DISCUSSION 1

WHAT'S UP YOUR SLEEVE? PART 1: THE PLAYBOOK

Deceptive Tactics for Discrediting Science

Merchants of Doubt traces the history of the use of unethical tactics by pundits-for-hire, and reveals the impact they continue to have on vital issues of health and safety that are shaping the future. The story divulges the stark reality that many of those talking about health and science in our media actually have little to no interest in health or science. Instead, their goal is to blur the facts and bring public action to a grinding halt.

In the 1950s and 60s cigarette smoking was everywhere. Look at an old episode of *I Love Lucy*, sponsored by Philip Morris, and you see Lucy, Ricky and their friends lighting up almost anywhere. The contemporary series Mad Men, set in that time, shows doctors smoking in their offices as they examine patients and pregnant women smoking with abandon. It took more than 50 years to change those habits, a process that still continues. The filmmakers use the story of the tobacco industry's history as a cautionary tale. It was there, according to historian and scholar Stanton Glantz, that the "playbook" for corporate doubting was born.

DISCUSS THE FOLLOWING STATEMENTS

1. In the 1950's, the public relations firm Hill and Knowlton created a document that spelled out tactics designed to intentionally mislead the public and delay regulations and litigations that would negatively impact the tobacco industry.
2. The document, or playbook, advocated the use of stall tactics, false statistics, fake science, misinformation, and manipulative marketing to help tobacco companies and their allies veil the health hazards of smoking cigarettes.

WHAT'S UP YOUR SLEEVE? PART 2: THE ILLUSIONIST

Magic as a Metaphor for Deception

The dominant metaphor in the documentary is magic and illusion. The magician, Jamy Ian Swiss, emerges as the moral narrator of the piece. He is not a scientist, journalist, or policy maker. He is, by definition, an entertainer, who claims that once you see how an illusion works, you will notice it every time. In essence, you will become "critically literate" when it comes to viewing the work of magicians.

The metaphor of magic and illusion does not dominate the book upon which the documentary is made. The book is illustrated with more science and filled with footnotes. It is the job of the documentary filmmaker to create a work that is informative and visually arresting. The writers of the documentary compare the illusionist to the corporate and political forces who argue against the reality and science of global warming.

DISCUSS THE FOLLOWING STATEMENTS

1. Taking a cue from the playbook, powerful individuals and corporate interests create a "Twilight Zone" effect, that is, an "alternate universe," where nonscientific reports "mirror" in appearance and structure scientific ones.
2. A handful of scientists, none of whom are experts on climate, have obscured the truth on issues from tobacco smoke to global warming.
3. Think of and discuss a time when you felt "fooled" by a message from an ad, the news, or a politician.

ANSWER THE FOLLOWING QUESTIONS

MY EXPERTISE IS IN DECEPTION

1. Evaluate the use of the illusionist analogy in describing the political and corporate deniers of global warming. Is it a fair comparison?
2. Does it make sense in terms of the science?
3. Are there places where the illusionist analogy falls apart?

DISCUSSION 2

A CANDLE IN THE CRIB

During a time when cigarettes were being blamed for deadly fires, the tobacco industry used the flammability of furniture as a scapegoat. Flame retardant chemicals were touted as a way to protect consumers and rapidly became a standard component of household products.

The Chicago Tribune's 2012 investigation into the flame retardant industry revealed that the companies that make these chemicals engaged in a sophisticated campaign to deceive the public, including lawmakers, about their safety and effectiveness. Journalists Patricia Callahan, Sam Roe and Michael Hawthorne from The Tribune reported that the chemicals leach into our environment and our bodies, and on top of that, they don't even deter fires.

Watch this *5-minute video* for a quick overview of the investigation. Or read the entire six-part investigative report, review source documents and watch additional videos *here*.

Journalism is a discipline of verification. Reporters find things out and check things out. Against that standard, discuss the work of reporters Sam Roe and Patricia Callahan from The Chicago Tribune as they covered the issue of flame retardant furniture.

ANSWER THE FOLLOWING QUESTIONS

1. Do investigative journalists have a duty to debunk unscrupulous claims in the public interest?
2. What does the chemical industry say about flame retardants? What did the journalists find?
3. What did the journalists uncover about the founders of the group Citizens for Fire Safety? How did this group want to be perceived by the public?
4. In the video, there is a short clip of Dr. David Heimbach testifying before the California Senate about the safety of flame retardants on behalf of the Citizens for Fire Safety. Do you think lawmakers knew who was behind Citizens for Fire Safety? Should they know?
5. Based on the actions and reporting strategies of Patricia Callahan, Sam Roe and Michael Hawthorne what can you say about the importance of responsible investigative journalism in the public interest?

