AGNOTOLOGY

The Making and Unmaking of Ignorance

Edited by Robert N. Proctor
and Londa Schiebinger

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Preface

WE LIVE IN AN AGE OF IGNORANCE, and it is important to understand how this came to be and why. Our goal here is to explore how ignorance is produced or maintained in diverse settings, through mechanisms such as deliberate or inadvertent neglect, secrecy and suppression, document destruction, unquestioned tradition, and myriad forms of inherent (or avoidable) culturopolitical selectivity. Agnotology is the study of ignorance making, the lost and forgotten. One focus is on knowledge that could have been but wasn't, or should be but isn't, but we shall also see that not all ignorance is bad.

Our primary purpose here is to promote the study of ignorance, by developing tools for understanding how and why various forms of knowing have "not come to be," or disappeared, or have been delayed or long neglected, for better or for worse, at various points in history. Swimming as we do in oceans of ignorance, examples could be multiplied ad infinitum. Contributors to this volume probe the secrecy maintained by military classification, the "doubt" peddled by manufacturers of carcinogens ("doubt is our product"), the denialist claims of environmental troglodytes, the nontransfer of technologies (such as birth control) from colonial outposts to imperial centers, the role of disciplinarity and media "balance routines" on agnogenesis, and certain aspects of racial and sexual ignorance. The idea is that a great deal of attention has been given to epistemology (the study of how we know) when "how or why we don't know" is often just as important, usually far more scandalous, and remarkably undertheorized.

This volume emerged from workshops held at Pennsylvania State University in 2003 and at Stanford University in 2005, the goal of which was to come to grips with how ignorance has been understood, created, and ignored, linking these ideas also to allied creations of secrecy, uncertainty, confusion, silence, absence, and impotence—especially as these pertain

to scientific activities. For financial support, we owe a debt of gratitude to the National Science Foundation—and at Penn State, to the Science, Medicine, and Technology in Culture initiative, the Institute for Arts and Humanities, the Rock Ethics Institute, and the departments of History, English, and Anthropology. At Stanford we are also grateful to the History & Philosophy of Science, the Suppes Center, the Humanities Center, Modern Thought and Literature, and the Stanford Center for Biomedical Ethics. We are also thankful for administrative help provided by Rosemary Rogers, Michelle Cale, and Jeanette Jenkins.

We are hoping this volume will be taken as opening a door to a broader realm of inquiry. We invite others to step through this door, and to explore the many other realms of ignorance that saturate and define our world.

A G N O T O L O G Y

CHAPTER 1

Agnotology

A Missing Term to Describe the Cultural Production of Ignorance (and Its Study)

ROBERT N. PROCTOR

We are often unaware of the scope and structure of our ignorance. Ignorance is not just a blank space on a person's mental map. It has contours and coherence, and for all I know rules of operation as well. So as a corollary to writing about what we know, maybe we should add getting familiar with our ignorance.

Thomas Pynchon, 1984

Doubt is our product.

Brown & Williamson Tobacco Company, internal memo, 1969

PHILOSOPHERS LOVE TO TALK ABOUT KNOWLEDGE. A whole field is devoted to reflection on the topic, with product tie-ins to professorships and weighty conferences. *Epistemology* is serious business, taught in academies the world over: there is "moral" and "social" epistemology, epistemology of the sacred, the closet, and the family. There is a Computational Epistemology Laboratory at the University of Waterloo, and a Center for Epistemology at the Free University in Amsterdam. A Google search turns up separate websites for "constructivist," "feminist," and "evolutionary" epistemology, of course, but also "libidinal," "android," "Quaker," "Internet," and (my favorite) "erotometaphysical" epistemology. Harvard offers a course in the field (without the erotometaphysical part), which (if we are to believe its website) explores the epistemic status of weighty claims like "the standard meter is 1 meter long" and "I am not a brain in a vat."[1] We seem to know a lot about knowledge.[2]

What is remarkable, though, is how little we know about ignorance.[3] There is not even a well-known word for its study (though our hope is to

change that), no fancy conferences or polished websites. This is particularly remarkable, given (a) how much ignorance there is, (b) how many kinds there are, and (c) how consequential ignorance is in our lives.

