PROCTOR AFFIDAVIT DOJ CASE

Tobacco and Health: Expert Witness Report Filed on behalf of Plaintiffs in:

"The United States of America, Plaintiff, v. Philip Morris, Inc., et al., Defendants,"

Civil Action No. 99-CV-02496 (GK)

Robert N. Proctor

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I am a Distinguished Professor of History at Pennsylvania State University in University Park, Pennsylvania, where I am also Co-director of the Science, Medicine, and Technology in Culture initiative. I have been asked to review the history of tobacco health hazards, focusing also on the history of the tobacco industry's response to evidence of a tobacco hazard. I have also been asked to respond to the February 2002 reports submitted by Kenneth Ludmerer, Theodore A. Wilson, Richard D. Thomas and Peter C. English. I will begin with some historical background, followed by a review of the discovery of tobacco hazards and the tobacco industry's response to these discoveries. I will then respond to the four reports prepared by expert witnesses for the defense.

Section I: Tobacco and Health History

Historical Background

The tobacco plant is native to the Americas. Sailors accompanying Christopher Columbus on his voyage to the New World found Arawak and Taino Indians smoking the herb, and brought back samples with them to Europe, where the habit was eventually popularized.

Anecdotal evidence of possible harms from the habit began to accumulate shortly after smoking was introduced into Europe, but it was not until the eighteenth and nineteenth century that physicians began to publish observations of serious, life-threatening hazards. Tobacco snuff was linked to cancer of the nose in 1761 (by John Hill of London), to cancer of the lip in 1787 (by Percival Pott), and to cancer of the mouth in 1858. Etienne-Frédéric Bouisson in France in the 1850s noted that most of his patients suffering from cancer of the mouth were pipe smokers;[1] and the famous Rudolf Virchow in Berlin reported similar observations shortly thereafter. Cancer of the lips, tongue, jaw, mouth, pharynx, and nasal cavities were so well known to cancer specialists by the end of the century that medical students wrote doctoral theses on the topic--which by then were known to physicians as "Smokers' Cancers."[2]

Tobacco cancers were first recognized in the lips, mouth, and tongue because these are easily visible, but also because people rarely inhaled tobacco smoke prior to the invention

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[1] Etienne-Frédéric Bouisson, Tribut à la chirurgie, vol. 1 (Paris: Baillière, 1858), pp. 259-303.

[2] Joseph Cortyl, Du Cancer des fumeurs (Paris: Henri Jouve, 1897).

of cigarettes. Tobacco smoke was generally too harsh to inhale, and nicotine was most often absorbed through the lining of the mouth (whether chewed or smoked). An important change occurred in the mid-19th century, when the invention of a fermentation process known as "flue-curing" allowed smokers to inhale tobacco smoke deep into their lungs without coughing. This new method of smoking also meant that tissues deep in the lungs were exposed to tobacco smoke to an extent not possible previously.

Tobacco consumption grew dramatically in the late nineteenth and early twentieth century, following the invention of machines that could roll hundreds of thousands of cigarettes per day (e.g., the Bonsack machine). Cigarettes (literally "little cigars") had been introduced from Europe into America only a few decades previously, and the habit became popular with the invention of safety matches, facilitating a quick and easy light. Governments throughout the world quickly recognized tobacco as a source of tax revenue, further promoting their use. And though a number of U.S. states banned the sale of cigarettes in the 1890s, the end of Prohibition in the 1920s brought with it a more accepting attitude.[3] The inclusion of cigarettes with K-rations also helped popularize the habit: General John J. Pershing, commander of America's Expeditionary Forces, had argued that to win the war his soldiers needed "tobacco as much as bullets."[4] Millions of men returned from the Great War (1914-1918) addicted to the "little white slavers": Americans had

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[3] John C. Burnham, Bad Habits: Drinking, Smoking, Taking Drugs, Gambling, Sexual Misbehavior, and Swearing in American History (New York: New York University Press, 1993).

[4] Richard Kluger, Ashes to Ashes: America's Hundred-Year Cigarette War, the Public Health, and the Unabashed Triumph of Philip Morris (New York: Knopf, 1996), p. 63.

smoked only a billion cigarettes in 1880, but by 1920 this had climbed to 45 billion. The total number of cigarettes smoked in the U.S. continued to grow until 1980,[5] when more were being smoked in a day than had been smoked in a year a century earlier.

Lung cancer was not recognized as a tobacco hazard prior to the twentieth century. The disease must surely have existed, even among the natives of the Americas, but it was difficult to diagnose before the invention of X-rays (in the 1890s)--often being confused with tuberculosis and other lung ailments. The idea that tobacco might be a cause of lung cancer did not appear in medical literature until 1898--first in Germany--the idea being that tobacco workers might be contracting the disease from the inhalation of tobacco dust (not smoke) while at work.[6]

Isaac Adler, author of America's first lung cancer medical text, in 1912 was apparently the first to suggest that "the abuse of tobacco" might be a cause of the increase of lung cancer, though he also admitted that the subject was "not yet ready for final judgment."[7] The disease was still rare enough not to cause much worry, however: as late as the 1890s there were only about 142 cases known in published medical literature worldwide. Lung cancer was an extreme rarity. Smoking was on the rise, but no one seems to have realized that it might take 20, 30, or even 40+ years for a tobacco cancer to develop after onset of exposure (this is the so-called "time lag" or "latency").

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[5] Figures are from Worldwatch Institute and the U.S. Dept. of Agriculture, equating consumption with production.

[6] Hermann Rottmann, Über primäre Lungencarcinome (Würzberg: Med. Diss., 1898), pp. 29, 52.

[7] Isaac Adler, Primary Malignant Growths of the Lungs and Bronchi (London: Longmans, 1912).

The existence of this "time lag" helps explain why the rapid growth of smoking in the early decades of the twentieth century did not show up in massive increases in lung cancer until several decades later. Physicians were not yet very familiar with diseases caused by lifetimes of exposure to carcinogens.[8]

As a result, the first "case series" showing a connection between smoking and lung cancer was not published until 1929 (by Lickint in Germany), and the first "case-control epidemiological study" not until 1939--also in Germany, by Franz H. Müller at the University of Cologne. Lickint showed that lung cancer was much more common in smokers; Müller showed that this was true, even after controlling for the fact that smokers and non-smokers often came from different socioeconomic backgrounds.[9] The Journal of the American Medical Association in 1939 published an English abstract of Müller's paper[10]--which anyone with any strong interest or stake in this topic would certainly have noticed.

Tobacco lung cancers also began to be observed in the U.S. about this time. In 1928, Herbert L. Lombard and Carl R. Doering in Massachusetts found that 34 of 35 patients with cancers of the lung, lips, cheek, or jaw were heavy smokers. Raymond Pearl of Johns Hopkins University in 1938 showed that smoking was associated with a definite "impairment

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[8] See, however, my Cancer Wars: How Politics Shapes What We Know and Don't Know About Cancer (New York: Basic Books, 1995), pp. 27, 31, 38, 48.

[9] Fritz Lickint, "Tabak und Tabakrauch als ätiologischer Factor des Carcinoms," Zeitschrift für Krebsforschung, 30 (1929): 349-65; Franz Hermann Müller, "Tabakmissbrauch und Lungencarcinom," Zeitschrift für Krebsforschung, 49 (1939): 57-85.

[10] The translated abstract was published in the September 30, 1939, issue of JAMA (1939): 1372.

of longevity" among men; and in 1939, Alton Ochsner and Michael DeBakey of Tulane University showed that an overwhelming fraction of his 79 lung cancer patients had been smokers.[11]

Reports acknowledging the link continued to multiply.[12] In 1943, E. J. Grace of the American Board of Surgery in Brooklyn reported that among the many lung cancer patients he had seen, almost all were "heavy cigarette smokers and always inhalers." W. S. Wallace and Harold G. Jackson that same year published an article in the Texas State Journal of Medicine concluding that "tobacco smoking plays a definite role in the causation of primary lung carcinoma." Frank E. Tylecote, writing in Britain's prestigious medical journal, Lancet, characterized his experience treating lung cancer patients as follows: "in almost every case I have seen and known of, the patient has been a regular smoker."[13]

Historians have not been able to find any evidence of a timely American tobacco industry response to either Müller's abstract, or any of the other German papers, or the Ochsner report, or Pearl's paper, or Tylecote's report in Lancet, or Arkin and Wagner's paper, or the papers of Grace or Lombard and Doering. These early reports were simply

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[11] Herbert L. Lombard and Carl R. Doering, "Cancer Studies in Massachusetts," New England Journal of Medicine, 198 (1928): 481-87; Raymond Pearl, "Tobacco Smoking and Longevity," Science, 87 (1938): 216-17; Alton Ochsner and Michael DeBakey, "Primary Pulmonary Malignancy," Surgery, Gynecology and Obstetrics, 68 (1939): 435-51.

[12] Wilhelm C. Hueper, Chief Pathologist at the University of Pennsylvania's Cancer Research Laboratory, argued as early as 1942 that male and female lung cancer rates differed primarily due to their different smoking rates; see his Occupational Tumors and Allied Diseases (Springfield: Charles C. Thomas, 1942), p. 426.

[13] E. J. Grace, "Tobacco Smoking and Cancer of the Lung," American Journal of Surgery, 1943; W. S. Wallace and Harold G. Jackson, "Bronchogenic Carcinoma," Texas State Journal of Medicine, 38 (1943): 607. Frank E. Tylecote, "Cancer of the Lung," Lancet, 2 (July 30, 1927): 256-57.

ignored, or countered with advertisements asserting that "More Doctors Smoke Camels" or that Old Gold offered "not a cough in a carload" or that L&M (of Liggett & Myers) was "just what the doctor ordered." This is in contrast with the response in central Europe at this time, where tobacco industry officials undertook an effort to address the medical reports of hazards. An industry institute with the name Tabacologia medicinalis was founded in Budapest in 1941, having the publicly-stated goal of investigating the mounting health evidence.[14]

It is not yet clear how much the leaders of American tobacco companies knew about this early tobacco health research. There is some evidence, though, that industry officials were already privately conceding the possibility of a hazard, while publicly ignoring it. In 1946, for example, a Lorillard chemist who later joined the board of Lorillard wrote to that company's manufacturing committee in New York, cautioning that:

> Certain scientists and medical authorities have claimed for many years that the use of tobacco contributes to cancer development in susceptible people. Just enough evidence has been presented to justify the possibility of such a presumption.[15]

Claude E. Teague, an R.J. Reynolds researcher who would later rise high in the executive ranks of the company, in 1953 acknowledged the Müller paper in his elaborate review of "Cancer Research, with Emphasis upon Possible Carcinogens from Tobacco"; he also noted that "excessive and prolonged use of tobacco, especially cigarettes, seems to be an important

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[14] Robert N. Proctor, "The Nazi War on Tobacco: Ideology, Evidence, and Possible Cancer Consequences," Bulletin of the History of Medicine, 71 (1997): 435-88.