THE TRUTH ABOUT FLAME RETARDANTS

DISCUSSION 3

ENEMIES OF THE PEOPLE

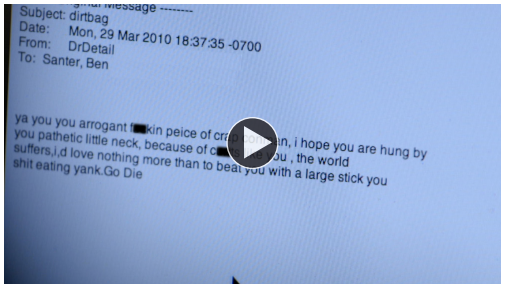
Merchants of Doubt is certainly not the first narrative that involves the communication of what a previous Participant Media documentary described as "an inconvenient truth." The idea of "killing the messenger" bearing bad news goes back to ancient times.

In 1882 the Norwegian playwright Henrik Ibsen wrote a play titled *An Enemy of the People*. The protagonist is a man named Dr. Stockmann whose research leads him to discover the waters of the town's healing hot springs have been contaminated by a nearby tannery. People go to the springs for the healing waters not realizing the water is poisoned. The doctor expects that the news he delivers will turn him into the savior of his city. Instead, the forces in the city, from the government to the newspaper to business interests turn Stockmann into "an enemy of the people." Without the tannery, the economy of the town will be destroyed.

In this work of fiction, the doctor perseveres against efforts to silence, ostracize, and punish him. But in the *Merchants of Doubt*, threats and slanderous allegations against responsible scientists cause real harm. In spite of an overwhelming consensus among their peers about the nature of climate change, scientists are called communists and threats to American democracy. Concerted efforts are made to undercut their work, to marginalize them, even to subject them and their families to harm.

DISCUSS THE FOLLOWING STATEMENTS

Warning: This clip contains profanity.



HATE MAIL

1. There is a very strong consensus among climate scientists that global warming exists and that it is accelerated by human activities. When responsible scientists speak out, they not only have their work attacked, some are harassed and receive death threats.

2. Scientists have clearly demonstrated that global warming, if it continues unchecked, will do irreparable harm to the planet, to the survival of certain species, and to human civilization.

3. The environmental movement is like a watermelon — green on the outside, red on the inside: climate scientists are communists and socialists in disguise, abusing science to change policies and societies to their liking.

ANSWER THE FOLLOWING QUESTIONS

1. How does the story of Dr. Stockmann compare and contrast with stories of climate scientists Benjamin Santer, Michael Man, and Katharine Hayhoe who receive threatening emails?

2. Why do you think many people tend to reject scientific truths predicting future harm when such truths threaten the status quo or call into question the sustainability of certain economic and cultural habits and values?

3. Think of and discuss a time when someone in authority – a teacher, a parent – told you something important that you just didn't want to believe. How did you react?

DISCUSSION 4

SCIENCE ILLITERACY AND THE PUBLIC

A 1988 documentary titled *A Private Universe*, reveals common misconceptions about the world and universe we inhabit – even among the well-educated. It turns out, according to the film, that Ivy League grads were clueless when it came to answering basic astronomy questions: Why are there phases of the moon? Why do we have seasons? What creates an eclipse of the sun? The makers of the documentary (Schneps and Sadler) show examples of effective high school science education as pathways for learning about science.

Do you know the answers to basic science questions such as: What is the difference between a hypothesis and a theory? What is an example of a paradigm shift, and what does it reveal about our understanding of nature and the universe? What is the difference between weather and climate? Who was Heisenberg?