The point of this volume is to argue that there is much, in fact, to know. Ignorance has many friends and enemies, and figures big in everything from trade association propaganda to military operations to slogans chanted at children. Lawyers think a lot about it, since it often surfaces in consumer product liability and tort litigation, where the question is often "Who knew what, and when?" Ignorance has many interesting surrogates and overlaps in myriad ways with—as it is generated by—*secrecy, stupidity, apathy, censorship, disinformation, faith,* and *forgetfulness,* all of which are science-twitched. Ignorance hides in the shadows of philosophy and is frowned upon in sociology, but it also pops up in a great deal of popular rhetoric: it's no excuse, it's what can't hurt you, it's bliss. Ignorance has a history and a complex political and sexual geography, and does a lot of other odd and arresting work that bears exploring.

And deploring—though we don't see inquiry in this area as necessarily having the goal of *rectification.* Ignorance is most commonly seen (or trivialized) in this way, as something in need of correction, a kind of natural absence or void where knowledge has not yet spread. As educators, of course, we are committed to spreading knowledge. But ignorance is more than a void—and not even always a bad thing. No one needs or wants to know everything all the time; and surely all of us know things we would rather others not know. A founding principle of liberal states is that omniscience can be dangerous, and that some things should be kept private. Rights to privacy are essentially a form of sanctioned ignorance: liberal governments are (supposed to be) barred from knowing everything; inquisitors must have warrants. Juries are also supposed to be kept ignorant, since knowledge can be a form of bias. There is virtuous ignorance, in the form of resistance to (or limits placed on) dangerous knowledge.[4]

The causes of ignorance are multiple and diverse. Not many people know that the biggest building in the world is a semi-secret facility built to produce explosive uranium-235, using enormous magnets, near a nondescript town in southern Ohio (Piketon); but that is for reasons that are different from why we don't know much about the origin of life, or any-

thing at all about time before the Big Bang circa 14 billion years ago. And there are many different ways not to know. Ignorance can be the flipside of memory, what we don't know because we have forgotten, parts of which can be restored by historical inquiries but most of which is forever lost. (And we often cannot say which.) Ignorance can be made or unmade, and science can be complicit in either process.

THE PURPOSE OF THE PRESENT VOLUME is programmatic, to begin a discussion of ignorance as more than the "not yet known" or the steadily retreating frontier. We need to think about the conscious, unconscious, and structural production of ignorance, its diverse causes and conformations, whether brought about by neglect, forgetfulness, myopia, extinction, secrecy, or suppression. The point is to question the *naturalness* of ignorance, its causes and its distribution. Why have so few Americans heard about the *Nakba?* Why did epidemiologists miss the high levels of pellagra among early-twentieth-century African Americans?[5] How did World War I-era research into the reproductive effects of alcohol become "scientifically uninteresting"?[6] Why have today's geneticists developed a "collective amnesia" about Francis Galton?[7] Why do "we" (many men and surely fewer women) know so little about the clitoris (see Nancy Tuana, this volume), or laws of nature classified for national security, or indigenous abortifacients (see Londa Schiebinger, this volume), or the countless Xs or Ys or Zs that we cannot even name, given how low they fly under the radar?

Now, certain kinds of exploration require that we make distinctions; that is a reasonable first step into understanding. "Cutting up" and "dividing into parts" is implicit in the etymology *of scientia,* which derives from the proto-Indo-European *skein,* via the Latin *seco* and *scindo* (to cut), from which we get *scissors* and *schism, scat* and *skin.* There must be as many kinds of ignorance as of knowledge—perhaps more, given how scant is our knowledge compared to the vastness of our ignorance. And though distinctions such as these are somewhat arbitrary, I shall make three to begin the discussion: ignorance as *native state* (or resource), ignorance as *lost realm* (or selective choice), and ignorance as a deliberately engineered and *strategic ploy* (or active construct). There are of course other ways to divide this pie, and several of the contributors to this volume provide alternative taxonomies.

