation between cigarette smoking and cancer’ and that such TIRC statements became confused with being the view of the SAB.⁹⁹ Of particular concern was a public statement sent out in 1957 on behalf of the SAB, which claimed that the SAB ‘questions the existence of sufficient definitive evidence to establish a simple cause and effect explanation of the complex problems of lung cancer.’¹⁰⁰ The meeting of the SAB on 9-10th March 1957 is worth quoting verbatim in this respect:

‘ . . . (Comroe) . . . said that when he was asked he stated that there was no evidence to establish any cause and effect relationship but there was a strong suspicion of association. He felt it would be better if TIRC would be equally candid and admit the possibility of a connection, stating that there was no proof of it and that the TIRC proposed to find out if there was such a relation. Jacobsen feels somewhat the same and has expressed it on previous occasions.’¹⁰¹

The proposed solution of the SAB’s Scientific Director was to have exhibits at ‘small medical meetings’ on which the TIRC would distinguish between its work and that of the SAB.¹⁰² At this same meeting, it is evident that some SAB members were sufficiently concerned that they raised objections that ‘the industry was in such a position that, for commercial reasons, they must withhold information – even concerning the composition of cigarette smoke.’¹⁰³ The minutes do not appear to indicate that reassurance was given to the scientific advisors by the industry.

These disputes were followed shortly thereafter by the publication of a major US report concerning the harm posed to health by tobacco in the journal 'Science'. In June 1957, the 'Study Group on Smoking and Health', comprising members of the National Cancer Institute, the National Heart Institute, the American Cancer Society and the American Heart Association, reported on its examination of 18 independent epidemiological studies into smoking and lung cancer and experimental, pathological and other evidence. It concluded that '[t]he sum total of scientific evidence establishes beyond reasonable doubt that cigarette smoking is a causative factor in the rapidly increasing incidence of human epidermoid cancer of the lung'.¹⁰⁴ This was followed in July by a statement from US Surgeon General Burney, which stated: 'it is clear that there is an increasing and consistent body of evidence that excessive cigarette smoking is one of the causative factors in lung cancer.'¹⁰⁵ These events are noted in Figure 1, which shows that there appears to have been little impact on per capita cigarette consumption, which had been rising steadily since its 1954 low. Nor do tobacco company stock prices appear to have been particularly adversely affected (see Figures 1 and 2).

Tensions within the SAB continued into 1958. The publication of Tobacco and Health provoked a strong reaction from the scientific advisors, who were angry that it was first issued under the aegis of the SAB and the TIRC. Their anger stemmed from a belief that Tobacco and Health presented a 'hazard to their maintenance of an impartial attitude as scientific advisors.' Such was their anger that two members 'felt strongly enough that they raised the question of whether or not to continue on the SAB.'¹⁰⁶ At the meeting of the SAB in February 1958, much time was spent discussing a personal letter from Comroe to Kotin. The letter followed from a discussion between Comroe and Jacobson, both of whom 'had been disturbed by a misunderstanding of the relationship between the TIRC and the SAB.' Comroe and Jacobson were 'particularly irked by 'Tobacco and Health' and the fact that some of their colleagues held them responsible for its contents.'¹⁰⁷ Such were the misgivings of Comroe that he felt he 'would have to withdraw from the SAB unless some changes were made.'¹⁰⁸ Comroe was not alone; Kotin strongly defended him, told the Board that he and Comroe had often discussed the situation and that 'they were both distressed over it,'¹⁰⁹ whilst Jacobson told the Board 'he was not responsible and did not wish to be linked with any statements made by the TIRC.'¹¹⁰ Cattell agreed with both Kotin and Jacobson. Comroe, by all accounts, felt 'he could not continue to be placed in the awkward position of unwittingly endorsing everything that the TIRC said.'¹¹¹ These exchanges are described in the minutes as an argument.¹¹² The solution which followed was to issue Tobacco and Health under a subcommittee of the TIRC known as the Tobacco Information Committee.

On January 27th 1958, the Tobacco Institute, Inc., was formed.¹¹³ This took over the public relations activities of the TIRC, largely under the direction of Hill and Knowlton. It was described as being 'a communications organization . . . we are the communicator of the industry's viewpoints and the advocate for its position.'¹¹⁴ From this date onwards, the TIRC's involvement in public relations is described as tapering off and becoming 'minimal.'¹¹⁵

In May 1958, the relationship between the SAB and the TIRC came to a head over the perceived conflict of interests of Little who, as Chairman of the SAB and also Scientific Director of the TIRC, was responsible for writing the annual report of the Scientific Director. This troubled some members of the Scientific Advisory Board, who believed that Little's statements as Scientific Director of the TIRC could be inferred as also being made on behalf of the SAB. Three members (Comroe, Kotin and Jacobsen) felt that they could not continue to serve on the Board if the situation were to continue.¹¹⁶ At the meeting of the TIRC on May 8th, 1958, Hartnett, the chair of the committee, read out a letter from Comroe, which objected to public statements in press releases and the annual reports of the Scientific Director. Comroe argued that, unless a more distinct divorce could be established between the SAB and the TIRC, he felt he could not continue to serve on the Board. Hartnett further told the TIRC members that Comroe was joined in this by two other (unidentified) board members. Hartnett declared that 'since this situation had arisen the matter had been ironed out satisfactorily', but this was to be proven incorrect two days later.¹¹⁷

On 10-11th May 1958, a whole morning of the SAB meeting in New York was devoted exclusively to a discussion of plans, policy, administration, and so on. By this time, Comroe had missed the last three meetings.¹¹⁸ At that meeting, Jacobson, Kotin and Cattell demanded clarification as to the duties and activities of the SAB and its relations to the TIRC.¹¹⁹ The problem was referred to a sub-committee which, in September of that year, reaffirmed the independence of the SAB. The sub-committee recommended that the role of the Chairman of the SAB and that of the Scientific Director of the TIRC be separated and that