If you couldn't answer these questions off the top of your head, you're not alone. For many Americans, the best shot at a quick answer would be to the last one, to which you might get: "Walter White, the high school chemistry teacher turned drug lord in the television series *'Breaking Bad.'*"

DISCUSS THE FOLLOWING STATEMENTS

1. It is up to educators, scientists, and skilled journalists to create a picture of the world, to paraphrase Walter Lippman, upon which people can act.
2. When critics or ideologues claim that evolution or global warming is "just a theory," they are using the word "theory" in a common, rather than a scientific way.
3. Scientists follow a disciplined method that helps reveal truths about the natural world — including the state of the environment.
4. The scientific method includes:
    - forming hypotheses (educated guesses about how things work)
    - testing hypotheses in clinics or labs
    - turning hypotheses, once tested, into theories
    - publishing results in scientific journals, so that other scientists can test them

ANSWER THE FOLLOWING QUESTIONS

1. In *Merchants of Doubt,* Fred Singer, a credible scientist, argues that climate science is "bunk." Based on adherence to the scientific method and peer review, is his argument valid?
2. Based upon the science, as you understand it, which of these claims seems least credible?
    - Global warming is real, caused by the burning of fossil fuels, and potentially catastrophic.
    - The climate is warming, but it is a natural process and not a result of human activities.
    - The climate is warming, and the "greening" effect will be beneficial for life on Earth.
    - The climate is cooling.
3. How could scientific literacy make the public less vulnerable to false claims, misinformation, and political propaganda?

DISCUSSION 5

SOURCES OF INFORMATION

Many so-called experts came forward to argue against the warnings of scientists and doctors about the dangers of smoking. The public, hearing what appeared to be authoritative voices of doubt, were often caught in confusion.

People who view information through the lens of "critical literacy" learn quickly that you cannot judge the quality of information in any field of endeavor without knowing the "source" of the information.

DISCUSS THE FOLLOWING STATEMENTS

1. It took a half-century to regulate cigarette smoking and reveal its true dangers, but global warming is a more urgent problem. Climate change is not reversible, its effects are global.
2. Scientists need to do a much better job at communicating with the public and developing a rhetorical stance that matches the credibility of their scientific findings.
3. Citizens should develop a form of critical literacy that helps them "see through" the false claims of propagandists and ideologues.

READ THESE TIPS FOR VETTING SOURCES

1. Does the source have the credentials to speak as an expert in a particular field?
2. Is the source transparent, that is, does he or she explain any potential bias?
3. What "tribe," if any, does the source belong to?
4. Does the source have "a dog in the fight," or are they (pick your word) neutral, objective, impartial, non-partisan, disinterested (meaning that they have no special interest).
5. Does the source work for a company or organization that has some special interest in the outcome?
6. Does the source have something to gain from a particular outcome?

USE THE TIPS TO VET EACH OF THE FILM'S SOURCES

- James Hansen, director of the Goddard Institute for Space Studies, who testified before Congress in 1988 about the scientific evidence of the greenhouse effect.
- Dr. Fred Singer, government scientist, anti-Communist, critic of EPA, doubter of various aspects of global warming.
- Marc Morano, author of op-ed pieces, television commentator, self-described "environmental journalist," attacker of scientists who promote idea of global warming.
- Benjamin Santer, climate change researcher at Program for Climate Model Diagnosis, Lawrence Livermore National Laboratory.
- Bob Inglis, former member of U.S. Congress, Republican, South Carolina, persuaded by the science and personal experience of global warming and its effects.
- Naomi Oreskes, professor of history and science studies. Coauthor of book Merchants of Doubt.

DISCUSSION 6

TRIBAL AFFILIATIONS

In philosophy there is a big word: epistemology. In plain English, it refers to the study of how people know things. According to the filmmakers, what we know depends in large measure on what "tribe" we belong to. If you don't like the word "tribe," you can substitute: group, family, club, team, or school of thought.

It's easy to find examples of tribes with opposing views: New York Yankee fans see things differently from Boston Red Sox fans and teenagers see things differently from their parents.

The filmmakers focus on two tribes of scientists. One involves a large group of reputable climate scientists. The other involves a much smaller group, most of whom do not conduct their own climate research and are in alliance with corporations, special interest groups and political figures.

TRIBAL AFFILIATION

TWO TRIBES OF SCIENTISTS AND THEIR CORE BELIEFS

Climate change scientists: This group believes that Earth's climate is getting warmer and that such warming will do irreversible damage to the planet, to many species, to human kind, and to human culture. Moreover, a major cause of this warming involves human activity, especially a dependence upon fossil fuels, such as oil and gas. This group advocates policies that include such measures as developing alternative forms of energy and discouraging the use of fossil fuels through taxation.

Free-market fundamentalists: This group offers a variety of beliefs that stand in opposition to those of the climate change scientists. These beliefs include:

- The world's climate is not warming.
- It may be warming, but only as the result of a natural cycle that is not influenced by human activities.
- The warming may have some benefits.
- Regardless of what may be causing the warming, dealing with it would result in economic catastrophe, over-regulation by governments, and the loss of important liberties.

