

David M. Allen
James W. Howell *Editors*

Groupthink in Science

Greed, Pathological Altruism, Ideology,
Competition, and Culture

 Springer

Editors

David M. Allen
Department of Psychiatry
University of Tennessee Health
Science Center
Memphis, TN, USA

James W. Howell
Department of Psychiatry
University of Tennessee Health
Science Center
Memphis, TN, USA

ISBN 978-3-030-36821-0 ISBN 978-3-030-36822-7 (eBook)
<https://doi.org/10.1007/978-3-030-36822-7>

© The Editor(s) (if applicable) and The Author(s) 2020

This work is subject to copyright. All rights are reserved by the Publisher, whether the whole or part of the material is concerned, specifically the rights of translation, reprinting, reuse of illustrations, recitation, broadcasting, reproduction on microfilms or in any other physical way, and transmission or information storage and retrieval, electronic adaptation, computer software, or by similar or dissimilar methodology now known or hereafter developed.

The use of general descriptive names, registered names, trademarks, service marks, etc. in this publication does not imply, even in the absence of a specific statement, that such names are exempt from the relevant protective laws and regulations and therefore free for general use.

The publisher, the authors, and the editors are safe to assume that the advice and information in this book are believed to be true and accurate at the date of publication. Neither the publisher nor the authors or the editors give a warranty, expressed or implied, with respect to the material contained herein or for any errors or omissions that may have been made. The publisher remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.

This Springer imprint is published by the registered company Springer Nature Switzerland AG
The registered company address is: Gewerbestrasse 11, 6330 Cham, Switzerland

Chapter 13

Conflict Between Public Health Science and Markets: The Case of Tobacco Research – Illustrations from Tobacco and CO²



Augustine Brannigan

Introduction: Beyond Unconscious Bias to the Manufacture of Doubt

The idea of “groupthink” in science arises from concerns about how psychological conditions among researchers working in groups bias their conduct of objective research. In this chapter, we examine a different issue. What if ignorance is the outcome of institutional processes designed to suppress knowledge? The cases identified here involved the conscious creation of and exploitation of scientific ambiguity, confusion, doubt, and denial of important scientific facts. The objective was to countermand the control of commodities injurious to individuals and the environment. This occurred primarily in the area of public health science. In these cases, the evidence of injury suggested by scientific methods, including epidemiology and biomedical experiments, is said to have been deliberately obfuscated by producers and their industry experts.

These cases involve:

- (a) Injuries to individuals using such consumer products as cigarettes, pharmaceuticals, and other healthcare products and implants resulting in preventable disease and death
- (b) Diseases contracted by workers who are recklessly exposed to known toxic manufacturing materials such as asbestos, tetraethyl lead, barium, chromium, and radiation (to name a few) and
- (c) Potentially catastrophic degradation of the biosphere including destruction of the atmosphere’s protective ozone layer, the destruction of forests and lakes as a result of acid rain created by the sulfur emissions from industrial smoke

A. Brannigan (✉)
University of Calgary, Calgary, AB, Canada
e-mail: branniga@ucalgary.ca

stacks, and atmospheric warming and worldwide coral decline due to CO² emissions from fossil fuel consumption

Two recent investigations of these diverse situations are found in David Michaels' (2008a, 2008b) *Doubt is their Product* and Oreskes and Conway's (2010) *Merchants of Doubt*. Where do these titles originate? In 1964, the US Surgeon General published a landmark report establishing patterns of epidemic levels of cancer, emphysema, and heart disease associated with cigarette use. In the face of undeniable evidence of long-term increases in disease, the strategy of the industry was characterized in a private memo sent in 1969 by a senior executive at Brown and Williamson Tobacco to other executives. It read as follows: "Doubt is our product since it is the best means of competing with the body of fact that exists in the mind of the general public. It is also the means of establishing that there is a controversy. If we are successful in establishing a controversy at the public level, then there is an opportunity to put across the real facts about smoking and health" (cited in Proctor, 2011, 289).

