The following is the two-hour long, interactive ethics seminar presented to first and second-year applied physics, applied mathematics, and materials science and engineering doctoral students on May 3, 2022.

The first several slides describe recent events in ethics (confined here to responsible conduct of research and professionalism) and are updated every year.

The next set of slides is core material that is used every year.

Most of the period is used in a discussion of mini-case synopses based on fiction and real circumstances. Different mini-case synopses are selected for discussion each year. Only the ones used in 2022 are shown; backups that were not used and those used in earlier years (and which will be used again in future years) are not shown. A continually updated listing of mini-case synopses are also be available from the author's web site, http://www.columbia.edu/~iph1/ .

Sometimes slides describing humorous ethics violations in the TV shows Leave it to Beaver, House, Bones, and Death in Paradise, and a song by Tom Lehrer are used. The first two were used in 2022; the others are presented at the end.

Feedback concerning these slides can be directed to me at IPH1@columbia.edu .

- Irving P. Herman, Department of Applied Physics and Applied Mathematics, Columbia University; posted 5-4-22

Research and Professional Ethics

For All of Us

Irving P. Herman

APAM Seminar
Tuesday, May 3, 2022

Harvard chemist Charles Lieber charged with fraud

Bethany Halford, Andrea L. Widener JANUARY 28, 2020
https://cen.acs.org/research-integrity/misconduct/Harvard-chemist-Charles-Lieber-charged/98/i5

- "Charles M. Lieber, the chair of the chemistry and chemical biology department at Harvard University, **was arrested** on Jan. 28 and charged with **fraud**.

- The complaint alleges that Lieber hid his financial ties to China's Thousand Talent program from the US National Institutes of Health (NIH) and the Department of Defense (DOD), as well from his own university.

Charlse Lieber,

Nanomaterials leader

- from C&E article:
Credit: Courtesy of Charles Lieber

- Lieber is charged with **a single felony count for making false statements to US government agencies**. The maximum sentence for such a charge is 5 years in prison, 3 years of supervised release, and a $250,000 fine, the Department of Justice says.. …

- "The charges brought by the US government against Professor Lieber are extremely serious," the university says in a statement. "Harvard is cooperating with federal authorities, including the National Institutes of Health, and is conducting its own review of the alleged misconduct.""

Prominent Harvard Professor Found Guilty of Lying About China Ties

By Byron Tau Followand Aruna Viswanatha Updated Dec. 21, 2021, 7:17 pm ET
https://www.wsj.com/articles/harvard-professor-charles-lieber-found-guilty-of-six-counts-related-to-china-payments-11640128133

- "A jury on Tuesday found Harvard professor Charles Lieber **guilty on six counts** related to payments he received from a Chinese government talent program, delivering a win for the U.S. government."

- Mr. Lieber, who holds joint appointments in Harvard University's chemistry and engineering departments and is a **renowned expert in the field of nanoscience**, **was accused of lying to government investigators about his participation** in the Chinese government's Thousand Talents program aimed at wooing foreign experts. **He also was charged with failing to disclose cash payments from the program on his income tax returns and concealing the existence of a Chinese bank account.**

Charlse Lieber,

Nanomaterials leader

- from C&E article:
Credit: Courtesy of Charles Lieber

Temple Physics Prof, 47, is Charged in Alleged Fraud Scheme

Part 1 of 2

http://articles.philly.com/2015-05-22/news/62510061_1_xi-china-superconductivity

BY BARBARA LAKER, Daily News Staff Writer lakerb@phillynews.com, 215-854-5933

POSTED: May 22, 2015

Xiaoxing Xi

- "THE CHAIRMAN of Temple University's physics department, a world-renowned expert in a complex field that most people know nothing about (superconductivity), has been indicted for fraudulently obtaining key technology to help associates in his native People's Republic of China."
- "Between 2002 and 2003, he took a sabbatical from his teaching position and worked with a … "U.S. Company" in the field of thin-film superconductivity. During that time, people at that company invented a device that revolutionized the field."
- "Xi got a U.S. Defense Department grant to finance his purchase of the device and relevant research equipment, the indictment says. The company initially resisted Xi's efforts to buy the breakthrough equipment. Ultimately, the firm agreed to give him the device for a year if he signed an agreement saying that he was using it solely for testing purposes and agreed to not reproduce, sell, transfer or distribute it."
- ""In exchange for his efforts to advance the field of superconductivity in China . . . Xi repeatedly sought lucrative and prestigious appointments in China," the indictment said. Xi is charged with four counts of wire fraud and related offenses. If convicted, he faces a maximum possible sentence of 80 years in prison, three years of supervised release and a fine of up to $1 million."

U.S. Drops Charges That Professor Shared Technology With China

Part 2 of 2

http://www.nytimes.com/2015/09/12/us/politics/us-drops-charges-that-professor-shared-technology-with

By MATT APUZZO SEPT. 11, 2015, New York Times

Xiaoxing Xi

First

- "About a dozen F.B.I. agents, some with guns drawn, stormed Dr. Xi's home in the Philadelphia suburbs in May, searching his house just after dawn, he said. **His two daughters and his wife watched the agents take him away in handcuffs on fraud charges.** Temple University put him on administrative leave and took away his title as chairman of the physics department."

Because

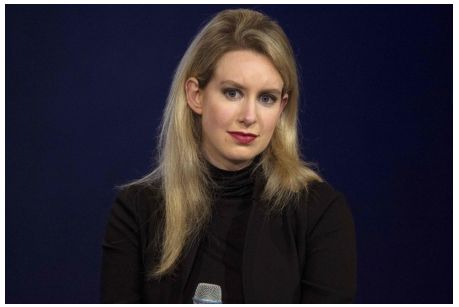
- "When the Justice Department arrested the chairman of Temple University's physics department this spring and accused him of sharing sensitive American-made technology with China, prosecutors had what seemed like a damning piece of evidence: schematics of sophisticated laboratory equipment sent by the professor, Xi Xiaoxing, to scientists in China."

But, then

- "… months later, long after federal agents had led Dr. Xi away in handcuffs, independent experts discovered something wrong with the evidence at the heart of the Justice Department's case: The blueprints were not for a pocket heater. Faced with sworn statements from leading scientists, including an inventor of the pocket heater, **the Justice Department on Friday afternoon dropped all charges against Dr. Xi**, ..."

SEC Charges Theranos Founder Elizabeth Holmes With Fraud

https://www.wsj.com/articles/sec-charges-theranos-and-founder-elizabeth-holmes-with-fraud-1521045648 By John Carreyrou Updated March 14, 2018 1:27 p.m. ET



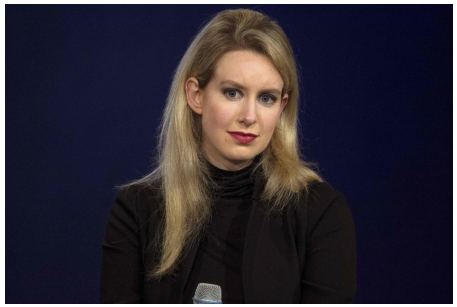
Theranos founder Elizabeth Holmes (from 2015)
PHOTO: BRENDAN MCDERMID/REUTERS

"Theranos Inc. founder and chief executive Elizabeth Holmes surrendered voting control of her blood-testing company, paid a **$500,000 penalty and agreed to a 10-year ban** from being an officer or director in a public company in settling civil-fraud charges Wednesday with the Securities and Exchange Commission. …

… the Journal published an article revealing that Theranos **used its proprietary blood-testing technology for only a fraction** of the blood tests it offered in Walgreens stores. …

Theranos has since **voided nearly one million test results**, and Ms. Holmes agreed to a two-year federal ban from owning or operating laboratories. The company also has settled lawsuits from a hedge-fund investor and Walgreens, its former retail partner, alleging that it made misleading representations to them."

The Elizabeth Holmes Verdict: Theranos Founder Is Guilty on Four of 11 Charges in Fraud Trial



Theranos founder Elizabeth Holmes (from 2015)
PHOTO: BRENDAN MCDERMID/REUTERS

By Sara Randazzo, Heather Somerville and Christopher Weaver, Updated Jan. 3, 2022 11:45 pm ET
https://www.wsj.com/articles/the-elizabeth-holmes-verdict-theranos-founder-is-guilty-on-four-of-11-charges-in-fraud-trial-11641255705

"A federal jury **convicted Elizabeth Holmes**, the startup founder who claimed to revolutionize blood testing, on four of 11 charges that she conducted a years long fraud scheme against investors while running Theranos Inc., which ended up as one of Silicon Valley's most notorious implosions.

She was found guilty on three of the nine fraud counts and one of two conspiracy counts."

Top Sloan Kettering Cancer Doctor Resigns After Failing to Disclose Industry Ties

By Katie Thomas and Charles Ornstein
Sept. 13, 2018
https://www.nytimes.com/2018/09/13/health/jose-baselga-cancer-memorial-sloan-kettering.html

- "Dr. José Baselga, the chief medical officer of Memorial Sloan Kettering Cancer Center, **resigned** on Thursday amid reports that he had **failed to disclose millions of dollars in payments from health care companies in dozens of research articles**."

- "Dr. Baselga, a prominent figure in the world of cancer research, **omitted his financial ties** to companies like the Swiss drugmaker Roche and several small biotech start-ups in prestigious medical publications like The New England Journal of Medicine and The Lancet. He also **failed to disclose any company affiliations** in articles he published in the journal Cancer Discovery, for which he serves as one of two editors in chief."

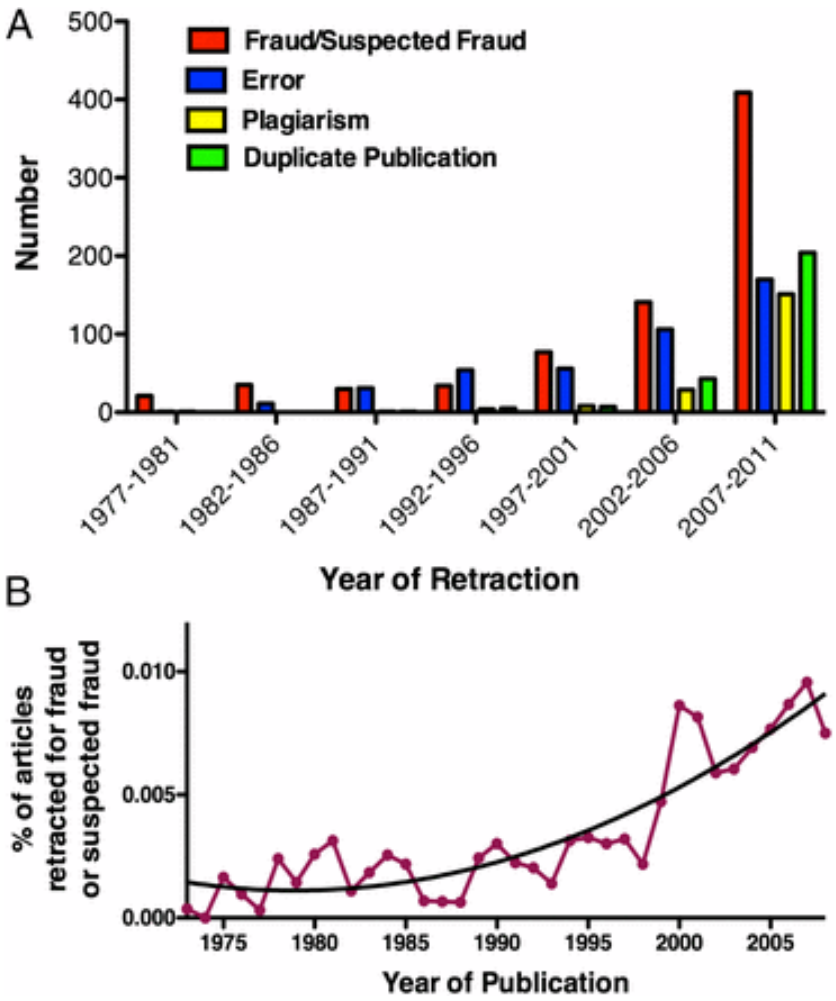
Dr. José Baselga
Credit Thos Robinson/Pershing Square Sohn Cancer Research Alliance, via Getty Images

- "… Dr. Baselga said he **planned to correct** his conflict-of-interest disclosures in 17 journal articles … also said his failed disclosures were unintentional and should not reflect on the value of the research he conducted."

Misconduct accounts for the majority of retracted scientific publications

Ferric C. Fang, R. Grant Steen, and Arturo Casadevall, PNAS October 16, 2012 109 (42) 17028-17033; https://doi.org/10.1073/pnas.1212247109

- "… revealed that only 21.3% of retractions were attributable to error. In contrast, 67.4% of retractions were attributable to misconduct, including fraud or suspected fraud (43.4%), duplicate publication (14.2%), and plagiarism (9.8%)."



Repairing Research Integrity

Repairing research integrity, Sandra L. Titus, James A. Wells & Lawrence J. Rhoades, Nature volume 453, pages980–982 (2008), https://www.nature.com/articles/453980a

"In the United States, the Office of Research Integrity (ORI) evaluates all the investigation records submitted by institutions and plays an oversight role in determining whether there has been misconduct at institutions that receive support from the Department of Health and Human Services (DHHS). … A conservative extrapolation from our findings to all DHHS-funded researchers predicts that **more than 2,300 observations of potential misconduct are made every year**."

"Scientists were asked to indicate how they became aware of the possible misconduct … The following are examples of how scientists described such incidents. "

"A post doc changed the numbers in assays in order to 'improve' the data."

"A colleague duplicated results between three different papers but differently labelled data in each paper."

"A co-investigator on a large, interdisciplinary grant application reported that a postdoctoral fellow in his laboratory falsified data submitted as preliminary data in the grant. As principal investigator of the grant, I submitted supplementary data to correct the application."

"A colleague used Photoshop to eliminate background bands on a western blot to make the data look more specific than they were."

Make up Data for the Supporting Information

A Disturbing Note in a Recent SI File

August 6th, 2013

http://blog.chembark.com/2013/08/06/a-disturbing-note-in-a-recent-si-file/

"A recently published ASAP article in the journal Organometallics is sure to raise some eyebrows in the chemical community. While the paper itself is a straightforward study of palladium and platinum bis-sulfoxide complexes, page 12 of the corresponding Supporting Information file contains what appears to be **an editorial note that was inadvertently left in the published document**:

'Emma, please insert NMR data here! where are they? and for this compound, **just make up** an elemental analysis…'

This statement goes beyond a simple embarrassing failure to properly edit the manuscript, as it appears the first author is being instructed to fabricate data. Elemental analyses would be very easy to fabricate, and long-time readers of this blog will recall how fake elemental analyses were pivotal to Bengu Sezen's campaign of fraud in the work she published from 2002 to 2005 out of Dalibor Sames' lab at Columbia. …

This story points to very real concerns that young researchers can be instructed and pressured to fabricate data. Would a scientist be so concerned that a journal would reject his manuscript over a piece of missing characterization data that he'd feel pressure to make something up?"