This may be the most common way that scientists think about our topic: ignorance is like Kansas, a great place to be from. Knowledge grows out of ignorance, as a flower from honest soil, but the direction of movement is pretty much one way. Here, though, ignorance can also be a *prompt* for knowledge, insofar as we are constantly striving to destroy it—fact by fact. Ignorance has both an ontogeny and a phylogeny: babies start out ignorant and slowly come to know the world; hominids have become sapient over millions of years from the happy accident of upright posture and not knowing what to do with our idle hands. (I personally favor the theory that bipedalism enabled us to "put things in quotes" with our newly freed fingers.)

Ignorance in this sense of a primitive or native state is something to be fought or overcome; we hope and plan for it to disappear over time, as knowledge triumphs over foolish superstition. Ignorance is not necessarily evil—it can be innocent (as knowledge can be sin). But it seems to be something we are all supposed to want to grow out of, to put behind us, in the process of generating (or acquiring) knowledge. Johannes Kepler in the sixteenth century had a rather brutal way of putting it: ignorance was "the mother who must die for science to be born."[8]

And foolish ignorance abounds. Jay Leno makes good sport interviewing people who don't know whether the Earth has one or two moons, or what day of the week Good Friday lands on. More serious is the fact that 52 percent of all Americans answer "yes" when asked whether "the earliest humans lived at the same time as the dinosaurs."[9] Science educators (and all thinking people) worry about the fact that about half of all Americans believe the Earth is only 6,000 years old, among them several former and living presidents. Ronald Reagan once proclaimed in a televised speech that America was great "because it has never known slavery"; ignorance seems to know no bounds.

Ignorance in this sense of "native" or "originary" state implies a kind of deficit, caused by the naivete of youth or the faults of improper education—or the simple fact that here is a place where *knowledge has not yet penetrated.* Ignorance is compared to innocence or, in the secular variant, knowledge in its infancy, with ontogeny more or less recapitulating phylogeny.[10] Scientists often cherish this kind of ignorance, using it as a prompt to inquiry. There is

the familiar grant application version: we know this and that but not yet this other thing—so fund me please! Fill this gaping hole (which also happens to be my pocketbook)! Less cynical renditions are familiar from the history of philosophy: Socrates taught that the truly wise are those who realize how little they know; knowledge of one's ignorance is a precondition for enlightenment. The modern twist has ignorance as something to be escaped but also as a kind of rejuvenating force, since it is only by asking the right questions—by knowing wherein fruitful (that is, eradicable) ignorance lies—that we can ever come to knowledge.[11] Creative intellects are ignorance experts: they know where it can be found, and how to make it go away.

Modernity gives this a greater sense of urgency, insofar as ignorance becomes a kind of *vacuum* or hollow space into which knowledge is pulled. Science rushes in to fill the void, or rushes out to greet the world, if we recall the birthing metaphor of Kepler. Psychoanalytics aside, we could give various names to this theory of ignorance. I have called it *native ignorance,* because the notion is of a kind of *infantile absence* by virtue of primitivity, a dearth or cavity that is rectified (filled) by growth or birth—though other metaphors are used. Light floods the darkness, keys are found to unlock locks, ignorance is washed away, teaching uplifts out of ignorance, which is thereby destroyed or chased, and so forth.[12]

Ignorance here is seen as a *resource,* or at least a spur or challenge or prompt: ignorance is needed to keep the wheels of science turning. New ignorance must forever be rustled up to feed the insatiable appetite of science. The world's stock of ignorance is not being depleted, however, since (by wondrous fortune and hydra-like) two new questions arise for every one answered. Some veils of ignorance are pushed aside but others always pop up, saving us from the end of inquiry. This regenerative power of ignorance makes the scientific enterprise sustainable. The nightmare would be if we were somehow to run out of ignorance, idling the engines of knowledge production. We need ignorance to fuel our knowledge engines. Science is sustainable because ignorance proliferates, a triumph not foreseen by early champions of modernity. Bacon and Descartes both envisioned a time in the not so distant future—perhaps within their own lifetimes—when all scientific problems would be solved—but later Moderns knew a good thing when they saw it, and how to keep it going.