This logic originated in the defense of the tobacco industry, but *the manufacture of doubt* has become an effective strategy in other areas. For example, in 1992, Republican pollster and strategist, Frank Luntz advised political candidates who were critical of climate change to use scientific uncertainty as a political tactic. "Voters believe there is *no consensus* about global warming within the scientific community. Should the public come to believe that the scientific issues are settled, their views about global warming will change accordingly. Therefore, *you need to make the lack of scientific certainty a primary issue in the debate . . . The scientific debate is closing [against us] but not yet closed*" (emphasis in the original) (cited in Michaels, 2008b: 92). Through a series of case studies, Oreskes and Conway (2010), Michaels (2008a, 2008b) and Proctor (2011) trace how the merchants of dangerous products employ industry scientists and form alliances with university scientists who are friendly to industry to dispute the evidence of harm, that is, to contest, minimize, and deny harm and to delay regulations injurious to profits. The paradigm case is tobacco, but it may apply to other products, to varying degrees.

The Social Evolution of Tobacco Use

Up until the 1920s, tobacco was smoked primarily in pipes and in hand-rolled cigars, or it was chewed. Robert Proctor (2011, 31–35) reports that a revolution in tobacco preparation occurred in North Carolina in the mid-nineteenth century which led to the curing of tobacco leaves with charcoal-heated air through steel pipes or "flues." Leaves cured in this fashion had significantly lower alkalinity which made tobacco smoke much easier to inhale deep into the lungs. The flue-curing revolution made American tobacco a more potent experience that proved a major financial success. In the twentieth century, the market flourished with the introduction of disposable "safety matches," flammable paper wrappers, and Bonsack rolling machines that could pump out astronomical numbers of cigarettes on a daily basis. However,

according to Proctor, these developments ultimately resulted in a medical catastrophe. “Flue curing may well be the deadliest invention in the history of modern manufacturing. Gunpowder and nuclear weapons have killed far fewer people” (2011, 34). In the twentieth century, worldwide consumption of tobacco led to the premature death of an estimated 100 million people. In the current century, “we . . . can expect a billion tobacco deaths if we continue on the present course” (p. 549).

Cancer by the Carton

In the nineteenth century, lung cancer was extremely rare. The US started tracking lung cancer deaths in 1914 when 400 cases were identified. However, with the huge popularity of cigarettes, it became increasingly prevalent, and reached epidemic proportions wherever cigarettes were widely used. In the US, the number of recorded deaths attributed to lung cancer peaked in 2005 at 163,500 (Proctor, 2011). Inferences about the link between smoking and health risks began to converge across different kinds of evidence. There had been clinical reports of the links between tobacco use and various lip and lung tumors in the late nineteenth and early twentieth centuries.

In the 1930s, an Argentinian oncologist, Angel Honorio Roffo, conducted experiments on animals to explore the link between carcinomas and the contents of tobacco smoke. He found that tar from tobacco smoke painted on the ears of rabbits produced tumors. This work was replicated on mice, and established that the lethal ingredient was the tar, as opposed to the nicotine. Following other approaches, researchers employed retrospective studies of hospital patients to link an elevated risk of current cancers to prior habits of cigarette use. In 1939, Franz H. Mueller (University of Cologne) linked cancers of the lung to previous cigarette use. In 1943, Shairer and Shöniger (University of Jena) drew the same conclusions from a better-designed study (Proctor, 2011, 226). Ironically, Nazi Germany was the first country in twentieth century Europe to undertake a sustained campaign against cigarette use, as outlined in Proctor’s *Nazi War on Cancer* (1999). To preserve the vitality of the “master race,” the German medical establishment undertook a cancer prevention campaign that included the promotion of healthy diets, natural foods, whole grain breads, and the banning of contaminants in food, such as pesticides, food dyes, and saccharin. The campaign extended to restricting worker exposure to such occupational carcinogens as asbestos, radon, and x-rays, and included a prolonged advertising campaign designed to suppress cigarette use.

In 1939, Fritz Lickint, published his 1100 page *Tabak und Organismus* (Tobacco and the Organism). Proctor describes it as “arguably the most comprehensive scholarly indictment of tobacco ever published” (1999, 184). It surveyed 8000 studies from the international literature linking cancers all along the “smoke alley” (lips, tongue, mouth, throat, esophagus, and lungs) to tobacco use. Lickint further tied tobacco use to arteriosclerosis, infant mortality, ulcers, and dozens of other maladies (p. 184). Finally, he claimed that nicotine made tobacco use addictive

(comparing it to morphine addiction), and that non-smokers were at health risks from “passive smoking,” that is, “second-hand smoke.” Lickint believed that the curtailment of smoking would dramatically reduce cancer in Germany. The progressive aspects of Nazi public health policies were purged from memory by the hideous flip side of the preservation of the “master race”— the racial extermination of Jews and gypsies, and the euthanasia of persons judged unfit to live.