[15] H. B. Parmele to A. Raifner, July 29, 1946 (available online).

factor in the induction of lung cancer." Teague concluded that tobacco smoke had "some degree of carcinogenic activity," and that there was growing acceptance of the idea that the parallel increase in cigarette consumption and lung cancer was "more than coincidence." His paper and his conclusions remained unpublished.[16]

The industry's public response prior to 1954, by contrast, was simply to insinuate that by choosing carefully among brands, you could minimize whatever "discomfort" you, as a smoker, might discern. Philip Morris, for example, claimed that medical research had "proved conclusively" that by shifting to its brand of cigarettes, you could clear or improve "every case of irritation due to smoking."[17] Early TV ads pumped out slogans like "Got a cough? Smoke Kool!"--drilling home such messages "program after program, night after night," according to one popular magazine's TV critic.[18]

Readers, listeners and (eventually) TV-watchers were far more likely to encounter messages such as these than messages cautioning against tobacco use. The corporate watchdog George Seldes, editor of In Fact (1940-1950), pointed out that most popular magazines were reluctant to publish on the tobacco hazard, fearing the loss of advertising revenues. Seldes also lamented the fact that tobacco interests had managed to convince the U.S. Congress to send hundreds of millions of dollars worth of cigarettes to Europe--at

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[16] Claude E. Teague, "Survey of Cancer Research, with Emphasis upon Possible Carcinogens from Tobacco," RJR document dated February 2, 1953, Bates #504184895-4923, pp. 17, 19.

[17] "Admen Soft-Pedal Health," Business Week, June 19, 1954, p. 58.

[18] Goodman Ace, "Smoke Gets in Your Ears," Saturday Review, 36 (February 28, 1953), p. 41.

taxpayers' expense--as part of the Marshall Plan.[19]

The 1950s and the "Frank Statement"

Cigarette consumption by the year 1950 in the U.S. had reached 370 billion per year, more than 2000 for every man, woman and child. Total U.S. cigarette consumption more than doubled from 1940 to 1950, and would double again over the next ten years.

Lung cancer was also on the rise, however, with 18,000 deaths in 1950 alone, up from only about 2,000 two decades previously, reflecting the rapid growth in popularity of cigarettes from earlier in the century. Physicians all over the U.S. were noticing this alarming trend: a previously rare or even unknown disease was killing thousands of Americans every year.[20]

This early history shows that it was not such a bolt-out-of-the-blue in 1950, when four separate papers appeared in prestigious American medical journals, demonstrating a close connection between smoking and lung cancer.[21] The studies were slightly different in design, but all pointed to a significant relationship between smoking and lung cancer--with

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[19] George Seldes, "Cancer and Tobacco News Suppressed," In Fact, October 2, 1950, p. 3; also his "US to Force Europe to Take $911,100,000 in Tobacco, Only 2 Billions in Food in ERP Plan," In Fact, March 22, 1948, pp. 1-2.

[20] The trend had been documented in Germany in the 1920s, at a meeting of that country's prestigious Society of German Pathologists. See the extended discussion in the Verhandlungen der deutschen pathologischen Gesellschaft, 19 (1923): 190-92.

[21] Ernest L. Wynder and Evarts A. Graham, "Tobacco Smoking as a Possible Etiologic Factor in Bronchiogenic Carcinoma," JAMA, 143 (1950): 329-36; Richard Doll and A. Bradford Hill, "Smoking and Carcinoma of the Lung. Preliminary Report," British Medical Journal, 2 (1950): 739-48; Robert Schrek et al., "Tobacco Smoking as an Etiologic Factor in Disease. I. Cancer," Cancer Research, 10 (1950): 49-58; M. L. Levin, H. Goldstein and P. R. Gerhardt, "Cancer and Tobacco Smoking: A Preliminary Report," JAMA, 143 (1950): 336-38.

unprecedented controls to eliminate the possibility of bias. Historians see these 1950s papers as a turning point in the recognition of major tobacco hazards, and a classic example of "simultaneous discovery."[22]

Popular reports of this discovery soon appeared in a number of American newspapers and popular magazines. Readers' Digest published several reports,[23] as did several other periodicals. Scholarly knowledge was further solidified as new kinds of methodologies were developed. Mouse-painting experiments showed that tobacco tars rubbed on the shaved backs of mice could cause cancer, and pathologists showed that the lung cells of smokers were injured in proportion to how long they had smoked.[24] The early "retrospective studies" of epidemiologists were also joined by "prospective" studies showing that when two populations were matched for age, sex, race, health, and occupation, smokers were far more likely to die from lung cancer.[25]

It would be wrong to imagine, though, that knowledge of these hazards quickly became common knowledge. Few people read the technical medical literature, and even when people did read or hear about "the cancer scare," they also heard--repeatedly and from various sources--that smoking was safe. Cigarettes were widely advertised on billboards and

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[22] Colin White, "Research on Smoking and Lung Cancer: A Landmark in the History of Chronic Disease Epidemiology," Yale Journal of Biology and Medicine, 63 (1990): 29-46.

[23] Roy Norr, "Cancer by the Carton," Reader's Digest, December 1952, pp. 7-8.

[24] Oscar Auerbach, "The Anatomic Approach to the Study of Smoking and Bronchogenic Carcinoma," Cancer, 9 (1956): 76-83.

[25] E. C. Hammond and D. Horn, "The Relationship Between Human Smoking Habits and Death Rates: A Followup Study of 187,776 Men," JAMA, 155 (1954): 1316-1328; Richard Doll and A. Bradford Hill, "A Study of the Aetiology of Carcinoma of the Lung," British Medical Journal, 2 (1952): 1271-86.

in magazines and newspapers, and increasingly in movie theaters, on radio, and on television. Popular sports figures, movie stars, and other high-profile personalities appeared in thousands of cheery tobacco ads with never a mention of a hazard. Ronald Reagan and Joe Dimaggio advertised cigarettes in the 1940s, as did Lucille Ball and Desi Arnaz in the 1950s. Perry Como, Jimmy Stewart, Frank Sinatra, and football and golf greats Frank Gifford and Arnold Palmer all appeared in tobacco ads--along with many other popular athletes, singers, media personalities. Popular pro-smoking books reported the testimony of physicians that tobacco was safe or that the hazards had been exaggerated.[26] Millions of Americans were led to believe that cigarettes were satisfying, sexy, and safe.

Part of this sense of safety came from the fact that the tobacco industry spent a lot of time and money to establish the image that smoking was safe. Doctors were used to advertise cigarettes, and smoking brand x, y, or z was said to help "soothe the throat" or "aid digestion" or "keep you alert," etc. These early "white-coat" advertisements claimed many health virtues for cigarettes: Belairs let you "breathe easy" (1960); Camels "never get on your nerves" (1934) and don't "get your wind" (1935); Kools were "soothing to your throat" (1937); L&M Filters were "just what the doctor ordered" (1953); Old Gold you smoked "for a treat, instead of a treatment"; Larks had filters packed with "the basic material science uses to purify air"; women were told to "reach for a Lucky instead of a sweet"--and so forth. Philip Morris cigarettes were supposed to provide "pleasure without

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[26] Many examples of American physicians taking such a stand are reported in Lloyd Mallan, It Is Safe to Smoke (New York: Hawthorn, 1966). Mallan also records Senator Bass's response, after hearing conflicting testimony in Senate Commerce Committee hearings of March 1965: "What impresses me, then--and the conclusion that I reach as a layman--is that there seems to be still a great deal of doubt as to the cause of cancer" (p. 140).

penalties" (1941) and to take "the fear out of smoking" (1953); Camels were good for a supposed "T-Zone--Throat and Taste."[27]

The industry stopped making explicit health claims of this sort in the 1950s, following a decade of governmental investigations charging the industry with false advertising but also in consequence of worries that overt health assurances might open up legal liabilities. The "health scare" was also having a negative impact on cigarette sales. Strong scientific evidence was piling up that tobacco was a major killer, and in 1952-1953, per capita smoking rates actually fell for the first time in many years.

In response, the industry decided to launch a new and aggressive campaign of coordinated deceit.

The first great offensive in this campaign was planned in December of 1953, when leaders from seven of the nation's largest tobacco companies met at the Plaza Hotel in New York to chart out a response to the mounting evidence of hazards.[28] One outcome was the drafting of a "Frank Statement," a full-page advertisement published on January 4, 1954, in 448 newspapers throughout the United States, reassuring the public that the industry was doing all it could to address the question of tobacco hazards. The Statement announced that the industry was accepting a "basic interest" in people's health as "paramount to every other consideration in our business"; it also claimed that charges against tobacco as a source of

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[27] A B&W document listing 186 different health slogans used in cigarette ads can be found in "A Review of Health References in Cigarette Advertising, 1927-1964," Bates #696000889.

[28] Paul M. Hahn, "Statement Concerning The Origin and Purpose of the Tobacco Industry Research Committee and Its Proposed Functions," January 25, 1954, Bates #MNAT 00609873. The immediate prompt was the publication of Ernst L. Wynder et al., "Experimental Production of Carcinoma with Cigarette Tar," Cancer Research, 13 (1953): 855-64.

death and disease had been abandoned "one by one" for lack of evidence. The Statement concluded that such charges were nonetheless "of deep concern to us" and promised that the industry would "cooperate closely with those whose task it is to safeguard the public health." A "Tobacco Industry Research Committee" (TIRC) was therefore being set up to explore "all phases" of tobacco health and safety.[29]

Most of these claims were either outright lies, or proven disingenuous over the course of time. The "Frank Statement" stated that the claims of a hazard had abandoned "one by one" when, in fact, evidence for hazards had grown steadily stronger over time. The Statement said that the statistics used in the classic epidemiological studies "could apply with equal force to any one of the many other aspects of modern life," when the most influential studies had been carefully designed to exclude such possibilities.[30] The Statement pledged cooperation with health authorities, when industry officials and their PR consorts had already privately committed to a strategy of confrontation, obstruction, and obfuscation. The Statement pledged to aid and assist research into "all phases" of tobacco use and health when, in reality, the research funded through the TIRC was deliberately steered into areas that were unlikely to incriminate tobacco. The TIRC was not supposed to operate as a trade association,[31] but it was in fact a PR organization masquerading as a tobacco health research

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[29] First published on January 4, 1954, the "Frank Statement" is now accessible online at: www.library.ucsf.edu/tobacco/docs/html/1901.01/. Some of the language of the "Frank Statement" (e.g., abandoned "one by one") is from an American Tobacco Company's press release of November 26, 1953, authored by Paul Hahn.

[30] Doll and Hill, "Smoking and Carcinoma of the Lung" (1950); also their "A Study of the Aetiology of Carcinoma of the Lung" (1952).

[31] Hahn, "Statement Concerning the Origin," 8.

organization. Its existence allowed the industry to say "we're studying the problem," when it was actually doing everything it could to misrepresent the nature and scale of possible harms.

From a historian's point of view, the "Frank Statement" represents the beginning of one of the largest campaigns of deliberate distortion, distraction, and deception the world has ever known. The tobacco industry in effect becomes two industries: a manufacturer and seller of tobacco products, and a manufacturer and distributer of doubt about tobacco's hazards. Tobacco Institute Vice President Fred Panzer conceded as much in a private 1972 memo, noting that the industry's strategy involved "creating doubt about the health charge without actually denying it."[32] Many millions of dollars were spent on this part of the industry's activities, the point being to keep the public believing--as Panzer put it--that smoking "may not be a causal factor in diseases such as lung cancer."[33] The industry became a gigantic engine of deceit, utilizing deceptive press releases, "decoy research," deceitful newsletters and pamphlets mailed to physicians, journalists, and stockholders, and many other strategies. Further strategies included misleading word-smithing, duplicitous skepticism (e.g., of research results), false reassurances to consumers, and (eventually) the hiring of historians to misrepresent history.[34]

Deception on a Grand Scale

There is a large literature on the history of the tobacco health research, including the

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[32] Fred Panzer to Horace R. Kornegay, May 1, 1972, Bates #87657703-06.