A vast literature exists on how to escape from ignorance, including the recognition that learning often implies a process of "unlearning" (try any of the 542,000 Google hits for this term). But there is also the appreciation that the *distribution of ignorance is unequal,* hence the digital divide, remedialisms of various sorts, and so forth. Technologies can cause the proliferation of ignorance: "the public seems to be awakening to the fact that in the midst of the 'information' explosion, there has been an 'ignorance' explosion as well."[13] Media analyst Sut Jhally in 1991 made headlines when he found that people were misinformed about the Gulf War in direct proportion to how much TV they had watched on the topic.[14] Radio was early on criticized as a vehicle for propaganda (spreading ignorance, as was often said), and Walter Benjamin discussed the quaint idea from the 1920s that film could lead to a kind of dictatorship of the imagination, via an enforced railroading of the eye (versus the freedom purportedly allowed by static graphic arts).[15] The Internet has certainly fostered the spread of fictions along with facts—as when South Africa's president Thabo Mbeki "during a late-night Internet surfing session" happened on, and became convinced by, a website challenging the view that HIV was the cause of AIDS.[16] The president's views were later used to justify a slowdown in efforts to combat exposure to the virus.

Our interest here, though, is less in remediation than in what Nancy Tuana has called the "liberatory moment"—which brings us to a more subtle form of agnotology.

IGNORANCE AS LOST REALM, OR SELECTIVE CHOICE (OR PASSIVE CONSTRUCT)

This second variant recognizes that ignorance, like knowledge, has a political geography, prompting us to ask: Who knows not? And why not? Where is there ignorance and why? Like knowledge or wealth or poverty, ignorance has a face, a house, and a price: it is encouraged here and discouraged there from ten thousand accidents (and deliberations) of social fortune. It is less like a vacuum than a solid or shifting body—which travels through time and occupies space, runs roughshod over people or things, and often leaves a shadow. Who at Hiroshima did not know to leave the city that day, and turned into a shadow on the asphalt?

Part of the idea is that inquiry is always selective. We look *here* rather than *there;* we have the predator's fovea (versus the indiscriminate watchfulness of prey), and the decision to focus on *this* is therefore invariably a choice to ignore *that.* Ignorance is a product of inattention, and since we cannot study all things, some by necessity—almost all, in fact—must be left out. "A way of seeing is also a way of not seeing—a focus upon object A involves a neglect of object B."[17] And the world is very big—much bigger than the world of Descartes and Bacon, with their hopes for an imminent finish to the project of science. A key question, then, is: how should we regard the "missing matter," knowledge not yet known? Is science more like the progressive illumination of a well-defined box, or does darkness grow as fast as the light?

Both images are common. Selectivity is often conceived as transient, evanescent, a kind of "noise" in the system or scatter about the line, with bias slowly being rectified. Science is like mowing your lawn: you can choose any place to start, but things end up looking pretty much the same. I was recently faced with a succinct (albeit unpleasant) version of this in a peer review of a grant proposal of mine to the National Science Foundation. This rather disgruntled hooded "peer" was unhappy with my request for funds to study the history of paleoanthropology, given my failure to recognize, as he or she put it, that science was biased *"only in the past,* but *not in the present."* In this undialogic context I did not have the opportunity to respond to this wonderfully self-refuting chestnut, which soured as soon as it was uttered; I couldn't point out that errors often do languish, projects go unfunded, opportunities are lost, the dead do not spring back to life, and justice does not always prevail—even in science. This is a different sense of selectivity: that knowledge switched onto one track cannot always return to areas passed over; we don't always have the opportunity to correct old errors.[18] Research lost is not just research delayed; it can also be forever marked or never recovered.

