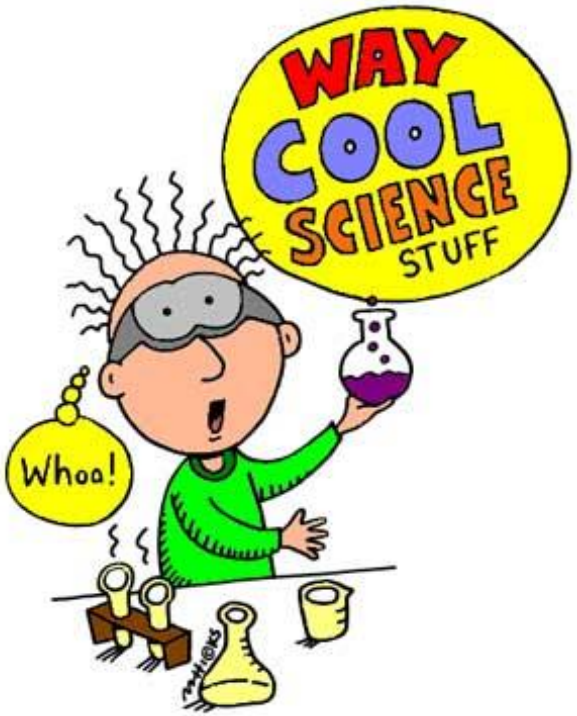
Communicating unpopular science

Marina Joubert, Biosafety SA Symposium, 1 February 2018, Pretoria, South Africa

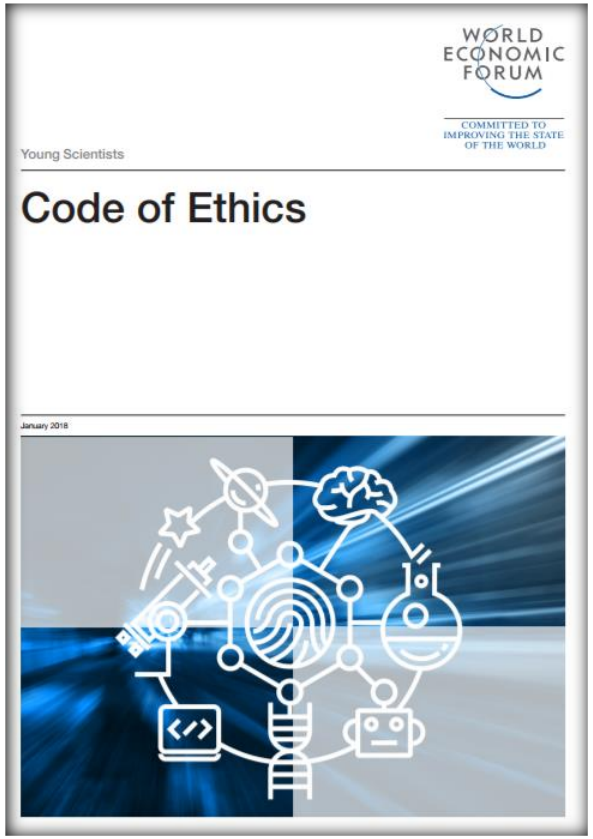

Science
is FUN!

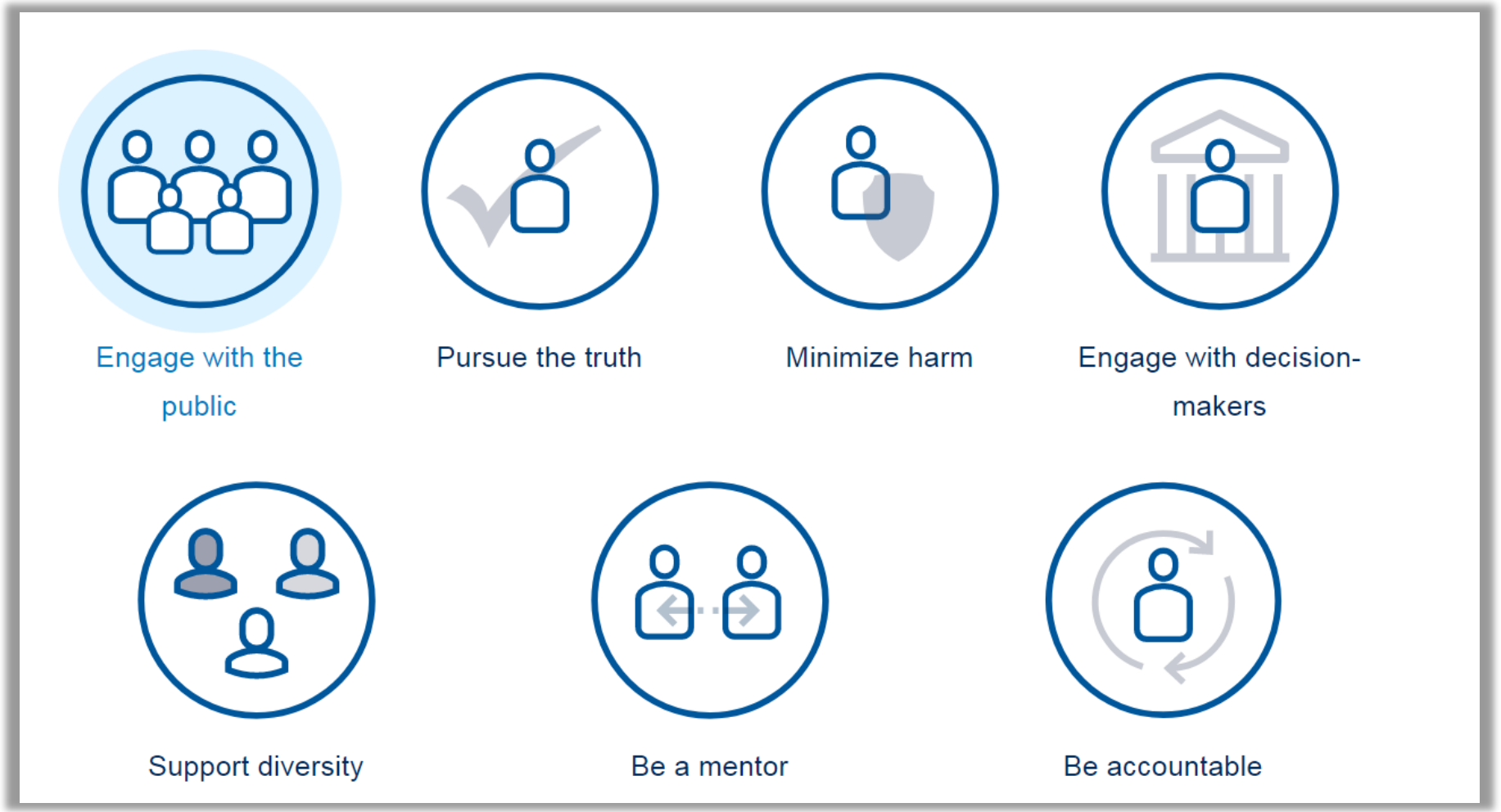

WAY
COOL
SCIENCE
STUFF
Whoa!


SCIENCE ROCKS!