In postwar Britain and the US, a flood of new studies were published, five alone in 1950. The new studies were cohort or prospective studies that tracked tobacco use overtime before cancers appeared. In 1954, Doll and Hill published a preliminary report of the smoking habits of 40,000 British physicians initially contacted in 1951. They subsequently assessed the prevalence of death in this sample 29 months later, comparing the causes of death among smokers and nonsmokers. The Registrars General of the United Kingdom yielded 789 death reports, including 36 cases attributed to lung cancer. None of the nonsmokers succumbed to lung cancer, and the risk of cancer relative to the individuals’ age group increased in proportion to the amount of their smoking. In a subsequent study published in 1956 after 53 months, there were 1714 deaths, including 84 attributed to lung cancer. All but one of the lung cancer deaths were in the smoking group. In 1954, Hammond and Horn published a study of over 187,766 men in the US. These were aged 50–69, and were followed up for a period of 3–5 years. Hammond and Horn discovered a similar association between a prior history of smoking and cancer (both lung and other forms) as well as other diseases (especially coronary heart disease). These health risks occurred in proportion to the level of smoking (Proctor, 2011, 225–30; US, 1964, 83–85).

A number of news reports brought these concerns to the public. In retrospect, one of the most effective was a short report by Roy Norr in *Reader’s Digest* (1952), one of the most widely read publications in America: “Cancer by the Carton.” Norr summarized the enormous increase in the incidence of cancer in American society, the opinions of leading medical experts linking this to tobacco use, and the need for action to educate the public about the risks of tobacco use.

In 1953, in response to public health concerns about the hazards of smoking, the industry engaged the services of the largest public relations firm in the world, Hill & Knowlton, to manage the clouds of suspicion over the industry. This resulted in collusion between all the major US tobacco companies in the development of an aggressive policy to contest the alleged linkage between tobacco and disease through a number of ingenious strategies.

- In January 1954, the industries’ leading tobacco producers released the famous “Frank Statement” published in 448 newspapers nationwide. This announced the creation of the Tobacco Industry Research Committee which would be funded to investigate “all phases of tobacco use and health.” The industry attracted highly respected scientists to lead the institute. The TIRC was renamed the Council for Tobacco Research in 1964 to create the illusion of distance from the industry (Glantz et al., 1996, 32–39).

- The industry fronted academic journals to publish research that was designed to air every potential cause of cancer except for tobacco (e.g., *Reports on Tobacco and Health Research*): asbestos, genetics, month of birth, reporting bias, measles virus, family factors, etc. (Michaels, 2008a, 7–8).
- The industry funded research in tobacco-friendly universities such as the Medical College of Virginia, in the heart of tobacco country, and cultivated the careers of senior scientists who were skeptical of the harm of tobacco (Proctor, 2011, 177–181).
- In the course of this funding bonanza, the industry recruited scores of scientists who would be employed as expert witnesses in torts for disease inflicted by tobacco use. The industry never lost a tort for damages from any of the hundreds of plaintiffs heard after the mid-fifties presenting with lung cancer, emphysema, or coronary heart disease (Player, 1998).
- Industry scientists also began to investigate the chemistry of tobacco in their own labs, and discovered its addictive qualities, as well as the carcinogenic effects of second-hand smoke. And while this private information accumulated in the labs of the producers, the companies continued to promote the healthy benefits of smoking, and to deny any links between tobacco use and disease (Glantz et al., 1996, 37ff; Proctor, 2011, 215–22).
- The industry marketed products that were said to be “milder,” and promoted filtered products as a token of commitment to consumer health, although they never disclosed what risks the filters afforded protection from (TCLC, 2006, Part 3).
- Friends of the industry were able to attract money to front organizations such as the George C. Marshall Institute to provide industry a way to attack the work of its critics behind a façade (Oreskes & Conway, 2008, 60ff).
- The industry paid famous Hollywood performers to “place” cigarettes in their movies. For example, in 1983, Sylvester Stallone signed a contract to smoke Brown and Williamson brands (i.e., Kool & Belair) in five movies, for which he was to be paid \$500,000. When the “product placement” in the movies appeared inconspicuous, the contract was cancelled and Stallone was paid \$110,000 (Glantz et al., 1996, 366–67).
- Tobacco publicists acknowledged the allegations of harm, but insisted the question be posed in terms of the “controversy” over tobacco and harm, and aggressively lobbied news media to exercise impartiality by always insisting that both “sides” of the controversy be given equal attention (Michaels, 2008a, 11).
- The industry recruited scientists to reanalyze the original data of government and academic health researchers whose work supported the link between tobacco and health deficits, and to find ways to discredit their conclusions, a model followed for other studies of harmful products (Michaels, 2008a, 50, 52, 74–76, 103, 148, etc.).
- The industry financed the development of the “product defense industry” which specialized in taking doubt before juries in legal cases, and in lobbying elected officials, as well as government scientists on the industry perspective (Michaels, 2008a, 46ff.).