Londa Schiebinger describes a clear instance of agnotology of this sort in her essay for this volume. The background here is that for three or four centuries following the first transits of the Atlantic and circumnavigations of Africa, European monarchs and trading companies sent out ships in search of fame or fortune, conquering and colonizing but also capturing

knowledge and wealth from far-flung territories. Not all knowledge gained in the peripheries flowed back to the center, however. The passage was unequal in that only certain *kinds* of goods were imported, while others were ignored. Abortifacients in particular were excluded: African and European women knew many different ways to prevent childbirth, but these were judged irrelevant to the kind of knowledge/extraction projects favored by the colonizing Europeans. The potato was fine, as was quinine from the bark of the *Cinchona* tree (for malaria), but not the means by which (white) women might have prevented conception or caused abortion. European governments were trying to grow their populations and conquer new territories, for which they needed quinine but not the peacock flower (the abortifacient described by Sibylla Maria Merian in 1710). Methods of contraception or abortion were low on the list of priorities, and the plants used for such purposes by the indigenes were simply ignored.

It may well be that no *decision* was ever made to ignore or destroy such knowledge. It is not hard to imagine an "overdetermined" mix of deliberate and inadvertent neglect, though the boundary between these two is not always clear. The mechanisms involved in producing or maintaining ignorance can change over time, and once things are made unknown—by suppression or by apathy—they can often remain unknown without further effort. Once lost or destroyed, a document or a species or a culture does not spring back to life. Diego de Landa must have known this when he burned the Mayan royal libraries at Mani on the Yucatan in 1562, defending this act of cultural vandalism with the argument that such codices contained only "superstitions and lies of the devil." This bridges into our next form of agnogenesis: the deliberate production of ignorance in the form of strategies to deceive.

IGNORANCE AS STRATEGIC PLOY, OR ACTIVE CONSTRUCT

The focus here is on ignorance—or doubt or uncertainty—as something that is made, maintained, and manipulated by means of certain arts and sciences. The idea is one that easily lends itself to paranoia: namely, that certain people don't want you to know certain things, or will actively work to organize doubt or uncertainty or misinformation to help maintain (your) ignorance.

They know, and may or may not want you to know they know, but you are not to be privy to the secret. This is an idea insufficiently explored by philosophers, that ignorance should not be viewed as a simple omission or gap, but rather as an active production. Ignorance can be an actively engineered part of a deliberate plan. I'll begin with trade secrets, moving from there in the next three sections to tobacco agnotology, military secrecy, and the example of ignorance making (or maintenance) as moral resistance.

There have always been lots of reasons to keep things secret—for love, for war, for business, for every conceivable human desire or enterprise.[19] Thought itself, of course, is secret until expressed in perishable verbal form, or in the more durable medium of print or some other enduring mode of capture. Secrets are as old as human thought and perhaps older still, judging from the fantastic variety of animal techniques of deception, ranging from insect camouflage to predators stashing their prey to the myriad disguises of herbivores. Recall how the white underbellies of deer and most other ungulates help turn these animals into non-objects by canceling shadows.

Science and trade are often said to be (or forced) open, but secrecy plays an important role in both realms—think of peer review, or the jealous guarding of discoveries until publication. Science and industry are increasingly interwoven, with R&D pursued under cloaks of privacy to maintain some business advantage. Science even in the best of circumstances is "open" only under highly ritualized constraints. The point of confidential peer review, for example, is to guarantee objectivity—here a kind of balanced fairness—to allow one's peers to criticize without fear of recrimination. Blinded review comes at a cost, however, since it means that an author—the recipient of criticism in this instance—cannot "consider the source." Reviewers can also act without taking responsibility for their opinions, except insofar as an editor or grant officer takes this into account.[20] A similar weakness plagues Wikipedia-style publishing, though preservation of page histories makes it at least theoretically possible to minimize vandalism (the bigger problem here is the perpetual "balance of terror" produced on controversial topics such as intelligent design).