'the objectives of the SAB are to promote research on the relation of tobacco to health in the various fields of physiology, chemistry, pathology, pharmacology, clinical medicine and other disciplines by means of grants, seminars, conferences, fellowships and the distribution of information.'¹²⁰

The Board accepted unanimously and Little was replaced as Chair of the Board by Dr Lynch. Little did, however, remain a member of Board because he was Scientific Director of the funding organization.¹²¹

1958 appears to be the year in which the content and tone of records of meetings of the SAB change significantly. Prior to 1958, the minutes contain a rich account of the discussions and deliberations of the SAB members. After 1958, the minutes of the SAB meetings contain nothing more than lists of approvals, or otherwise, of grant applications. This makes it difficult for us to present a detailed account of SAB meetings for the years 1959-1964.

On 28th November 1959, Surgeon General Burney issued a second statement, updating his one of 1957 by reviewing further published evidence, in which he concluded that 'the weight of evidence at present implicates smoking as the principal factor in the increased incidence of lung cancer . . . cigarette smoking particularly is associated with an increased chance of developing lung cancer.'¹²² Figure 1(a) shows that per capita

cigarette consumption and stock prices had continued their upward trends between 1957 and 1959 and continued to do so during 1960 and most of 1961.

The first official resignation from the SAB was that of Comroe, tendered in a letter dated 16th March 1960. The reason given was the work load of his new job,¹²³ but it is clear from the minutes of the SAB meetings that Comroe had expressed dissatisfaction with the operations of the TIRC on a number of occasions during his time on the board and that he had been absent from a number of meetings of the SAB prior to his resignation.

Stock prices and per capita consumption of cigarettes continued to climb during the rest of 1960. Stock prices peaked towards the end of 1961. On 7th March 1962, the UK Royal College of Physicians published 'Smoking and Health', concluding that 'cigarette smoking is a cause of lung cancer, and bronchitis and probably contributes to the development of tuberculosis; coronary heart disease and various other less common diseases.'¹²⁴

On 7th June of the same year, the formation of the Surgeon General's Advisory Committee on smoking and health was announced. Figure 1(a) shows that Reynolds stocks fell sharply at the end of 1961 and during the first half of 1962, more than halving in value, and these falls were reflected in the movements of stocks in other tobacco companies (see Figure 2) but not in the stock market in general (Figure 1). Reports and market updates at the time attribute the falls in stock prices to the publication of the RCP report and gathering concern in the United States.¹²⁵ Neither the publication of the report of the Royal College of Physicians, nor the announcement of the establishment of the Surgeon General's Advisory Committee, appears to have prompted debate or discussion amongst the members of the SAB, at least as far as the minutes of their meetings are concerned.

The Surgeon General's Advisory Committee on Smoking and Health reported on 11th January 1964.¹²⁶ It concluded that cigarette smoking 'contributes substantially to mortality from certain specific diseases and to the overall death rate' and that it 'is a health hazard of sufficient importance in the United States to warrant appropriate remedial action.'¹²⁷ Shortly thereafter, on 11th March 1964, the TIRC was renamed the Council for Tobacco Research - USA, Inc.. Per capita cigarette consumption fell in 1964, the first fall since the ones of 1953/4. As Figures 1 and 2 demonstrate, tobacco company stock prices appear to have remained relatively stable during 1963 and 1964 in comparison with their poor performance at the end of 1961 and during the first half of 1962.

On 26th November 1965, a year and a half after the publication of the Advisory Committee's report, Paul Kotin became the second scientific advisor to resign from the SAB, again citing his work load as the explanation.¹²⁸

4.3 The research awards of the Scientific Advisory Board

Initially, the SAB had serious problems spending money to support research. Although five hundred thousand dollars were appropriated as the first year's research budget, the SAB found that 'the suspicion and distrust on the part of many institutions toward taking tobacco company money was so great that it was impossible to apportion more than a small amount of the budget. Yale, Harvard and Cornell Universities, for example, would not allow their investigators to apply to the TIRC for funds.'¹²⁹ In the early years, therefore, energy was expended promoting the availability of large monies to finance research. As a result, the SAB:

'made a special effort to award grants to scientists and institutions, which would not only support important research but would also enhance the scientific stature of the program and encourage understanding and acceptance of the TIRC program'¹³⁰

Gradually, some members of the research community appear to have been won round. The first grants were made in September 1954.¹³¹ By March 1960, the SAB had awarded grants totaling around \$3.2m to 90 scientists in 61 medical schools and research institutions in the United States.¹³² For recipients of grants, no restriction on publication appears to have been set by the SAB. According to the records, each successful grant holder was given 'full freedom to pursue his research and to publish his findings in accepted scientific journals, without limitation of any kind.'¹³³ By 1958, it was claimed that about 45 papers acknowledging TIRC support had been published in scientific journals.¹³⁴ How were the findings of these papers used by the TIRC? In a speech in 1957, Associate Scientific Director of the TIRC, RC Hockett, stated:

'we . . . have made rather a point of not trying deliberately to publicize their work at the time they give reports or when they first publish the paper. Because if we did this, where the results, let's say, are rather favorable to tobacco we would also have to do it where they were rather un-favorable.'¹³⁵

Plaintiffs were later to claim that lawyers planned and controlled the research process.¹³⁶ We find that the evidence in the very early years of the SAB's existence is not so straightforward. Initially, it would appear that the SAB members were independent in their awarding of grants. By 1958, however, it is apparent that the TIRC may have been directing its research grant activities 'from behind the scenes'. At a meeting of the SAB held in February 1958, Little not only laid out the research objectives 'which he felt should receive attention', but also he 'outlined the desirability of a fresh look at the SAB program.' The three objectives laid out by Little were: development of tissue culture techniques; standardization of bioassay methods and psychosomatic relationships.¹³⁷ Meanwhile, Little's 'fresh look at the SAB program' suggested that it should 'point toward more planning and selection of researchers to do specific pieces of work, rather than place too great a dependence upon applications filed by investigators.'¹³⁸ Little remarked that 'in this way added emphasis could be put on making each grant fit into the objectives of the SAB program.'¹³⁹ We did not find any record of the other members of the SAB questioning Little; on the contrary, they appear to have agreed with him.