[33] Ibid. Panzer called this a "holding strategy" defined by variations on the theme that "the case is not proved."

[34] Laura Maggi, "Bearing Witness for Tobacco," The American Prospect, 2000.

industry's disinformation campaign;[35] here I will provide only an overview of some of the more prominent aspects.

The strategy launched in 1954 was essentially to scoff at whatever evidence of tobacco health effects might emerge, while also promising to be honestly and energetically studying the question of possible harms. Instruments of this deception included press releases, advertisements in newspapers, journals, pamphlets, TV and radio interviews, and other media. The "Frank Statement" has already been mentioned, but there were many others. Between 1954 and the 1990s the Tobacco Industry Research Council, the Tobacco Institute, individual tobacco companies, and PR firms working for the industry issued a steady stream of refutations of tobacco science, using carefully-crafted language to instill doubt in the minds of the public concerning hazards.

The industry spent a great deal of time and money creating, maintaining, and reinforcing this sense of doubt and controversy. On April 14, 1954, for example, the TIRC published a booklet titled "A Scientific Perspective on the Cigarette Controversy," listing authorities in support of the view there was "no proof establishing that cigarette smoking is a cause of lung cancer."[36] 176,800 copies were mailed to doctors, another 15,000 to members of the press, and thousands more to members of Congress, deans of medical

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[35] Some of the best historical work has been done by journalists, physicians, and scholars from fields other than history; I have listed some of these sources in the attached list of sources consulted.

[36] Tobacco Industry Research Committee, "A Scientific Perspective on the Cigarette Controversy," April 14, 1954, p. 1.

schools, and so forth.[37] Mainstream newspapers such as the New York Times and Wall Street Journal reported on the publication of the document,[38] which articulated an industry position ("no proof" of harms) that would remain unchanged for more than four decades.

For the first four years after the Frank Statement, the Tobacco Industry Research Committee (TIRC) was a chief source of industry denials of harm. The Tobacco Institute (TI), established in 1958, continued this campaign of disinformation. A 1959 press release asserted that the case against tobacco was nothing new, but rather based on "constantly rehashed statistical theories."[39] A 1962 press release claimed that "the causes of lung cancer are not now known to science" and that cigarettes should be looked upon as "goodwill ambassadors around the world."[40] A 1968 TI document denied that smoking had ever been shown to cause premature death, lung cancer, or any other ill effect, and proposed instead that smokers may just be "a different breed of cat."[41] A 1978 Tobacco Institute booklet reasserted that "years of scientific research" had "failed to provide conclusive evidence that

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[37] Richard W. Pollay, "Propaganda, Puffing and the Public Interest," Public Relations Review, 16 (1990): 47.

[38] "Cigaret Controversy: Tobacco Industry's 'White Paper' Counters Smoking-Cancer Tie-in," Wall Street Journal, April 14, 1954; "Tobacco Industry Denies Cancer Tie," New York Times, April 14, 1954.

[39] Tobacco Institute, "To the Board of Directors," November 27, 1959, Bates #TIMN 0110091.

[40] George V. Allen, "The Tobacco Economy--1962 Review and Outlook," December 27, 1962, Bates #1005136953-57.

[41] Tobacco Institute, "The Cigarette Controversy" (Version 23), April 16, 1968, Bates #TIMN 0071046.

smoking causes disease."[42]

The industry was skilled in getting its message heard on the radio and TV and in major newspapers. A Mutual News Radio broadcast of November 18, 1962, included a long interview with George V. Allen, President of the Tobacco Institute, who reaffirmed the industry position that "nobody knows what causes cancer, and specifically lung cancer."[43] An April 6, 1967, article in The New York Times reported the assertion of Robert B. Walker, president and chairman of the American Tobacco company, that "no clinical or biological evidence has been produced which demonstrates how cigarettes relate to cancer or any other disease in human beings."[44] Walker Merryman, vice-president and chief spokesman for the Tobacco Institute, appeared on the MacNeil-Lehrer Report on January 11, 1978, where he stated that the evidence linking smoking to cancer and heart disease was "not conclusive, and not proof of the cause and effect relationship that the tobacco industry has been researching independently since 1954, a full ten years before the first Surgeon-General's report."[45] Four years later, on February 23, 1982, Merryman was interviewed on WJLA TV (News 7 Live), stating that the "bottom line" was that "we don't have the faintest notion

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[42] Tobacco Institute, "The Smoking Controversy: A Perspective," p. 5, Bates # 50018 4766.

[43] Mutual News Broadcasting System, "The Smoking Question," Radio Broadcast Transcript, Nov. 18, 1962, p. 2, Bates #500062011.

[44] Alexander R. Hammer, "Tobacco Studies Draw Criticism," New York Times, April 6, 1967.

[45] Merryman's remarks can be found in the "Full Text" transcript produced by Radio TV Reports, Inc., for Gross & Associates on "The MacNeil-Lehrer Report," January 11, 1978, pp. 4-5.

why a normal cell suddenly becomes malignant.[46] Merryman also appeared on ABC's "World News Tonight" stating once again that "the cause or causes of cancer remain unknown."[47]

Tobacco Institute position papers were also sent to tobacco company stockholders, to counter what American Brands Chairman Robert K. Heimann called "recent outbreaks of antitobacco propaganda."[48] Mainstream newspapers commented on Tobacco Institute reports, but the "no proof" message was also spread, according to a 1976 Brown and Williamson PR report, through "letters-to-the-editor, a bimonthly newsletter, feature article placements, pamphlets and brochures, film, direct mail and one-on-one communication with government officials."[49] In 1975 alone, Tobacco Institute "media communicators" made more than 700 public appearances, including radio, TV, and newspaper interviews, plus speeches before clubs in 42 states and the District of Columbia--all to support the industry's position on the "smoking and health controversy." The films produced by the Institute ("Smoking and Health"; "Leaf"; "The Answers We Seek") were seen by more than 500,000 people, to which the reactions were "primarily positive."[50]

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[46] Radio TV Reports, Inc., letter to the Tobacco Institute, February 23, 1982, p. 5, Bates #50052 4898.

[47] Radio-TV Reports, Inc., transcript of "ABC World News Tonight" for the Tobacco Institute, February 22, 1982, p. 1, Bates #50052 4788.

[48] Robert K. Heimann, "Dear Stockholder," February 20, 1979, Bates #MNAT 00224316.

[49] Brown & Williamson document, "Public Relations Strategy of U.S. Tobacco Manufacturers RE Smoking and Health Controversy," May 1, 1976, Bates #690020605.

[50] "Public Relations Strategy of U.S. Tobacco Manufacturers RE Smoking and Health Controversy," May 1, 1976, Bates #690020608, pp. 3-4.

Tobacco press releases were often picked up by newspaper writers and editors operating under what has been called the "balance routine." Journalists often felt that a news story, especially of a controversial topic, was improved by citing an alternate or opposing view. Tobacco industry pronouncements were used to provide this semblance of balance, regardless of whether the health effect in question was or was not in need of "balancing."[51] The net effect is that, as was already observed in the 1960s, "like the tail of a kite, no story about the risk of smoking goes anywhere without a tobacco industry rebuttal trailing along behind."[52] The Tobacco Institute promoted the inclusion of its views by advertising a toll-free number reporters could call for comments on health stories. The Institute is known to have protested publicly (in letters to the editor) when it was not consulted for a response. Tobacco Institute pronouncements were carried in thousands of newspaper articles: in the year 1990 alone, for example, Tobacco Institute positions were mentioned in at least 358 different newspaper stories.[53]

Industry press releases most often challenged reports of tobacco health hazards, while also claiming to be investing huge sums of money into researching the issue via the Tobacco Industry Research Council. Such statements falsely represented the state of scientific knowledge (by exaggerating uncertainties), but they also falsely implied that the relevant research was underway at the TIRC. Throughout the forty-odd years of its existence, the

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[51] C. Kevin Swisher and Stephen D. Reese, "The Smoking and Health Issue in Newspapers: Influence of Regional Economies, the Tobacco Institute and News Objectivity," Journalism Quarterly, 69 (1992): 987-1000.

[52] Maurine Neuberger, Smoke Screen: Tobacco and the Public Welfare (Englewood Cliffs: Prentice-Hall, 1963), p. 26.

[53] Swisher and Reese, "The Smoking and Health Issue," pp. 991-98.

TIRC--renamed the Council for Tobacco Research [CTR] in 1964--made little or no effort to explore the existence of tobacco hazards. The studies funded were almost always so narrow that questions of whether cigarettes might cause a particular disease were never even raised. In 1960, TIRC President Clarence C. Little testified that the Council had done no studies of tobacco smoke, because it had never been proven to be carcinogenic. Philip Morris research director Helmut Wakeham in 1967 admitted to Tobacco Institute president Earle Clements that "much of the grant work [of the CTR] has little or no relevance to smoking and health."[54] Nearly 30 years later, CTR president James F. Glenn testified before Congress that he could not name a single research report funded by the CTR which acknowledged a causal relationship between smoking and cancer, adding: "I reject the premise that smoking causes cancer."[55] The TIRC/CTR was essentially an industry front or shield, whose primary purpose was for the industry to be able to say it was "studying the problem," while also warding off whatever science might be challenging the industry's central fiction of "not yet proven."

Most industry misrepresentations were issued in response to breaking news of research demonstrating hazards. When Surgeon General Leroy Burney announced that people who have never smoked "have the best chance of escaping lung cancer" (on November 26, 1959), the Tobacco Institute responded that this was "not supported by statistical evidence." (Little's remarks were reported on both WCBS radio in New York and

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[54] Cited in Kluger, Ashes to Ashes, p. 322.

[55] Subcommittee on Health and the Environment, U.S. Congress, Hearings on Regulation of Tobacco Products (Part 2), April 28, May 17, May 26, 1994, pp. 374-75.

CBS Network radio.)[56] When an American Cancer Society study showed that cancer could be induced in laboratory animals (Auerbach's 1970 beagle inhalation studies--see below), industry officials said the experiment bore "little, if any, relation to cigarette smoke as it related to the smoker."[57] When the U.S. Dept. of Health and Human Services released the results of its $115 million "MR. FIT" study, confirming a number of different hazards based on a study of 12,000 males over a seven-year period (in 1983), the Tobacco Institute challenged the study by pointing to an older, unpublished study in which dogs forced to smoke had experienced a "possible protective effect" from cigarette smoking.[58] When the U.S. Surgeon General in 1988 concluded that nicotine was an addictive drug, the Tobacco Institute declared that this contradicted "common sense."[59] And in 1993, when the EPA and National Academy of Sciences cautioned that secondhand smoke could be causing thousands of American deaths per year, the Tobacco Institute derided the study as "another step in a long process characterized by a preference for political correctness over sound

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[56] Radio Reports, Inc., "Little Answers Burney's Charge," November 26, 1959, Bates #50050 7657. The TI also publicly branded Burney's remarks "extreme and unwarranted"; see Tobacco Institute, "To the Board of Directors," November 27, 1959, Bates #TIMN 0110091.

[57] Brown and Williamson, "The Smoking/Health Controversy: A Vews from the Other Side," in cover labelled "Project Truth," presented to the Courier-Journal and Louisville Times, February 8, 1971, Bates #BW W2-03083ff, quote is on to (cited also in Glantz et al., Cigarette Papers, p. 21).

[58] Tobacco Institute Press Release, November 20, 1983, in Minnesota 10401037, p. 4 (emphasis added); the same position was elaborated in a 44-page TI document published that year, titled Cigarette Smoking and Heart Disease (1983), Bates #10401045.