- Firms which flourished in the defense of tobacco reappeared to contest the scientific evidence for the causes and consequences of acid rain, ozone depletion, and toxic chemicals employed in various manufacturing processes (Oreskes & Conway, 2010).

The US Surgeon General Reports

It is just over 50 years since the publication of the First US Surgeon General's Report on *Smoking and Health* (US, 1964). Since that time, governments have undertaken public health policies to reduce the devastating effects of tobacco. The most recent report appeared in 2014, *The Health Consequences of Smoking—50 Years of Progress* (US, 2014). It estimated that in the US, from 1965 to 2014, there were over 20,000,000 preventable, premature deaths caused by tobacco use. A series of targeted public service programs were undertaken to reduce tobacco consumption. These included aggressive taxation, limitations of advertising, grotesque pictures of tobacco-induced illness on the covers of tobacco cartons, control of sales by age, smoking prevention in work places and public conveyances, etc. These have resulted in a reduction of smoking in the US from about 43% of adults in 1965 to 18% in 2012 (US, 2014, 17) (Table 13.1).

A Game-Changing Case: The Racketeering Case Against Tobacco

When the health risks of tobacco first came to light in the 1950s, hundreds of victims sued the companies for damages. Several legal theories emerged in these cases: the products were unfit to use, they were inherently dangerous and the advertising failed to alert users to the risks. Tobacco never settled a single case out of court,

Table 13.1 Premature deaths caused by smoking and exposure to second-hand smoke, 1965–2014 (US, 1964: 1): Cause of death totals

Smoking-related cancers: 6,587,000
Cardiovascular and metabolic diseases: 7,787,000
Pulmonary diseases: 3,804,000
Conditions related to pregnancy and birth: 108,000
Residential fires: 86,000
Lung cancers caused by exposure to second-hand smoke: 263,000
Coronary heart disease caused by exposure to second-hand smoke: 2,194,000
Total: 20,830,000

Source: Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion, Office on Smoking and Health, unpublished data

invested extensively in expert witnesses who denied that the products were dangerous, that the plaintiffs' illnesses were caused by something other than tobacco, and that, even if the products were dangerous, smokers already knew the risks. They appealed every adverse decision relentlessly and successfully (Rabin, 1992).

They were also committed to strangling the plaintiffs financially to prevent cases from ever going to trial through endless pre-trial motions and depositions. They never paid a penny in damages. The fees of the plaintiff lawyers were typically only paid contingent on a successful settlement. The only notable decision in this period was in the case of *Lartigue (1963)* where the court found that the defendant was responsible for causing the plaintiff's illness, but because at the time they did not know the harm of the products, they could not foresee the outcome, and as a result could not be held liable (Player, 1998, 312–13). In the second wave of cases in the 1980s, the plaintiffs raised the issue that the companies knew that the products caused cancer and that they were addictive. The plaintiffs argued that the industry might not be totally responsible for an individual's habit, but bore some portion of the damages. In *Cipollone v. Liggett (1983)*, these arguments met with more success and the plaintiff's surviving husband was awarded \$400,000 in damages. The defendant was assessed 20% of the responsibility, but in New Jersey tort law, no damages were payable when the plaintiff was over 50% responsible (Player, 1998, 318). However, thousands of documents were released through pretrial discovery that began to uncover what the companies knew and when they knew it.

The third wave of cases was brought by states seeking some relief from the inflated healthcare costs arising from tobacco diseases. This built on the expanding mountain of culpable industry documents obtained in pretrial depositions. A case against Liggett & Myers resulted in the first successful court action against a cigarette manufacturer. The company, on the edge of bankruptcy, acknowledged the harmfulness of the product, agreed to pay damages and further agreed to turn over its own internal documents which implicated the entire industry.