The matter of whether or not the grants awarded directly addressed the tobacco/cancer connection became a central feature of later legal argument. By the 1990s, plaintiffs were claiming that grants sponsored work which investigated the implications of factors other than smoking in the etiology of disease. Recent legal opinion has stated that the tobacco companies:

‘orchestrated a variety of research projects . . . including CTR, Special Projects, Lawyers (*sic*) Special projects . . . and special projects conducted through the Tobacco Institute . . . the main purpose of the lawyer-directed and orchestrated research was the procurement and development of witnesses favourable to Defendants for testimony before Congress, other regulatory bodies, in litigation, and for support of industry public statements.’¹⁴⁰

Special research projects were funded outside of the SAB¹⁴¹ and date from December 1965, when representatives of the tobacco companies met with outside counsel to discuss the need for industry witness development following the Surgeon General Advisory Committee’s Report.¹⁴² Self-evidently, by 1965, from the point of view of the tobacco companies, the SAB could not be trusted to fund research by scientists who might provide reliable witnesses in the face of litigation. It is testament to the work of the SAB that industry lawyers were concerned that SAB-evaluated project funding had some basis in scientific legitimacy, even though under the direction of Little. Lawyers appear to have been principally concerned with litigation and liability.¹⁴³ Whilst the SAB continued its lone and restricted work in giving research grants to bone fide scientists, albeit on issues which do not appear directly to have addressed the issue of the link between smoking and cancer, the real impetus of the CTR appears to have turned to defence in the likely scenario of litigation. When later questioned in court, Paul Kotin confirmed that the funding of such projects and the independence of the research grants made by the TIRC had been major factors in his decision to resign from the SAB.¹⁴⁴

Does the SAB appear to have been biased in its awarding of grants or in renewals to grant holders who were not supportive of the tobacco industry? Analysis of the available evidence for the period 1953 - 1964, in terms of the minutes of the meetings, does not appear to indicate this. Rather, when applications were turned down, the evidence suggests that it was on scientific grounds, such as the size of a sample chosen for a particular study, the feasibility of the project (could it be completed within the stated time?) and so on. We did not find records of applications for renewals being turned down explicitly on the basis of prior ‘anti-tobacco’ findings.

In summary, our analysis suggests that the early days of independent financing of research into tobacco and ill health using the SAB did not last. By 1957/8, it appears that the scientists on the SAB felt that their independence was being compromised and their ability to carry out what they perceived to be independent roles undermined by the public relations activities of the TIRC. Furthermore, by 1958, it appears that their ability to act independently in the awarding of grants was limited, to some extent at least, by Little’s efforts to redefine the research objectives and fit grants to them. 1957 and 1958 appear to mark a turning point in the activities of the TIRC and the SAB: they are the years in

which the independent scientific advisors started raising serious concerns about the independence of the SAB, the Tobacco Institute took away the public relations activities of the TIRC and the minutes of SAB meetings start to reflect the activities of a body which did little other than sign off (or otherwise) grant applications. Discussions as to any wider role of the SAB, and to events occurring in wider society, such as the publication of the reports relating to tobacco use and disease, are notable by their absence.

5 Discussion

The principal-agent literature¹⁴⁵ lends insight into the various options open to the principals, in this case the holders of tobacco company stocks, to exert pressure on the agents, the managers of those companies, by exercising either limited exit options (selling sufficient stocks to act as a warning to management) or full exit options (selling all of the stocks). Equally, they may exert the ‘voice option’, either through private meetings or representations of discontent at Annual General Meetings. The movement of tobacco stock prices immediately prior to the formation of the TIRC is not inconsistent with it being exit options which prompted the US tobacco industry to react; chief executives could write off health scares in the short term, as long as stockholders retained confidence in their companies. In the years prior to 1953, it does not appear that the industry launched a serious public response to health warnings and the publication of scientific articles warning that tobacco was harmful, because there was no serious pressure on stock prices.

Further, the upward trends in per capita cigarette consumption and stock prices between 1954 and the early 1960s are not inconsistent with the desired aim of the policies to stop public panic and restore confidence in tobacco products as suggested by Hill and Knowlton at the time the TIRC was founded. Client account papers donated by the founder of Hill and Knowlton, John Hill, to the Wisconsin State Historical Society provide detailed information on the thinking behind this strategy. In 1990, an internal review of some of these documents by a representative of Brown and Williamson, listed as ‘attorney work product’, expressed concern that Hill’s papers could be used to show that the tobacco industry’s approach to the health scare of the early 1950s aimed to “reassure” the public and protect industry profits.¹⁴⁶ Hill and Knowlton outlined six problems facing the industry: 1) establishing public confidence in the industry’s leaders; 2) reassuring the public while there existed a lack of definitive facts for ‘giving complete assurance’; 3) validating the message of assurance; 4) countering the findings of, amongst others, Wynder and Ochsner; 5) identifying tobacco companies ‘completely with concern for the public good’ and 6) stopping public panic.¹⁴⁷ In essence, according to Hill and Knowlton, the problem facing the industry was that of:

‘. . . confidence, and how to establish it; public assurance, and how to create it – in perhaps the long interim when scientific doubts must remain. And, most important, how to free millions of Americans from the guilty fear that is going to arise deep in their biological depths – regardless of any pooh-poohing logic – every time they light a cigarette.’¹⁴⁸