Duke Whistleblower Gets More Than $33 Million In Research Fraud Settlement

Bill Chappell March 25, 2019 https://www.npr.org/2019/03/25/706604033/duke-whistleblower-gets-more-than-33-million-in-research-fraud-settlement

- “Duke University is paying the U.S. government $112.5 million to settle accusations that it submitted bogus data to win federal research grants. The settlement will also bring a **$33.75 million payment to Joseph Thomas, the whistleblower** who drew attention to the fraud when he worked for Duke.

Duke University Hospital. Chris Keane/Reuters

- **Thomas, a former Duke lab analyst, sued the university on behalf of the federal government**, saying that a Duke researcher fudged data to help the university win and keep lucrative grants from two agencies, the National Institutes of Health and the Environmental Protection Agency.

- The dozens of grants in question covered the study of the lung function of mice. The Justice Department says Thomas' lawsuit alleged that "between 2006 and 2018, Duke knowingly submitted and caused to be submitted" claims to federal agencies that were unknowingly paying grant money for falsified research data. It adds that while the agreement settles the court case, it does not mean Duke has been determined liable.”

Fired Professor Shot 2 Men Outside Chappaqua Deli, Police Say

By JONAH ENGEL BROMWICH AUG. 29, 2016
http://www.nytimes.com/2016/08/30/nyregion/fired-professor-shoots-2-in-chappaqua-police-say-revenge-may-be-motive.html

"A former faculty member at the Mount Sinai School of Medicine who had been fired shot the school's dean outside a popular deli in Chappaqua, N.Y., on Monday, apparently in an act of revenge, the authorities said.

The former employee, Hengjun Chao, 49, of Tuckahoe, N.Y., was charged with attempted second-degree murder after he allegedly fired a shotgun and hit two men around 7 a.m. outside the deli, Lange's Little Store, ….

In October 2002, Mr. Chao joined Mount Sinai as a research assistant professor. He stayed at Mount Sinai until May 2009, when he received a letter of termination from Dr. Charney for "research misconduct," …

"In informing his colleagues of his termination, Mount Sinai/MSSM stated that Dr. Chao had been 'fired for data fraud,'" the lawsuit said. The case was dismissed, and Mr. Chao lost on appeal. …"

Purdue scientist appeals ruling

Man will challenge panel's findings that he committed research misconduct

By Rick Callahan / Associated Press, Posted: **July 24, 2008**, Indystar
http://www.indystar.com/apps/pbcs.dll/article?AID=/20080724/LOCAL/807240413

(Prof. Rusi) "Taleyarkhan must provide Purdue with a summary by Monday explaining the grounds on which he will contest the conclusion that he misled the scientific community by claiming his **"bubble fusion"** findings **had been independently replicated**."

"Taleyarkhan made headlines in 2002 when he published a paper in the journal Science claiming he had produced nuclear fusion -- the force that powers stars -- using a tabletop experiment that collapsed tiny bubbles in a liquid with powerful ultrasound vibrations. That experiment stood in contrast to nuclear fusion research that has required large, multibillion-dollar machines in the quest to unleash what could be an unlimited energy source."

"The Purdue panel **did not** investigate the 2002 Science paper, which was published when Taleyarkhan was a researcher at Oak Ridge National Laboratory in Tennessee."

"The **two cases of misconduct** cited in the panel's report related to subsequent papers. The panel, which includes representatives from other schools, said that in a follow-up paper published in 2006 in Physical Review Letters, **Taleyarkhan falsely claimed that his 2002 work had been confirmed independently.** In fact, Taleyarkhan was extensively involved in the work he cited as being done independently of him, the committee found. It also found that in two 2005 papers, **Taleyarkhan added another person as an author even though that researcher did not contribute substantially to that work.**"

Cheating in classes—including lab

http://www.oberlin.edu/colrelat/ats/story/honorCode.html

In a CAI survey conducted during the 2001-02 academic year:

- 27 percent of students questioned said that falsifying laboratory data occurred "often or very often" on their campus.

- 41 percent said the same for plagiarism on written work,

- 30 percent for cheating during exams, and

- 60 percent for collaborating on assignments when the professor had instructed students to work alone.

Also:

- 55 percent of the students did not think that getting test questions and answers from a student who had already taken an exam was serious cheating, and

- 45 percent said falsifying lab or research data was not serious cheating.

- 41 percent of students said they'd cut and pasted from the Internet without attribution, and

- only 27 percent said such cutting and pasting was serious cheating.

- only 12 percent thought unpermitted collaborations on assignments qualified as serious cheating.

College Lecturer Pleads Guilty to Selling Fake Certificates

https://www.nytimes.com/2018/05/31/nyregion/medgar-evers-college-certificates.html By David W. Chen May 31, 2018

"A biology lecturer at Medgar Evers College, a part of the City University of New York, pleaded guilty on Thursday to one count of federal wire fraud for teaching unauthorized health care classes and selling students bogus course-completion certificates.

From at least 2013 to 2017, Mr. Abdel-Sayed claimed to teach courses on topics such as electrocardiograms, phlebotomy and sonography at the college, located in Brooklyn. … He then provided students with fake certificates of completion for the courses. He charged fees of up to $1,000 per certificate and he kept the money for himself. ... He is scheduled to be sentenced on Sept. 7, and could face 21 to 27 months in jail, and fines of up to $95,000, under federal sentencing guidelines.

Medgar Evers officials first learned of Mr. Abdel-Sayed's classes in 2015, and ordered him to stop. But he did not stop. So last year, as part of a continuing probe by Catherine Leahy Scott, the state inspector general, into CUNY's oversight and management practices, **two undercover investigators,** posing as students, attended his classes and bought his certificates."

Doomed Boeing Jets Lacked 2 Safety Features That Company Sold Only as Extras

By Hiroko Tabuchi and David Gelles March 21, 2019 https://www.nytimes.com/2019/03/21/business/boeing-safety-features-charge.html

- "As the pilots of the doomed Boeing jets in Ethiopia and Indonesia fought to control their planes, they lacked two notable safety features in their cockpits.

- One reason: Boeing charged extra for them. … … the practice of charging to upgrade a standard plane can be lucrative. …Sometimes these **optional features** involve aesthetics or comfort, like premium seating, fancy lighting or extra bathrooms. But other features involve communication, navigation or **safety systems,** and are more fundamental to the plane's operations. … **Many airlines, especially low-cost carriers like Indonesia's Lion Air, have opted not to buy them — and regulators don't require them**.

Standard 737 Max planes are not equipped with a so-called angle of attack indicator or an angle of attack disagree light. The indicator will continue to cost airlines extra, but the light won't.
Credit Ruth Fremson/The New York Times

- Now, in the wake of the two deadly crashes involving the same jet model, Boeing will make one of those safety features standard as part of a fix to get the planes in the air again.

- *It is not yet known what caused the crashes* of Ethiopian Airlines Flight 302 on March 10 and Lion Air Flight 610 five months earlier, both after erratic takeoffs. But investigators are looking at whether a new software system added to avoid stalls in Boeing's 737 Max series may have been partly to blame. Faulty data from sensors on the Lion Air plane may have caused the system, known as MCAS, to malfunction, authorities investigating that crash suspect."

Boeing Didn't Advise Airlines, FAA That It Shut Off Warning System

By Andy Pasztor Updated April 28, 2019 7:20 p.m. ET
https://www.wsj.com/articles/boeings-enduring-puzzle-why-certain-safety-features-on-737-max-jets-were-turned-off-11556456400

"**Boeing Co. didn't tell** Southwest Airlines Co. and other carriers when they began flying its 737 MAX jets that a **safety feature found on earlier models that warns pilots about malfunctioning sensors had been deactivated**, according to government and industry officials.

The cockpit of a grounded Lion Air Boeing 737 Max 8 aircraft at Soekarno-Hatta International Airport in Indonesia. PHOTO: DIMAS ARDIAN/BLOOMBERG NEWS

Federal Aviation Administration safety inspectors and supervisors responsible for monitoring Southwest, the largest 737 MAX customer, also were unaware of the change, the officials said.

The alerts inform pilots whether a sensor known as an "angle-of-attack vane" is transmitting errant data about the pitch of a plane's nose. Accident investigators have linked such bad data to the deadly Ethiopian Airlines crash in March and the Lion Air crash last year; both planes lacked the alert system.

In the 737 MAX, which features a new automated stall-prevention system called MCAS, Boeing made those alerts optional. They would be operative only if a carrier bought a package of additional safety features. Southwest's management and cockpit crews didn't know about the lack of the warning system for more than a year after the planes went into service in 2017, industry and government officials said. They and most other airlines operating the MAX **learned about it only after the Lion Air crash** in October led to scrutiny of the plane's revised design."

Boeing 737 Max Safety System Was Vetoed, Engineer Says

By Natalie Kitroeff, David Gelles and Jack Nicas
Published Oct. 2, 2019 Updated Oct. 11, 2019
https://www.nytimes.com/2019/10/02/business/boeing-737-max-crashes.html

- "A senior Boeing engineer filed an **internal ethics complaint** this year saying that during the development of the 737 Max jet the company **had rejected a safety system to minimize costs**, equipment that he felt could have reduced risks that contributed to two fatal crashes."

Range of Discussion

Data and Research

Authorship

Papers and Theses - Content

Preparing Proposals

Reviewing Papers and Proposals

Employment and Conflicts of Interest

Other - medical, society, industrial ethics

Responsible Conduct of Research

- We will focus on these areas

Professional and other Ethics

- We will sample topics in professionalism, engineering/industrial ethics, and medical ethics

All of these areas can impact your career here at Columbia, and afterwards—however your career progresses

At The Core

Learning to be aware that you are facing an ethical issue

At The Core

Learning to be aware that you are facing an ethical issue

Developing ways to handle such an ethical issue

FAQs:
Why are they making me take this seminar?

Don’t they trust me?

FAQs:
Why are they making me take this seminar?

Don't they trust me?

When "violations" occur, it is very serious.

Every year I am shocked by new revelations of problems in ethics – in the news, that I see, that I hear about, …

FAQs:
Why are they making me take this seminar?

Don't they trust me?

When "violations" occur, it is very serious.

Every year I am shocked by new revelations of problems in ethics – in the news, that I see, that I hear about, …

THERE IS SO MUCH BRAND NEW MATERIAL FOR THIS SEMINAR EVERY YEAR!!!

FAQ:
Do faculty members take seminars like this?

FAQ:
Do faculty members take seminars like this?

No

Police officers say that crimes are committed by bad people doing bad things and by good people doing stupid things.

We could say that research misconduct is conducted by unethical people doing unethical things and by ethical people doing stupid things.

Ethics Awareness and Education

Ethics education is becoming a standard component
in graduate and undergraduate studies

- a very good idea
- devote classes to it
  or at least multi-day workshops
- equally important for experimentalists
  and theorist/modelers
- now being mandated by NSF

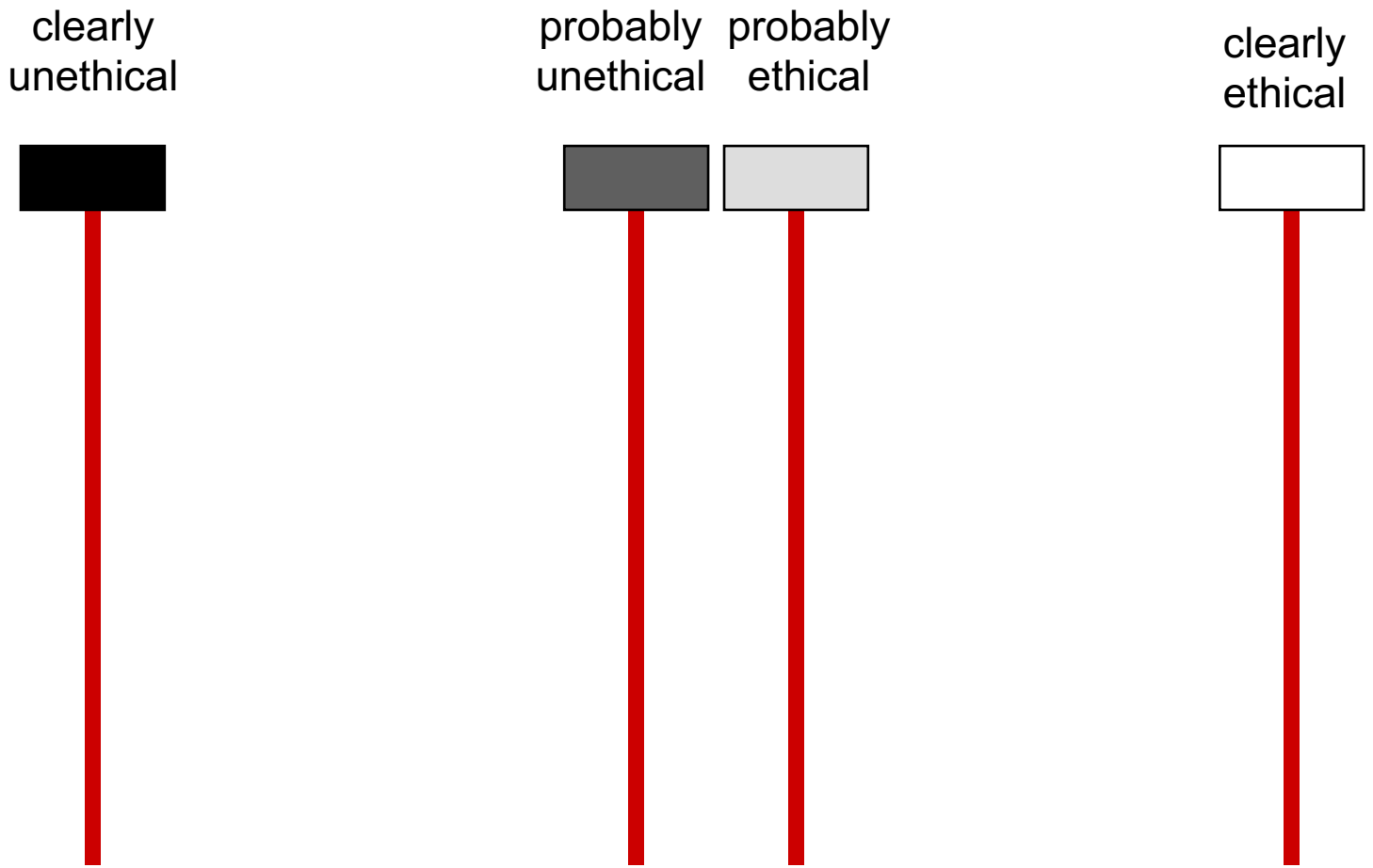
Our start:

This seminar (first and second year doctoral students)
On-line course

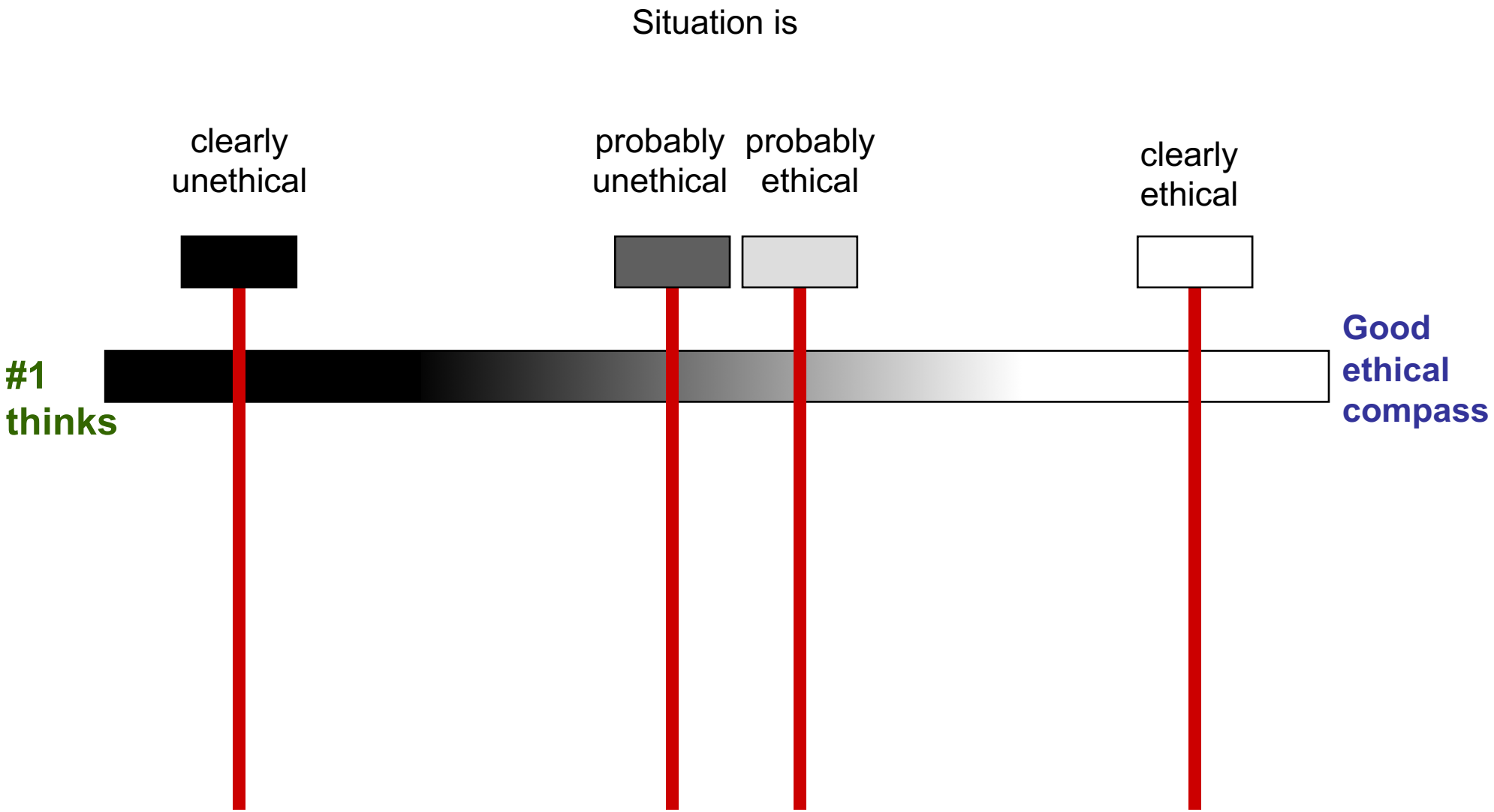
Our two hours today is not enough time to devote to this
(and overall <10 hours out of >8,000 hours)

Why Do This?

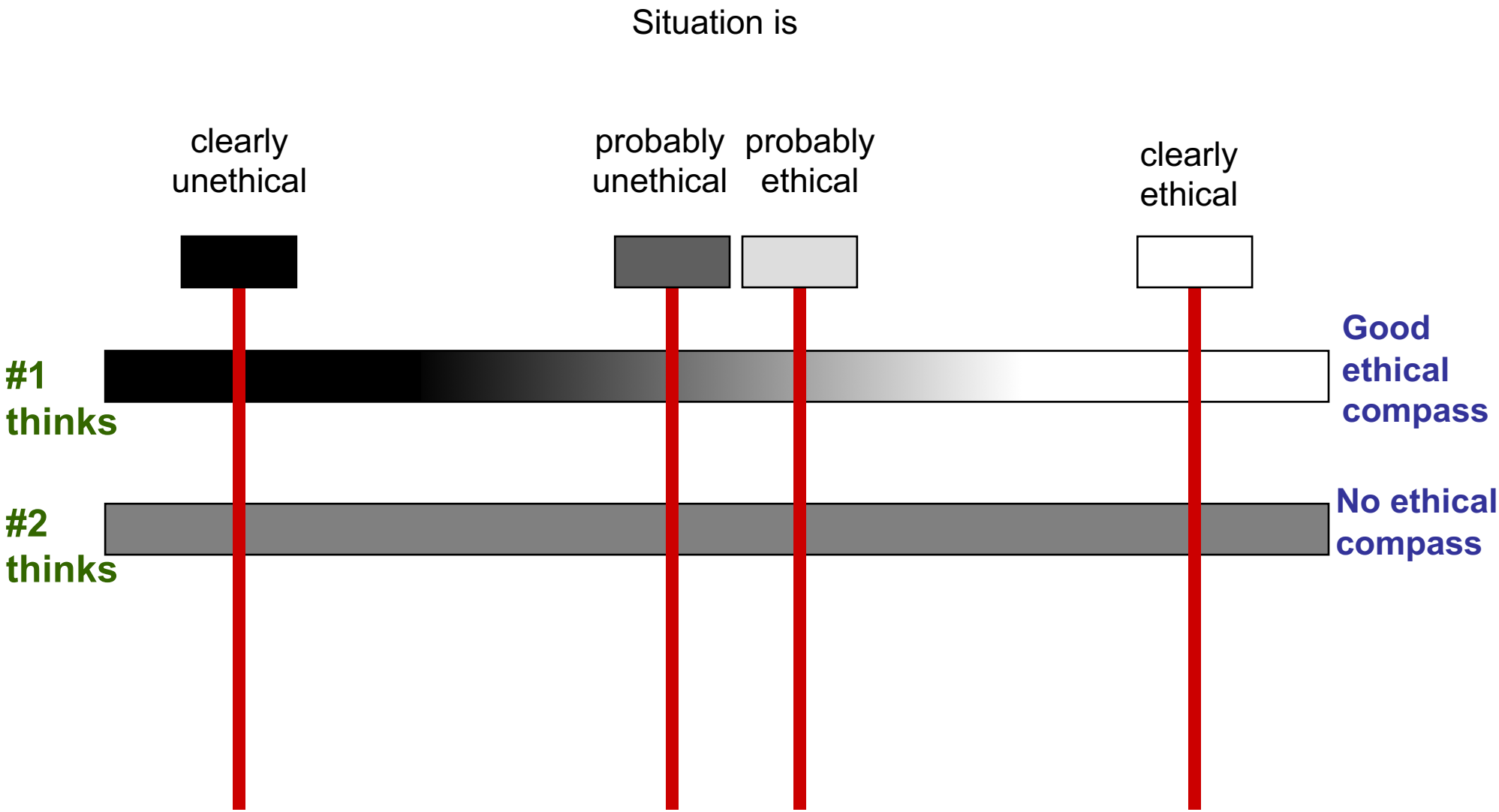
Situation is



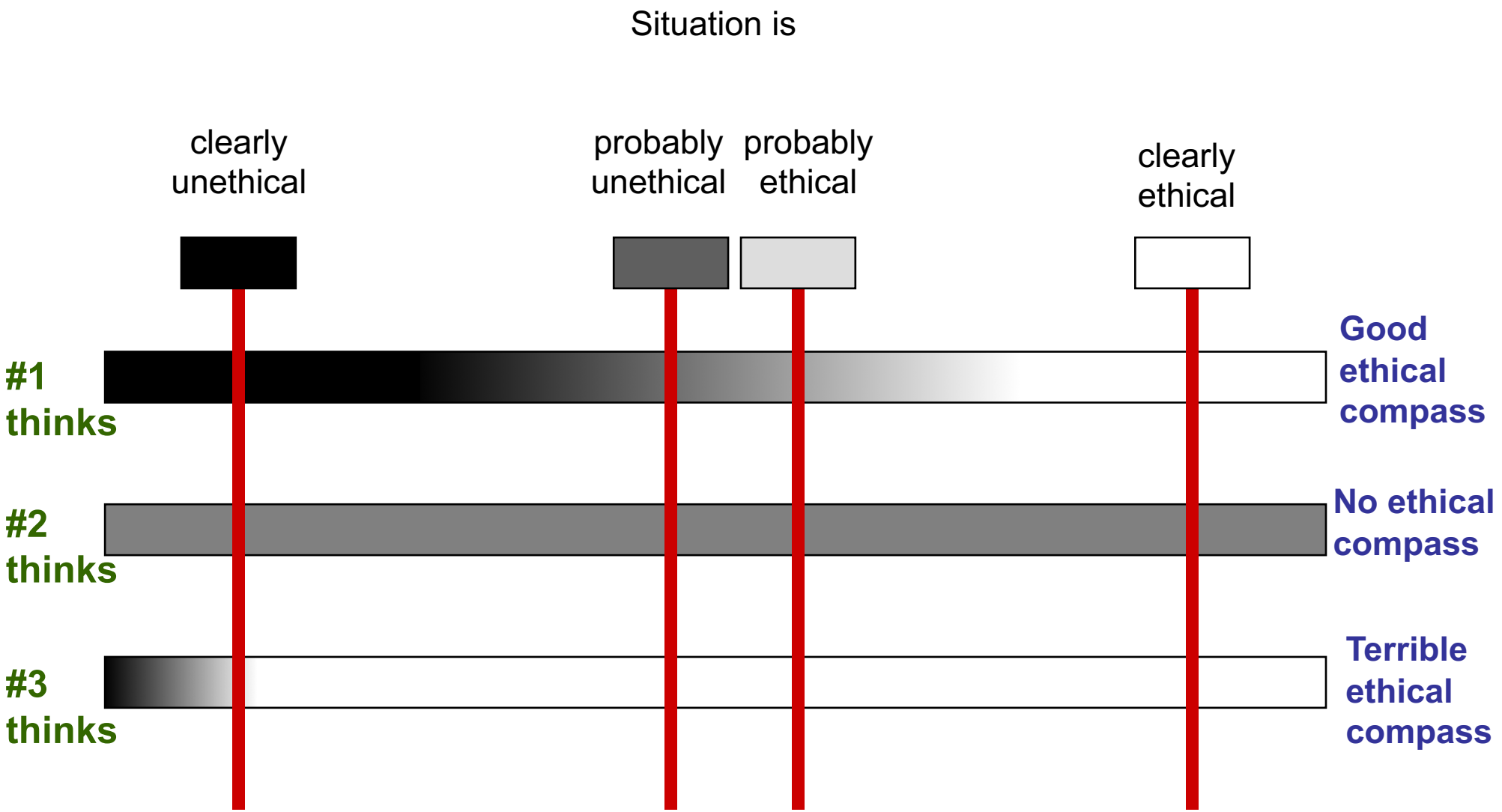
Why Do This?


Situation is
clearly unethical
probably unethical
probably ethical
clearly ethical
#1 thinks
Good ethical compass

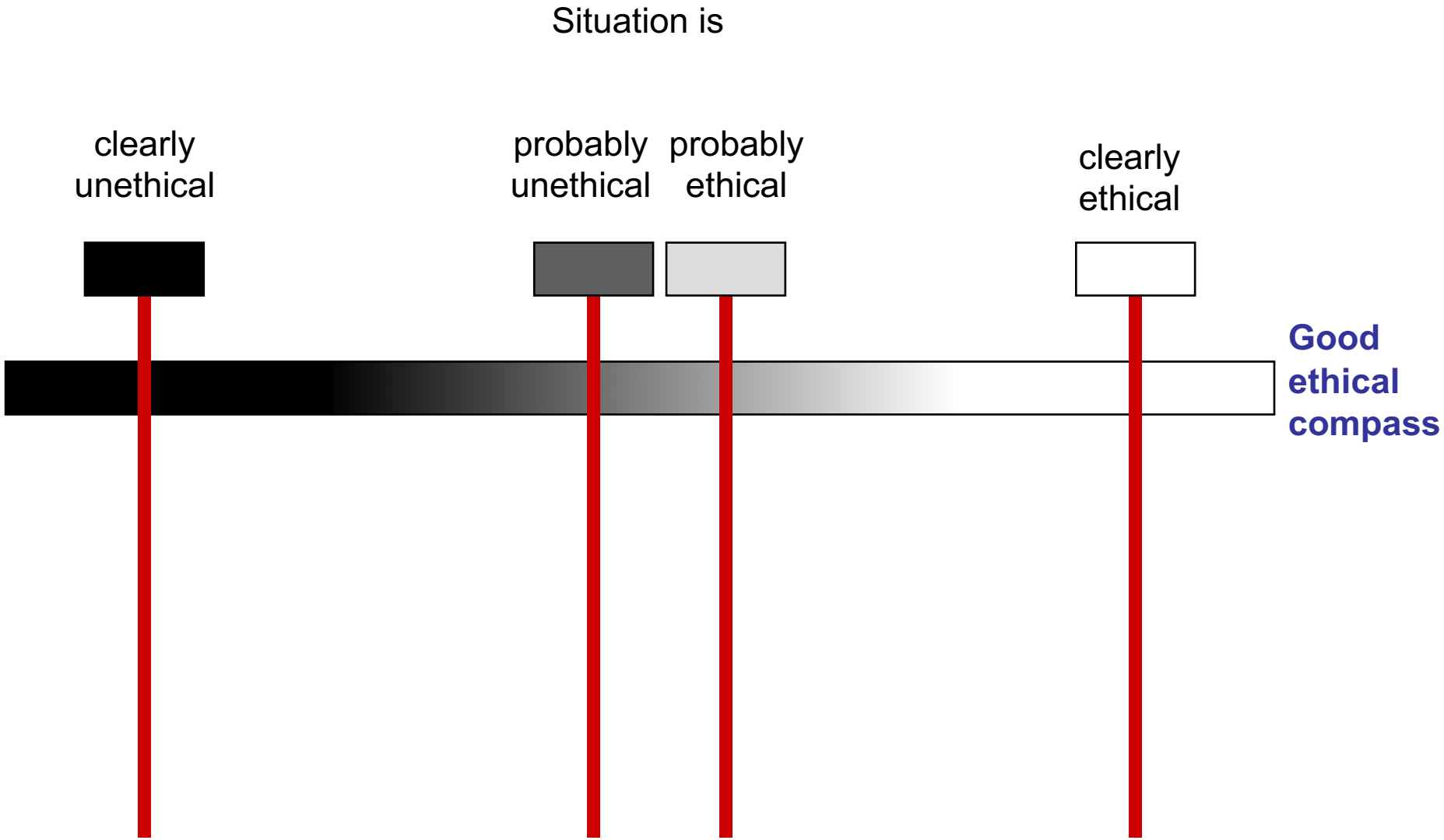
Why Do This?