Scientific secrecy long predates peer review. Alchemy and astrology were often advertised as occult sciences, in the sense of harnessing dark powers but also of being practiced in the dark, hidden from view.[21] The

two senses were intertwined, since the principles sought were supposed to lie behind or beyond ordinary kinds of knowledge that flourished in the light. Much of early modern science was also guild-like, insofar as "secrets of the trade" were taken for granted. Trade secrets were guarded to control access to a particular kind of technique, resource, ritual, or market. Much of the rhetoric of the so-called Scientific Revolution was directed toward eliminating secrecy, to open up practices to inspection—whence the omnipresent rhetorics of "light," "clarification," and eventually "enlightenment." Alchemy done in the light became chemistry.

Trade secrets are still a vital part of manufacturing,[22] however, and it is probably not far from the mark to say that older forms of secrecy have simply been replaced by newer ones. A great deal of modern chemistry is tied up with industrial production, making it hard to speak of an open exchange of ideas. Three or four people are supposed to know the formula for Coca-Cola, locked in a vault in Atlanta; the same is true for the spices used in Kentucky Fried Chicken (in Louisville) and many other celebrated consumables.[23] Publication is one way of claiming intellectual property, but ideas are also often shared "openly" only within some restricted social space. Military technologies are an obvious example, but there is a great deal of private speech inside law firms, hospitals, governments, and every other kind of institution, for whom knowledge is not just power but *danger*—which is why institutional amnesia may be as valued as institutional memory. Within academia, scholars will often keep certain ideas secret or limit their circulation to avoid improper use; and it is only after publication that circulation becomes difficult to control. Information flows are also limited for legal or PR purposes, or for reasons of national security. The apparent free flow of ideas celebrated in academia is actually circumscribed by the things that make it onto the public table; I taught at Pennsylvania State University for almost a dozen years before I stumbled onto a department called "Undersea Warfare," which is also about how long it took for me to learn that Penn State was the official university of the United States Marine Corps. I don't know how many of my former colleagues were aware of either of these closely held facts.

But there are other ways ignorance is crafted, and one of the most dramatic examples stems from the black arts of tobacco manufacturers.

Tobacco Industry Agnotology

One of my favorite examples of *agnogenesis* is the tobacco industry's efforts to manufacture doubt about the hazards of smoking. It was primarily in this context (along with military secrecy) that I first began exploring this idea of manufactured ignorance,[24] the question again being "Why don't we know what we don't know?" The none-too-complex answer in many instances was "because steps have been taken to keep you in the dark!" We rule you, if we can fool you. No one has done this more effectively than the tobacco mongers, the masters of fomenting ignorance to combat knowledge. Health fears are assuaged by reassurances in the form of "reasonable doubt"—a state of mind with both PR and legal value. The logic is simple, but it also has some devious twists and turns. I'll deal here only with the U.S. case, though the duplicity project is now being franchised globally to buttress the continued sale of 5.7 trillion cigarettes per annum, enough to circle the Earth some 13,000 times.

Marketing has always involved a certain persuasion bordering on deception, insofar as laundry soap is pretty much the same throughout the world. The tobacco industry early on recognized health concerns as market impediments, which is why L&M Filters were offered as "just what the doctor ordered," Camels were said to be smoked by "more doctors," and so forth. The industry was barred from making such claims in the 1950s and moved to more subtle inducements, associating smoking with youth, vigor, and beauty, and later freedom, risk, and rebellion. For a time in the 1980s, when health infringements centered around secondhand smoke, we were told that smoking was a form of free speech. The industry likes to have it both ways: smoking is patriotic yet rebellious, risky yet safe, calming yet exciting, and so forth.