In 1998, the Attorneys General from 46 US states negotiated a Master Settlement Agreement that collected \$368.5 billion dollars to be paid over the following 25 years to the states as compensation for their inflated public healthcare costs (Player, 1998, 329–31). The agreement also prohibited advertising to children. And the industry disbanded their public "research" programs which were designed solely from the beginning to sow doubt about the links between tobacco use and illness. At the same time, a disgruntled employee, Merrell Williams, started circulating tens of thousands of pages of internal company documents that reflected the internal research that the companies had been conducting for 40 years (Glantz et al., 1996, 7–8). These were sent to news organizations, politicians, and health scientists, principally Stanton Glantz, and formed the basis of *The Cigarette Papers (1996)*. This dramatically altered the legal response to tobacco control.

The most important case to examine issues in light of these files was a civil case called *United States v. Philip Morris* brought by the US Department of Justice in 1999 against the major tobacco companies. In 2000, the DOJ won a ruling that permitted the government to seek damages under the Racketeer Influence and Corrupt Organizations Act (RICO). RICO was created to combat organized crime by per-

mitting the government to seize the assets of criminal organizations. The DOJ filed 1400 pages of evidence of misconduct on the part of the tobacco manufacturers who had engaged in a decades-long conspiracy to:

1. Mislead the public about the risks of smoking
2. Mislead the public about the danger of second-hand smoke
3. Misrepresent the addictiveness of nicotine
4. Manipulate the nicotine delivery of cigarettes to stimulate addiction
5. Market cigarettes misleadingly characterized as “light” or “low tar,” while knowing that those cigarettes were at least as hazardous as full-flavored cigarettes
6. Target young smokers to ensure lifelong dependency
7. Reject the production of safer cigarettes, i.e., products with lower levels of nicotine (PHLC, 2010; TLC, 2006)

In 2006, Judge Kessler issued a 1683-page opinion that found on the evidence that the tobacco companies had violated civil racketeering laws by lying for decades about the health risks of smoking and marketing to children. The DOJ sought to punish the companies by seizing assets obtained by this misconduct. However, the appeal court denied the government’s remedy of a disgorgement of profits of \$280 Billion (California HDE, 2005). The evidence suggested that the tobacco industry funded extensive pseudoscientific research in an attempt to discredit the efforts of various regulatory agencies to document the effects of environmental tobacco smoke, including second-hand smoke (Muggli et al., 2001).

In the 2006 decision Judge Kessler found that *“each and every one of these defendants repeatedly, consistently, vigorously - and falsely - denied the existence of any adverse health effects from smoking, despite the massive documentation in their internal corporate files from their own scientists, executives, and public relations people that confirmed that there was little evidence supporting their claims. Specifically, Defendants knew there was a consensus in the scientific community that smoking caused lung cancer and other diseases by at least January 1964. Despite this internal knowledge, the Defendants embarked on a campaign of proactive and reactive responses to scientific evidence that was designed to mislead the public about the health consequences of smoking”* (US v. Philip Morris, 2012). The court went on to say that the defendants publicly denied and distorted the truth about the addictive nature of nicotine, and designed their cigarettes to deliver the nicotine “sufficient to create and sustain addiction.” The remedies consisted of an order issued in 2006 to publish “corrective statements” in advertisements on television, in newspapers, on the companies’ websites and on cigarette packages to describe how the companies had misled the public. A preliminary agreement on how this was to be done was reached in October 2017, eleven years after the initial order was issued (Campaign TFK, 2017). The industry continues to face individual lawsuits from persons who have been affected by lung cancer and/or other tobacco-related diseases. In Canada, the provinces are negotiating with tobacco manufacturers to seek relief from costs inflicted on provincial health schemes from illnesses related to tobacco use. But tobacco remains legal and none of the tobacco executives who had the *mens rea* for decades have faced any criminal liabilities. Even after

being directed by the court during the *Philip Morris* trial to preserve all business records, 11 tobacco executives were found to have erased incriminating emails covering a two-and-a-half-year period prior to the initial verdict. The companies were fined \$2.75 Million (Levin, 2004). Not the individuals.