[59] Tobacco Institute, "Claims that Cigarettes are Addictive Contradict Common Sense," Press Release, May 16, 1988.

science."[60] The Institute also developed a rather sudden interest in non-tobacco sources of indoor air pollution--such as allergenic molds, fungi, bacteria, fumes from carpets[61]--the point being to draw whatever attention it could away from secondhand smoke.

Tobacco industry authorities also repudiated health science coming from overseas. In 1971, for example, when the British Research Council found that babies born to smoking mothers had higher mortality rates and were significantly underweight, Philip Morris's chairman of the board, Joseph F. Cullman III, responded (on national television) that "we do not believe that cigarettes are hazardous." He also stated that "some women would prefer having smaller babies."[62]

Industry officials made such claims publicly, while privately acknowledging many of these hazards (and the addictive nature of tobacco). There are many examples:

-- In 1961, the public relations firm Arthur D. Little, Inc., did a confidential review of tobacco hazards for Liggett and Myers, pointing out that there were four different kinds of "biologically active" materials found in cigarette tobacco: "a) cancer causing, b) cancer promoting, c) poisonous, and d) stimulating." The company advised L&M that by identifying and removing such compounds, one might be able to make a less hazardous

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[60] Warren E. Leary, "U.S. Ties Secondhand Smoke to Cancer," New York Times, January 8, 1993.

[61] Tobacco Institute, Smokers' Rights in the Workplace: An Employee Guide (Washington, D.C., n.d. [1990?]), p. 7; also their Smoking Restrictions: The Hidden Threat to Public Health (1987) and Indoor Air Pollution: Is Your Workplace Making Your Sick? (1988).

[62] Joseph F. Cullman III, interviewed on "Face the Nation," January 3, 1971, p. 16, Bates #1002605562.

cigarette.[63] The fact that cancer-causing and promoting agents were present in cigarette smoke, however, was not made public.

-- In 1963, as is well known, a Brown and Williams executive wrote "We are, then, in the business of selling nicotine, an addictive drug." Industry executives realized early on that nicotine was key to the business, and that if forced to remove nicotine from tobacco products, the industry would find itself in a "heads we lose, tails we cannot win situation!"[64]

-- In 1966, in a semi-annual report on Philip Morris's "Project 6900," exploring the carcinogenicity of tobacco smoke, project director P. C. Luchsinger noted that "cigarettes will most likely be implicated as one of the causative agents in emphysema and bronchitis."[65] Luchsinger noted that in a series of long-term primate experiments financed by Philip Morris, monkeys that were forced to inhale smoke had a higher rate of emphysema than those in a non-smoking control group. Project 6900 included other experiments with smoking rodents, cats, etc.--to determine, for example, whether lung function was differently disabled by different Philip Morris brands (Commander, Marlboro 85, Philip Morris Filter, Triple Filter, etc.). Luchsinger's report, never released to the public, and marked "Not to be taken from this room," concluded that "gross lung pathology can be induced by smoking

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[63] Arthur D. Little, Inc, "L&M - A Perspective Review," March 15, 1961, Bates #2021382496-97.

[64] L. C. F. Blackman, "Notes of a Meeting of the Tobacco Company Research Directors" (February 16 1983), dated February 18, 1983, at the Imperial Head Office, BAT Bates #109840700

[65] P. C. Luchsinger, "Project 6900," October 25, 1966, p. 2, Bates #1000341402.

cigarettes."[66] A May 1967 report on "Project 6900" described further tests with mice, pigs, monkeys and cats, concluding that filtered smoke was "no less tumorigenic than nonfiltered smoke."[67] This, too, was kept quiet.

Some industry scientists seem to have been frustrated by having to keep two sets of scientific books. C. F. Todd, Director of London's Tobacco Research Council, in 1967 wrote to Addison Yeaman, vice president and general counsel of Brown and Williamson, explaining the difficulty in dealing with the "paradox" that while the industry refused to admit publicly any hazard, senior scientists at Britain's TRC actually did "accept the causation theory."[68] Some American industry scientists as early as 1958 questioned whether it might not be better to "bolt" from the duplicity project and compete on more honest grounds--a suggestion never taken up. (ref).

Throughout this time, the industry was unanimous and adamant in refusing to admit any kind of health threat from smoking. These public denials were very much at odds with concerns voiced privately from within the industry. The Tobacco Institute rebuked the Surgeon General's report of 1964, while Philip Morris's Wakeham privately admitted it contained "no vitiating errors of commission." The Tobacco Institute publicly criticized Hammond and Auerbach's 1970 beagle studies for the American Cancer Society as "a three-quarter-million-dollar fiasco,"[69] though high-level Philip Morris research officers privately

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[66] Ibid., np. & 4-6, Bates #1000341401 & #1000341404-06.

[67] R. D. Carpenter, "Project 6900," May 9, 1967, Bates #21000342065.

[68] C. F. Todd to Addison Yeaman, June 20, 1967, Bates #LG 0296543.

[69] William Kloepfer, "For Immediate Release" (Tobacco Institute), December 3, 1970, Bates #MNAT 00548995.

admitted this was "the first time that cigarette smoke as a direct agent has produced lung cancer in an animal in any reliably conducted experiment."[70] Industry officials publicly challenged Auerbach's smoking beagle studies, but a February 25, 1970, internal report to Philip Morris's research director concluded that the beagle experiment was "effective in that carcinoma in dogs has been produced." This same author (Raymond Fagan, a principle Philip Morris scientist) also concluded that even if one were to question the carcinoma, "the obvious emphysema produced cannot be denied."[71]

Industry scientists realized how hard it was to restrict research to the narrow scope required by the industry's governing myth of "no evidence of harm." In 1970, in a memo to Philip Morris's board chairman Cullman, company Research Director Helmut Wakeham described the difficulty as follows:

> Let's face it. We are interested in evidence which we believe denies the allegation that cigaret smoking causes disease. If the CTR program is aimed in this direction, it is in effect trying to prove the negative, that cigaret smoking does not cause disease. Both lawyers and scientists will agree that this task is extremely difficult, if not impossible.[72]

Wakeham identified one possible use of the CTR as "a means of establishing expert scientific witnesses who will testify on behalf of the Industry in legislative halls, in litigations, at

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[70] R. M. Salenby to J. T. Landry, February 5, 1970, Bates #100298389.

[71] R. Fagan to H. Wakeham, "Auerbach's Smoking Beagles," February 25, 1970, Bates #1000837391.

[72] Helmut Wakeham to J. F. Cullman III, "'Best' Program for C.T.R.," December 8, 1970, Bates #2022200161.

scientific meetings, and before the press and the public"; he also noted how impressed he was "by the legislative testimony we are able to muster at Congressional hearings."[73]

The "not yet proven" dogma sometimes led to efforts to disguise the kinds of research being pursued. Code-names were sometimes used for certain words to obscure the nature of the objects under investigation: ZEPHYR was used instead of "lung cancer," for example, and "cancer" was often euphemized as "biological activity" or "pseudo-epitheliomatous hyperplasia." Nicotine was similarly disguised as "W," and benzpyrene had the cover-name "BORSTAL." Documents from this time (esp. 1950s) talk about the "Journal of ZEPHYR Research," and the like--though secrecy continued into more recent decades. Industry research scientists have testified that "They didn't want us to call anything cancer."[74]

Yet another form of deception involved organizing and distributing articles in popular magazines, while disguising the fact that the industry was the source of the documents. In January of 1968, for example, a sportswriter by the name of Stanley Frank published an article in True magazine (circulation 2,000,000) stating that there was "absolutely no proof that smoking causes human cancer."[75] The Wall Street Journal later reported that copies of the article had been sent out to 185,000 doctors, 41,000 life scientists, 19,000 educators, 10,000 government officials, and hundreds of thousands of other opinion-makers, all at the

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[73] Ibid.

[74] Freddy Homberger, a CTR-funded researcher, is cited in Alix M. Freedman and Laurie P. Cohen, "Smoke and Mirrors: How Cigarette Makers Keep Health Question 'Open' Year After Year," Wall Street Journal, February 11, 1993, pp. A1-6. ZEPHYR (= lung cacner) and BORSTAL (= benzpyrene) can be found in the BAT Research and Development document: "A Possible Alternative Hypothesis," January 30, 1957, Bates # 100175773.

[75] Stanley Frank, "To Smoke or Not to Smoke--That is Still the Question," True, January 1968, p. 71.

expense of the Tobacco Institute and its associates. Those who received the article were not told that its author had been paid for his services by the tobacco industry, and that the entire project was an industry invention.[76] The article was later shortened for publication in the National Enquirer, where an additional million-odd readers encountered it under the new title: "Cigarette Cancer Link is Bunk."

The industry also sought to mislead physicians by establishing a widely circulated quarterly publication, Tobacco and Health Research (1958-1969), published by the Tobacco Institute and mailed free of charge (first class) to some 340,000 U.S. doctors, scientists, dentists and medical schools. The total print run of the newsletter in 1967 was 475,000, with the additional copies going to "communications media, selected opinion leaders, brokers and analysts, members of tobacco farm groups, tobacco industry suppliers and others with an interest in the industry."

A privately expressed goal of the newsletter was to draw attention to "doubts about the smoking theory."[77] Non-tobacco causes of cancer were a major focus, meaning (for example) genetic or psychological predispositions, mining gases, misdiagnoses, metastases from other parts of the body, infections of various sorts, atmospheric pollution--and even one's date of birth.[78] Typical articles included the following:

"Rare Fungus Infection Mimics Lung Cancer" (Nov.-Dec. 1963)

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[76] Kluger, Ashes to Ashes, p. 324; Whiteside, Selling Death, pp. 78-79; Glantz, Cigarette Papers, pp. 179-80; Jonathan Kwitny, "Defending the Weed," Wall Street Journal, January 24, 1972.

[77] Tobacco Institute, "Tobacco and Health Research--1967," Bates #ATCM 014768.

[78] See, for example, "March Birth, Lung Cancer Linked," Tobacco and Health Research, 6 (Nov.-Dec. 1963): 1, 4.

"Viral Infections Blamed in Bronchitis Outbreaks" (March-April 1964)

"English Surgeon Links Urbanization to Lung Cancer" (Winter 1964-65)

"Nicotine Effect is Like Exercise" (March-April 1964)

"Lung Cancer Rare in Bald Men" (March-April 1964)

"28 Reasons for Doubting Cigarette-Cancer Link" (July-August 1963)

"No One Yet Knows the Answers" (July-August 1963)

Private editorial communications make it clear that the goal was to steer attention away from anything that might support the cancer link: an October 18, 1968, memo from Hill & Knowlton to the Tobacco Institute's head of public relations states that "The most important type of story is that which casts doubt on the cause and effect theory of disease and smoking." The point was to publish eye-grabbing headlines which "should strongly call out the point--Controversy! Contradiction! Other factors! Unknowns!"[79] Thompson listed the following examples of suitable topics:

-- a report in which the statistics of a smoking-associated disease are questioned.

-- one in which death certificates or classifications of such a disease are questioned.

-- one showing that many lung cancers may be metastatic from some other organ.

-- one indicating that a virus may cause human cancer, whether or not that cancer is associated with smoking.