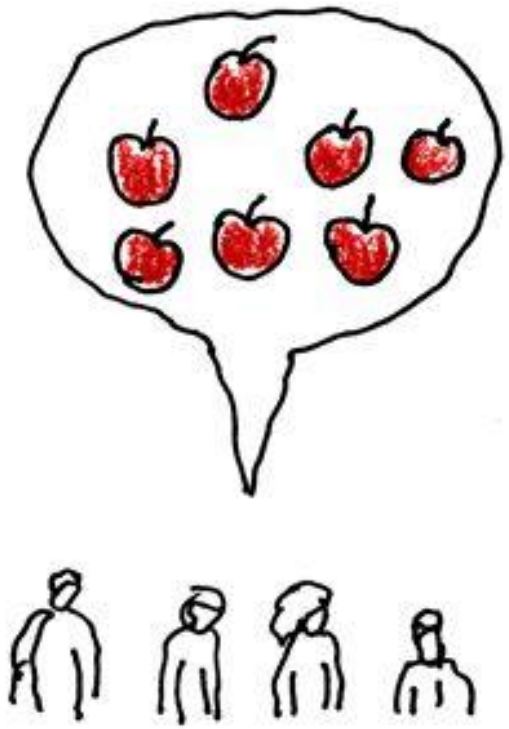

SCIENCE!
IS AWESOME

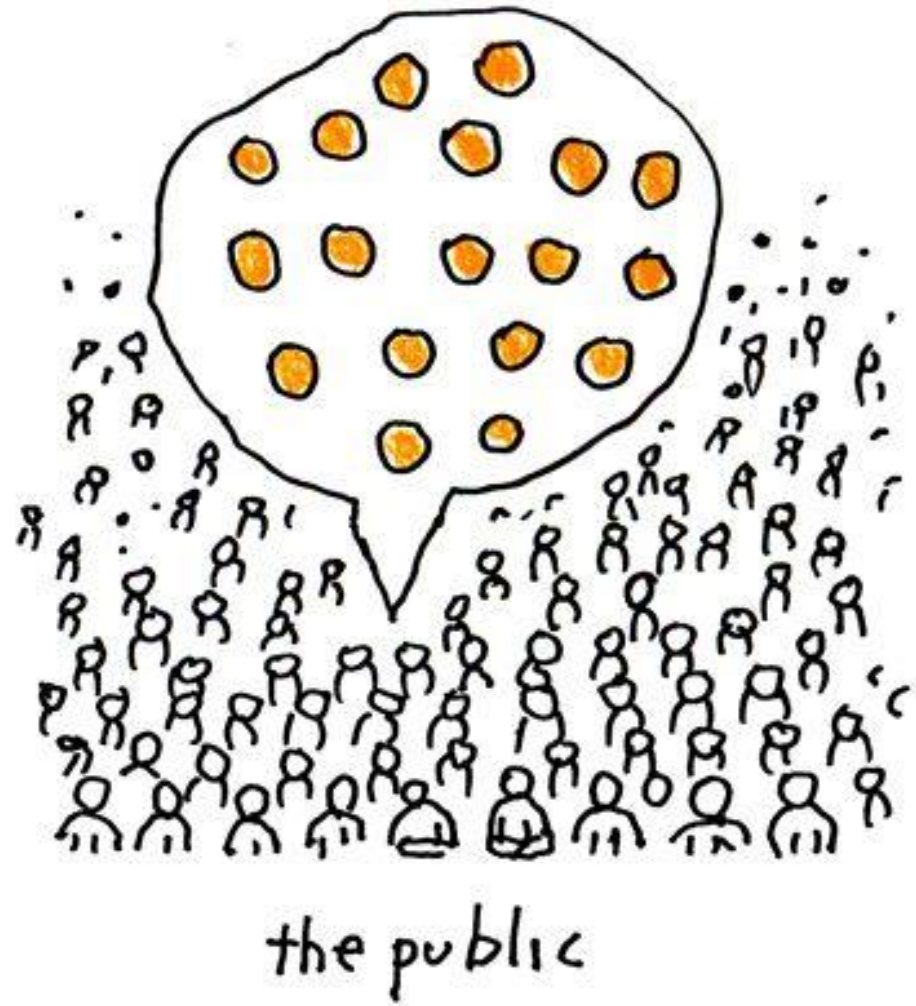

PRO GMO
MIDDLE GROUND
NO GMO

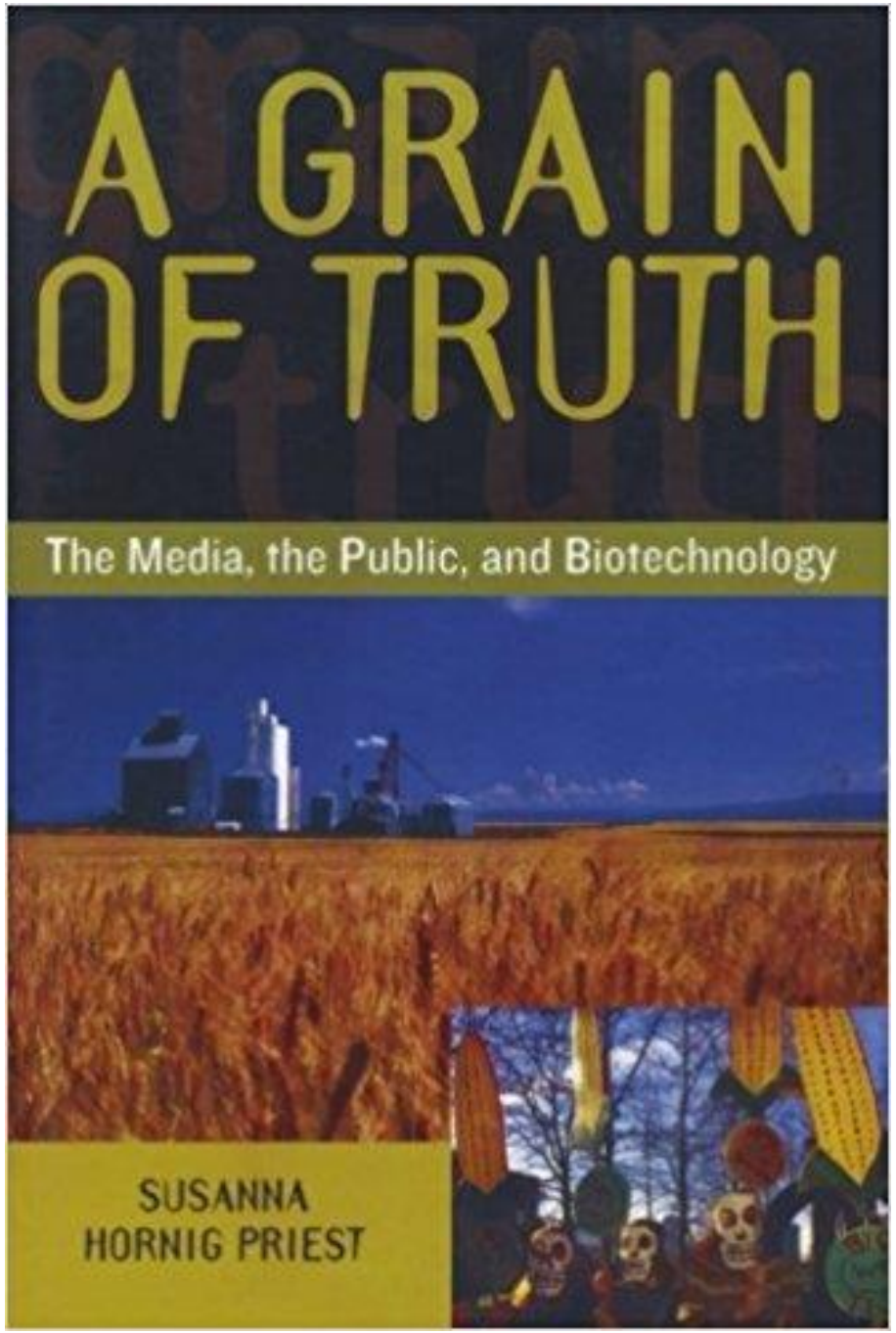

WORLD ECONOMIC FORUM
COMMITTED TO IMPROVING THE STATE OF THE WORLD
Young Scientists
Code of Ethics
January 2018