Beyond Tobacco: Exxon, Global Warming, and “Agnotology”

In 2015, a report appeared in *Scientific American* that expressly drew a parallel between Exxon and its knowledge of climate change, and the earlier history of tobacco. “Exxon was aware of climate change, as early as 1977, 11 years before it became a public issue . . . This knowledge did not prevent the company (now ExxonMobil and the world’s largest oil and gas company) from spending decades refusing to publicly acknowledge climate change and even promoting climate disinformation—an approach many have likened to the lies spread by the tobacco industry regarding the health risks of smoking” (Hall, 2015). The journalists of the primary investigation of the Exxon case at *Inside Climate News* painted a more nuanced picture. In 1977, James F. Black gave a talk to senior executives suggesting that the expanding utilization of fossil fuels could lead to significant increases in greenhouse gases that would begin to warm the earth’s atmosphere significantly (Banerjee, Song & Hasemyer, 2015). Within 2 years, the company’s research division had commissioned a tanker, the Esso Atlantic, to measure the rate at which the oceans were absorbing CO², which it did from 1979 to 1982. Exxon also employed a team of mathematicians to prepare estimates of climate change based on complex atmospheric models. The work of Exxon scientists was published in various refereed journals between 1983 and 1984, and thereafter. Exxon was the sole leading oil and gas producer to take climate change seriously, and to develop an expertise in climate science.

Other scientists at Exxon warned of the development of an enormous natural gas find off Indonesia. It contained 70% CO² and would become the single largest source of CO² release on the globe if developed; it was not (Goldenberg, 2015). However, when the international community advocated the first steps to reduce carbon consumption by an international treaty at the Kyoto Summit, the chairman of Exxon, Lee Raymond, opposed it. For the next eleven years, Exxon funded climate change skeptics. In 2008, under mounting pressure from activist stakeholders, the company announced that it would end support for . . . [the] dozens of organizations who were actively distorting the science” (Banerjee et al., 2015). Currently, the Attorney General of New York has taken legal action to obtain corporate documents to determine if the company undertook a campaign to mislead shareholders and the public about global warming (Flitter, 2017). A 2017 study of company documents presented a rather ambiguous case against ExxonMobil based on a comparison of the publications of its scientists and the internal documents of executive versus what it suggested in its “advertorials” in the *New York Times*. “We conclude that ExxonMobil contributed to advancing climate science—by way of its scientists’

publications—but promoted doubt about it in its advertorials . . . We stress that the question is not whether ExxonMobil ‘suppressed climate change research.’ But rather how they communicated about it” (Supran and Oreskes, 2017).

The analogy between the tobacco case and the CO² case is not altogether convincing. Oreskes and Conway (2008, 2010) argue as though the “facts” behind climate change are completely incontrovertible and that there was a scientific consensus about them from the late 1970s. However, in a symposium on *Merchants of Doubt* (*Metascience*, 2012), scholars highly supportive of the research pointed out that it depicted science, particularly climate science, in a fashion that was inconsistent with studies of the actual practices of scientists in Science and Technology Studies, which emphasize the contingency, the boot-strapping logic, and idiosyncrasies of the discovery process. As Steve Yearly observes, “Oreskes and Conway are keen to emphasize the similarities between the work on these environmental and health topics and regular academic science . . . one cannot be a skeptic about the heliocentric solar system because the science is settled” (Yearly, 2012, 535) – implying that climate science is certainly *not* as settled as Newtonian physics. Yearly also points out that there has been a move away from science considered as an autonomous institution devoted to basic discovery to its increasing assignment in the post-WW2 state to enlarging the productivity of the economy, the military and medicine. And in the area of public health science, there is an increasing emphasis on risk assessment which necessarily involves public and political involvement in the regulatory process.

Assessing an optimum level for pesticide exposure, disposal of hazardous materials, etc. requires an estimation of *probable* safety levels, *probable* consequences and an evaluation of alternative solutions. These solutions “have to be offered in public forums where various interest groups have a legitimate role and where (the threat of) legal review is likely to be invoked” (p. 534).

David Mercer (2012, 537) argues in a similar vein. There is a tendency for “Oreskes and Conway’s analysis to treat the boundaries between science, policy and regulation as clear and distinct,” but in a democracy, where science is only possible by massive public investment, this is not the case. Furthermore, health science inevitably comes to play a role in governance, even though the science is not always “settled.” The recent US report of global warming (CSSR, 2017) emphasizes that it has to develop policies based on two separate parameters: the *confidence* in the likelihood of change and the *impact* of the change should it occur. This approach recognizes the uncertainty of the measures and predictions, but unlike the tobacco “sound science movement” (Ong and Glantz, 2001), it does not freeze the regulatory agenda. In the case of global warming, the consequences of getting the policy wrong may prove to be catastrophic.