DISCUSS THE FOLLOWING STATEMENTS

1. We are members of "tribes," unwilling to accept any truths, even scientific truths, that oppose our values, habits, and ways of seeing the world.
2. An objective observer may look at evidence one way, but partisans interpret evidence in a way that supports their existing world view.

ANSWER THE FOLLOWING QUESTIONS

1. What clubs or tribes do you belong to that might influence the way that you view scientific evidence? Make a list. (A list might include: female, Asian, Buddhist, father, business owner, tennis player, smoker.)
2. Looking at the two tribes described in this section, which one do you most identify with?
3. Which one is most persuasive to you in terms of the evidence on global warming?

DISCUSSION 7

JOURNALISTS AND THE PROBLEM OF FALSE BALANCE

Although some trained scientists become journalists, most journalists have little knowledge of science. Traditionally, they are more likely to have been interested in the arts and humanities than college math and science. But they still have a job to do in the public interest. They have to sort through technical information – often on deadline – and make it clear to a general audience. They depend on experts to explain things to them. On contentious issues, they want to be fair. But that virtue – fairness – often leads to a vice: false balance.

We say there are "two sides to every story," but this is often not true. Sometimes there are three sides — or ten. But not all of those are equal. One of a journalist's responsibilities is to sort through these competing claims and to pay special attention to those that are most accurate.

Sometimes journalists treat discussions of scientific findings as they would treat political debates. In a political debate between two parties, journalists are likely to present arguments from each side in an evenhanded way. That may not be a helpful method in distinguishing responsible science from propaganda and misinformation.

EXAMPLES

1. The overwhelming majority of biological scientists subscribe to some version of Charles Darwin's theories of natural selection to explain the creation of life and the evolution of the human species. Doubters of evolution include many, but not all, religious believers, especially those who accept the Bible as literal truth. When it comes to the development of public school curricula, these ideas often clash. Should students be exposed in school to alternative, faith-based theories of creation? And how should that debate be framed by journalists: as an argument among equally valid claims (a "they said" vs. "they said" debate), or as one in which scientific truth is recognized and other claims ignored or marginalized?

2. In 2014 an Ebola outbreak in West Africa resulted in some American doctors and nurses becoming infected. Many people turned to the media to answer questions such as: How contagious is the virus? How do people get it? How should Ebola patients be treated? How should those who treat Ebola patients be treated? Should governments impose travel restrictions or quarantines? Which parts of the debate are scientific? Which ones are related to policy? Which ones are strictly political? How does a journalist sort out these complicated questions and issues? If journallists are not trained well enough or cautious enough in their coverage, significant harm can be done. Journalists must often turn to scientists as subject matter experts who can help provide key analysis. But scientists may, as a tribe, be over-cautious or inhibited about engaging in the public debate. Their focus, they say, should be on the scientific claims, not communicating them to the general public.

DISCUSS THE FOLLOWING STATEMENTS

1. Corporate interests fund think tanks, who create disinformation and promote "contradictory experts." Under the guise of fairness, journalists fall for this strategy, creating a "false balance" in coverage in which scientists are opposed by industry shills.
2. Journalists should no longer cover global warming as a balance between two competing sides. Global warming should be covered as a scientific fact, deniers should be investigated, and their biases and partisan interests revealed.
3. A fair-minded observer will see that "data trumps politics," and that the most credible sources are doubters who become believers when confronted with evidence, such as the conservative Republican from South Carolina, Bob Inglis.
4. Corporate interests can buy the testimony of supposed scientific experts, such as the doctor who testified on the death of babies in crib fires.
5. The media has enabled elements of the political right, backed by a few scientists from the Cold War, to use it as a platform to distort, distract and subvert the scientific findings of climate scientists.

DISCUSSION 7
ANSWER THE FOLLOWING QUESTIONS

1. How would you critique both the roles of scientists and journalists as public communicators? How would you compare and contrast their missions?
2. What kind of training might journalists need to do a better job covering global warming and its effects?
3. What kind of coverage might journalists extend to the climate science deniers?
4. To what extent should scientists receive training to better communicate on issues of public concern?
5. To what extent should scientists collaborate with journalists to help people understand the truths upon which public policy will be based?
6. Make a list of the sources of news you find most reliable. What makes them trustworthy?