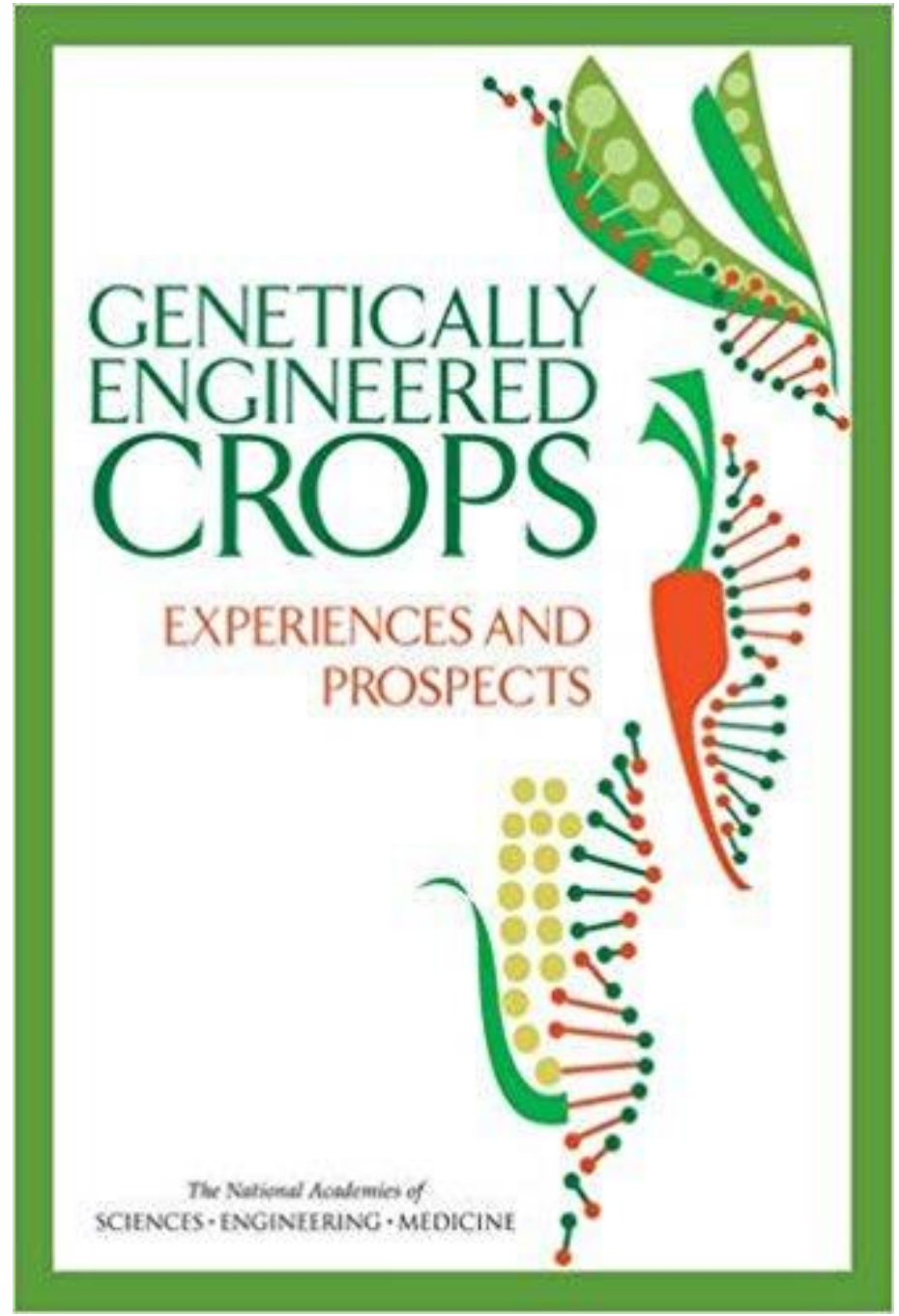

Engage with the public
Pursue the truth
Minimize harm
Engage with decision-makers
Support diversity
Be a mentor
Be accountable

Science communication





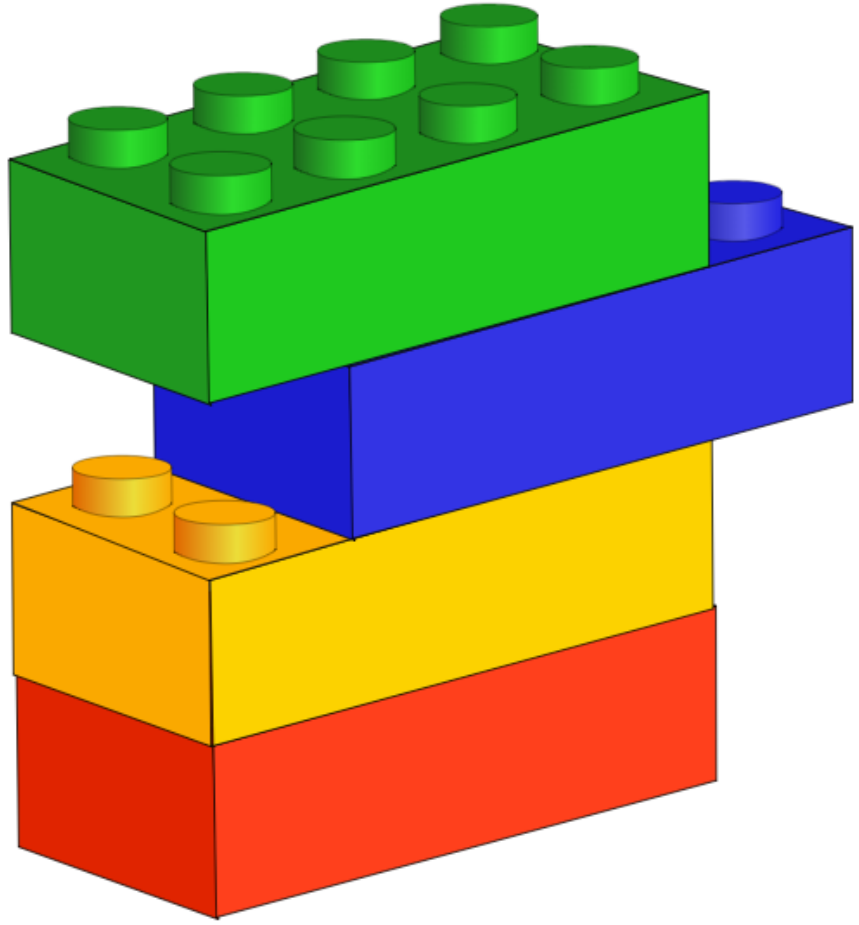

A GRAIN OF TRUTH
The Media, the Public, and Biotechnology
SUSANNA HORNIG PRIEST


GENETICALLY ENGINEERED CROPS
EXPERIENCES AND PROSPECTS
The National Academies of
SCIENCES · ENGINEERING · MEDICINE

Communication biotech

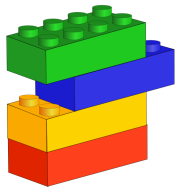
1. knowledge (awareness)
2. trust (confidence)
3. mediated discourse
4. risk communication

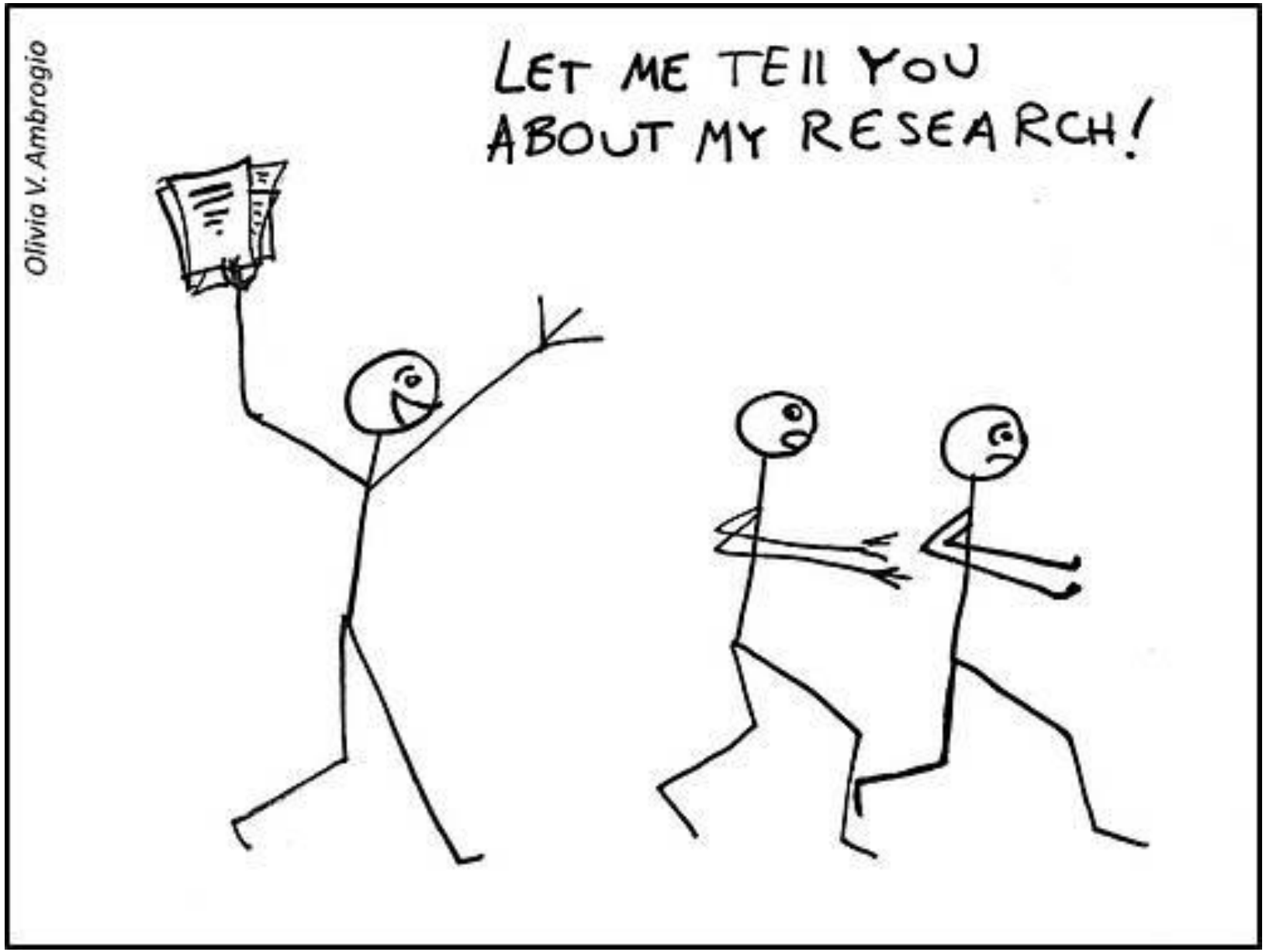
Add up to: public opinion



Knowledge

- **More knowledge does not lead to more support.**




Olivia V. Ambrogio
LET ME TELL YOU
ABOUT MY RESEARCH!