Situation is
clearly unethical
probably unethical
probably ethical
clearly ethical
#1 thinks
Good ethical compass
#2 thinks
No ethical compass

Why Do This?

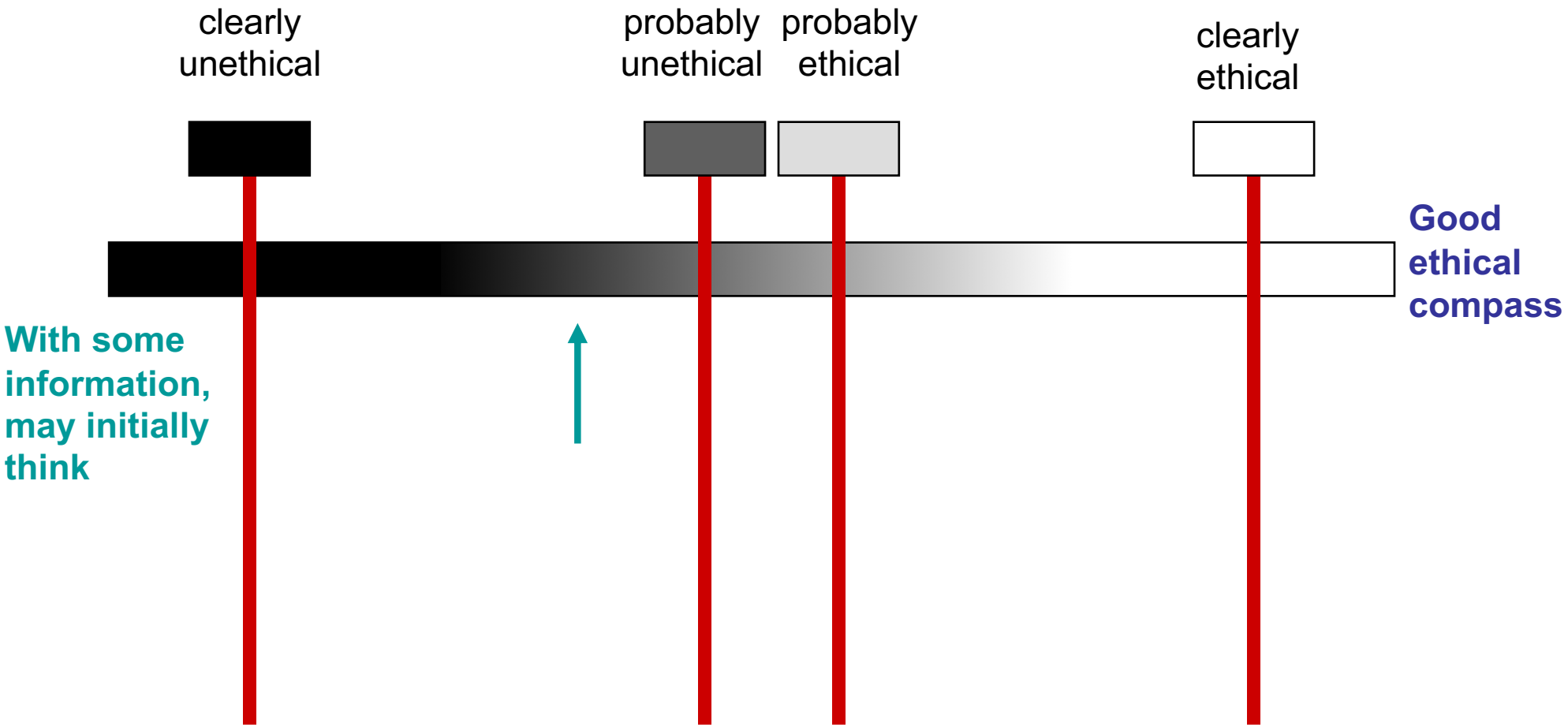

Situation is
clearly unethical
probably unethical
probably ethical
clearly ethical
#1 thinks
Good ethical compass
#2 thinks
No ethical compass
#3 thinks
Terrible ethical compass

Why Do This?

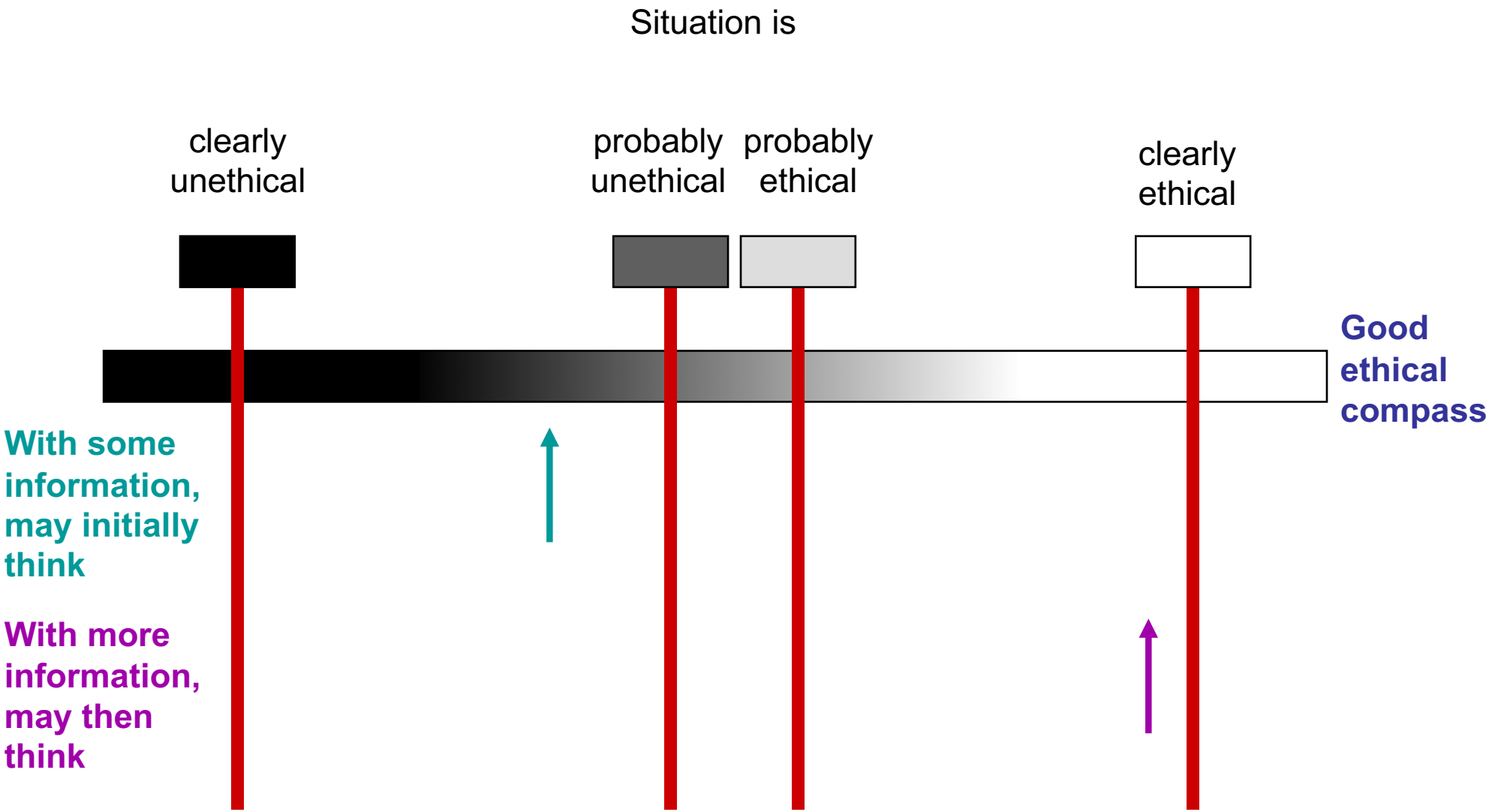

Situation is
clearly unethical
probably unethical
probably ethical
clearly ethical
Good ethical compass

Why Do This?

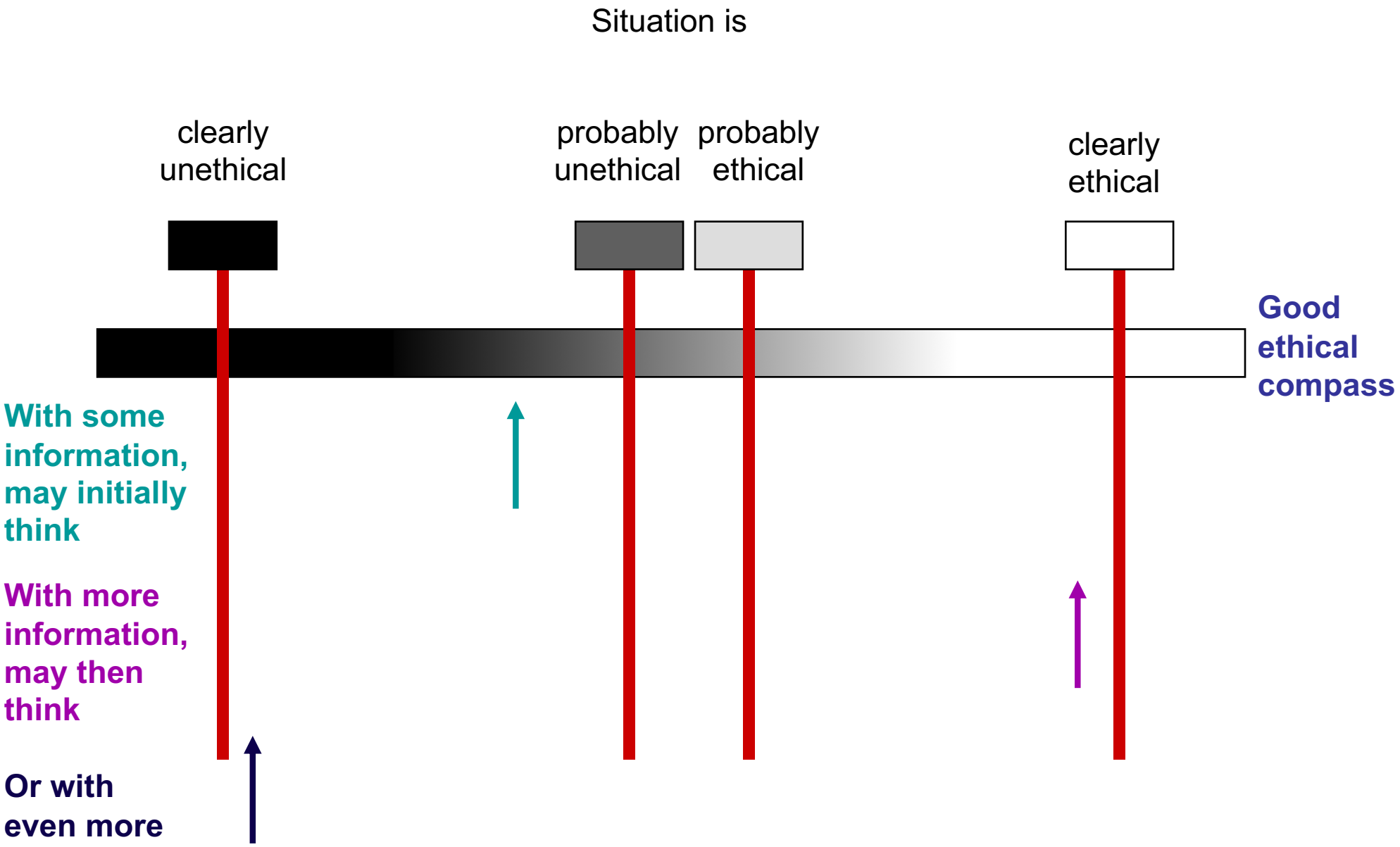
Situation is



Why Do This?


Situation is
clearly unethical
probably unethical
probably ethical
clearly ethical
Good ethical compass
With some information, may initially think
With more information, may then think

Why Do This?


Situation is
clearly unethical
probably unethical
probably ethical
clearly ethical
Good ethical compass
With some information, may initially think
With more information, may then think
Or with even more

What can we accomplish in two hours?

Get all to start thinking about ethics.
This translates from professional conduct of research to all career choices.

Can we change the ethics of the unethical?

Perhaps usually not, but we can make some of them fearful of committing unethical acts because of the consequences.

Method: Discuss Case Histories

Case synopses are online at http://www.columbia.edu/~iph1/

- some are referenced
- some come from personal knowledge or from others
- many of the more outrageous ones are based on real events

See references cited in the online information

- Columbia University

  Institutional Policy on Misconduct in Research, February 3, 2006
  http://www.columbia.edu/research/index.html
  Research Misconduct: Responsible Conduct of Research
  http://ccnmtl.columbia.edu/projects/rcr/rcr_misconduct/foundation/index.html

- On Being A Scientist: Responsible Conduct In Research,

  National Academy Press, 1995 and 2009

  - received by all incoming doctoral track APAM graduate students

  - http://www.nap.edu/readingroom/books/obas/

- See https://ori.hhs.gov https://ori.hhs.gov/research-misconduct-0

- List of scientific misconduct incidents – Wikipedia

- Plastic Fantastic: How the Biggest Fraud in Physics Shook the Scientific World, Eugenie Samuel Reich (Macmillan Science) 2009. Jan Hendrik Schön

Method: Discuss Case Histories

On Being A Scientist: Responsible Conduct In Research,
National Academy Press, 1995 and 2009

- received by all incoming doctoral track APAM graduate students

- http://www.nap.edu/readingroom/books/obas/

1995

* Introduction
  * The Social Foundations of Science
  * Experimental Techniques and the Treatment of Data
  * Values in Science
  * Conflicts of Interest
  * Publication and Openness
  * The Allocation of Credit
  * Authorship Practices
  * Error and Negligence in Science
  * Misconduct in Science
  * Responding to Violations of Ethical Standards
  * The Scientist in Society
  * Bibliography
  * Appendix: Discussion of Case Studies

2009

Advising and Mentoring
The Treatment of Data
Mistakes and Negligence
Research Misconduct
Responding to Suspected Violations of Professional Standards
Human Participants and Animal Subjects in Research
Laboratory Safety in Research
Sharing of Research Results
Authorship and the Allocation of Credit
Intellectual Property
Competing Interests, Commitments, and Values
The Researcher in Society

The Advantage of this Approach: Theory vs. Practice

Answering questions correctly on an ethics exam

vs.