To return to the comparison with the tobacco case, a final point should be raised. “Sound science” counseled against regulation before the science was settled, but the advocates in the tobacco industry played a key role in creating the doubt. That was the rationale for promoting the term. And in the course of doing so, they lied to the public while millions of people died from the normal use of their products. To what extent is the charge comparable in the case of Exxon? To what extent had Exxon undermined effective public policies to protect the environment through its secrecy

and misrepresentations to the public? Or, on the contrary, to what extent have decisions about public policies been hobbled by technical incompleteness, debates about data manipulation, and the slow process of accumulating observations over the last few years as the current consensus has emerged, and as the international coalitions were proposed and adopted? At this point, no one can say with certainty. The exposé of tobacco is based on the disclosure of millions of pages of internal incriminating documents. No comparable record exists for Exxon.

There was another insidious aspect of the hold of tobacco on politicians and the media that differentiates it from the Exxon case: it stifled free speech. When “60 Minutes” produced a program on tobacco culpability and industry conspiracy, the program was spiked. When Stanton Glantz published the leaked tobacco papers on the website of USF, a congressional subcommittee took the unprecedented step of de-funding his studies of tobacco and health. And when Sharon Eubanks was successfully leading a RICO investigation against Philip Morris, persons associated with the Bush Presidency tried to undermine her prosecution. Tobacco lobbyists and lawyers were behind all of these cases. In a republic predicated on free speech, the power of corporate actors to suppress criticism is injurious to the free exchange of ideas and, in this case, the negotiation of effective policies to protect public health.

We do not have to draw any conclusions about Exxon at this point, but there is a more general lesson. It is raised through the term, “agnotology,” coined by Robert Proctor (Proctor & Scheibinger, 2008). Recalling Nietzsche, it might be called *the genealogy of ignorance*. Often, the absence of knowledge is not a natural condition of society, but an outcome of concerted, institutional efforts to suppress knowledge, sow confusion, disappear the past, suppress unwanted voices, and occlude competing world views. In this essay, we have attempted to enlarge the study of groupthink – which emphasizes how people come to give erroneous accounts of the world – to conditions where knowledge of reality is actively and institutionally suppressed or distorted. Tobacco “science” represents a compelling case study in agnotology.

References

- Banerjee, N., Song, L., & Hasemyer, D. (2015). The road not taken: Exxon’s own research confirmed fossil fuels’ role in global warming decades ago. *Inside Climate News* online, <https://insideclimatenews.org/content/Exxon-The-Road-Not-Taken>. Retrieved 26 July 2019.
- California HDE. (2005). *California healthline daily edition “supreme court refuses to hear appeal on past profits in doj racketeering case against tobacco companies”*, Online <https://california-healthline.org/morning-breakout/supreme-court-refusesto-hear-appeal-on-past-profits-in-doj-racketeering-case-against-tobaccocompanies/>. Retrieved 10 Nov 2017.
- Campaign TFK. (2017). Tobacco companies must finally tell public the truth about their lethal product – 11 years after a court ordered it. *Press Release* on October 4, https://www.tobacco-freekids.org/press-releases/2017_10_04_corrective. Retrieved 4 Nov 2017
- CSSR. (2017). *Climate science special report: Fourth national climate assessment*. Washington, D.C.: US Global Change Research Program. <https://doi.org/10.7930/J0J964J6>