Broken Trust, Willem Boshoff, 2012

What makes someone trustworthy?

- Credibility (expertise & competence)
- motivation to be truthful
- **warmth**

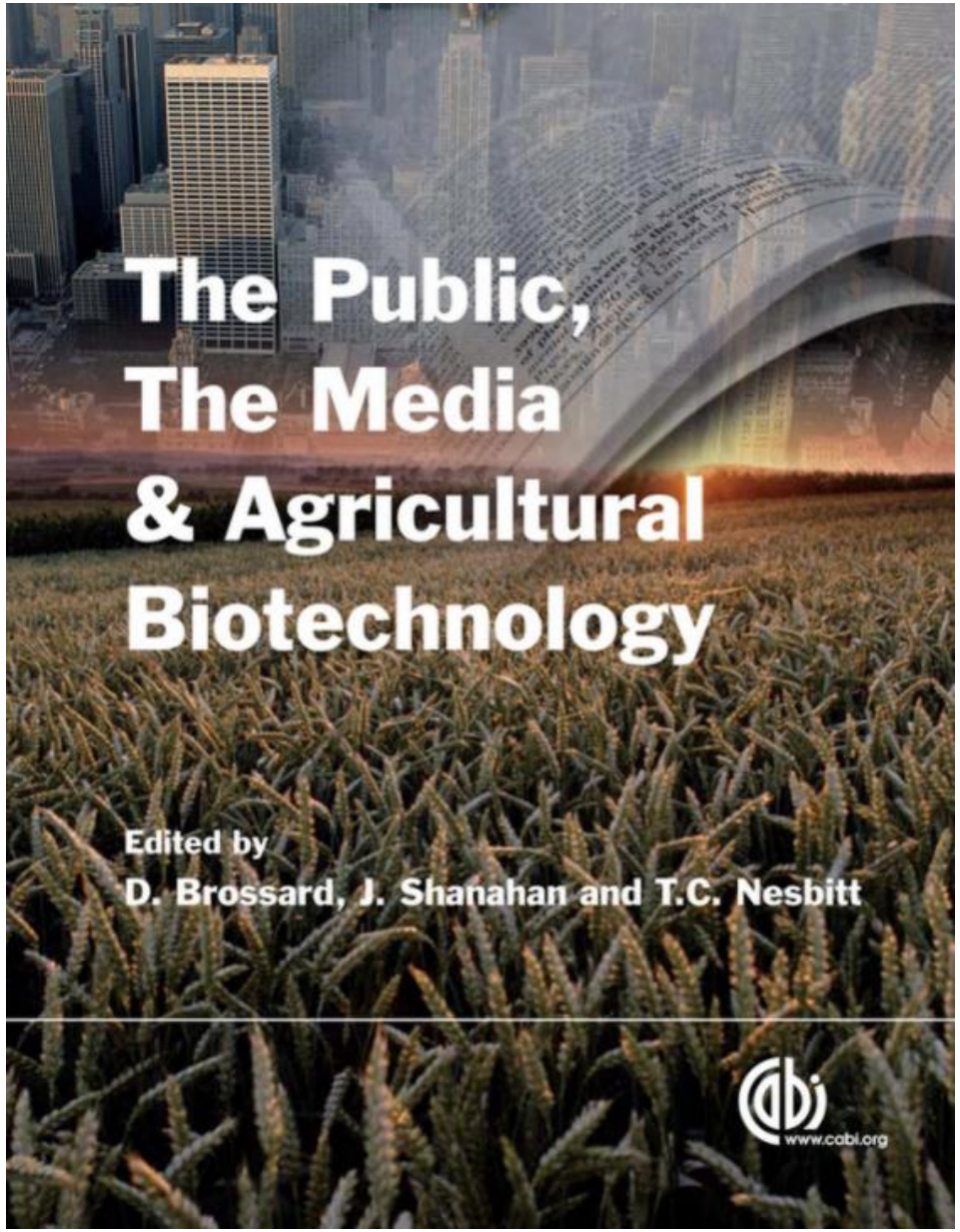
Scientists are typically perceived as **competent, but cold.**

Consequently, scientists have earned audiences' respect, but not necessarily their trust.

Trust

- **Trust precedes knowledge**
- **Delivering information does not build trust**
- **Therefore …**
  it is more important to build trust than to try to increase knowledge

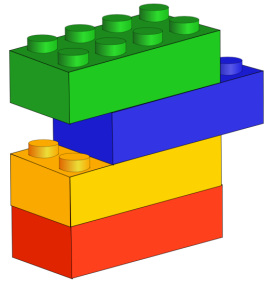

COMMUNICATE



"The effect of increasing information is valuable for its own sake, but is best treated as an outcome. For policy-makers wishing to increase public acceptance of a technology such as GM, trust comes first."

Mediated discourse

- Limited evidence that media coverage has a defining influence on public opinion
- But …



Science communication as political communication

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Scientific debates in modern societies often blur the lines between the science that is being debated and the political, moral, and legal implications that come with its societal applications. This manuscript traces the origins of this phenomenon to professional norms within the scientific discipline and to the nature and complexities of modern science and offers an expanded model of science communication that takes into account the political contexts in which science communication takes place. In a second step, it explores what we know from empirical work in political communication, public opinion research, and communication research about the dynamics that determine how issues are debated and attitudes are formed in political environments. Finally, it discusses how and why it will be increasingly important for science communicators to draw from these different literatures to ensure that the voice of the scientific community is heard in the broader societal debates surrounding science.

advocacy | medialization | public attitudes | deficit model | motivated reasoning

Some of the most polarizing topics in American politics are scientific ones. Even the existence of phenomena, such as global climate change and evolution, that are widely accepted in the scientific community is questioned by significant proportions of the US public (1, 2). In addition, the regulation and public funding of new technologies, such as stem-cell research, have become highly contested issues in national and local election campaigns (3).

The Blurry Lines Between Science and Politics

The explanations for the blurry boundaries between science and politics are multifaceted and some centuries old (4, 5). In other words, the production of reliable knowledge about the natural world has always been a social and political endeavor (6). There are at least three explanations, however, that are particularly relevant when examining the challenges that science faces in modern democracies.

Scientists as Political Advocates. First, in most democratic societies, scientists have long played advisory roles to a variety of political entities. In those roles they have shaped policy and regulatory frameworks as members of advisory panels, through expert testimony and as political appointees, and—as a result—have been the target of partisan criticism (7). In some instances, however, scientists have also interfaced with the political arena in roles even more explicitly focused on advocacy. These efforts have focused on both advocacy for specific investments in science and recommendations on specific applications of science in societal contexts.

One example is Albert Einstein's letter to President Roosevelt in 1939, drafted by fellow physicist Leo Szilard, urging the US government to accelerate academic research on nuclear chain reactions and to maintain "permanent contact . . . between the Administration and the group of physicists working on chain reactions in America" (8). The letter ultimately led to the Manhattan Engineering District, also known as the Manhattan Project, a program designed to develop atomic weapons before Nazi Germany. Six years later, Szilard (9) drafted another petition, this time to President Truman, which did not advocate for investments in scientific circumstances and to consider "all the other moral responsibilities which are involved" (9).