What you actually do

The Advantage of this Approach: Theory vs. Practice

Answering questions correctly on an ethics exam

vs.

What you actually do

What you should do

vs.

What you can do (and get away with)

Raising Ethical Issues

When is an issue an ethical one?

When is it just an honest mistake or misunderstanding or a legitimate difference in opinion?

When is it sloppiness, which is itself unprofessional if it is deemed to be “reckless’?

When is it just a matter of style or local convention?

When is an issue minor or trivial and when is it major and significant-and worth following up on?

When is something a fraud or hoax, and when is the issue really difficult scientific reproducibility?

Raising Ethical Issues

When is an issue an ethical one?

When is it just an honest mistake or misunderstanding or a legitimate difference in opinion?

When is it sloppiness, which is itself unprofessional if it is deemed to be “reckless’?

When is it just a matter of style or local convention?

When is an issue minor or trivial and when is it major and significant-and worth following up on?

When is something a fraud or hoax, and when is the issue really difficult scientific reproducibility?

Some “checks and balances” are in place to alleviate unethical situations, but they are not perfect!

How to Identify, Understand, and Resolve Ethical Issues?

Talk to:

Colleagues

Advisor

Department Chair

Department Conciliators

Office of Research Compliance and Training

Ombud's Office

Underlying "Reasons" for Unethical Actions

- Good old-fashioned **greed**
- **Rewards could outweigh the risks**
    - **especially if not caught**
    - not wrong if not caught
    - my family comes first
- **Easier and faster to cut corners** (skip work, copy, plagiarize, cheat)
- **Easier to ask for forgiveness than permission**
- **All's fair in love, war, and my work**
    - want to get ahead at all costs
- **Special circumstances** for a given case
    - more important than ethics in this case
- **Organizational pressures**
- **Ignorance** of the ethical, moral or legal standards

Underlying "Reasons" for Unethical Actions

- Good old-fashioned **greed**
- **Rewards could outweigh the risks**
    - **especially if not caught**
    - not wrong if not caught
    - my family comes first
- **Easier and faster to cut corners** (skip work, copy, plagiarize, cheat)
- **Easier to ask for forgiveness than permission**
- **All's fair in love, war, and my work**
    - want to get ahead at all costs
- **Special circumstances** for a given case
    - more important than ethics in this case
- **Organizational pressures**
- **Ignorance** of the ethical, moral or legal standards

Maybe before, but NOT after this seminar!

The Normative Ethics
(The Study of Ethical Action)

Contentment and serenity (Stoicism)

Maximum pleasure and minimum pain (Hedonism)

Prudently-attained pleasure is virtue (Epicureanism)

Consequences of the action, with ends justifying means (Consequentialism)

Greatest happiness to the greatest number (Bentham, Mills; Utilitarianism)

Follow the acts (rules, duties), not consequences; Do unto others as they would have done unto you (Kant; Deontology)

Follow social consequences (not consequences, duty) (Pragmatic Ethics)

Impact on community and family (Role Ethics)

Equal liberties, fairness, opportunities for all (Social Justice; John Rawls)

Lawrence Kohlberg's Stages of the Moral Development of (Many) People

Judge morality of an action by its direct consequences (Children and some adults)

1. Obedience and Punishment: *How can I avoid punishment?*
2. Self-interest: *What's in it for me?*

Judge morality by comparing them to society's views and expectations (Adolescents and some adults)

3. Interpersonal accord and conformity: *Social norms*, *Be a good boy/girl attitude to live up to expectations*
4. Authority and social-order maintenance: *Law and order morality*

An individual's own moral perspective may take precedence over society's view (Many, but not all adults)

5. Laws are social contract and not edicts: *Need to be changed when they do not meet general welfare, by majority decision and compromise*
6. Universal ethical principles: *Principled conscience, laws must be grounded in justice, must view interactions with others as "in their shoes"*

Wikipedia

Normative Ethics and the Highest Levels in the Kohlber Development

are used in

Applied Ethics

(What a Person Must Do in a Given Situation)

which is our main focus here

There are different competing interests

and different ways to present and address them

The Ethical Matrix: An Assessment Tool

Interests of stakeholders vs. guiding principle (tool of Ben Mepham)

Radioactive waste management facility siting	Autonomy	Justice	Wellbeing
Government institutions	Authority of elected officials	Build partnerships and sharing authority	Adopting strategies to lower risk to the aggregate population
Nuclear industry	Freedom to generate nuclear-powered electricity	Benefits of ensuring electricity production outweigh risks/costs to public	Reduce risks to communities, future generations, workers, and the environment
Host community	Self determinism	Receiving compensation	Having protection from risks. Long-term socio-economic stability. Freedom from social stigma
Future generations	Freedom to adopt better future waste solutions	Better living than for current generations	Continuing unhindered access to resources
The environment	Represent non-human interests	Ensuring equal value of humans and nonhumans	Maintaining biodiversity, prevent ecosystem degradation and resources depletion

Adapted from “Evaluating the 'Ethical Matrix' as a Radioactive Waste Management Deliberative Decision-Support Tool”, Matthew Cotton, Environmental Values, Volume 18, Number 2, May 2009, pp. 153-176(24)

Professional Ethics – IEEE Code of Ethics

We, the members of the IEEE, in recognition of the importance of our technologies in affecting the quality of life throughout the world, and in accepting a personal obligation to our profession, its members and the communities we serve, do hereby commit ourselves to the highest ethical and professional conduct and agree:

1. to accept responsibility in making decisions consistent with the safety, health, and welfare of the public, and to disclose promptly factors that might endanger the public or the environment;
2. to avoid real or perceived conflicts of interest whenever possible, and to disclose them to affected parties when they do exist;
3. to be honest and realistic in stating claims or estimates based on available data;
4. to reject bribery in all its forms;
5. to improve the understanding of technology; its appropriate application, and potential consequences;
6. to maintain and improve our technical competence and to undertake technological tasks for others only if qualified by training or experience, or after full disclosure of pertinent limitations;
7. to seek, accept, and offer honest criticism of technical work, to acknowledge and correct errors, and to credit properly the contributions of others;
8. to treat fairly all persons and to not engage in acts of discrimination based on race, religion, gender, disability, age, national origin, sexual orientation, gender identity, or gender expression;
9. to avoid injuring others, their property, reputation, or employment by false or malicious action;
10. to assist colleagues and co-workers in their professional development and to support them in following this code of ethics.

http://www.ieee.org/about/corporate/governance/p7-8.html

(Evolving) Codes of Ethics in Other Technical Areas: Artificial Intelligence Code of Ethics

OREN ETZIONI

Sept. 1, 2017 https://www.nytimes.com/2017/09/01/opinion/artificial-intelligence-regulations-rules.html

Evolving from Isaac Asimov's laws of robotics:

1. "An A.I. system must be subject to the full gamut of laws that apply to its human operator. "

2. "An A.I. system must clearly disclose that it is not human."

3. "An A.I. system cannot retain or disclose confidential information without explicit approval from the source of that information."

Partnership on AI: Tenets

https://www.partnershiponai.org/tenets/

"We believe that artificial intelligence technologies hold great promise for raising the quality of people's lives and can be leveraged to help humanity address important global challenges such as climate change, food, inequality, health, and education.

The Partnership on AI shares the following tenets:

1. We will seek to ensure that AI technologies benefit and empower as many people as possible. …
2. We will educate and listen to the public and actively engage stakeholders to seek their feedback on our focus, inform them of our work, and address their questions.
3. We are committed to open research and dialogue on the ethical, social, economic, and legal implications of AI." …

Some ethical expectations may change with time,
some may be judged in hindsight with
expectations that evolved later,
some may border on the gray area.
We will avoid these possibilities today.

Often, “when there is smoke, there is also fire.”

But, sometimes people rush to judgment with little substantive evidence.

Some may be judged improperly and falsely accused of being unethical.
Things may not always be what they seem to be.

Research and Research Papers

Should be *Original*: New findings, insights of potential impact

Must be *Correct* to the best of your knowledge with **no data fabrication, data falsification, or plagiarism** (with good controls; following proper procedures; careful, thorough) **Sometimes-used limited-view of Responsible Conduct of Research**

Must be *Reproducible* (ability to reproduce exactly, and build on the results)

Should be *Well Written*

Cite previous work and methods that are relevant and **that you used**

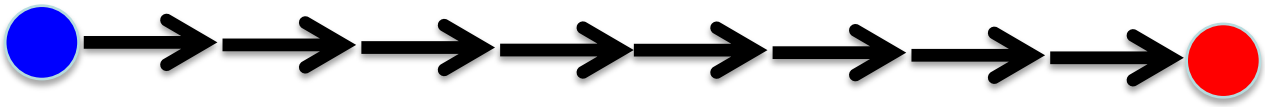
Present all relevant data and results, all of which must have been obtained legitimately (no falsification, fabrication, removing outliers, "cherry picking")

Author list must be "proper," authors must approve of the submitted paper; can also acknowledge those of 'lesser contribution'

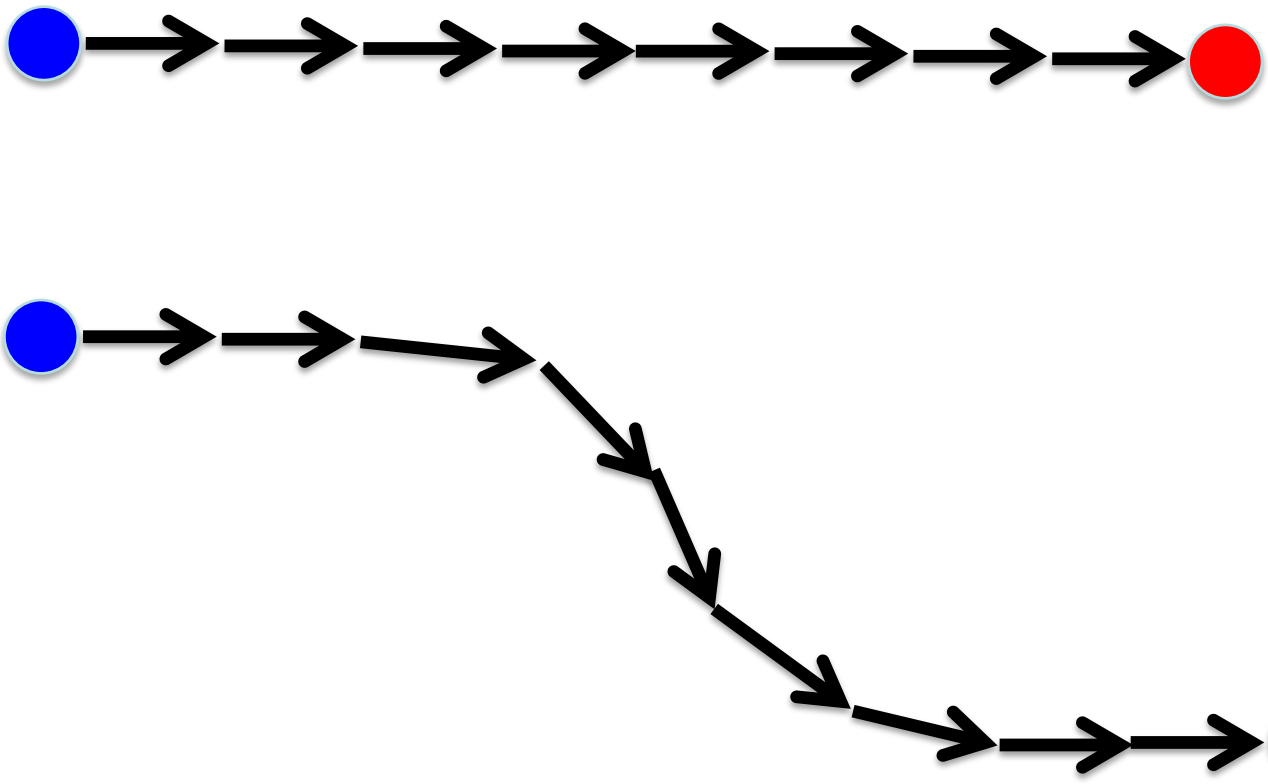
It is plagiarism if you copy anything (including introductory material or framework) from another paper (must cite; can quote in quote marks—but extensive quoting makes for a bad paper)