- Flitter, E. (2017, June 2). New York prosecutor says Exxon misled investors on climate change. *Reuters Business News*. <https://www.reuters.com/article/ususa-climatechange-exxon/new-york-prosecutor-says-exxon-misled-investors-on-climate-change-idUSKBN18T1XK> Retrieved 4 Nov 2017.
- Glantz, S., Slade, J., Bero, L. P., Hanauer, P., & Barnes, D. (1996). *The cigarette papers*. Berkeley, CA: University of California Press.
- Goldenberg, S. (2015, July 9) Exxon knew of climate change in 1981, email says – But it funded deniers for 27 more years. *The Guardian* online, <https://www.theguardian.com/environment/2015/jul/08/exxon-climate-change-1981-climate-denier-funding>. Retrieved 26 July 2019.
- Hall, S. (2015). Exxon knew about climate change almost 40 years ago. *Scientific American*, Online October 26, <https://www.scientificamerican.com/article/exxon-knew-about-climate-change-almost-40-years-ago/>. Retrieved 26 July 2019.
- Levin, M (2004, July 22). Judge orders Philip Morris, Altria to pay \$2.75 Million. *Los Angeles Times*. <http://articles.latimes.com/2004/jul/22/business/fi-smoke22>. Retrieved 4 Nov 2017.
- Mercer, D. (2012). Symposium comments “perspectives on global warming”. *Metascience*, 21, 235–240. <https://doi.org/10.1007/s11016-011-9639-9>
- Metascience. (2012). Perspectives on global warming. *Australasian Association for the History, Philosophy and Social Studies of Science*, 21, 531–559. <https://doi.org/10.1007/s11016-011-9639-9>
- Michaels, D. (2008a). *Doubt is their product*. New York, NY: Oxford University Press.
- Michaels, D. (2008b). Manufactured uncertainty: Contested science and the protection of the public’s health and environment. In R. N. Proctor & L. Schiebinger (Eds.), *Agnotology: The making and unmaking of ignorance* (pp. 90–107). Stanford, CA: Stanford University Press.
- Muggli, M. E., Foster, J. L., Hurt, R. D., & Repace, J. L. (2001). The smoke you don’t see: Uncovering tobacco industry scientific strategies aimed against environmental tobacco smoke policies. *American Journal of Public Health*, 91(9), 1419–1423.
- Norr, R. (1952, December). Cancer by the carton. *Reader’s Digest*, 7–8.
- Ong, E. K., & Glantz, S. (2001). Constructing ‘sound science’ and ‘good epidemiology’: Tobacco, lawyers and public relations firms. *American Journal of Public Health*, 91(11), 1749–1757.
- Oreskes, N., & Conway, E. M. (2008). Challenging science: how climate science became a victim of the cold war. In R. N. Proctor & L. Schiebinger (Eds.), *Agnotology* (pp. 55–89). Stanford, CA: Stanford University Press.
- Oreskes, N., & Conway, E. M. (2010). *Merchants of doubt*. New York, NY: Bloomsbury Press.
- PHLC. (2010). *United States v. Philip Morris (D.O.J. Lawsuit)*. St. Paul, MN: Public Health Law Center at William Mitchell College of Law. <http://www.publichealthlawcenter.org/topics/tobacco-control/tobacco-controllitigation/united-states-v-philip-morris-doj-lawsuit/>. Retrieved 3 Nov 2017.
- Player, T. S. (1998). After the fall: The cigarette papers, the global settlement, and the future of tobacco litigation. *South Carolina Law Review*, 49, 311–342.
- Proctor, R. N. (1999). *The nazi war on cancer*. Princeton, NJ: Princeton University Press.
- Proctor, R. N. (2011). *Golden holocaust: origins of the cigarette catastrophe and the case for abolition*. Berkeley, CA: University of California Press.
- Proctor, R. N., & Schiebinger, L. (Eds.). (2008). *Agnotology: the making and unmaking of ignorance*. Stanford, CA: Stanford University Press.
- Rabin, R. L. (1992). A Sociolegal history of tobacco tort legislation. *Stanford Law Review*, 44(4), 853–878.
- Supran, G., & Oreskes, N. (2017, August 23). Assessing ExxonMobil’s climate change communications (1977–2014). *Environmental Research Letters*, 12(8). <http://iopscience.iop.org/article/10.1088/17489326/aa815f?fromSearchPage=true>. Retrieved 5 Nov 2017.
- TCLC. (2006). *The Verdict is in: Findings from United States v. Philip Morris*. Saint Paul, MN: Tobacco Control Legal Consortium.

- U.S. (1964). *Surgeon general's report, Smoking and health: report of the advisory committee to the surgeon general of the public health service*. Washington, D.C.: USGPO.
- U.S. (2014). *Surgeon general's report, The health consequences of smoking: 50 years of progress*. Washington, D.C.: USGPO.
- U.S. v. Philip Morris. (2012). Judgment of United States District Court for the District of Columbia, Civil Action No. 99-2496 (GK), November 27.
- Yearly, S. (2012). Symposium comments, "Perspectives on global warming". *Metascience*, 21, 531–535. <https://doi.org/10.1007/s11016-011-9639-9>.