In the mid-1990s, Rice University chemist Richard Smalley played a similarly instrumental role when he openly lobbied Congress and two White House administrations to establish and fund the National Nanotechnology Initiative (NNI), a multibillion dollar program that today coordinates the efforts in nanoscale science, engineering, and technology for 25 different US federal agencies (10). After winning a Nobel Prize in Chemistry in 1996, Smalley engaged in advocacy efforts in the political arena that made him "the most visible champion of nanotechnology and its promise to lead to revolutionary sustainable technologies" (11) and that were instrumental in creating the NNI. Although efforts like Smalley's can be tremendously important in securing funding for particular areas of academic research, they also create perceived or real overlaps between the realms of science and politics.

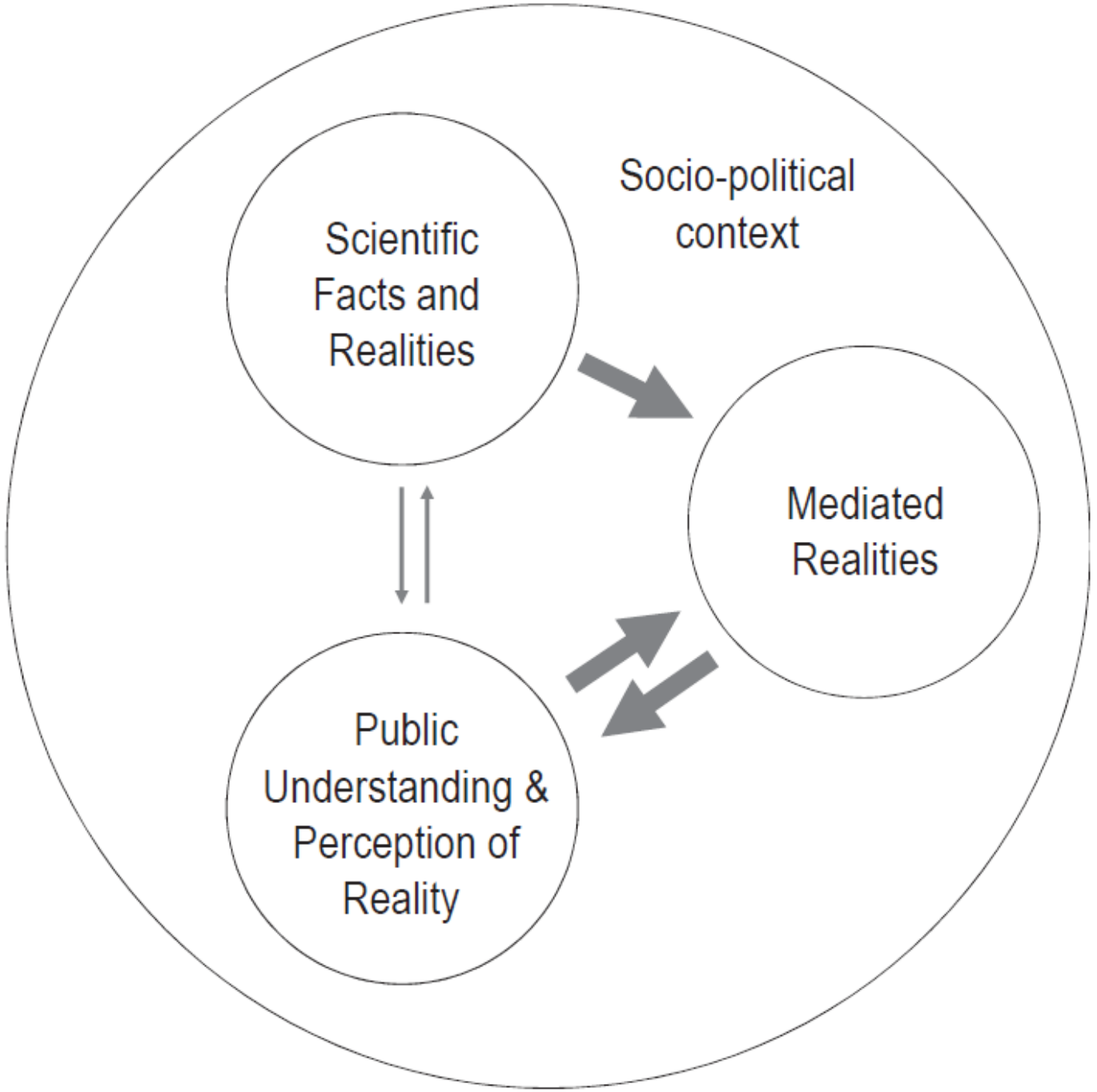
Such overlaps are even more frequent for scientists who work as staff members, advisers, collaborators, or board members at think tanks or advocacy groups. In these roles, scientists often publish not just peer-reviewed work but also reports and other nonrefereed literature that use their own credibility as scientists to lend scientific credibility to those of the sponsoring organization. Roger Pielke, Jr., for example, critiques scientists for too often playing the role of "stealth advocates" who discuss only a subset of potential policy options for a problem their research has identified rather than presenting the tradeoffs and advantages of a broader, comprehensive portfolio of policy choices (12). This tendency to selectively highlight policy options might be—at least in part—motivated by scientists' own political preferences. Surveys among leading scientists in nanotechnology, for instance, show that, after controlling for discipline, seniority, and scientific judgments about risks and benefits, scientists' support for regulatory options was significantly correlated to their ideological stances, with liberal scientists being more likely to support regulations than conservative scientists (13).

The Media Orientation of the Scientific Profession. Some of these overlaps are directly related to a second explanation for blurring boundaries between science and politics that has been described as "medialization" (14) of science. Medialization refers to the notion that science and media are increasingly linked: "With the growing importance of the media in shaping public opinion, conscience, and perception on the one hand and a growing dependence of science on scarce resources and thus on public acceptance on the other, science will become increasingly media-oriented" (14).

Medialization therefore assumes a reciprocal relationship between scientists and media. Media, on the one hand, rely on public scholars or celebrity scientists for newsworthy portrayals of

This paper results from the Arthur M. Sackler Colloquium of the National Academy of Sciences, "The Science of Science Communication II," held September 23–25, 2013, at the National Academy of Sciences in Washington, DC. The complete program and video recordings of most presentations are available on the NAS website at www.nasonline.org/science-communication-II.

Author contributions: D.A.S. wrote the paper.