Cannot submit same work for publication to more than one journal

Research Plan

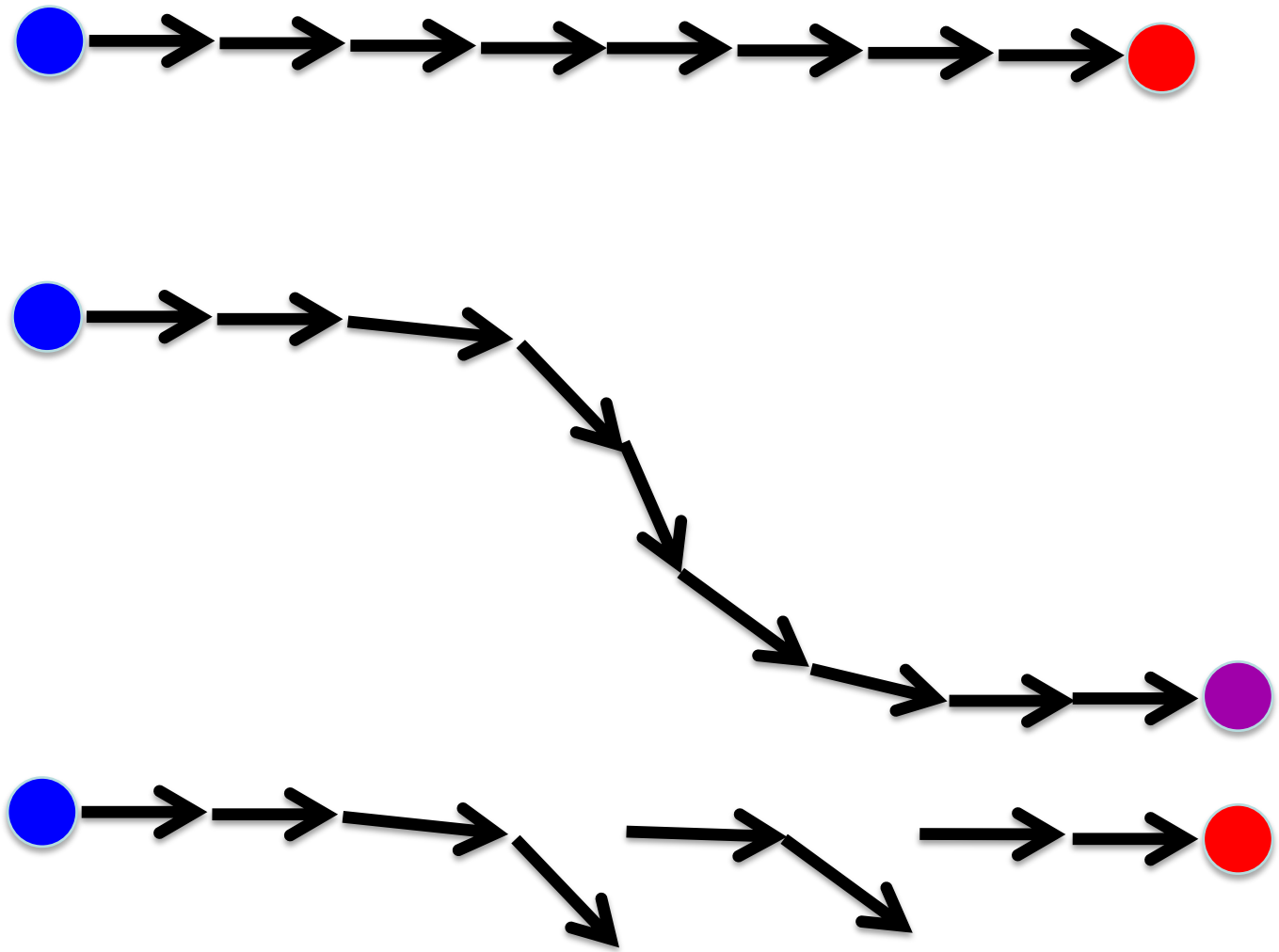


Research Plan



Common course of research.

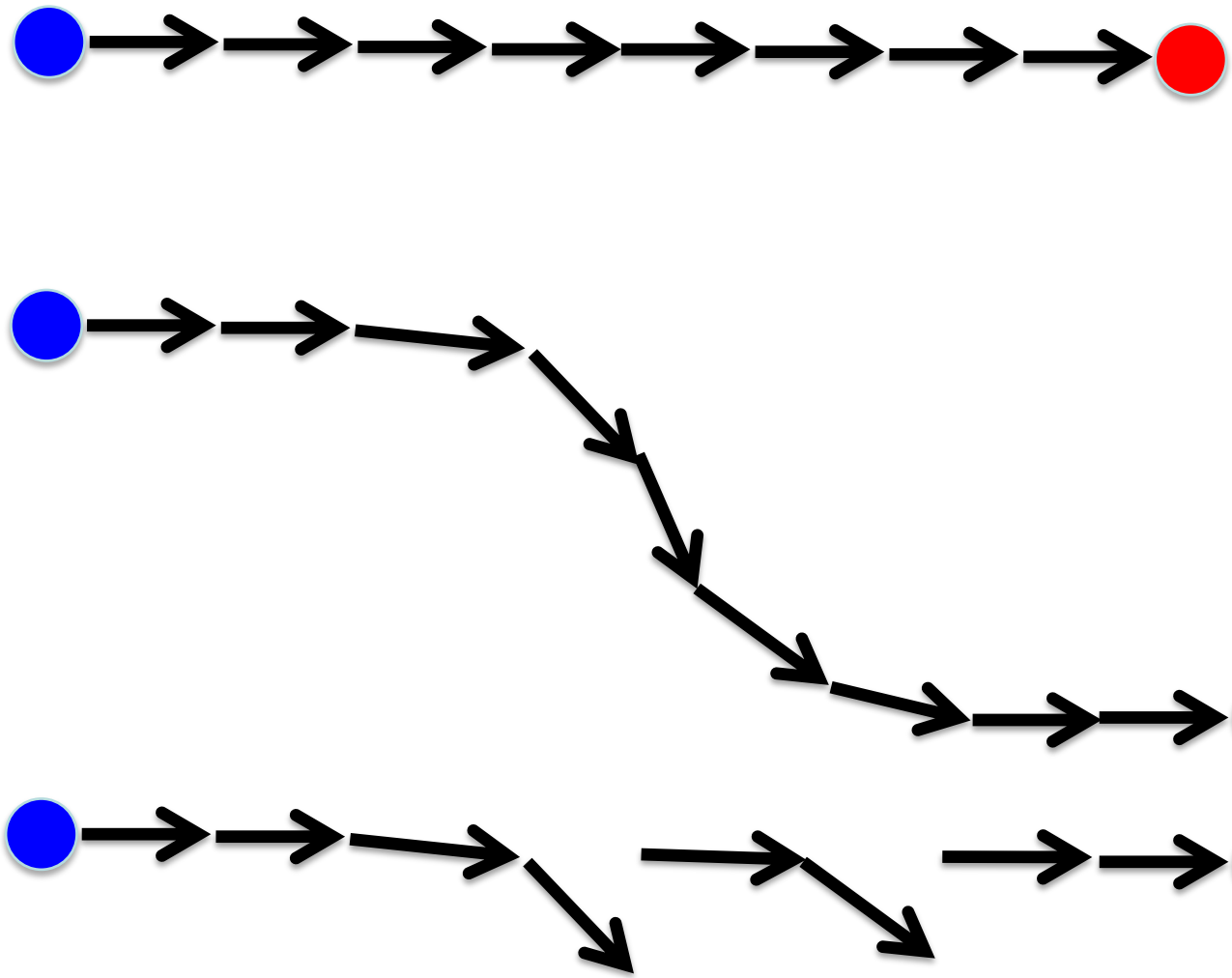
Research Plan



Common course of research.

Fudging data/unethical research.

Research Plan

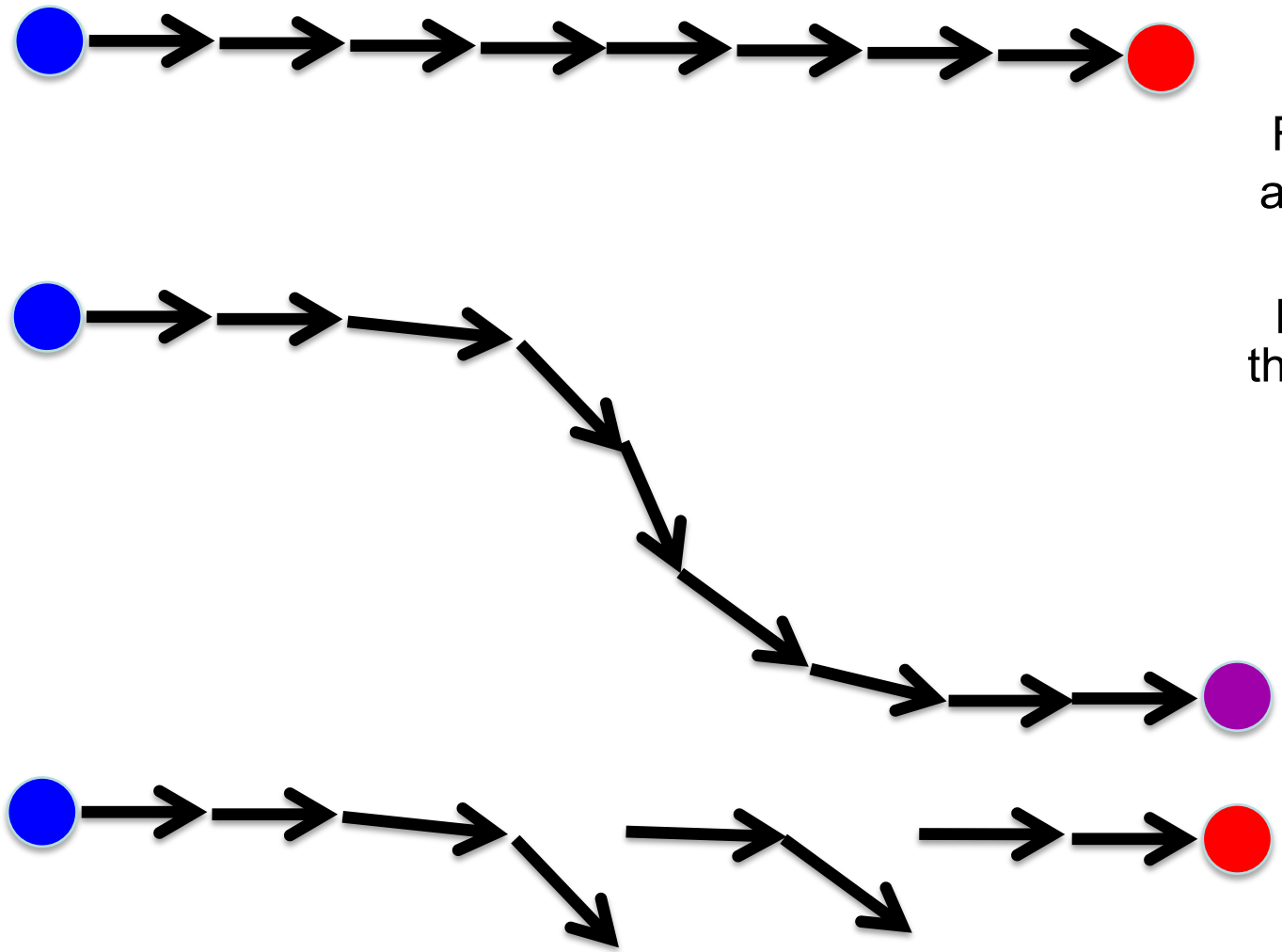


When should you stick to this unchanging plan?

Common course of research.

Fudging data/unethical research.

Research Plan

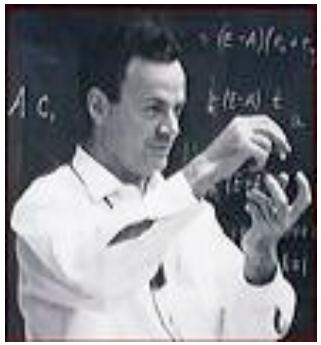


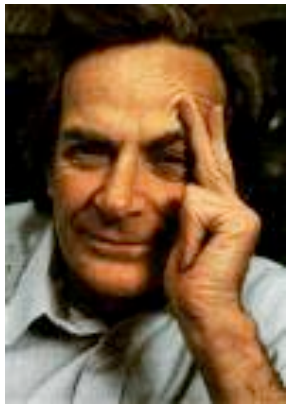
When should you stick to this unchanging plan?

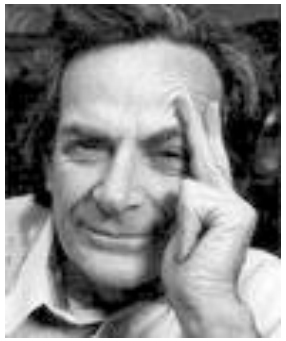
For hardcore engineering and medical (translational) testing of products/procedures, but there even even exceptions here.

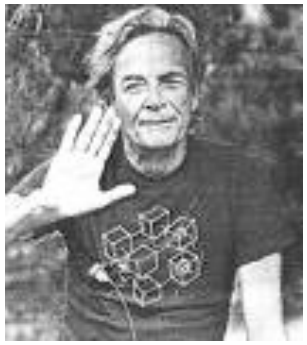
Common course of research.

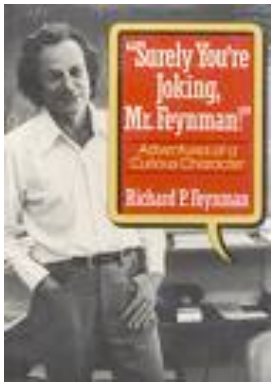
Fudging data/unethical research.



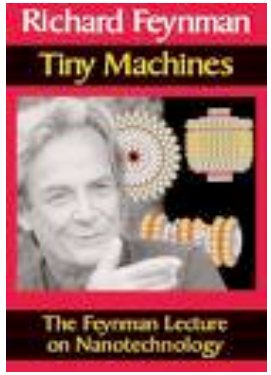







"Surely You're Joking, Mr. Feynman!"
Richard P. Feynman


RICHARD FEYNMAN
Tiny Machines


Richard Feynman
Tiny Machines
The Feynman Lecture on Nanotechnology

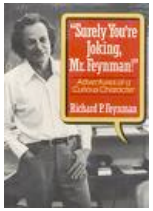
From the book: Surely You're Joking, Mr. Feynman!, by Richard Feynman

…For example, **if you're doing an experiment, you should report everything that you think might make it invalid--not only what you think is right about it:** other causes that could possibly explain your results; and things you thought of that you've eliminated by some other experiment, and how they worked--to make sure the other fellow can tell they have been eliminated.

Details that could throw doubt on your interpretation must be given, if you know them. You must do the best you can--if you know anything at all wrong, or possibly wrong--to explain it. **If you make a theory, for example, and advertise it, or put it out, then you must also put down all the facts that disagree with it, as well as those that agree with it.** …

We've learned from experience that the truth will come out. Other experimenters will repeat your experiment and find out whether you were wrong or right. Nature's phenomena will agree or they'll disagree with your theory. **And, although you may gain some temporary fame and excitement, you will not gain a good reputation as a scientist if you haven't tried to be very careful in this kind of work.**

In summary, the idea is to **give all of the information to help others to judge the value of your contribution; not just the information that leads to judgement in one particular direction or another.**



Throwing Out “Bad” Data

A student finds the reaction rates for eight of the ten solvents tested fall on a straight line versus solvent polarity, while those for the other two fall way above the line, and wonders whether those two deviant points should be plotted, ignored because they do not match expectations, or remeasured (either those two solvents alone or all ten of them again). What should he/she do? [Kovac]

Reporting Your Results

A researcher measures a (very good) conversion efficiency of 20% for a process sometimes, but usually measures 2%, and wants to publish a paper giving the 20% value. What should he/she do?

A researcher measures a (very good) conversion efficiency of 20% for a process sometimes, but usually measures 2%, and wants to submit a proposal for more funding on this work and wants to use the 20% value to promote the work. What should he/she do?

A researcher measures a (very good) conversion efficiency of 20% for a process sometimes, but usually measures 2%, and wants to use the 20% value in a progress report to the agency that is funding the work. What should he/she do?