The public relations activities subsequently adopted by the TIRC appear to have exploited the matter of 'scientific doubt'. Tobacco and Health countered the findings of scientific research by quoting limited, non-peer reviewed and obscure articles in 'low level' publications. Little was appointed to chair the SAB because of his 'open-minded' attitude towards whether or not tobacco use was harmful and his reports of the Scientific Director frequently referred to the existence of a controversy. Time and again the TIRC argued that, although there may be some kind of association between tobacco use and various diseases, this did not prove causality. For example, in 1959, Little argued that 'statistics may indicate an association. They may even indicate a cause and effect relationship but by themselves, they cannot prove cause and effect.'¹⁴⁹ In 1958, the Chamber of Commerce was told that 'often complete and unbiased statistics are competent evidence, but, in the field of medicine, never proof.'¹⁵⁰ A further line was that of the complexity of the causes of lung cancer. Gender, environmental and genetic factors were all cited as being contributory.¹⁵¹ In 1959, the Annual Report of the Scientific Director of the TIRC for 1958 was reported in some detail to the stockholders of RJ Reynolds, who appear to have been reassured.¹⁵² The rise in the price of tobacco company stocks in the years following the formation of the TIRC suggests stockholders were reassured by the efforts the tobacco companies were making to deal with the health scares.¹⁵³

The second major fall in stock prices occurred towards the end of 1961 and during the first half of 1962, around the time that the report of the Royal College of Physicians was published and the announcement of the formation of the Surgeon General's Advisory Committee was made. The relative stability of stock prices following the publication of the Surgeon General's Advisory Committee report in 1964 (Figure 1 shows that stocks in RJ Reynolds actually rose slightly in the weeks following the publication of the report) suggests to us that the market had already incorporated the news concerning the harmfulness of tobacco into the price of tobacco stocks in early 1962, just as it had done at the end of 1953. The content of the Advisory Committee's report was therefore not 'news', at least as far as the US stock market was concerned. This is in contrast to the movement of per capita cigarette consumption, which was steady in 1962, rose in 1963 and then fell in 1964.

The variety of responses of different individuals and organisations within society to a common, growing, scientific evidence-base suggesting that tobacco was harmful makes the matter of when it would be 'reasonable' to deem that the controversy regarding tobacco harm no longer existed difficult to resolve. The organisations and individuals involved will have had different agendas and responsibilities and faced different incentives, all of which would have interfered with their efforts objectively to interpret the evidence available. But there was, amongst some, appreciation that complete resolution of the controversy was not a precondition for action to safeguard the public health. Cornfield et al., writing in the Journal of the National Cancer Institute in 1959, stated:

'[a]s in other fields of science, new findings lead to new questions, and new experimental techniques will continue to cast further light on old ones. This

does not imply that judgment must be suspended until all the evidence is in, or that there are hierarchies of evidence, only some types of which are acceptable. The doctrine that one must never assess what has already been learned until the last possible piece of evidence would be a novel one for science.’¹⁵⁴

The debate concerning the duration of the ‘controversy’ surrounding tobacco harm continues today and is complicated by potential conflicts of interest associated with payments by tobacco companies to some of the scientists of the day. By means of illustration, we consider here the opinions expressed by two individuals: Kotin and Berkson. Kotin, the member of the SAB who resigned in 1965, stated later that the publication of the US Surgeon General’s Advisory Committee report in 1964 was the point at which he regarded the controversy to be truly over:

‘[t]he state of knowledge was such that there was a complete and total conflict between the economics of tobacco and the scientific statement. From 1954 to 1964, the progress and research in smoking and health was analogous to the spectacular progress in all other areas of health. Many of the issues, as you very correctly pointed out, at the time I went on the board were to some degree unanswered, some unresolved, some questions really hadn’t been formulated yet. But by 1964, it was clear that what the tobacco industry was saying was entirely incompatible with the state of the art of tobacco and health.’¹⁵⁵

Berkson, however, writing in an updated, republished article based on one given in 1963, continued to argue after the publication of the Advisory Committee’s report that the case against smoking was unproven:

‘[t]he idea that cigarette smoking causes all these many deaths from all these many causes does indeed seem seriously questionable. There is not any scientifically known pharmacologic or physical explanation for so widespread or multifarious effect.’¹⁵⁶

Both Kotin and Berkson have been quoted by academics and in legal cases to support claims that a legitimate controversy concerning tobacco harm existed during the 1950s and early 1960s.¹⁵⁷ In making their case, Talley et al. omit to mention that Kotin was a member of the SAB. Talley et al., Parascandola and the case of *McTear v. Imperial Tobacco*, fail to mention that, according to the recent RICO judgment, at the time of publication of the Surgeon General’s report, Berkson was receiving consultancy fees of \$8,000.00 per annum (approximately \$50,000.00 in 2005 prices) from ‘Special Account No. 3’, operated by Philip Morris, RJ Reynolds, Lorillard, Liggett, Brown and Williamson and American Tobacco. According to the evidence referred to in the judgment, Special Account No. 3 was created by the tobacco companies to be a tobacco lawyers’ ‘work product’ and thus not subject to subpoena.¹⁵⁸ It is not clear to us when this information regarding Berkson’s consultancy became public. At a minimum, we believe it is important that future reference to scientists on either side of the debate regarding

tobacco during the 1950s and 1960s should mention any relationships that they had with the tobacco industry and any payments that they were receiving from it.

To what extent is it legitimate to criticise unconditionally the scientists who sat on the SAB during the period in question? The 1950s were the decade in which the health scare surrounding tobacco broke out in earnest, and there will inevitably have been scientists finding themselves on either side of the debate, some of whom will not have had problems being associated with the tobacco industry or taking payments from it. What interested us were the motives the independent advisors had for agreeing to sit on the SAB in the first place, their reaction to the growing evidence-base indicting tobacco and what eventually drove some of them to resign from the SAB.