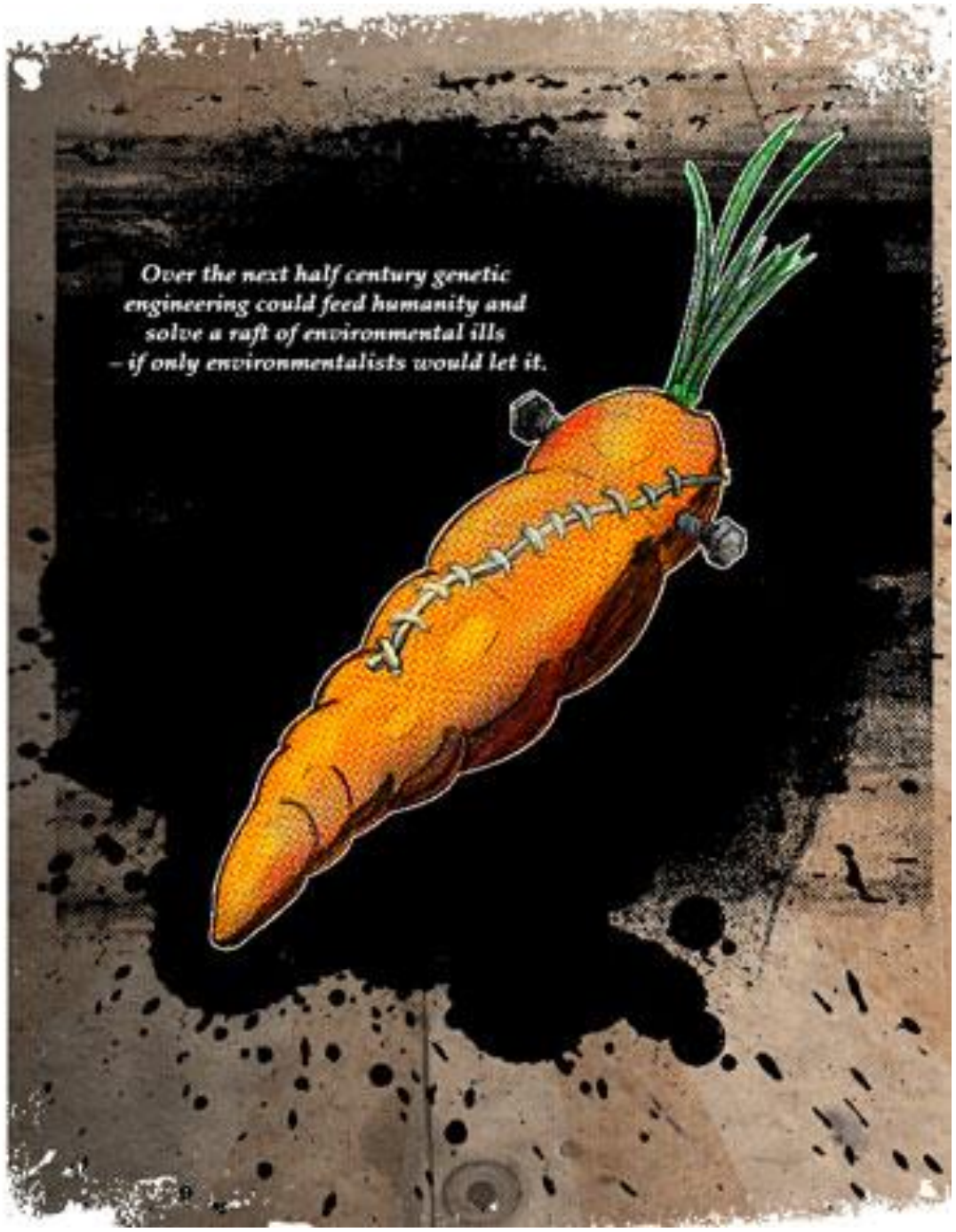


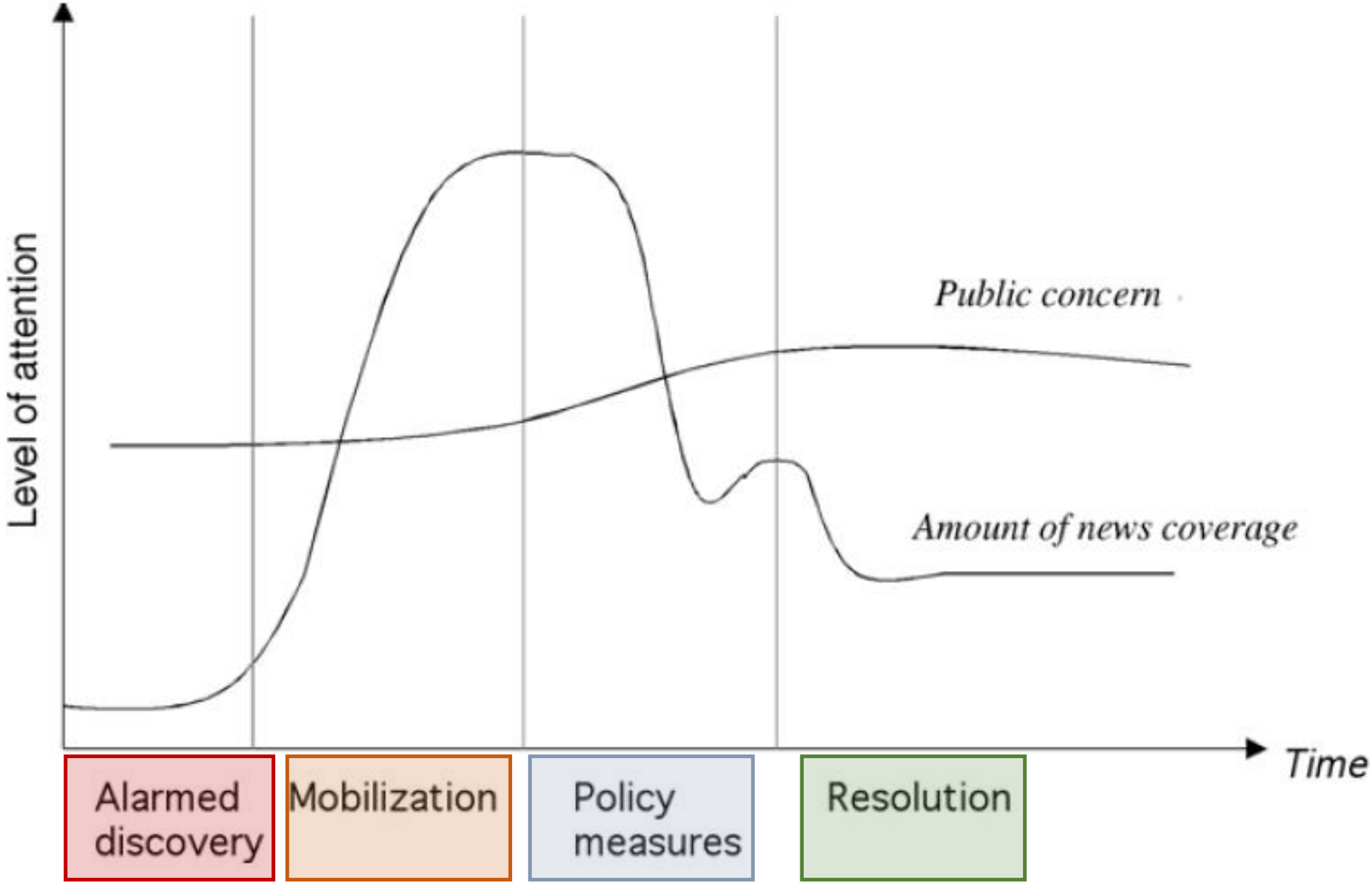
WILL FRANKENFOOD SAVE THE PLANET?

by Jonathan Rauch

Illustrations by Jesse Lenarski

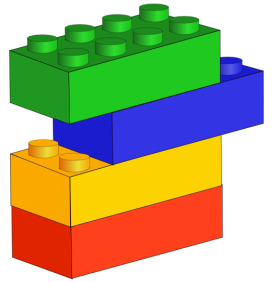
That genetic engineering may be the most environmentally beneficial technology to have emerged in decades, or possibly centuries, is not immediately obvious. Certainly, at least, it is not obvious to the many U.S. and foreign environmental groups that regard biotechnology as a bête noire. Nor is it necessarily obvious to people who grew up in cities, and who have only an inkling of what happens on a modern farm.