Data and Papers

A scientist has data that are central to the paper but that do not look very convincing, so he/she wonders if it would be okay to summarize them in the main text and show the data only in the supplemental information, because the supplemental information is officially considered part of the paper. What should he/she do?

A scientist has micrographs of samples that are central to analysis in the paper but that do not look very convincing, so he/she wonders if it would be okay to present idealized diagrams of them in the main text and show the real micrographs only in the supplemental information, which is officially considered part of the paper. What should he/she do?

A scientist wants to make a more convincing case about the novelty of his work, and wonders if it would be okay to discuss the related prior work mostly or only in the supplemental information, which is officially considered part of the paper, so it may be overlooked by the reviewers. What should he/she do?

Do Digitally Altered Photos Represent Fact or Fiction?

http://www.wsj.com/articles/do-digitally-altered-photos-represent-fact-or-fiction-1470940019 Wall Street Journal
By ELLEN GAMERMAN Aug. 11, 2016 2:27 p.m. ET ILLUSTRATION: STEPHEN WEBSTER

Famous photo of Churchill, Roosevelt, and Stalin in February, 1945 at Yalta

Do Digitally Altered Photos Represent Fact or Fiction?

http://www.wsj.com/articles/do-digitally-altered-photos-represent-fact-or-fiction-1470940019 Wall Street Journal
By ELLEN GAMERMAN Aug. 11, 2016 2:27 p.m. ET ILLUSTRATION: STEPHEN WEBSTER

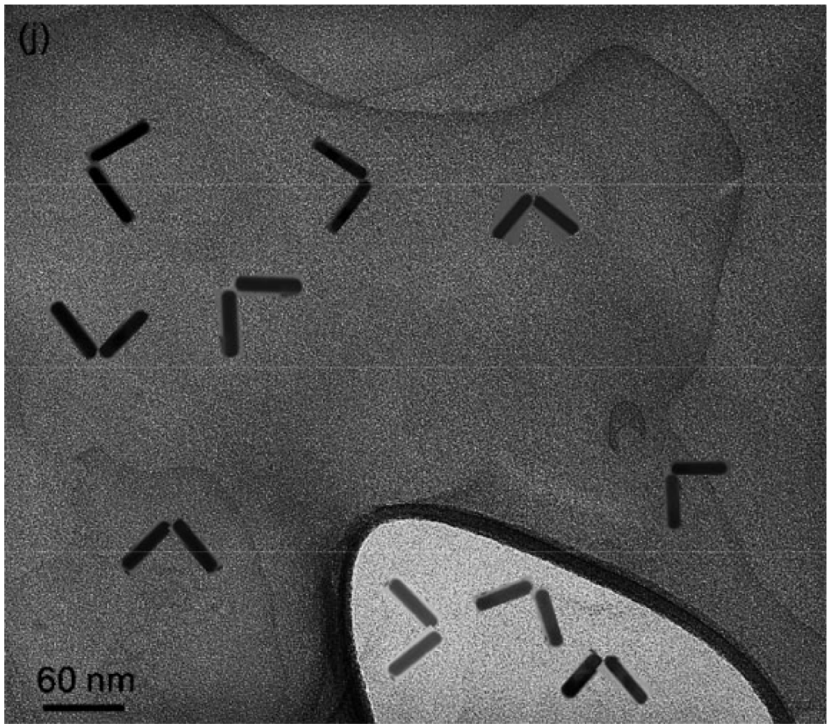
Famous photo of Churchill, Roosevelt, and Stalin in February, 1945 at Yalta

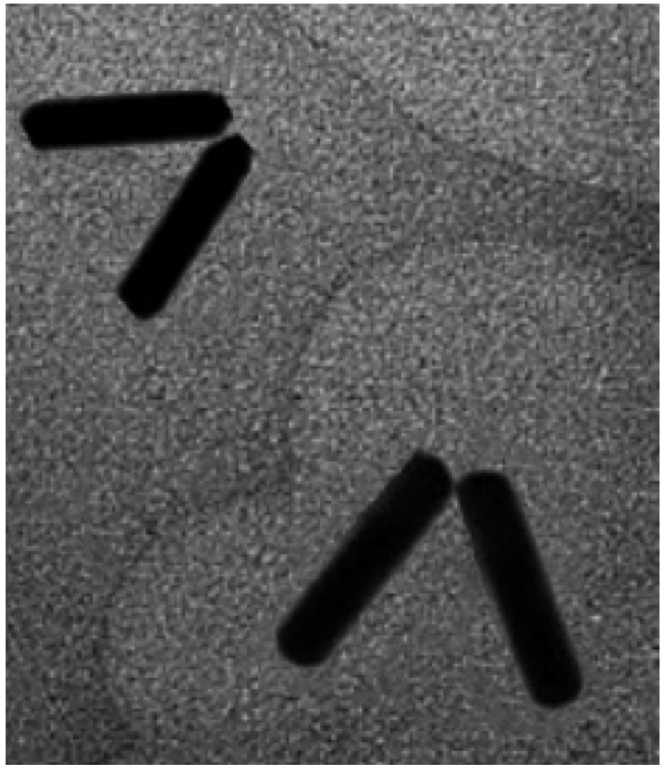
Fudging TEMs

Some VERY Suspicious TEM Images in Nano Letters
August 14th, 2013
http://blog.chembark.com/2013/08/14/some-very-suspicious-tem-images-in-nano-letters/

"Mitch at Chemistry-Blog has a new post about a set of very suspicious TEM images that was published recently in the journal Nano Letters.

The associated paper reports the fabrication of pairs of gold nanorods in "chopstick" structures where the two rods touch at their tips and form an angle that the authors say they can tune. Some of the TEM data can be viewed for free in the associated SI file. If you zoom in on the images, it appears that the background immediately around many of the rods is different from the rest of the background field. Hmmm…"

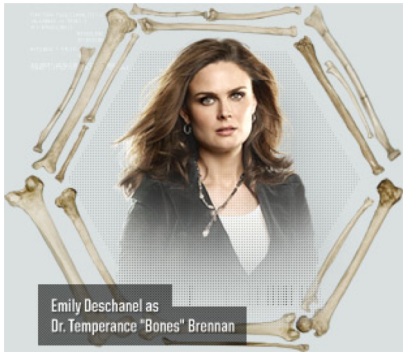




TV Show Episode Plots That Address Professional Ethics Lapses

Leave it to Beaver (1958)
plagiarism

House (2006)
publication ethics



Bones (2012)
conflict of interest

Death in Paradise (2013)
authorship, plagiarism

The Ethics Violator: Theodore Beaver Cleaver

But is he the only ethics violator?

“Leave it to Beaver”

Original Air Date:

2 October 1958 (Season 2, Episode 1; Episode 40 overall)

***Beaver's Poem* (1958) or**

Ethics Violation in the Third Grade

The Cleavers

Wally

June

Ward

Beaver
aka the Beave
aka Theodore

http://www.leaveittobeaver.org/ http://www.imdb.com/title/tt0827858/

http://en.wikipedia.org/wiki/Leave_It_to_Beaver_%28season_2%29

The scene of the ethics violation.

Beaver needs to write a poem for a school assignment.

Ward writes the poem when Beaver goes to bed.

The next day, Wally announces Beaver has been chosen to read his poem in assembly and will be given an award.

Sue Randall as Miss Landers

What should happen?

Ward and June discourage Beaver from accepting an award for a poem he didn't write.

What should happen?

Ward talks to Mrs. Rayburn who decides to give Beaver another chance to write a poem.

Doris Packer as Mrs. Cornelia Rayburn (the Principal)

“House”

The Players
(M.D.s, not Ph.D.s)

http://www.fox.com/house/

SLEEPING DOGS LIE
Aired **4/18/06, Season 2, Episode 218,** http://www.fox.com/house/recaps/218.htm

http://www.televisionwithoutpity.com/articles/content/a11906/

The Conflict

I am very angry. I wrote a manuscript about our case. It sat on House's desk for months waiting his approval. I gave Foreman my notes about the case when he asked for them, and he knew I was writing an article based on them. Now I have just learned that he wrote an article about our case with my notes, House approved it, and now it has been submitted to journal, and published by him.

The Response

The Response

The Resolution

(On the verge of dying in a later episode--he really doesn't die) I'm sorry, I shouldn't have stolen your article.

The Resolution

(On the verge of dying in a later episode--he really doesn't die) I'm sorry, I shouldn't have stolen your article.

(When Foreman is dying) I don't accept your apology.

(When Foreman is on the verge of death) I accept your apology.

What do you think?

Who is at fault?

All Are Wrong

All are wrong, but some were more wrong than others

- Cameron is the least wrong

Should have been only 1 paper with all as authors (if all contributed)

- maybe “medical community” standards are different (no)

Foreman using her notes is wrong

- accentuated by his knowledge of “her” article

Boss (House) made a mess

- didn’t care at all about any of this

The Rush to Fame

A scientist claims credit for discovering an effect because his/her paper announcing it was published first, but someone else with a very similar paper also claims credit because he/she submitted his own paper first. What should he/she do?

A doctoral student learns just before he/she submits his/her dissertation that someone else has published the same work and wonders whether his/her thesis will still be accepted. What should he/she do?

Advisor Wants to Make a Joke

A graduate student is upset because his/her famous advisor wants to add a third (also famous) author to the paper, who never worked on the project at all, because the author list would then be humorous, but he/she objects because all would think the work was done by the two famous scientists and not by him/her. What should he/she do?

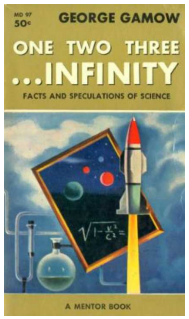
PHYSICAL REVIEW VOLUME 73, NUMBER 7 APRIL 1, 1948

The Origin of Chemical Elements

R. A. ALPHER*
Applied Physics Laboratory, The Johns Hopkins University, Silver Spring, Maryland

AND

"Almost" Nobel Prize in Physics, 1978



G. GAMOW
The George Washington University, Washington, D. C.

February 18, 1948

PHYSICAL REVIEW VOLUME 73, NUMBER 7 APRIL 1, 1948

"Almost" Nobel Prize in Physics, 1978

The Origin of Chemical Elements

R. A. ALPHER*
Applied Physics Laboratory, The Johns Hopkins University, Silver Spring, Maryland

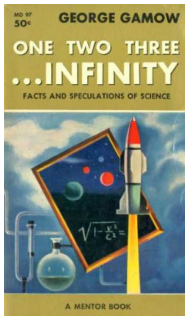
AND

H. BETHE
Cornell University, Ithaca, New York

AND

G. GAMOW
The George Washington University, Washington, D. C.

February 18, 1948



PHYSICAL REVIEW VOLUME 73, NUMBER 7 APRIL 1, 1948

The Origin of Chemical Elements

R. A. ALPHER*
Applied Physics Laboratory, The Johns Hopkins University, Silver Spring, Maryland

AND

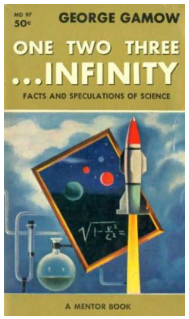
H. BETHE
Cornell University, Ithaca, New York

AND

G. GAMOW
The George Washington University, Washington, D. C.

February 18, 1948

"Almost" Nobel Prize in Physics, 1978



Nobel Prize in Physics, 1967

PHYSICAL REVIEW VOLUME 73, NUMBER 7 APRIL 1, 1948

The Origin of Chemical Elements

R. A. ALPHER*
Applied Physics Laboratory, The Johns Hopkins University, Silver Spring, Maryland

AND

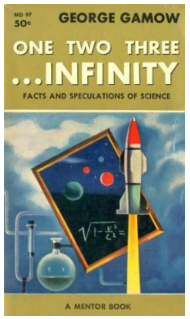
H. BETHE
Cornell University, Ithaca, New York

AND

G. GAMOW
The George Washington University, Washington, D. C.

February 18, 1948

"Almost" Nobel Prize in Physics, 1978



Nobel Prize in Physics, 1967

The famous αβγ paper.

PHYSICAL REVIEW VOLUME 73, NUMBER 7 APRIL 1, 1948

The Origin of Chemical Elements

R. A. ALPHER*
Applied Physics Laboratory, The Johns Hopkins University, Silver Spring, Maryland

AND

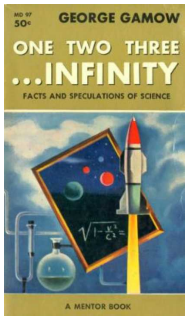
H. BETHE
Cornell University, Ithaca, New York

AND

G. GAMOW
The George Washington University, Washington, D. C.

February 18, 1948

"Almost" Nobel Prize in Physics, 1978



Nobel Prize in Physics, 1967

The famous αβγ paper.

Gamow humorously decided to add the name of his friend—the eminent physicist Hans Bethe—to this paper in order to create the whimsical author list of Alpher, Bethe, Gamow, a play on the Greek letter α, β, and γ (alpha, beta, gamma).

Gamow: … (this paper) is often referred to as the 'alphabetical article.' It seemed unfair to the Greek alphabet to have the article signed by Alpher and Gamow only, and so the name of Dr. Hans A. Bethe (*in absentia*) was inserted in preparing the manuscript for print. Dr. Bethe, who received a copy of the manuscript, did not object, and, as a matter of fact, was quite helpful in subsequent discussions. There was, however, a rumor that later, when the alpha, beta, gamma theory went temporarily on the rocks, Dr. Bethe seriously considered changing his name to Zacharias.

Authorship: Who is an Author?-Conventions

A postdoc learns that his/her professor wants to make his friend, a famous person in the field who contributed essentially nothing to the paper, as an author on their paper because it could help the paper being accepted, and thinks this is wrong. What should he/she do?

A scientist learns that in the company he/she just joined it is customary to add lab technicians as authors on papers and thinks this is wrong. What should he/she do?

A scientist learns that in the company he/she just joined it is customary to add department managers as authors on papers and thinks this is wrong. What should he/she do?

First Author in Question

Long after a researcher gave a colleague a great idea, with the understanding that the colleague would do the experiment and (if the results warranted it) write the manuscript and be the first author, the researcher is frustrated because after doing the successful experiment the colleague never wrote the manuscript and now he/she now wants to write the manuscript him/herself and be first author. What should he/she do?

An author on a paper is angry because his/her advisor made another student first author to help that person get a good job, but his/her own contribution was greater. What should he/she do?

First one: The Responsible Conduct of Science, Discussion Materials, Harvard Medical School, 2010

Authorship: Graduated Students

A doctoral student graduates before a paper on his/her work has been written (and has not discussed potential publications with his/her advisor before leaving). How would you (as student and/or advisor) handle each of these scenarios?