One possible explanation for their agreeing to sit on the SAB is that the advisors wished to protect their own academic reputations in the light of material that they had already published. However, from what we could find, only one SAB member, with the exception of Kotin, had produced peer-reviewed research on the links between tobacco use and ill health. There therefore do not appear to have been academic reputations in this area to protect.¹⁵⁹

A second explanation could be that SAB members received favorable treatment in terms of funding for their own work. The RICO judgment claims that ‘members of the SAB awarded themselves over \$5 million in grants in aid funding between 1954 and 1991.’¹⁶⁰ A review of the list of grants made over the period covered in this paper reveals that Comroe was awarded two grants,¹⁶¹ Merrill Lynch one grant and Bing five separate grants.¹⁶² So some awards were made to SAB members, but the major part of the \$5 million appears to have been allocated after 1964.

The limited evidence in the archives makes it hard to investigate whether personal, monetary gain for the SAB members was an issue. SAB members at this time received limited financial reward in relation to payment for their time attending meetings.¹⁶³ The per diem rate, being computed from time of departure to time of return, was \$100.00 in 1954 (worth approximately \$725.00 in 2005 prices), rising to \$150.00 in 1963 (approximately \$950.00 in 2005 prices).¹⁶⁴ SAB members could also claim expenses. In October 1962, one SAB member, Wilson, wrote to Hoyt, noting that meetings tended to take place at ‘swell hotels’ which, he suggested, could be interpreted by outside parties as ‘corruption’.¹⁶⁵ It appears that Hoyt dealt with the matter in a telephone call, and we were unable to find a record of its content.¹⁶⁶

The evidence to support any argument that SAB members gained in terms of largesse in expense claims is, in terms of the evidence available, not supported. This is not to say that members did not claim expenses, but rather that the existing evidence provides details of expenses being claimed and of cheques being issued, but rarely records the amounts involved. More information exists in terms of the total expense budget for SAB members. In 1955, \$66,500.00 (approximately \$485,000.00 in 2005 prices) was set aside for per diem rates and expenses.¹⁶⁷ Thereafter, until 1963, the records do not detail the amounts set aside for either. The proposed 1964 budget allowed

for \$45,000.00 (approximately \$283,000.00 in 2005 prices) in SAB expenses and fees.¹⁶⁸ Unfortunately, the records fail to record the split between per diem fees and expenses.

What eventually prompted SAB members Comroe and Kotin to resign? To us it was the pressure brought about by the accumulating evidence indicting tobacco in the scientific literature, the statements of the US Public Health Service and related groups that are noted in Figure 1 and a growing concern that they were being used by the tobacco industry as part of its public relations efforts. It is instructive that obituaries of Comroe written after his death in 1984, whilst citing his professional activities and membership of learned bodies, do not mention his work for the Scientific Advisory Board.¹⁶⁹

Before concluding, it is worth mentioning the limitations of the research reported in this paper. It is unrealistic for us to make definitive cause-and-effect claims about the relationships summarized in Figure 1 of the paper. For example, we cannot say that the recoveries in per capita consumption of cigarettes and the prices of tobacco stocks which followed the establishment of the TIRC at the end of 1953 were due to the TIRC's formation. Firstly, we cannot observe the counterfactual, that is, what would have happened had the TIRC not been formed. Secondly, this paper has not examined the marketing strategies adopted by the individual tobacco companies, including their pricing and advertising policies, during the same period. Further, in reviewing the documents that have been released as part of the Master Settlement Agreement, we are limited to those which have not been subject to a classification of attorney-client privilege and which have not been destroyed or moved abroad in attempts by the tobacco industry to withhold evidence.¹⁷⁰ We cannot therefore claim that the documents that we have reviewed are taken from an unbiased source.

6 Conclusion

If we view the principal objective of the firm as being the maximisation of returns for its owners, then the behaviour of the tobacco companies in the period covered by this paper makes sense. Adult per capita consumption of tobacco fell after the health scare of 1953, with a knock-on effect on the price of tobacco stocks, as stockholders adjusted expectations of future revenues (and dividends) downwards and sold. We believe that this is a clear, direct and explicit expression of an exit strategy on behalf of the principals which, in turn, forced the tobacco companies into action, which they did by forming the TIRC.

Were stockholders and the consuming public reassured by the industry's response? Figure 1 shows that per capita consumption of tobacco and stock prices recovered until around the time of the publication of the report of the Royal College of Physicians (1962, for stock prices) and the publication of the Surgeon General's Advisory Committee report (1964, for per capita cigarette consumption). But these two indicators mask years of private conflict between the scientific advisors who sat on the SAB and the TIRC and, in public, between those who wished to warn the public about tobacco and those who thought, or wished to argue that, the case remained unproven.

From the perspective of the tobacco companies, it appears that the strategy adopted by the TIRC was not unsuccessful, at least in the short term. The anti trust regulations in the USA restricted their options, yet allowed them to present a united face by forming a body which, in public at least, ear-marked money to independent research into the health effects of tobacco use. But this did store up longer term problems of litigation and accusations of 'cover-up' and, in the eyes of some, to accusations that it gave legitimacy to claims that the controversy regarding tobacco harm lasted into the 1960s. Whether or not it is reasonable to claim that that the 'controversy' was still a controversy by 1964 depends very much on the perspective one takes and the associated incentives and responsibilities associated with that perspective: holders of tobacco stocks, sensitive to the future profitability of the tobacco companies, appear to have incorporated information into the health scares almost immediately, in both 1953 and 1962. Consumers, on the other hand, seemed to have responded in 1953 and then again in 1964. Whatever the perspective, we believe that present day debates about the legitimacy, or otherwise, of the controversy during the 1950s and early 1960s should make reference to potential conflicts of interest associated with some of the scientists of the day accepting tobacco industry money.