Marketing tools of a novel sort were introduced in the early 1950s, following the explosion of evidence that cigarettes were killing tens of thousands every year. Responding to this evidence, the industry launched a multimillion dollar campaign to reassure consumers that the hazard had not yet been "proven." Through press releases, advertisements, and well-funded industry research fronts, epidemiology was denounced as "mere statistics," animal experiments were said not to reflect the human condition, and lung pathologies revealed at autopsy were derided as anecdotes without "sound

science" as backing. Cigarette manufacturers often invoked the laboratory as the site where the "controversy" would be resolved, knowing that it was difficult to mimic human smoking harms using animal models. Small animals just don't contract cancer from breathing smoke; it takes twenty or thirty or more years for human smokers to develop cancer, and rats don't live that long. And even when cancers were successfully produced in mice (by painting tobacco tars on their shaven backs), the industry admitted only the presence of "mouse carcinogens" in smoke. Cigarette apologists worked in a conveniently tight logical circle: no evidence was good enough, no experiment close enough to the human condition. True proof was hard to have short of experimenting on humans—but do you really want us to experiment on humans? What are you, some kind of Nazi?

We don't yet know what evil genius came up with the scheme to associate the continued manufacture of cigarettes with prudence, using the call for "more research" to slow the threat of regulation, but it must rank as one of the greatest triumphs of American corporate connivance.[25] The idea was that people would continue to smoke so long as they could be reassured that "no one really knows" the true cause of cancer. The strategy was to question all assertions to the contrary, all efforts to "close" the controversy, as if closure itself were a mark of dogma, the enemy of inquiry. The point was to keep the question of health harms open, for decades if possible. Cancer after all was a complex disease with multiple causes, all of which would have to be explored without rushing to any kind of judgment. We owed as much to those poor souls suffering from this terrible scourge, we had to keep an open mind, leaving the question of causation open. Do you want to close down research? Can't you keep an open mind?

Establishing and maintaining "the tobacco controversy" was a key element in the industry's PR strategy from the beginnings of the modern conspiracy in the 1950s. Controversy was like hope, something you (they) wanted to keep alive. Interminable controversy had an immediate value in keeping smokers smoking and legislators pliable. It eventually also had a legal value, insofar as the industry could claim it had never *denied* the hazards, but had only called for further evidence. The idea of "no proof" becomes one of the two main pillars of the industry's defense against lawsuits, the other being *common knowledge:* everyone has always known

about the dangers, so smokers have only themselves to blame for whatever illnesses they may contract. *Universal awareness* was matched with *open controversy:* everyone *knew* that cigarettes are harmful, but no one had ever *proven* it.[26]

The strategy is a clever one, though it does require that we adopt a rather broad rift between popular and scientific knowledge. In court, the industry's experts do some fancy dancing to make this work, pointing to historical examples of "folk" wisdom predating scientific knowledge, with more "cautious" confirmations coming only later. Folk healers use an herb to effect a cure, but it takes some time for doctors to accept this and grasp how it works. So while *popular* belief may recognize that tobacco is hazardous, the *science* has been much harder to nail down. In court, the industry's experts like to emphasize the continuance of "legitimate scientific doubt" long past even the Surgeon General's report of 1964. Kenneth Ludmerer, a St. Louis medical historian and frequent witness for the industry, recently claimed under cross-examination that there was "room for responsible disagreement" with the hazards consensus even after the Surgeon General's report. Indeed, he says, "There's always room for disagreement."[27]

A crucial issue in many lawsuits is whether the industry acted responsibly in denying any proof of a hazard. "Common knowledge" and "open controversy" come to the rescue, the hoped-for point being that since everyone has always known that cigarettes are dangerous, the manufacturers can't be faulted for failing to warn. The establishment of controversy in the scientific community is also crucial, though, because it gives cigarette makers yet another excuse for negligence in failing to warn. Why did the industry not warn smokers of a hazard? Because the issue had not been settled! No proof was forthcoming—so the industry maintained, duplicitously[28]—so we cannot say it acted irresponsibly.[29]

The tobacco industry was rarely innocent in any of these respects, since its goal at many points was to *generate* ignorance—or sometimes false knowledge—concerning tobacco's impact on health. The industry was trebly active in this sphere, feigning its *own* ignorance of hazards, while simultaneously affirming the *absence of definite proof in* the scientific community, while also doing all it could to *manufacture ignorance*