-- one on research with animals, indicating that some other factor may

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[79] Carl Thompson to William Kloepfer, Jr., October 18, 1968, Bates #TIMN 0071488.

be involved with carcinogenesis or ciliostasis[80]

The publication was essentially a propaganda sheet to spread misinformation about the reality of tobacco hazards. Newspapers often picked up and published stories from the newsletter: the October, 1962, issue alone, for example, resulted in at least four separate news stories.[81]

It was not until the 1990s that tobacco industry officials finally began to admit--publicly--that smoking could cause cancer. The industry never has come clean, however. The industry never has admitted that tobacco is one of the world's largest and most preventable causes of death, and that the same pattern of death experienced by the U.S. in the 1960s, '70s and '80s is now beginning to unfold in the rest of the world. The World Health Organization estimates that tobacco will kill roughly ten million people worldwide by the year 2020.[82] If global rates continue on their present course, the 21st century could see as many as a billion deaths.[83] And whatever happens in U.S. courts or U.S. markets, companies such as Philip Morris, R.J. Reynolds and the others will still enjoy a flourishing trade in Africa, Latin America, Asia, and the nations of eastern Europe.

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[80] Ibid., p. 1; the sequence is quoted in its entirety.

[81] "Tobacco Link to Cancer Said Overstressed," News-Tribune (Duluth, Minnesota), October 19, 1962; "Cigarettes as Cancer Cause Hit," American (Austin, Texas), October 19, 1962; "'Cigarette Theory' on Lung Cancer Is Overstressed, Says New Survey," Free Press (Burlington, Vermont), October 19, 1962; "Scientists Report Cancer Causes in Air," World Telegram and Sun (New York City), October 26, 1962.

[82] World Health Organization, Tobacco or Health: A Global Status Report (Geneva: World Health Organization, 1999).

[83] Robert N. Proctor,"Tobacco and the Global Lung Cancer Epidemic," Nature Reviews Cancer, 1 (2001): 82-86.

Section II: Assessments of the Reports by Profs. Ludmerer, Wilson, Thomas, and English

Kenneth Ludmerer, Theodore A. Wilson, Richard D. Thomas, and Peter English have all entered briefs in defense of the tobacco industry. I shall respond to these separately and then provide a brief summary.

1. Kenneth Ludmerer is a historian of genetics who has also written on the history of American hospitals. He has published nothing on the history of tobacco or its relation to health--which may explain his astonishing claim that there was "no credible scientific evidence linking smoking to lung cancer or any life-threatening disease before 1950" (p. 3, emphasis added). As already reviewed above, many important hazards of tobacco were discovered long before 1950. Nasal cancer was linked to tobacco in 1761, lip cancer in 1787, cancers of the mouth in 1858, and so forth. These are non-trivial diseases, any one of which can be life-threatening. Knowledge of these hazards was repeatedly confirmed throughout the nineteenth century, and summarized in standard texts and doctoral dissertations.[84] Frederick L. Hoffman, chief statistician for the Prudential Life Insurance Company of America, by 1915 could write that the relation of smoking to cancer of the mouth was "so well established as not to admit of even a question of doubt."[85]

It is therefore wrong to say that there was no credible evidence linking smoking to

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[84] A good early review of tobacco cancers of the mouth, lips, and esophagus is Hugo H. Ahlbom, "Prädisponierende Faktoren für Plattenepithelkarzinom in Mund, Hals und Speiseröhre, Acta Radiologica, 18 (1937): 163-85.

[85] Frederick L. Hoffman, The Mortality From Cancer Throughout the World (Newark: Prudential Press, 1915), p. 185.

"any life-threatening disease before 1950."

It is also not correct to state, as Ludmerer does, that the scientific and medical literature in the early 1950s suggested only a "possible" link between cigarette smoking and lung cancer, as if this were simply one among many equally valid hypotheses. Already by the 1930s there are bibliographies listing thousands of articles on the hazards of smoking.[86] Wynder and Graham in their 1950 paper pointed out that Tylecote, Hoffman, McNally, Lickint, Arkin and Wagner, Roffo and Maier were "just a few" of the scholars who had concluded there was evidence that tobacco was "an important factor in the increase of cancer of the lungs."[87]

Ludmerer is also misleading when he states that at no time between 1950 and 1964 was there a "consensus" within the medical and scientific community that cigarette smoking caused "lung cancer, heart disease, or other life-threatening diseases" (p. 3, emphasis added). There was the already-mentioned documentation of cancers of the oral cavity, but even the lung cancer case was stronger than he implies. Schairer and Schöniger in 1943 had concluded that the increased incidence of lung cancer was "to an important degree due to the increase in tobacco consumption," and Müller in 1939 had concluded that tobacco was not just a cause of lung cancer, but rather the major cause of lung cancer.[88] Alton Ochsner in

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[86] Fritz Lickint, Tabak und Organismus: Handbuch der gesamten Tabakkunde (Stuttgart: Hippokrates, 1939).

[87] Ernest L. Wynder and Evarts A. Graham, "Tobacco Smoking as a Possible Etiologic Factor in Bronchiogenic Carcinoma," JAMA, 143 (1950): 329.

[88] Eberhard Schairer and Erich Schöniger, "Lungenkrebs und Tabakverbrauch," Zeitschrift für Krebsforschung, 54 (1943): 261-269; Müller, "Tabakmissbrauch."

1953 warned that the recent rise of lung cancer was unquestionably "due to the carcinogenic effect of cigarette smoking."[89] Wynder and Graham were cautious scholars, but even they concluded that smoking was "an important factor in the induction of bronchiogenic carcinoma."[90] Ludmerer himself notes that Wynder's tobacco tar-painting experiments were confirmed "at least fifteen times" within ten years of their first publication in 1953 (p. 4). In 1960, the American Cancer Society's Board of Directors reported that it was now "beyond a reasonable doubt" that smoking was "the major cause of the unprecedented increase in lung cancer."[91] Many other citations of this sort could be mentioned.

When Ludmerer says there was not a "consensus," he seems to mean that there was never absolute unanimity on the question of the magnitude of the tobacco hazard. But science does not work that way--by achieving unanimity. There are always people who are slow to accept new results in any science, just as there are marginal academics even today who do not accept, say, continental drift or the HIV theory of AIDS. Honest experts could still harbor doubts about whether tobacco was a lung cancer hazard prior to the 1950s, but by the end of that decade the evidence was overwhelming. Britain's influential 1962 report by the Royal College of Physicians (Smoking and Health) allowed that country's Minister of Health to conclude that the lung cancer connection had been "authoritatively and crushingly"

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[89] Alton Ochsner, "Bronchogenic Cancer," Kansas City Medical Journal, 29 (Nov.-Dec. 1953): 6.

[90] Wynder and Graham, "Tobacco Smoking," p. 336.

[91] Whiteside, Selling Death, p. 10.

demonstrated.[92] The turning point was the early 1950s, when a broad body of scholarship, published in the world's leading scientific and medical journals, was pointing in only one direction: tobacco-use is a major, life-threatening hazard to one's health.

Ludmerer is also not correct when he states that researchers in the 1950s and 1960s were "unable to identify any agent or combination of agents in tobacco smoke that could account for its alleged cancer-causing activity" (p. 4). The fact is that already by the 1930s, dozens of dangerous chemicals had been identified in tobacco smoke--including not just carbon monoxide, ammonia, and polycyclic aromatic hydrocarbons ("tars") of various sorts, but also well-known carcinogens such as benzpyrene, arsenic, and nitrosamines.[93] Richard Doll in a 1955 review article identified arsenic, 3,4-benzpyrene, radioactive potassium, and a number of pyrolysis products.[94]

Industry officials conceded the existence of carcinogencs in tobacco smoke, albeit only privately. In 1961, for example, Helmut Wakeham, head of the Philip Morris Research Center, presented a 23-page report to the company's R&D Committee listing 40 separate carcinogens in cigarette smoke, while also admitting this was only a "partial list."[95] The

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[92] Enoch Powell's words spoken to the British Parliament are cited in David Pollock, "Forty Years Ago," in 40 Fatal Years, ed. Royal College of Physicians and ASH, March 7, 2002, p. 14.

[93] Robert N. Proctor, The Nazi War on Cancer (Princeton: Princeton University Press, 1999), pp. 192-93, 215, 253.

[94] Richard Doll, "Etiology of Lung Cancer," in Advances in Cancer Research, vol. III, ed. J. P. Greenstein and A. Haddow (New York: Academic, 1955), p. 26.

[95] "Partial List of Compounds in Cigarette Smoke also Identified as Carcinogens," in Helmut Wakeham, "Tobacco and Health--R&D Approach" (presentation to Philip Morris's R&D Committee), November 15, 1961, n.p., Bates #100277434.

report also listed about a dozen additional "tumor-promoting agents." Company officials appear to have been proud of the fact that, among the 400+ compounds identified in cigarette smoke by that time (1961), the Philip Morris Research Center alone had identified about 50 of these. Wakeham proposed a 7-10 year research program to reduce "the general level of carcinogenic substances in smoke" and to generate "a medically acceptable cigarette."[96] Industry knowledge of cancer-causing agents in cigarettes goes back even earlier: a December 24, 1952, report by Brown and Williamson's Technical Research Department mentions their having isolated a number of different carcinogens in tobacco smoke, including the "partial isolation and identification of a carcinogenic hydrocarbon, benzopyrene."[97]

Ludmerer seems to be unaware of the work of Philip Morris, Brown & Williamson, and other company laboratories where both carcinogenic and cancer-promoting agents in cigarette smoke were investigated. One could argue that it was not yet possible to say precisely which of these were the primary culpable agents, or in what combination, or at what minimal doses, or by what precise mechanisms, but it cannot be denied that company officials were aware of carcinogenic components in tobacco smoke. The industry's repeated public denials of any such awareness have to be regarded as part of the duplicity project.

Ludmerer also muddies the water by claiming that the tobacco health issue was clouded by methodological feuds between "epidemiologists" and "experimentalists" (p. 5).

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[96] Wakeham, "Tobacco and Health" (1961), Bates #1000277426.

[97] "Report of Progress - Technical Research Department," B&W, December 24, 1952, p. 8, Bates #650200091.

He exaggerates the distinctions between these two communities and the extent to which disagreements of this sort led to uncertainties about the reality of the cancer hazard. Wynder, for example, published both epidemiologic evidence of the hazard and laboratory experiments on animals. His mouse-painting studies[98] were in fact the immediate prompt for the "Frank Statement."

Epidemiology and animal experimentation were also not the only kinds of methods used to confirm and reconfirm the hazard. Pathological data were important, as were clinical observations and "the whole background of medical science" (a private concession made by BAT researchers as early as 1962).[99] Microscopic studies of cellular changes induced by smoking was an important piece of evidence--and entirely ignored by Ludmerer. Oscar Auerbach at the Veterans Administration Hospital in East Orange, New Jersey, for example, gained wide attention for his detailed studies of how lung tissues degrade when exposed to smoke; Auerbach had begun these studies in the early 1950s, and within a few years had managed to demonstrate the stages by which tobacco transforms healthy lung tissues into precancerous and then cancerous states.[100]

Ludmerer also ignores the fact that the crucial epidemiological studies of the 1940s and 1950s themselves were experimental--using carefully-selected control groups to ensure that the results were not biased in some respect. Scholars knew that it was important not to compare, say, smokers from working class backgrounds with non-smokers from wealthier

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[98] Wynder et al., "Experimental Production of Carcinoma."

[99] S. J. Green to H. D. Anderson, Esq. (Millbank), "Smoking and Health," May 22, 1962, p. 1, Bates #100159220.