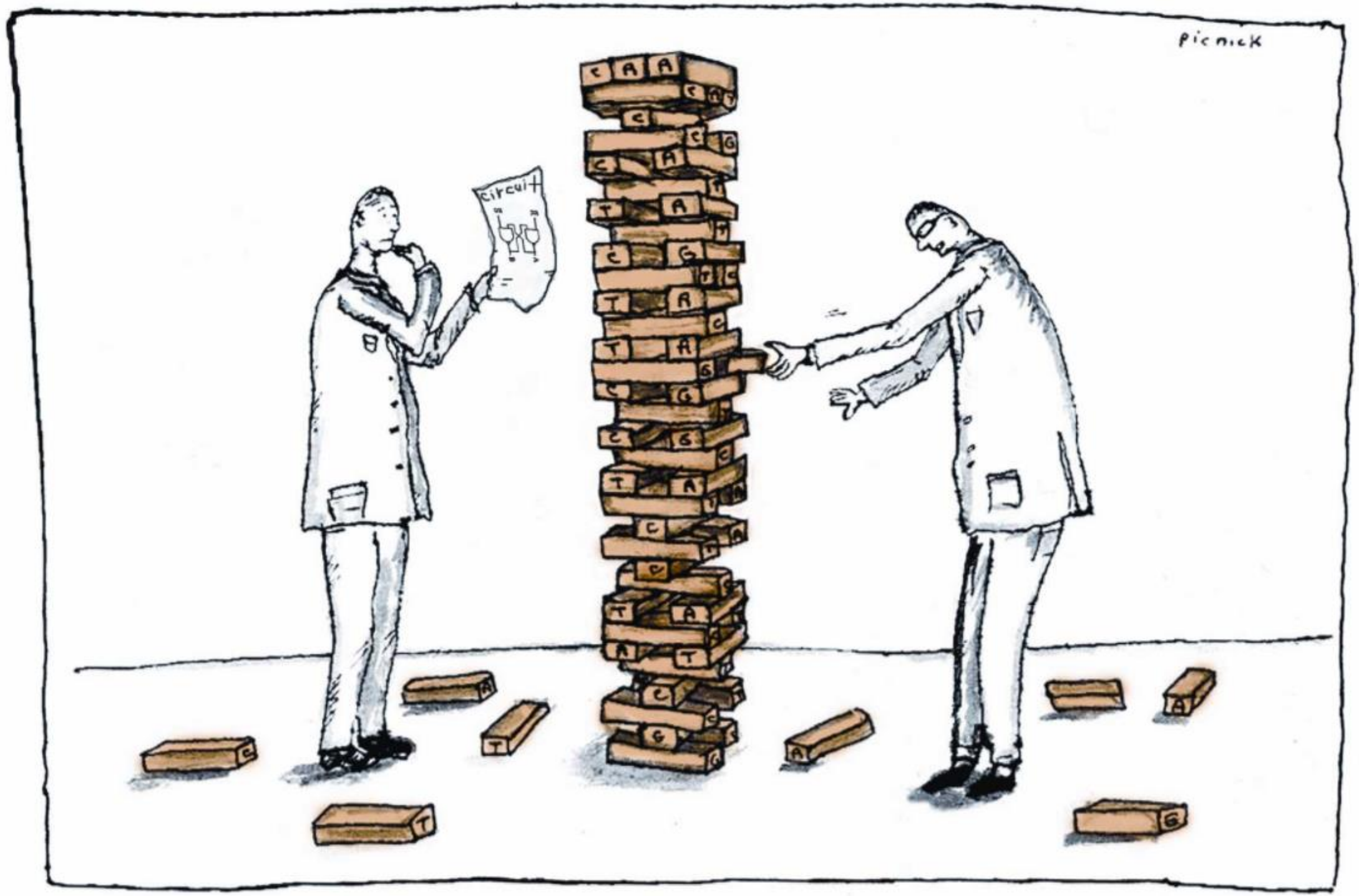



Level of attention
Public concern
Amount of news coverage
Time
Alarmed discovery
Mobilization
Policy measures
Resolution

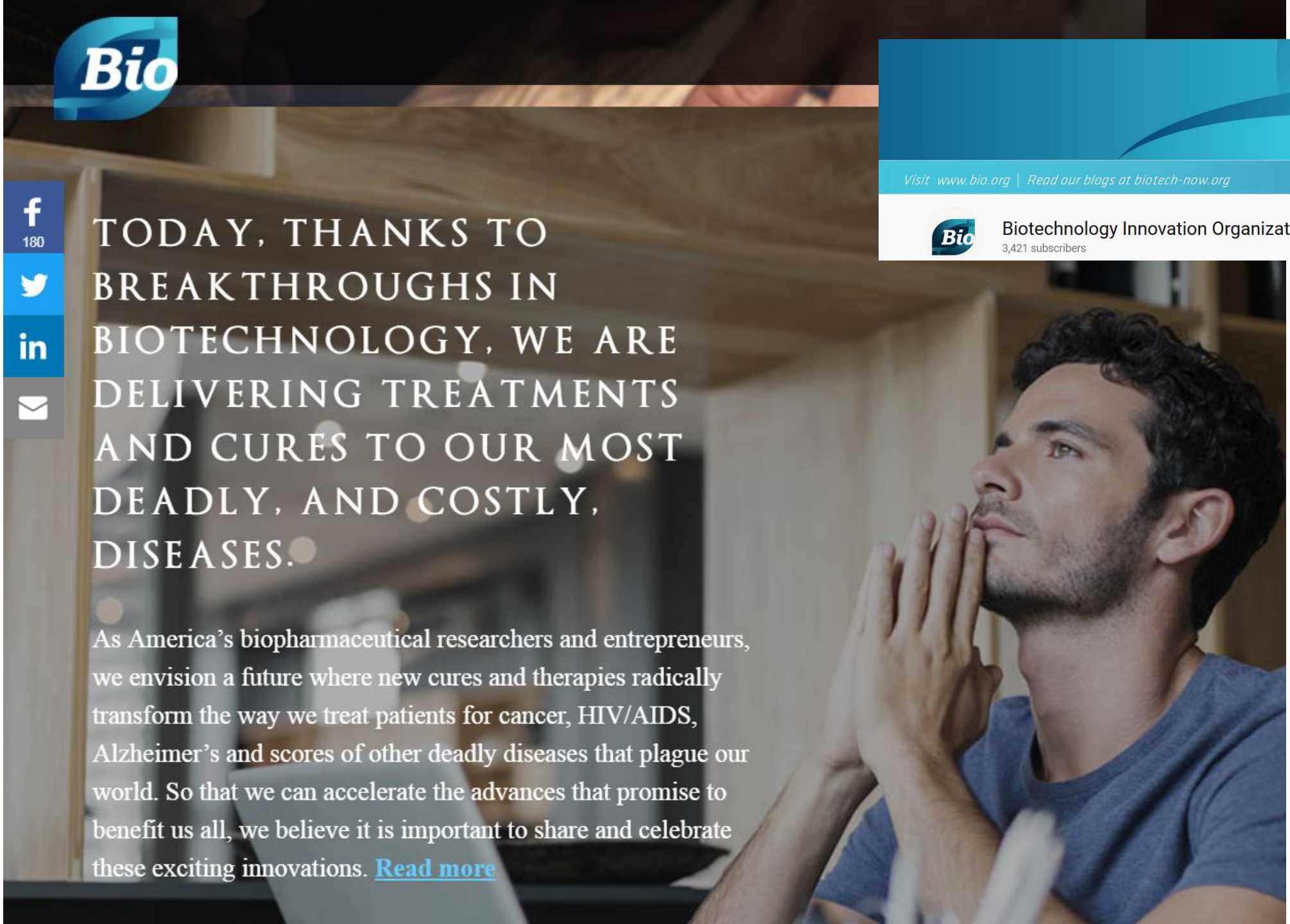
Risk communication

- Helps people to assess risk
- Perception of risk influences opinion/attitude
- Low risk does not always equate acceptance
- Perception of **benefit** is also important




Picnick
circuit

- voluntary
- individual’s control
- clear benefits
- natural
- familiar
- affecting everyone equally



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SCIENCE
SPEAKING TRUTH TO POWER
SCIENCE
PROTECTING OUR COMMUNITIES
SCIENCE
for the COMMON GOOD
SCIENCE SERVES
MARCH FOR SCIEN


NO SCIENCE,
NO BEER!
NO SCIENCE
=
NO COFFEE

Public opinion

- Embedded in culture, values
- Evolves over time
- Sharp variances

- Communicate science as a process; uncertainties
- Focus on building trust
- Seek public input; listen (& echo); show concern
- Know your audiences; what do they want to know?
- Respect your audience; never dismiss people
- Care about the language you use
- Focus on benefits (relevance!)
- Be aware of your own biases
- Humanise the science (and scientists)
- Make emotional connections; wrap facts in ‘warmth’
- Tell stories
- Never hype up, oversell, exaggerate or lie!

We should stop talking about "the public," and instead address individuals who have values - things that bother them, things that excite them, and make them feel emotional.