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Notes

- ¹ See, for example, The European Environment Agency (2001).
- ² See Munoz (2005) and Courtwright (2005).
- ³ The documents were made available through litigation brought by the National Association of Attorneys General (NAAG) that resulted in the Master Settlement Agreement (1998). The Tobacco Master Settlement requires tobacco companies to open, at their expense, a Website which includes all documents produced in state and other smoking and health related lawsuits. The Legacy Tobacco Documents Library (LTDL) contains 7 million documents related to advertising, manufacturing, marketing, sales, and scientific research of tobacco products. The LTDL includes documents posted on tobacco industry web sites as of July 1999 in accordance with the Master Settlement Agreement, additional documents added to those sites since that date, and the Mangini and Brown and Williamson document collections from the Tobacco Control Archives maintained by the University of California, San Francisco. For a discussion of the implications of the release of these documents see Collin, Lee and Gilmore (2004).
- ⁴ ‘John W. Hill Papers from the State Historical Society of Wisconsin, selected and related documents on the topic of the Hill and Knowlton public relations campaign formulated on behalf of the Tobacco Industry Research Committee’, Tobacco Trial Lawyers’ Association, www.ttlaonline.com/hksplash.htm.
- ⁵ Forster et al. (2006a).
- ⁶ Forster et al. (2006b).
- ⁷ See Barnes et al. (1995), Glantz et al. (1995b) and Glantz et al., (1996).
- ⁸ See, for example, the review of Doll (1998) and the work of Parascandola (2004) and Parascandola et al. (2006).
- ⁹ See, for example, Fisher (1957, 1958) and Berkson (1955, 1958).
- ¹⁰ Judgment of US District Judge, Gladys Kessler, August 17th 2006, ‘The Rico Case’, Civil Action 99 CV 02496 (GK), www.library.ucsf.edu/tobacco/litigation/uspm.html, page 3.
- ¹¹ Jodie Bullock v. Philip Morris U.S.A., Inc., (2006), page 3.
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- ¹³ Talley et al. (2004).

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- 14 United States Department of Health, Education and Welfare. Public Health Service (1964).
- 15 See, for example, Masood's survey on the uproar created by the MRC's decision to accept a grant of £147,000 from BAT in 1996 and Doll's endorsement of that decision (Masood, 1996).
- 16 Berridge (1997).
- 17 Source: retrospective and prospective studies investigating the links between smoking and lung cancer as listed in United States Department of Health, Education and Welfare, Public Health Service (1964), Table 1, page 83 and Table 3, pages 156-7. Series is summarised in Tables 2 to 4 of Forster et al. (2006a). Where a study reported more than once, the first publication only is used to construct the series.
- 18 Forbes Business and Finance, 'The remarkable prosperity of RJ Reynolds', 15/06/1961, RJ Reynolds collection, legacy.library.ucsf.edu/tid/cpe86a00.
- 19 See Centre for Disease Control (1994, 1999).
- 20 Hilton (2000).
- 21 Grove and Hetzel (1968), Figure 13, page 79.
- 22 Grove and Hetzel (1968), Figure 20, page 86 and Figure 21, page 87. The US Public Health started recording the death rates from specific causes of respiratory cancer from the beginning of the 1930s.
- 23 Doll (1998).
- 24 Bradford Hill was also Professor of Medical Statistics, London School of Hygiene and Tropical Medicine.
- 25 See Wynder and Graham (1950) and Doll and Hill (1950).
- 26 See Doll and Hill (1952).
- 27 Riis R.W., 'How Harmful are Cigarettes?' Reader's Digest, January 1950, RJ Reynolds collection, tobaccodocuments.org/rjr/501551877-1887.html, pages 1-11.
- 28 Norr, R. 'Cancer by the Carton', Reader's Digest (condensed from Christian Herald), 12/1952, RJ Reynolds collection, legacy.library.ucsf.edu/tid/pwo23a00, pages 7-8.
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- 33 www.reynoldsamerican.com/Investors/stockPriceHistory.aspx
- 34 Chadborne and Parke (inferred), 'The American Tobacco Company, Resolutions Adopted at Meeting held December 29, 1953', 29/12/1953, American Tobacco collection, legacy.library.ucsf.edu/tid/euk51a00. See also Council for Tobacco Research, 'A Brief History of the Council for Tobacco Research - USA, Inc. (CTR)', undated, Council for Tobacco Research collection, legacy.library.ucsf.edu/tid/jio10a00.
- 35 Chadborne and Parke (inferred), 'The American Tobacco Company, Resolutions Adopted at Meeting held December 29, 1953', 29/12/1953, American Tobacco collection, legacy.library.ucsf.edu/tid/euk51a00.
- 36 At that time, because of previous anti-trust problems, the industry had no trade-association to deal with accusations about tobacco harm. Council for Tobacco Research, 'A Brief History of the Council for Tobacco Research - USA, Inc. (CTR)', undated, Council for Tobacco Research collection, legacy.library.ucsf.edu/tid/jio10a00.
- 37 The original members were nine of the cigarette and tobacco products manufacturing companies in the United States and five organisations of growers of leaf tobacco and tobacco warehouse associations. See 'Brown and Williamson - Council for Tobacco Research Issues Notebook', 10/1990, Brown and Williamson collection, legacy.library.ucsf.edu/tid/mix95a00, pages 3 to 4. See Chadborne and Parke (inferred), 'The American Tobacco Company, Resolutions Adopted at Meeting held December 29, 1953', 29/12/1953, American Tobacco collection, legacy.library.ucsf.edu/tid/euk51a00. The committee and its activities were financed by contributions from cigarette manufacturers – initially on the basis of 'one-fourth per thousand of their 1953 domestic output of cigarettes.' Six