[100] Auerbach, "Anatomic Approach," pp. 76-83.

households, since there might be other differences between these two groups causing one or the other to get cancer (from exposure to occupational carcinogens, for example). The papers establishing the lung cancer hazard controlled for such potentially biasing factors, comparing only lung cancer patients with similar backgrounds to isolate out the unique effects of smoking (Doll and Hill's famous 1952 study, for example, used as its database the health and habits of 40,000 British physicians).[101] Typical of this new generation of studies was also their use of elaborate mathematical techniques to quantify levels of statistical significance. This was top-notch, world-class science, for which its authors were showered with awards (Richard Doll, for example, was knighted and nominated for the Nobel Prize).

Ludmerer on p. 5 of his paper repeats again his (erroneous) claim that medical science by the 1950s had "yet to identify" anything in tobacco smoke that might account for its cancer-causing activity. He also repeats the irrelevant point that nothing was known about the "fundamental mechanism of lung cancer." Ludmerer here again confuses causes and mechanisms--since you don't need to know precisely how something kills you (at, say, the molecular or biochemical level), to know that it kills you. The tobacco industry has long tried to play this card, claiming that you cannot say that cigarettes cause a particular illness until you have identified every last step in the mechanism by which they bring about that illness. The industry position is something like saying that no one can be convicted of a murderous poisoning by arsenic, until every last aspect of arsenic pharmacology is understood.

Ludmerer implies that "legitimate doubts" arose from the fact that it was hard to give

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[101] Doll and Hill, "Study of the Aetiology of Carcinoma of the Lung."

laboratory animals lung cancer by forcing them to smoke cigarettes. He is wrong, though, to claim that animal experiments were generally seen as providing a "higher standard of proof." Public health scholars and historians of medicine recognize the epidemiological papers of the 1950s as the definitive proof of the lung-cancer hazard--and not (for example) Oscar Auerbach's experimental work with smoking beagles in the late 1960s and '70s.[102] There is an odd and mischievous logic here: as if the "cigarette question" should be kept "open," since cigarettes have only been shown to be hazardous in humans, but not yet in experimental animals.

Ludmerer says there were "legitimate" grounds for dissenting from the Surgeon General's report even after 1964. He does not say when and how, in his view, it became no longer "legitimate." He does not mention tobacco industry efforts to misrepresent the science involved, to keep the "debate" going, to engineer false controversy, to hide what its own experts knew. He ignores this campaign of deceit, accepting the industry's own self-serving position that "legitimate doubt" existed even after the Surgeon General's report of 1964.

A more careful review of the historical literature shows that anyone with an honest, serious, and unbiased interest in finding out the truth cannot have been unaware of significant, life-threatening hazards by the mid-1950s. Scholars who denied the hazard after the Surgeon General's Report of 1964 were very much marginal figures in the science in

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[102] Oscar Auerbach et al., "Effects of Cigarette Smoking on Dogs II. Pulmonary Neoplasms," Archives of Environmental Health, 21 (1970): 754-68; White, "Research on Smoking"; Mark Parascandola, "Epidemiology: Second-Rate Science?" Public Health Reports, 113 (July/August 1998): 312-20.

question. And by the 1970s and '80s, the assertion of "no harm" had roughly the same status as six-day creationism or the "flat earth theory" for modern geoscientists.

2. Theodore A. Wilson is a specialist in U.S. military history, especially WWII and the Cold War, though he has also written on the history of continuing education at the University of Kansas. He has not published on the history of popular attitudes toward tobacco or its relationship to cancer, heart disease, or any other aspect of health.

Wilson's principal argument is that the American public has long been "keenly aware" of both the risks to health and the "addictive propensities" associated with tobacco use. He makes this point by citing numerous examples of anti-smoking messages in American popular culture, his point being that tobacco hazards were "common knowledge."

Wilson's account of the American public's knowledge of the risks of tobacco is selective and highly biased. He lists many examples of people cautioning against tobacco use from various periods in history, but says nothing about the sense of security many people felt in smoking, and the campaigns waged by the industry to promote that sense of security. He acts as if public opinion was shaped only by tobacco's critics, when it was also shaped by the industry itself, through advertisements, reassurances, duplicitous press releases, and a host of other factors.

Wilson tells us that Senator Reed Smoot urged Congress to place tobacco products under the jurisdiction of the Food and Drug Act (p. 15), but says nothing about how tobacco industry clout prevented such a measure from ever coming to pass. He mentions anti-smoking messages in Hollywood cartoons (p. 21), but ignores the fact that the industry has

also paid actors to smoke on screen (Brown and Williamson in 1983, for example, agreed to pay Sylvester Stallone $500,000 to use the company's tobacco products in several of his feature films).[103] He mentions the well-known alarms raised in magazines such as Reader's Digest, but fails to note that popular literature at this time was awash in tobacco ads--and that few magazines refused to publish tobacco ads.[104] Wilson's method has clearly been to "mine" popular magazines and newspapers for every possible shred of anti-tobacco sentiment, ignoring the role of the industry itself in getting people to smoke. His paper is therefore more of a collection of (misleading) facts than a serious and balanced history.

One way Wilson tries to make his point is by loose and overly-general statements about "common knowledge" or "the typical man or woman in the street"--without ever assessing how common the belief in question actually was. He says that a Presbyterian layman spoke against tobacco in church groups and schools, and that audiences were "left in no doubt" about the hazards of tobacco (p. 16), but he gives us no way to know how many of those in attendance believed the message. He says that an 1889 Kansas pamphlet on "moral purity" echoed views expressed "in every region of the nation" (p. 10)--but gives us no reason to believe that a majority of Americans agreed with such opinions. He says that YMCA efforts to impose a total ban on cigarettes expressed "the prevailing popular conviction" that cigarettes were harmful (p. 12), but there is no indication of whether such a view was held by 10 percent, 50 percent, or 90 percent of the general population.

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[103] Glantz, Cigarette Papers, pp. 365-67. Whiteside notes that in the late 1960s it was hard to find actors to play in anti-smoking commercials because many worried that this would jeopardize their chances of finding roles in pro-tobacco ads (Selling Death, pp. 72-73).

[104] Whiteside, Selling Death, p. 102.

Wilson repeats phrases such as "across the nation," "common knowledge," "self-evident," and "assimilated into popular awareness"--the insinuation being that no one could have escaped being convinced of tobacco's hazards. On p. 30, for example, we hear that "the general public" followed "every twist and turn" in the media's coverage of this question in the early 1950s--as if the general public were a single person, closely reading every page of JAMA, the New York Times, Reader's Digest, and popular articles reporting the latest scientific discoveries.

Wilson is correct to point out that criticism of tobacco is older than many people realize. But he exaggerates the extent to which people were aware of specific hazards. In his discussion of the 19th century, for example, he says it was common knowledge that tobacco "contained nicotine, a highly injurious alkaloid in concentrated form" (p. 9). Most ordinary Americans at this time would not even have recognized the word "alkaloid," let alone incorporated it into their decisions to begin smoking. He presents no evidence for his claim that the "typical man or woman in the street long ago was convinced that cigarette smoking was a nasty, deadly, difficult-to-break habit." Some people clearly held such views, but there is also polling evidence that many millions of Americans were (and are) often unaware of the nature and magnitude of cigarette hazards (see the polling evidence discussed below). Wilson also ignores the fact that many smokers took (and still take) their first puffs in their early teens--which means that surveys polling only the "typical man or woman in the street" may not say much about what young people believe when they first begin to smoke.

Wilson also ignores the fact that people young and old were constantly being bombarded with advertising images, urging them to light up. By 1938, tobacco advertising

was already a $50 million business. The 1957 budget for TV tobacco ads alone was $40 million, a figure which would grow to $115 million only five years later. Marlboro ads alone were seen by an estimated 90 million Americans per week.[105] No one can quantify the psychological impression made by such ads, but positive images of smoking clearly outnumbered negative images by an overwhelming margin. A historian simply cannot assume that the risks of smoking were "generally known and understood by the public" (Wilson, p. 19), when contradictory messages were constantly being thrown at them.

The polling evidence Wilson cites is also misleading. He points to a 1954 Gallup poll indicating that 90 percent of those surveyed had "heard or read about" the connection between smoking and lung cancer,[106] but fails to mention that when the same pollsters asked whether people believed what they had read--that cigarettes could cause cancer--they found that less than half of those polled (only 42 percent) answered "yes."[107]

Twelve years later, a Harris poll found only a slight improvement: when 1,250 people were asked whether cigarette smoking was a "major" or a "minor" cause of lung cancer, 40 percent said "major," 27 percent said "minor," and 33 percent said "can't yet tell."[108] Surveys conducted in 1966 for the U.S. Public Health Service found that only 46 percent of those polled answered "yes" when asked: "Is there any way at all to prevent a person from getting lung cancer?" Only 21 percent answered "yes" in response to the same

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[105] Whiteside, Selling Death, pp. 21-23.

[106] Wilson, Report, p. 19; Gallup Poll, June 1954.

[107] Maggi, "Bearing Witness for Tobacco."

[108] Roper Center at University of Connecticut Public Opinion Online, http://web.lexis-nexis.com/universe/docu...Al&_md5=745bc0da48d32853d26f4e4bd2b5e2a

question about emphysema and chronic bronchitis.[109]

Industry documents also show that the industry itself was aware that many people did not understand the nature of the hazards. A 1966 report on Philip Morris's "Project 6900" concluded that the public was "not fully aware of the relationship between cardiovascular disease and cigarette smoking."[110] A 1970 public opinion survey conducted by the industry (and never published) showed that a majority of those polled (52 percent) believed that cigarettes were "only one of the many causes" of smokers' having more illnesses.[111] A 1994 report by the Surgeon General cited data to the effect that many high school seniors still do not believe that smoking is unhealthful.[112]

It is therefore wrong to say that knowledge of such links was "common" or "indisputable."

There is also more direct evidence that many people did not believe there was a danger to smoking. Pre-twentieth century examples are easy to find: John Bain Jr.'s 1897 book, Tobacco in Song and Story, for example, gives example after example of the lore and love of tobacco, none of which mention cancer or heart disease. Thomas Huxley is cited grumbling about the nastiness of the habit, but is also quoted that "there is no more harm in

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[109] Use of Tobacco: Practices, Attitudes, Knowledge, and Beliefs. United States--Fall 1964 and Spring 1966 (U.S. Department of Health, Education, and Welfare: July 1969), pp. 52, 68.

[110] P. C. Luchsinger, "Project 6900," October 25, 1966, p. 2, Bates #1000341402.

[111] Panzer to Kornegay, May 1, 1972, 87657706.

[112] U.S. Surgeon General, Preventing Youth Smoking (Washington D.C.: USG Printing Office, 1994), p. 80. Wilson also ignores the fact that smoking correlates inversely with both wealth and education: a 1964 study by the American Cancer Society found that 60 percent of teenage smokers had a "D" academic average. Medical News Report, 1 #9 (November 10, 1969). (get full).

a pipe than there is in a cup of tea."[113] Similar views can be found in other popular books on smoking.[114]

Prior to the 20th century, tobacco was often used as a medicine. William Vaughan's 1726 Directions for Health, for example, advertised tobacco as a remedy for headaches, toothaches, epilepsy, dropsy, gout, and a host of other ailments. According to medical historian Morris Fishbein, attitudes toward tobacco softened after the succession of King James in 1625, and many people "began gradually to praise rather than to condemn" tobacco.[115]

Even in the period since the 1950s, however, we find examples of what could be called "common ignorance":

-- In 1954 Leonard Engel, a popular medical writer, in Harper's Magazine stated that "the case against cigarettes is by no means proved" and that cigarettes may have "little or nothing to do with cancer of the lung." Engel conceded that cigarettes were "dirty, expensive, and no contribution to physical health," but he also believed that the evidence

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[113] John Bain, Jr., Tobacco in Song and Story (New York: Caldwell, 1896), p. 90.