- Dominique Brossard

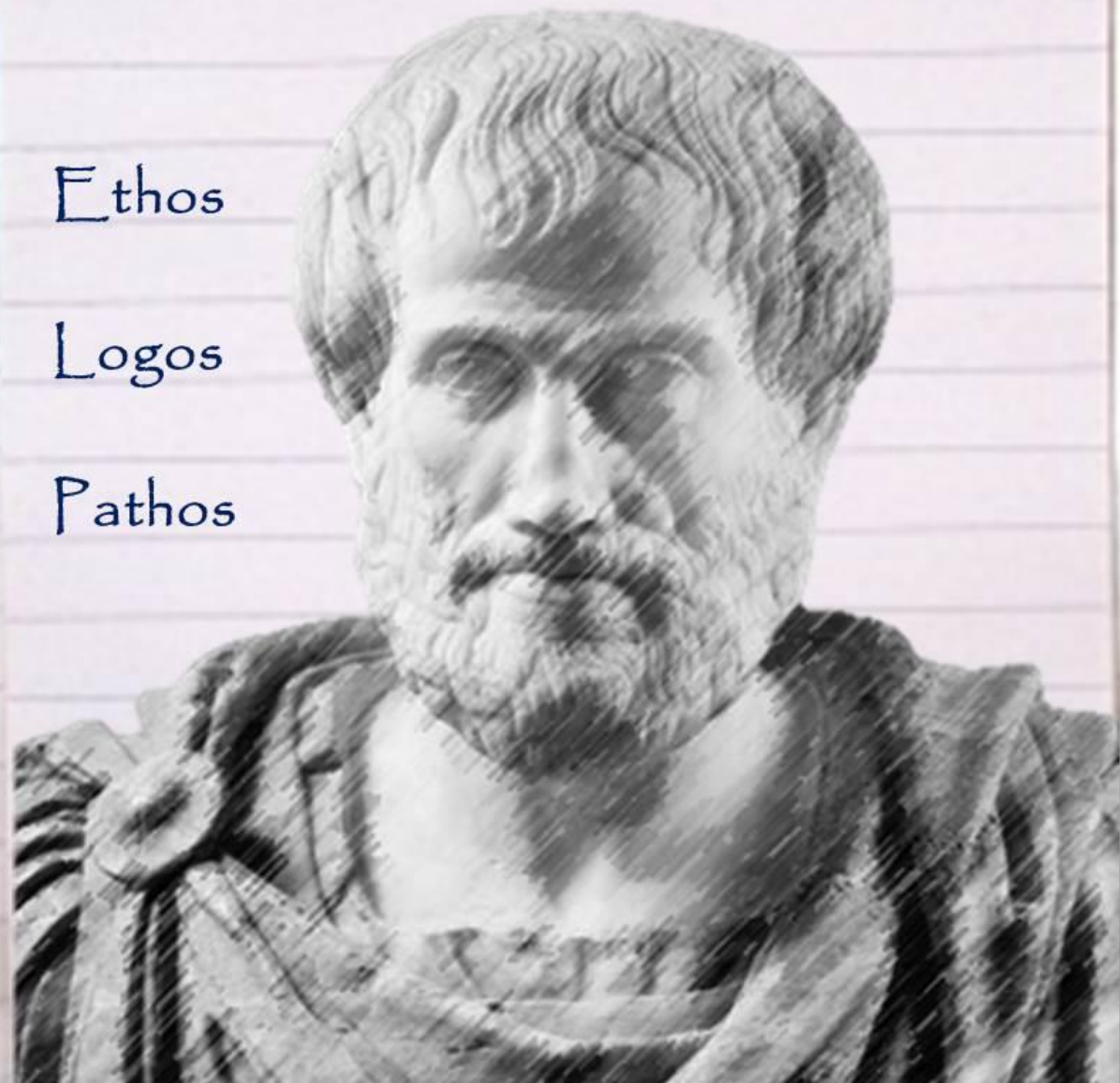
University of Wisconsin-Madison

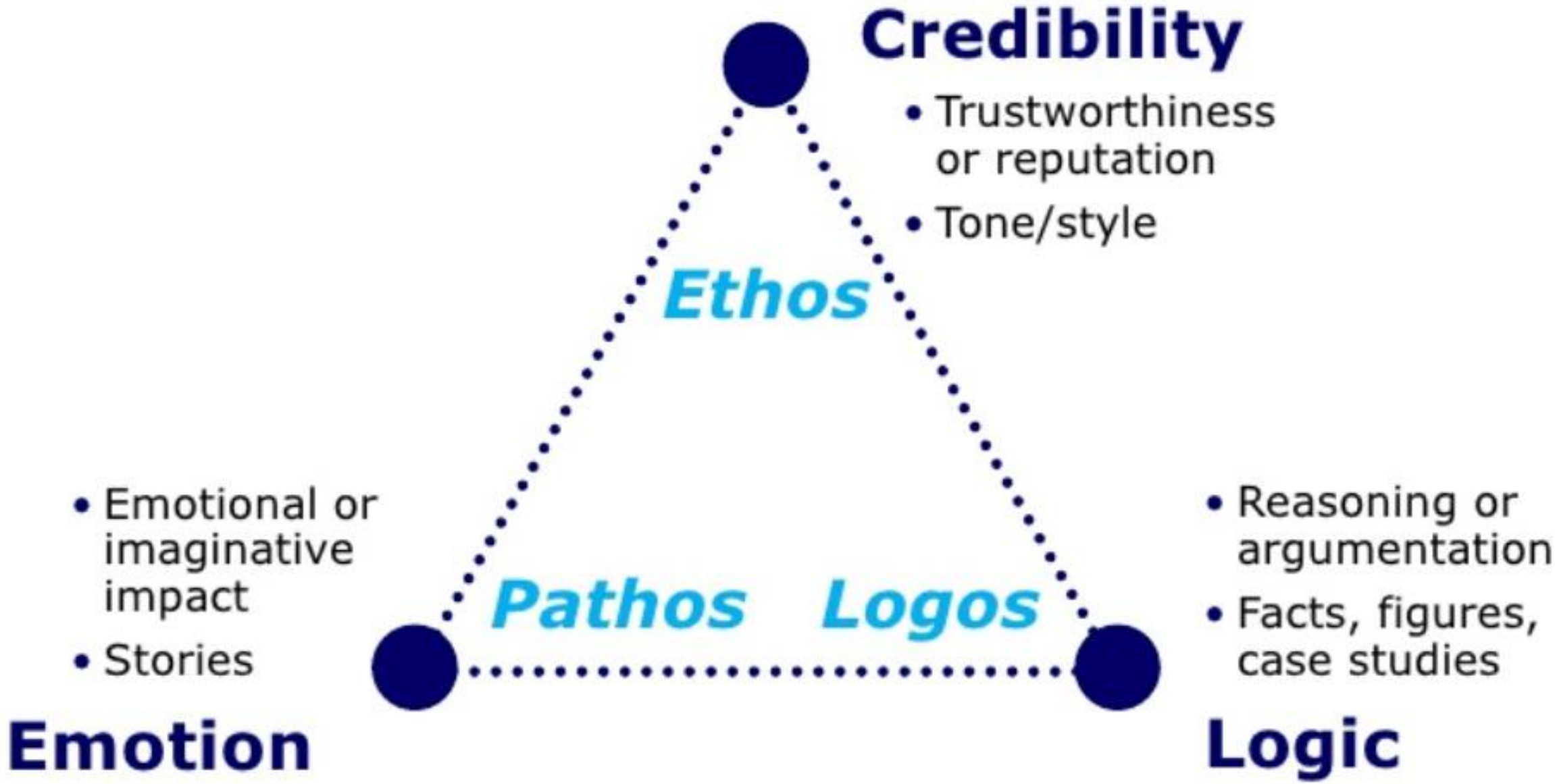
Aristotle

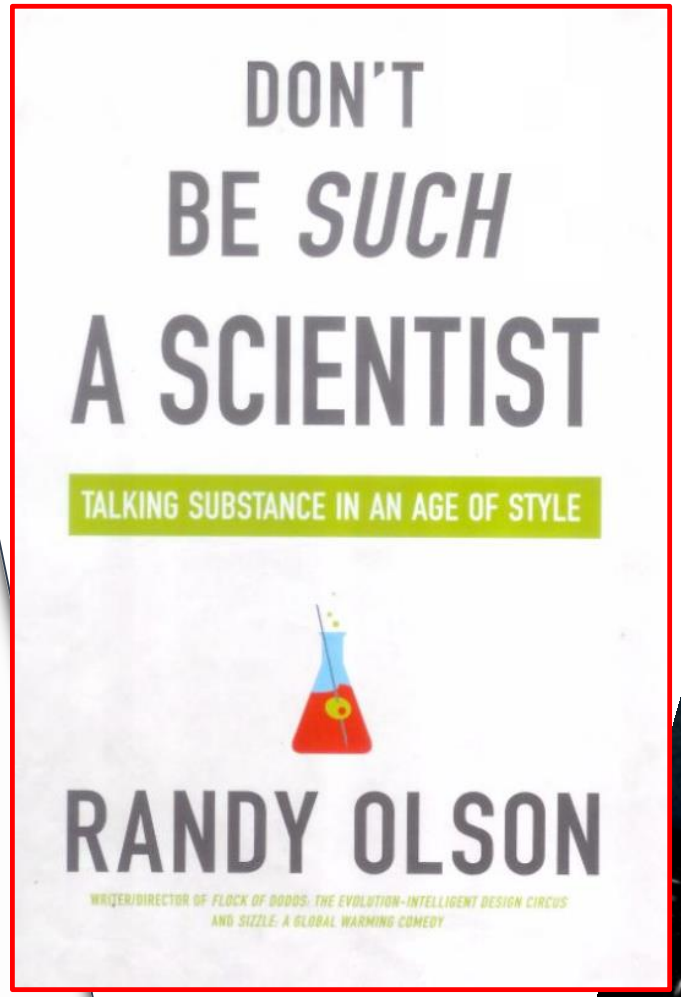
Ethos

Logos

Pathos




Credibility
• Trustworthiness or reputation
• Tone/style
Ethos
• Emotional or imaginative impact
• Stories
Pathos
Logos
• Reasoning or argumentation
• Facts, figures, case studies
Emotion
Logic



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