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- months after the Committee's formation, Hartnett (President of Brown and Williamson Tobacco Corporation) was appointed permanent paid Chairman of the Committee. Council for Tobacco Research, 'A Brief History of the Council for Tobacco Research - USA, Inc. (CTR)', undated, Council for Tobacco Research collection, legacy.library.ucsf.edu/tid/jio10a00, page 5.
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- 39 At that time Hahn was as Chairman of the Committee.
- 40 The statement further claimed that '[i]t is the considered judgment of the Committee that its activities shall be confined to the purposes set forth above, and that it is in no wise to be considered or to operate as a trade association or to participate in any activity, or give consideration to any matters, affecting the business conduct or activities of its members . . . ', Council for Tobacco Research, 'A Brief History of the Council for Tobacco Research - USA, Inc. (CTR)', undated, Council for Tobacco Research collection, legacy.library.ucsf.edu/tid/jio10a00, pages 3-4.
- 41 'Statement by the Executive Secretary TIRC Meeting-April 28, 1955', 28/4/1955, Council for Tobacco Research collection, legacy.library.ucsf.edu/tid/evi2aa00, page 3.
- 42 See 'Brown and Williamson - Council for Tobacco Research Issues Notebook', 11/1991, Brown and Williamson collection, legacy.library.ucsf.edu/tid/mix95a00, pages 3-4. Prior to the formation of The Tobacco Institute, Hill and Knowlton served the industry on an advisory basis. In 1958, when the Institute was created, Hill and Knowlton was employed on a full time basis. See Hill and Knowlton, Inc., 'Hill and Knowlton's recommendations to the Tobacco Institute' 18/6/1959, legacy.library.ucsf.edu/tid/bqh30c00.
- 43 'Confidential Report on Meeting January 18, 1954, Tobacco Industry Research Committee (TIRC)', 18/1/1954, American Tobacco collection, legacy.library.ucsf.edu/tid/rhm85f00, page 3.
- 44 Council for Tobacco Research, 'A Brief History of the Council for Tobacco Research - USA, Inc. (CTR)', undated, Council for Tobacco Research collection, legacy.library.ucsf.edu/tid/jio10a00, page 2. The relationship with Hill and Knowlton was severed in 1964. See also 'Brown and Williamson - Council for Tobacco Research Issues Notebook', 11/1991, Brown and Williamson collection, legacy.library.ucsf.edu/tid/mix95a00, pages 3-4.
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- 47 'Hill and Knowlton Publications for the Tobacco Institute', 20/4/1959, Council for Tobacco Research collection, legacy.library.ucsf.edu/tid/ugs30a00, page 2.
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- 51 'Confidential Report, Tobacco Industry Research Committee Meeting, November 8, 1957', 8/11/1957, American Tobacco collection, legacy.library.ucsf.edu/tid/thm85f00, page 2.
- 52 'Hill and Knowlton Publications for the Tobacco Institute', 20/4/1959, Council for Tobacco Research collection, legacy.library.ucsf.edu/tid/ugs30a00, page 3.
- 53 'Confidential Report, Tobacco Industry Research Committee Meeting, November 8, 1957', 8/11/1957, American Tobacco collection, legacy.library.ucsf.edu/tid/thm85f00, pages 22-23.
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- 63 Austin, K., 'Activities of the CTR-USA library', 30/1/1968, Council for Tobacco Research collection, legacy.library.ucsf.edu/tid/kxn10a00.
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- ⁶⁷ This item was presented under a report on public relations activities by Richard Darrow of Hill and Knowlton. ‘Confidential Report, Tobacco Industry Research Committee Meeting, November 8, 1957’, 8/11/1957, American Tobacco collection, legacy.library.ucsf.edu/tid/thm85f00.
- ⁶⁸ Hill and Knowlton, ‘Public relations report to the tobacco industry research committee Tuesday, October 9, 1956’, attachment #2, 9/10/1956, Council for Tobacco Research collection, legacy.library.ucsf.edu/tid/zkl10a00, page 8.
- ⁶⁹ ‘Reminder’, 9/1956, Lorillard collection, legacy.library.ucsf.edu/tid/dbz21e00.
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- ⁷¹ Forster et al. (2006a).
- ⁷² ‘Background Material on the Cigarette Industry Client’, 15/12/1953, John W Hill papers collection, www.tlaonline.com/HKWIS/0295.pdf, page 3.
- ⁷³ ‘Background Material on the Cigarette Industry Client’, 15/12/1953, John W Hill papers collection, www.tlaonline.com/HKWIS/0295.pdf, page 3.
- ⁷⁴ Legal counsel was later to argue (and witnesses to agree) that the scientists who were appointed to the SAB were eminent experts in a range of disciplines. See ‘Deposition of Sheldon Sommers, MD, 1986, Cipollone v Liggett Group Inc.’, 2/10/1986, Datta Transcripts collection, legacy.library.ucsf.edu/tid/cry75a00, pages 114-118; ‘Defendant closing statement, 23rd June 1999, [p.m.], Engle v. RJ Reynolds Tobacco Corp.’, 23/6/1999, Datta Transcripts collection, legacy.library.ucsf.edu/tid/dkr07a00; ‘Deposition of Thomas Murray, Ph.D., November 20th, 1996, in Re: Mississippi Tobacco Litigation’, 20/11/1996, Datta Transcripts collection, legacy.library.ucsf.edu/tid/ktq07a00, pages 564-573.
- ⁷⁵ ‘Brown and Williamson - Council for Tobacco Research Issues Notebook’, 11/1991, Brown and Williamson collection, legacy.library.ucsf.edu/tid/mix95a00, page 6.
- ⁷⁶ Here we find a signal difference in the reporting and recording of the work of the SAB between 1954 and 1963 (i.e. the period covered in this paper), and that after 1971 when policy determined that meetings met informally without minutes or publication. See Judgement of US District Judge, Gladys Kessler, August 17th 2006, ‘The Rico Case’, Civil Action 99 CV 02496 (GK), www.library.ucsf.edu/tobacco/litigation/uspm.html, Section 1, para 71, page 34.
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- 79 Judgment of US District Judge, Gladys Kessler, August 17th 2006, 'The Rico Case', Civil Action 99 CV 02496 (GK), www.library.ucsf.edu/tobacco/litigation/uspm.html, Section 1, para 63, page 31.
- 80 Judgment of US District Judge, Gladys Kessler, August 17th 2006, 'The Rico Case', Civil Action 99 CV 02496 (GK), www.library.ucsf.edu/tobacco/litigation/uspm.html, Section 1, paragraphs 61 and 64, pages 30 and 31.
- 81 Judgment of US District Judge, Gladys Kessler, August 17th 2006, 'The Rico Case', Civil Action 99 CV 02496 (GK), www.library.ucsf.edu/tobacco/litigation/uspm.html, Section 1, para 64 pages 31 - 32. See also Jasa K, 'Memorandum to Allen R Purvis from Karen K Jasa, May 7th 1990, 'Summary of Important Documents in John W Hill Collection'', 7th May 1990, legacy.library.ucsf.edu/tid/ndy95a00, pages 28 and 30.
- 82 Little, CC, Memorandum to W. Hoyt, 27/11/1963, American Tobacco collection, legacy.library.ucsf.edu/tid/jud94f00.
- 83 The original seven members of the Scientific Advisory Board were Clarence Cook Little, Founder and Director Emeritus, the Roscoe B. Jackson Memorial Laboratory, Bar Harbor, Maine; McKeen Cattell, Professor of Pharmacology, Cornell University Medical College, New York; Leon G. Jacobson Professor of Medicine, University of Chicago and Director, Argonne Cancer Research Hospital, Chicago, Illinois; Paul Kotin, Associate Professor of Pathology, University of Southern California School of Medicine, Los Angeles, California; Kenneth Merrill Lynch, President, Dean of Faculty and Professor of Pathology, Medical College of South Carolina, Charleston, South Carolina; Stanley P. Reimann, Scientific Director, The Institute for Cancer Research and Director, The Lankenau Hospital Research Institute, Philadelphia, Pennsylvania; William F. Reinhoff, Associate Professor of Surgery, Johns Hopkins University School of Medicine, Baltimore, Maryland. See 'Scientific Advisory Board to the Tobacco Industry Research Committee', 1/5/1957, American Tobacco collection, legacy.library.ucsf.edu/tid/alp51a00.