[114] For example: Sylvestre C. Watkins, The Pleasures of Smoking (New York: Schuman, 1948). There are such publications in other countries: An Australian general practioner by the name of William T. Whitby authored two such books: Smoking is Good for You (1978) and The Smoking Scare De-Bunked (1986), both self published in Sydney by what he called "Common Sense Publications." Philip Morris cooperated briefly with Dr. Whitby, despite calling his views "far out" and "eccentric,"; see Joan McBane(?) to James C. Bowling, Bates 002365473.

[115] Morris Fishbein, "The History of Smoking" (1966), Box 105 #7, Fishbein Papers, University of Chicago.

made available to him was not yet enough "for a firm conclusion."[116]

-- Eric Northrup's 1957 Science Looks at Smoking, a book written "for the layman," claimed that "all those who have attempted to prove the evil effects of tobacco have failed to establish a valid scientific case." Northrup admitted that some people by virtue of their constitution should not smoke, just as people with ulcers should not eat oranges; he also noted, though, that such prescriptions "point more to a deficiency in the patient than to any noxious quality in tobacco per se." Northrup conceded that some dangers may be real, but his overall message was one of reassurance: a chapter titled "Tobacco: Fact and Fiction," for example, characterizes smoking as a "positive factor in everyday living."[117]

-- In 1966, Lloyd Mallan published a 191-page book, It Is Safe to Smoke, making light of the purported dangers of smoking. A freelance writer and a former senior editor at Fawcett Books, Mallan records the opinions of hundreds of people testifying that it was safe to smoke, including the views of a number of influential scholars testifying before Congress. The author describes how his own wife, a smoker, was shaken by a recent NCI report linking smoking to cancer in women; he confesses he has written his book to reassure her and other "nervous smokers" that they can "relax" since, as he says: "it **is** safe to smoke."[118]

-- In 1976, while campaigning for president, Jimmy Carter told a North Carolina

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[116] Leonard Engel, "Do We Have to Give Up Smoking?" Harper's Magazine, 209 (1954): 25-30.

[117] Eric Northrup, Science Looks at Smoking: A New Inquiry into the Effects of Smoking on Your Health (New York: Coward-McCann, 1957) pp. 121-24, 179, 181.

[118] Lloyd Mallan, It Is Safe to Smoke (New York: Hawthorn, 1966), p. 23.

audience he hoped his administration would make smoking "even more safe than it is today," implying it was already pretty safe.[119]

-- And in 1994, during the presidential campaign, Senator Robert Dole publicly questioned the addictiveness of tobacco, comparing the dangers of smoking to those of drinking milk. Surgeon General C. Everett Koop commented on Dole's naiveté, saying that the senator expressed "either his abysmal lack of knowledge of nicotine addiction or his blind support of the tobacco industry."[120]

The point in listing such examples is simply to show that we cannot assume that people have always had a broad and realistic understanding of the nature and extent of tobacco hazards.[121] Popular knowledge changes over time, and though many people have become more aware of certain hazards, there are still many aspects not everyone will understand. Gilbert L. Ross, medical director of New York's American Council on Science and Health, says that it was not until 1998, after two decades of practice as an internist, that he learned that cigarettes "prematurely kill almost half of [all] smokers," that there is no

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[119] Carter later dismissed HEW Secretary Joseph Califano, acting "on behest of tobacco industry friends" incensed by the health secretary's characterization of smoking as "slow motion suicide" and "Public Health Enemy Number One"; see Joseph A. Califano, Jr., Governing America (New York, 1981), pp. 181-197 and 432.

[120] "Clinton Assails Dole on Tobacco And Liquor Company on TV Ads," New York Times, June 16, 1996, p. 21; John Schwartz, "Dole Tobacco Stand Draws Fire," Washington Post, June 22, 1996, p. A3.

[121] Don Oakley admitted as much in the preface to his 1999 prosmoking book, Slow Burn; recalling his 1964 response to the Surgeon General's Report, Oakley recalls: "Sure, I'd heard about 'smoker's cough' or 'smoker's hack' for years and we frequently referred to cigarettes as 'coffin nails,' but that was just joking. I was innocently unaware that there had ever been any really serious concern within the medical establishment about any possible health dangers from smoking" (Gainesville, Virginia: 1999, p. i).

known "safe" exposure, and that lung cancer is only "the tip of the morbidity iceberg."[122]

There is also, though, a certain hypocrisy in the tobacco industry's "common knowledge" defense, since the industry itself for more than forty years refused to admit that smoking caused any disease whatsoever. James C. Bowling, a high-ranking Philip Morris public relations officer, in 1970 said he was "impressed" with how many people thought the case against tobacco was not proven.[123] In 1994, leaders of the nation's major tobacco companies testified before Congress that they did not believe that smoking causes cancer.[124] Philip Morris's CEO and Chairman of the Board, reasserted the industry's "no evidence of harms" in 1997: testifying under oath in a deposition for a Florida tobacco lawsuit, Bible admitted that though carcinogens had been found in tobacco smoke, he still did not believe that smoking could cause lung cancer. He also said he would probably shut the company down "instantly" if it were in fact ever shown to cause cancer.[125]

Wilson also ignores the fact that the tobacco industry at many points has been able to exercise its economic and political power to influence popular knowledge of tobacco. Media analysts have often commented on how the dependency on tobacco advertising has made

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[122] Gilbert L. Ross, "Big Tobacco's No. 1 Lie Is that 'Everyone Knows,'" Los Angeles Times, August 2, 2001.

[123] James C. Bowling, cited in Kluger, Ashes to Ashes, p. 235. Bowling implied that smoking satisfied certain basic human needs, and that if people were to quit, then other psychological problems would crop up--including "more wife beating" (ibid.)

[124] Subcommittee on Health and the Environment, U.S. Congress, Hearings on Regulations of Tobacco Products (Part 1), 103-149 (March 25 and April 14, 1994), pp. 619-21.

[125] Geoffrey Bible, testifying at deposition for the Florida tobacco lawsuit, August 21, 1997, 22:20-23:3, 28:3 - 30:2, available online at: www.library.ucsf.edu/tobacco/litigation/fl/flbible1.pdf.

many magazines reluctant to report on tobacco hazards. In popular women's magazines in the 1970s, for example, tobacco hazards were rarely discussed--even in articles on women's health.[126] The tobacco industry was given the power to veto scientists selected for inclusion on the Surgeon General's Advisory Committee that produced the first Surgeon General's report (1964), and tobacco influence in the American Medical Association was one reason that prestigious body did not come out against tobacco until the mid-1980s. (The AMA received millions of dollars in research support from the industry, which some historians have suggested helped keep it quiet).[127]

Scholars have documented the impact of tobacco muscle on voting in the U.S. Congress: a 1994 study in JAMA, for example, found that U.S. congressmen receiving tobacco contributions were far more likely to oppose tobacco control than legislators not receiving such contributions.[128] A 1996 study by the U.S. Public Interest Research Group found that congressional representatives signing a letter opposing an FDA plan to limit tobacco marketing to children received 69 times more tobacco money than representatives who supported the regulations.[129]

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[126] Catherine L. Maroney et al., Tobacco and Women's Health: A Survey of Popular Women's Magazines, August 1999-August 2000 (New York: ACSH, 2000), pp. 1-10.

[127] Howard Wolinsky and Tom Brune, The Serpent on the Staff: The Unhealthy Politics of the American Medical Association (New York: Putnam's, 1994), pp. 144-73.

[128] Stephen Moore, "Epidemiology of Failed Tobacco Control Legislation," JAMA, October 19, 1994, pp. 1171ff; compare also S. A. Glantz and M. E. Begay, E., "Tobacco Industry Campaign Contributions Are Affecting Tobacco Control Policymaking in California," JAMA, 272 (1996): 1176-1182.

[129] U.S. Public Interest Research Group, March 14, 1996, reported in "Study SHows Impactg of Tobacco PAC Donations," Feb. 13, 1997.

Wilson's failure to take such complexities into account raises serious questions about the relevance of the material he has presented. You cannot write the history of attitudes toward tobacco without taking into consideration the influence of the industry itself, via its constant stream of ads, reassurances, and misrepresentations. An analogy could be made to Wilson's own field of expertise: the Cold War. What would we think of a historian exploring global attitudes toward communism from, say, 1930 to 1960, without ever acknowledging the existence of the Soviet Union at this time? What would we think of a historian writing on race relations in the mid-twentieth century, without ever mentioning segregation?

One last point: Wilson implies that epidemiology is somehow a lower grade of science than animal experimentation, but he fails to realize that epidemiology has in fact been a powerful tool for revealing the causes of many different kinds of illnesses. Even Brown and Williamson's tobacco and health website now admits this.[130] Animal experimentation has traditionally been useful for assessing the dangers of low-dose toxic exposures: laboratory animals are exposed to high doses, and the results are extrapolated via some dose-response model to humans. Occupational hazard researchers have long been aware that carcinogens are often first revealed by epidemiological means. This is true of many of the hazards of radiation, both ionizing and non-ionizing, but also asbestos, vinyl chloride, and many others.[131] It is simply not true that epidemiology is of a lower status than animal experimentation.

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[130] http://www.bw.com/SHC/Index.cfm?ID-2&Scct-3.

[131] Proctor, Cancer Wars.

3. Richard D. Thomas is not a historian but a toxicologist. He begins his report with the statement that "before 1950s, there was no reliable medical or scientific evidence that cigarette smoke might be a cause of lung cancer." He calls previous reports of a lung cancer/cigarette link "anecdotal" when (as already noted), physicians already by the 1920s had already begun to compile statistics showing higher rates of lung cancer (and other diseases) among smokers.

It is also not correct to assert that there was "no understanding of the mechanism by which any agent might actually give rise to cancer" (p. 4). While it is true that the mutation theory was not yet in place in the early 1950s, there was already clear recognition that certain types of chemicals were more likely to be carcinogenic than others. Many specific chemical carcinogens had been identified, from rare metals such as beryllium, to arsenic (widely used as a pesticide), to tars such as those to which chimney sweeps and petroleum workers had been exposed, and so forth.[132]

Thomas rightly notes that it is "not necessary for public health officials to understand the causal mechanism or even to have an appropriate animal model" to understand cancer causation (p. 5). He wrongly implies, though, that the epidemiologic studies undertaken in the early 1950s were not "purely scientific" (p. 5), and that a discipline such as toxicology is (or was) the more rigorous or appropriate tool for such studies.

Toxicology has been important in strengthening our understanding of disease mechanisms, and for quantifying the magnitude of certain kinds of chemical hazards. And Thomas is correct to say that some of the more subtle molecular and biochemical aspects of

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[132] Hueper, Occupational Tumors.

cancer causation were not deciphered until recently--meaning the 1980s and '90s, when tumor suppressor genes such as p53 were identified.[133] It would be wrong to conclude from this, however, that scholars had to wait until such studies were done to conclude that tobacco causes lung cancer "in accordance with traditional scientific standards" (p. 7). Thomas's appeal to tradition here is misleading on two counts, since a) there was nothing "unscientific" about the methods used in the 1950s to nail down the hazard, and b) animal experiments are not always the most effective way of identifying hazards. The perennial call for animal experiments has in fact been one of the ways the tobacco industry has tried to keep questions about the reality of tobacco hazards "open."[134]

There are many situations where animal experimentation has not been judged the most appropriate means to identify public health hazards. In cases such as tobacco, where hundreds of different chemicals are drawn into the lungs, it is often difficult to isolate out one individual offending agent or agents, particularly if they are acting somehow in concert or in stages to initiate the disease process. Epidemiology in such cases gives you a more direct and quantifiable measure of overall disease effect ("body count"), and is especially useful where the populations affected are large, the routes and magnitude of exposure are uniform, and the disease effects are strong--as in the case of tobacco.[135] Epidemiology is generally less useful for diseases where the risks are small and exposures are heterogeneous and difficult to quantify. In such cases animal studies can be used to help quantify risks,

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[133] Proctor, Cancer Wars, pp. 217-47.