DISCUSSION 8

WHY THE POPULATION BOMB BOMBED

Many Baby Boomers remember the 1968 blockbuster *The Population Bomb* in which butterfly biologist Paul Ehrlich turned ecologist and prophet of doom, predicted that the burgeoning human population could lead only to mass starvation, disaster, and war. Many of his predictions did not come to pass. He did not foresee how technology would improve agriculture, increasing the supply of food even in developing countries.

During the Y2K scare, at the turn of the millennium, people predicted that glitches in computer technology might cause global disasters. Religious groups, such as millenarians, have made predictions about the end of the world as we know it. At times, some groups have even predicted the date and the hour of cataclysmic changes. Then, time passes, nothing happens, and former believers become skeptical.

However sound the science of global warming, and however strong the consensus around it, there is always a rhetorical problem related to the communication of knowledge: How do you persuade a society to accept a theory of dire consequences? How do you then put into action both political and personal changes that make things safer, healthier, better?

EXAMPLE

Climate scientists also make dire predictions about what will happen to the planet. Documentaries such as *An Inconvenient Truth* and *Merchants of Doubt*, show that a warmer planet will result in the destruction of species, the continued melting of glaciers and the polar ice caps, more catastrophic weather events, and rising seas, which will lead to the flooding of coastal cities across the globe. These are some of the terrible consequences, say scientists and environmentalists, of a human-made problem, an over-reliance, especially in advanced industrial societies, on fossil fuels.

Considering this history, it is easy to see how – to quote the cover of the book *Merchants of Doubt* – "a handful of scientists obscured the truth on issues from tobacco smoke to global warming." Forms of propaganda can easily be harnessed on an endless number of issues – a rhetoric of doubt – that takes advantage of people's disinclination to believe the worst about themselves and their environment.

ANSWER THE FOLLOWING QUESTIONS

1. Given human skepticism, an unwillingness to change, and past failures of prediction, what might scientists, journalists, and responsible policy makers do to persuade people that global warming and its effects are real?
2. As a critically literate citizen, how can I evaluate and act upon current scientific knowledge – along with predictions based upon that knowledge? What is the difference between a rational prediction and one that is exaggerated to accelerate change?
3. Think of a time earlier in your life when you were told something important was going to happen, and it didn't. How did you feel? How did you react?

DISCUSSION 9

TECHNO-REALISM AND THE PRICE OF GAS

Some people might be called Technophobes. While they use technology in their daily lives, they tend to fear the consequences of technological change. On the other end of the spectrum are the Technophiles. They tend to be early adopters of new technologies, and they imagine that all problems, including global warming, might be solved by future technologies, not yet developed or even imagined.

Neil Postman, the influential social critic, espoused a form of Techno-realism. He believed that new technologies could indeed offer many benefits to human kind – and to the environment. These benefits should be embraced and shared. But those same technologies could come with collateral damage, including unforeseen consequences that destroy things we cherish, such as clean air and water.

Societies need reliable scientific evidence – not misinformation from global warming deniers – to make good policy decisions, balance the benefits of technology with potential negative effects, and establish regulations.

DISCUSS THE FOLLOWING STATEMENTS

1. Global warming deniers:
   - are primarily concerned about the implications of climate science, including the role of government and the need for government regulation.
   - view such regulation as a threat to democracy, individual freedom, and free enterprise.
   - have countered rational evidence with political slogans and appeals to the passions and fears of the general public.
   - see the science as a threat to their way of life, that "the science needs to be wrong, or else I need to change."
2. The effects of climate change are likely to be so dramatic and negative that they will REQUIRE more government regulation to deal with them. Short term obfuscation and resistance by deniers will ultimately frustrate their desire for less government regulations.
3. There are steps humans can take – based upon treaties among nations – that can help limit the problem. These would include the development of alternative energy technologies, conservation methods, and the taxation of certain energy sources to discourage their use.

A HARD PILL TO SWALLOW

DISCUSSION 9

ANSWER THE FOLLOWING QUESTIONS

1. What sacrifices should responsible citizens be willing to make on behalf of the planet and future generations?
2. What role should governments play in dealing with the effects of global warming?
3. Should energy consumption be regulated globally, even in developing countries with large populations? How could regulation be achieved in a way that allows developing countries to continue to develop?
4. Should forms of taxation be used to discourage the use of fossil fuels? What would you tax?
5. Do you agree that if gas is more expensive, people will drive less, use mass transportation more and buy more fuel-efficient vehicles? What price would you be willing to pay for a gallon of gas?
6. What new cleaner technologies can be imagined and encouraged?