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- 84 Council for Tobacco Research, 'A Brief History of the Council for Tobacco Research - USA, Inc. (CTR)', undated, Council for Tobacco Research collection, legacy.library.ucsf.edu/tid/jio10a00, page 6.
- 85 Edwin B. Wilson and Julius Comroe.
- 86 Council for Tobacco Research, 'A Brief History of the Council for Tobacco Research - USA, Inc. (CTR)', undated, Council for Tobacco Research collection, legacy.library.ucsf.edu/tid/jio10a00, page 6. Comroe was a lung physiologist and Chairman and Professor, Department of Physiology and Pharmacology, University of Pennsylvania Graduate School of Medicine. Dr Edwin Wilson was an expert in statistics and epidemiology and Professor Emeritus of Vital Statistics, Harvard University. Dr. Richard J. Bing joined in 1958. Hoyt, WT, 'Excerpt from History of the Council for Tobacco Research, USA, Inc.', 1984, Lorillard collection, legacy.library.ucsf.edu/tid/pty50e00, pages 16-17. See also 'Scientific Advisory Board to the Tobacco Industry Research Committee', 1/5/1957, American Tobacco collection, legacy.library.ucsf.edu/tid/alp51a00.
- 87 See for example, the meeting held in May 1958: 'Confidential Report, Scientific Advisory Board Meeting, May 10-11, 1958', 10/5/1958, American Tobacco collection, legacy.library.ucsf.edu/tid/ipr94f00.
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- 93 Hill and Knowlton, 'Research Grants Announced by Tobacco Industry Group, 4th February 1960', 4/1/1960, Council for Tobacco Research collection, legacy.library.ucsf.edu/tid/hqu00a00. See also Little, CC, TIRC, 'An address by Clarence Cook Little, Scientific Director, Tobacco Industry Research Committee before the Burley and Dark Leaf Tobacco Export Association Inc., Tuesday,

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- September 27th 1960', 22/9/1960, Council for Tobacco Research collection, legacy.library.ucsf.edu/tid/igb2aa00.
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- ⁹⁷ 'Report on Meeting of Scientific Advisory Board Washington, March 9-10 1957', 13/3/1957, American Tobacco collection, legacy.library.ucsf.edu/tid/qny34f00.
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- ¹¹⁹ 'Report on Meeting of Scientific Advisory Board, New York, N.Y., May 10-11, 1958', 13/05/1958, American Tobacco collection, legacy.library.ucsf.edu/tid/kpr94f00.
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- ¹²⁵ For example, Merrill Lynch's wire flash of 26th March, 1962 stated: 'Current weakness in cigarette shares today is apparently due to – 1. a speech last Thursday

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- by the government leader in the British House of Lords endorsing the recent report by the Royal College of Physicians claiming a definite relationship between cigarette smoking and lung cancer. 2. an article in the New York Times of March 25th indicating that a subcommittee of the House Appropriations Committee was told in closed hearings in February that there was continuing evidence of a link between cigarette smoking and various diseases . . .’ Merrill Lynch Wire Flash #A 198 March 26th, 1962. Cigarette Shares Current Weakness, 26/03/1962, RJ Reynolds collection, legacy.library.ucsf.edu/tid/fka23a00.
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