[134] Freedman and Cohen, "Smoke and Mirrors."

[135] White, "Research on Smoking and Lung Cancer."

usually by exposing animals to high doses and extrapolating from this downwards to more realistic human dosages.

It is therefore not really relevant to say, as Thomas does, that toxicologists have found it difficult to produce "significant lung cancer" in laboratory animals (p. 7). The proper conclusion to be drawn from this is not that smoking does not cause cancer, but rather that it is sometimes hard to give rats--or mice, or other small mammals--lung cancer by smoking (they typically do not live long enough to get lung cancer, which is rare even among human smokers under the age of 40). The U.S. Surgeon General's report of 1964 and the Royal College of Physicians' report of 1962 both considered the skin-painting evidence from animal experiments sufficient to make a plausible argument for the carcinogenicity of tobacco smoke in human lungs.[136] Thomas seems to be playing word games when he says that smoking is "more accurately termed a risk factor" for lung cancer rather than a "scientifically established cause" (p. 8). He seems to mean that not everyone who smokes get cancer--which is true. But that is like saying that if you randomly fire shots into a crowd, and someone gets hurt, the firing was not really a "cause" of the injuries but a "risk factor."

Two last points: I would second Thomas's statement that "it is not necessary for public health officials to understand the causal mechanism or even to have an appropriate animal model" in order to take action to correct a health threat. I would also highlight the point he makes on p. 7, that few laboratory inhalation studies have been undertaken since the

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[136] U.S. Surgeon General, Smoking and Health (1964); Royal College of Physicians, Smoking and Health (London, 1962).

early 1980s. Thomas fails to draw the obvious conclusion, however: that there is not much point in conducting animal experiments, once the human hazard has been nailed down.

4. Peter C. English is a Professor of History and Pediatrics at Duke University in North Carolina. He begins his statement with the erroneous claim that "prior to the early 1950s, there was no hard evidence that cigarette smoking posed a serious threat to the public health" (p. 1). He ignores the European science, and earlier studies implicating smoking in (for example) cancers of the oral cavity, going back into the 19th century.

English also misrepresents the state of American science vis a vis the lung cancer question in the 1950s. He cites Churchill's 1948 view, for example, without noting that this was before the great burst of American science that began in 1950. He cites E. Cuyler Hammond in 1954 in support of his thesis that smoking was "just one of several potential culprits" (English, p. 2); the truth, however, is that in that very same year, at a meeting of the American Medical Association in San Francisco, Hammond and his American Cancer Society colleague, Daniel Horn, announced that their study of 187,766 volunteers from the American Cancer Society had clearly implicated cigarettes as a major cause of lung cancer. "We know of no alternative hypothesis that is consistent with all of the known facts" was their conclusion.[137]

English is also not correct when he says that toxicologists discovered benzpyrene in tobacco smoke only in 1954 (p. 6). Angel Roffo in Argentina had already made this

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[137] E. C. Hammond and D. Horn, "The Relationship Between Human Smoking Habits and Death Rates: A Followup Study of 187,776 Men," JAMA, 154 (1954): 1316-1328.

identification in the 1930s, and Lickint confirmed it. By 1935, in fact, Lickint could state that nicotine was "probably innocent" of carcinogenic potency and that benzpyrene was the "more likely" guilty party.[138]

On the question of popular knowledge, English states that the public health community's campaign to inform the public of the dangers of smoking was "overwhelming" and "unparalleled in scope and magnitude" (p. 8), but it should not be overlooked (again) that the tobacco industry was also spreading enormous sums to promote its products. The Tobacco Institute's 1987 promotional budget alone was in excess of ten million dollars, in addition to the hundreds of millions of dollars being spent on advertisements.

English states that the federal government was "always fully aware of scientific, medical, and public health aspects of smoking and disease" (p. 10)--but this is not an accurate assessment, since the industry often did not publish what it knew about specific hazards. The tobacco industry concealed what it knew about the variety of ingredients in cigarette smoke, for example.[139] Industry concessions of a hazard were also kept private. The government was never told about Charles Teague's 1953 assessment that tobacco was probably "an important etiologic factor in the induction of primary cancer of the lung," or his conclusion that there was "a growing suspicion, or even acceptance, among medical men and cancer researchers that the parallel increase in cigarette consumption and incidence

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[138] Angel H. Roffo "Krebserzeugende Tabakwirkung," Monatsschrift für Krebsbekämpfung, 8 (1940): 97; Fritz Lickint, "Die Bedeutung des Tabaks für die Krebsentstehung," Deutscher Tabakgegner, 17 (1935): 30; also his Tabakgenuss und Gesundheit (Hanover: Wilkens, 1936), pp. 84-85.

[139] Wakeham, "Tobacco and Health" (1961), Bates #1000277426.

cancer of the respiratory system is more than coincidence."[140] The government was never told that the industry had acknowledged nicotine as "an addictive drug," or about the steps taken by Wakeham and others to measure the carcinogenicity of specific agents in tobacco smoke.[141] It is therefore not true that "At no point was the federal government unaware of any significant development in the field of smoking and health" (p. 10).

English states that the phenomenon of "compensation" was public knowledge as early as the 1950s, but the Wynder passage he cites (on p. 12) does not illustrate his point. Compensation has to do with the fact that smokers of low-nicotine cigarettes tend to "compensate" for the lesser "kick" they receive per puff by puffing harder, or inhaling deeper, or smoking further down on the butt, or increasing their per capita consumption, etc. This was recognized privately by the British American Tobacco Co. in 1974, though published literature on the phenomenon did not appear until the 1980s. Wynder in the 1950s states only that the amount of tar which a smoker inhales depends on how much that person smokes. He does not state the key insight of compensation, which is that when given low-nicotine cigarettes, smokers will in fact smoke more, to maintain a given level of nicotine intake.[142]

The same objection can be raised against English's claim that a knowledge of

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[140] Teague, "Survey of Cancer Research," February 2, 1953, pp. 5, 11, 14, Bates #504184895-4923.

[141] Helmut Wakeham, "Tobacco and Health--R&D Approach" (presentation to Philip Morris's R&D Committee), November 15, 1961, n.p., Bates #100277434.

[142] National Cancer Institute, Risks Associated with Smoking Cigarettes with Low Machine-Measured Yields of Tar and Nicotine. Smoking and Tobacco Control Monograph No. 13. (USDHHS: Bethesda, 2001), p. 58.

compensation is illustrated in the 1967 Federal Trade Commission announcement of its plan to measure tar and nicotine yields in cigarettes (English, p. 13). The passage he cites (p. 13) says only that smokers have different smoking habits, including different inhalation patterns while concentrating, talking etc. It does not demonstrate a recognition of the phenomenon of compensation. English seems to miss the whole point of compensation, which is that cigarettes sold as low yield products do not in fact lower smokers' tar and nicotine intake. The tobacco industry was aware of this before anyone else, and did not make this knowledge public. There is also evidence the industry considered compensation research "dangerous," given that the continued sale of low-tar or -nicotine cigarettes could constitute false advertising.[143]

General Remarks

It is wrong to make the blanket statement that the hazards of smoking were "common knowledge" in the 1950s, '60s--or even later in many respects. Appreciation of hazards has grown over time, though people have also received confusing messages from popular reports of medical findings, tobacco industry pronouncements, cigarette advertisements, and other sources. The hazards of tobacco are complex, including not just lung cancer and heart disease but also emphysema, chronic bronchitis, cancers of the lip, mouth, tongue, bladder cancer, diseases of eye, and several others. It is difficult even today for non-specialists to obtain a clear sense of the nature or magnitude of such hazards, and this was more true in

[143] Brown and Williamson vice-president R. A. Sanford recognized the legal dangers of compensation research in 1980; see Glantz, Cigarette Papers, p. 88.

previous decades, at the height of the tobacco duplicity project.

Part of that difficulty can be traced to the coordinated efforts of the tobacco industry to reassure the public smoking was safe, through its strategy of insinuating doubt. The project to distort the state of medical knowledge began with the "Frank Statement" of 1954 and continued for more than four decades, involving duplicitous public relations, distortions of research, manipulation of governmental and professional organizations, among other things. The industry reassured the public that it was assuming responsibility for finding, publicizing, and fixing whatever hazards its customers might be facing from tobacco products; this included repeated promises from the industry leaders that it would "stop business tomorrow" if evidence of harms were uncovered. George Weissman, vice president of Philip Morris, made this promise in a widely-reported speech in Chicago in 1954.[144] The same company's CEO and Chairman, Geoffrey Bible, made a very similar statement under oath in 1997: asked what he would do if it were established that cigarettes were a cause of lung cancer, Bible answered: "I'd probably . . . shut [the company] down instantly to get a better hold of things."[145]

The industry abandoned this responsibility, while also doing everything it could to prevent the public from learning the truth about cigarettes. Tobacco use is now spreading

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[144] George Weissman, vice president of Philip Morris, made this promise in a widely-reported speech in Chicago in 1954, vowing that the industry would "stop business tomorrow" if its product were shown to be harming smokers. Weissman blamed the cancer problem not on tobacco but on "medical propaganda . . . by a small number of doctors and a large number of magazines and newspapers." Quoted in the St. Paul Pioneer Press, March 31, 1954, p. H.

[145] Geoffrey Bible, testifying at deposition, Florida tobacco lawsuit, August 21, 1997, 28:3 - 30:2, available online at: www.library.ucsf.edu/tobacco/litigation/fl/flbible1.pdf.

into many other parts of the world, and it appears that some of the same strategies will be used overseas that were successfully used in the U.S. to augment consumption. The World Health Organization has estimated that tobacco could kill as many as 10 million people per year (globally) within two or three decades,[146] and the total number of tobacco deaths in the 21st century, world-wide, could be as high as a thousand million.[147]

I have previously submitted the following legal testimony:

1. "Sterilization and Eugenics in Alberta, Canada, 1927-1973," Report for the Plaintiffs in "Leilani Muir vs. the Government of Alberta, Canada," September 1995. 25 pages.

2. "Rebuttal Expert Witness Report," Testimony for the Plaintiffs in "Emma Craft, et al., Plaintiffs, vs. Vanderbilt University, et al., Defendant," Case # 3-94-0090--on the history of dose-response relations in radiogenic cancer studies. January 29, 1998. 71 pages.

3. "A Historical Reconstruction of Tobacco and Health in the U.S., 1954-1994," Testimony for the Plaintiffs in "Iron Workers Local Union No. 17 Insurance Fund and Its Trustees, et al., v. Philip Morris, Incorporated, et al." November 6, 1998. 45 pages.

Signed,

_____ Date: May 10, 2002

Robert N. Proctor

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[146] World Health Organization, Tobacco or Health: A Global Status Report (Geneva: WHO, 1997).

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