The graduated student writes a draft of a manuscript and sends it to his/her advisor.

The graduated student writes and submits a manuscript without informing his/her advisor.

This former student has included the advisor as an author.

The advisor learns of all of this by seeing the paper as "to be published" at a journal site.

The advisor writes a draft of a manuscript and sends it to his/her graduated student.

The graduated student cannot be located.

Alternatively, the graduated student refuses to okay the manuscript.

The advisor writes a draft of a manuscript and uses the same data as taken by this graduated student, but repeated by a new student---and does not include the previous student as an author.

Why the Interest in Seeing the Raw Data?

To see if good records are being kept (**lab book**, etc.)

To understand the nature of the data (signal/noise, …)

To help analyze it (look for trends)

To look for honest mistakes, misinterpretations

To make what is presented is quantitatively accurate ("just the facts"), and displayed data and conclusions are logical and not interpreted by what one would hope to see

To make sure that there is no reckless sloppiness in obtaining the data

To make sure that the data have not been "massaged", cherry-picked, smoothed, and outliers have not been inappropriately removed

To see if anything is "unusual" (fabricated, Schoen)

miraclesone.org

Jan Hendrik Schön; Plastic Fantastic

"Cleaning Up Data" is Bad - Even by the Untrained and Innocent

The Public Trust

- Data manipulation will be detected
  - Reason to believe that Mendel fudged his genetics results

- Need objective rules beforehand to decide what to do with outliers
  - Outliers may lead to discoveries, noise seen by Penzias/Wilson 3 K background-big bang theory

- Improper actions can be far-reaching and long-lasting
  - Robert Slutsky (Radiation, UC San Diego, resigned 1985) fabricated research (citations of his review in Circulation faded faster than for normal article, but still lasted a long time)

- **Scientific fraud can hurt people**
  - **Wakefield data (Lancet, 1998) about link of MMR vaccine to autism was faked, but still influences people and hurts children**

DATA MISUSE AND MANIPULATION: TEACHING NEW SCIENTISTS THAT FUDGING THE DATA IS BAD
Evan D. Morris, Jenna M. Sullivan and Anjelica L. Gonzalez, 2015, **8th International Conference on Ethics in Biology, Engineering & Medicine** (April, 2015)

What is Plagiarism?

The following is directly from http://www.plagiarism.org/plagiarism-101/what-is-plagiarism/

ALL OF THE FOLLOWING ARE CONSIDERED PLAGIARISM:

- turning in someone else's work as your own
- copying words or ideas from someone else without giving credit
- failing to put a quotation in quotation marks
- giving incorrect information about the source of a quotation
- changing words but copying the sentence structure of a source without giving credit
- copying so many words or ideas from a source that it makes up the majority (or much) of your work, whether you give credit or not

Plagiarism?

Applied Physics Letters **404**, 3100 (1999)

Photoluminescence in CdSe Quantum Dots

by G. N. Jones

.....

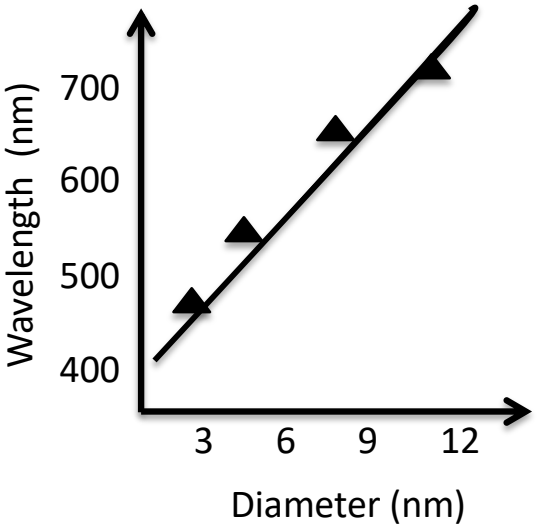


Fig. 2. The photoluminescence of CdSe quantum dots as a function of size.

.....

Your journal publication

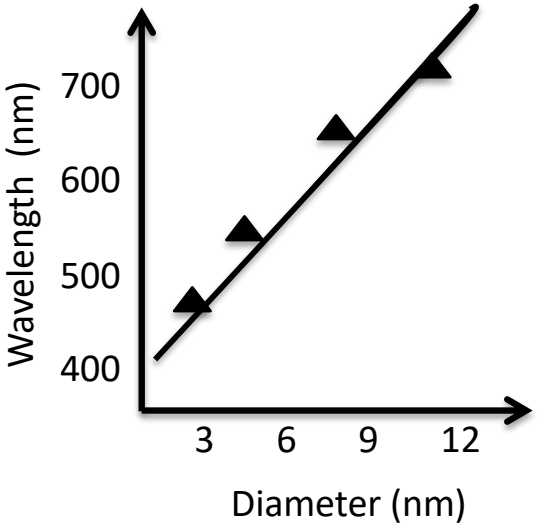


Fig. 8. The photoluminescence of CdSe quantum dots as a function of size.

Plagiarism?

Applied Physics Letters **404**, 3100 (1999)

Photoluminescence in CdSe Quantum Dots

by G. N. Jones

…….

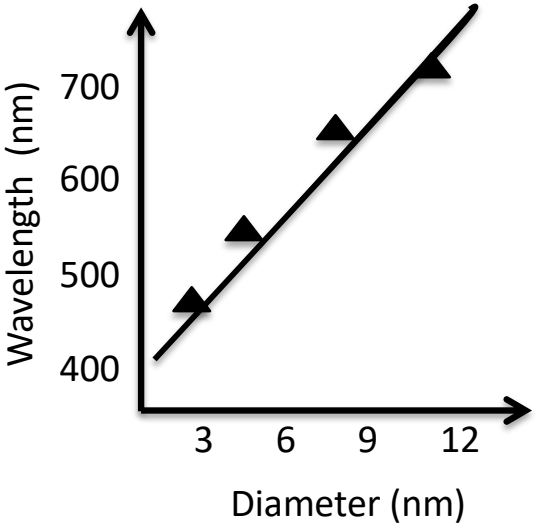


Fig. 2. The photoluminescence of CdSe quantum dots as a function of size.

…….

Your journal publication

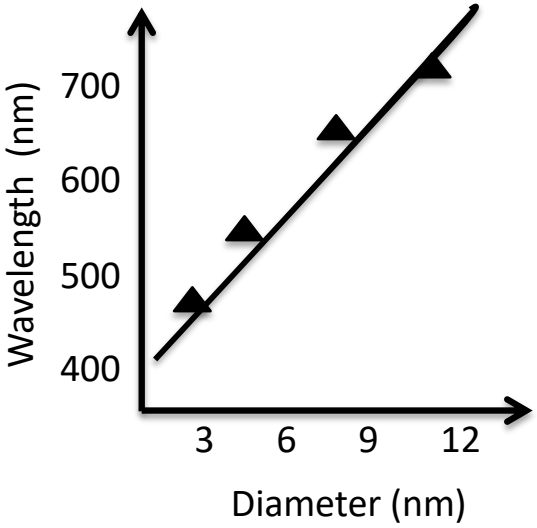


Fig. 8. The photoluminescence of CdSe quantum dots as a function of size.[12]

References

12. G. N. Jones, APL 404, 3100 (1999)

Plagiarism?

Applied Physics Letters **404**, 3100 (1999)

Photoluminescence in CdSe Quantum Dots

by G. N. Jones

.....

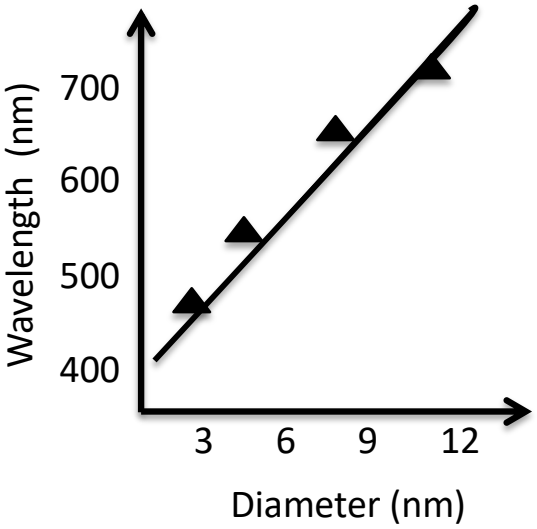


Fig. 2. The photoluminescence of CdSe quantum dots as a function of size.

.....

Your journal publication

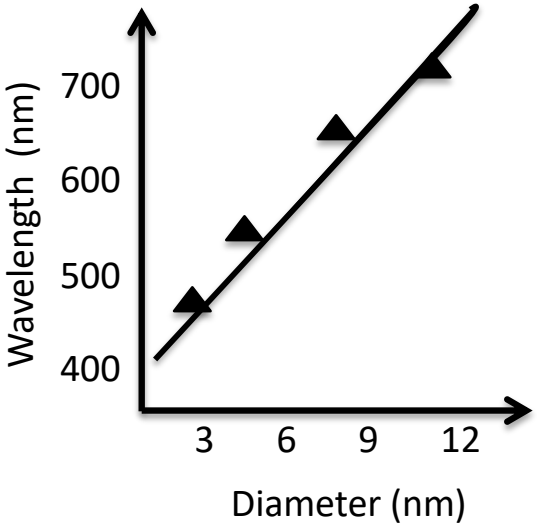


Fig. 8. The photoluminescence of CdSe quantum dots as a function of size.[12] (Used with the permission of the author and publisher.)

References

12. G. N. Jones, APL 404, 3100 (1999)

Plagiarism?

Applied Physics Letters **404**, 3100 (1999)

Photoluminescence in CdSe Quantum Dots

by G. N. Jones

.....

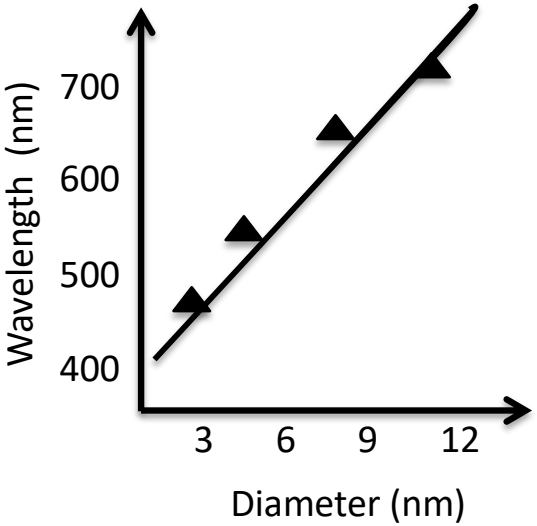


Fig. 2. The photoluminescence of CdSe quantum dots as a function of size.

.....

Your journal publication

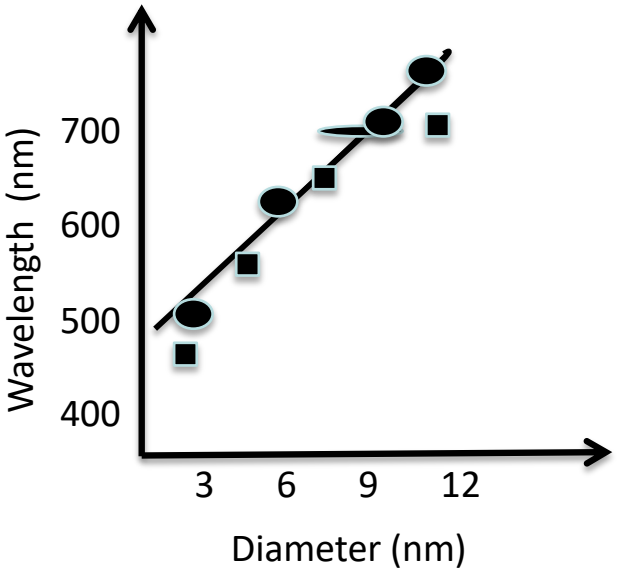


Fig. 8. Comparison of the photoluminescence of CdSe quantum dots in our experiment (ovals) and theory with the data of Ref. 12 (squares), as a function of size.

References

12. G. N. Jones, APL 404, 3100 (1999)

Reviewer Receives Similar Manuscripts to Review

A scientist is asked to review two manuscripts submitted for publication to two different journals at approximately the same time from two different groups at the same institution, that present exactly the same raw data and similar, but not identical analysis. What should he/she do?

Another World – Ethics in Engineering
Engineering Concerns - Pressures

- Make budget
- Make deadline
- Political pressure

- Possibly from managers who may not be engineers or scientists and who may not understand or care

Manufacturing Control and Extrapolation

An organization has purchased a device and wants to operate it at a temperature of 31^{o}F, and asks the manufacturer if this is possible. The manufacturer has tested a temperature-sensitive part in it down to 50^{o}F. What should it do?

An organization has purchased a device and wants to operate it at a temperature of 31^{o}F, and asks the manufacturer if this is possible **and needs a response within hours**. The manufacturer has tested a temperature-sensitive part in it down to 50^{o}F **and is warned by one its engineers that the device should not be expected to work well at 31^{o}F.** What should it do?

An organization has purchased a device and wants to operate it at a temperature of 31^{o}F, and asks the manufacturer if this is possible and needs a response within hours **because of political pressures---and it is known that it wants a positive answer**. The manufacturer has tested a temperature-sensitive part in it down to 50^{o}F and is warned by one its engineers that the device should not be expected to work well at 31^{o}F, **and knows that lives could depend on its response.** What should it do?

The Challenger Disaster

The Space Shuttle *Challenger* was to be launched on January 28, 1986 from Cape Canaveral, Florida. There were pressures within NASA and the manufacturer Morton Thiokol to keep space shuttle missions on time.

The operation recommendation was to stay within engineering guidelines and to launch only within their experience base, which meant at temperatures of 50 °F or higher. MT engineers were against launching at lower T.

Thiokol management initially supported its engineers' recommendation to postpone the launch, but NASA staff opposed a delay. The engineers were then told to think with their management hats on and not their engineering hats, and then they okayed the launch even at lower temperatures.

The Challenger was launched at 11:38 AM, when the temperature was/had been 31 °F. The O-ring seal in the right solid rocket booster failed at this low T, sending pressurized hot gas to the external fuel tank, causing separation.

The Challenger broke apart 73 seconds into the flight.

The cabin hit the surface 2 minutes and 45 seconds after breakup, with the crew likely alive until then. The shuttle had no escape system.

Morton Thiokol had suspected the O-ring design since 1977.

Professional Decisions:
The Job You Want
The Person They Want

A graduate student finishing his/her thesis applied for employment from companies A and B, received and then accepted the offer from company A, later received an offer from company B---which he/she prefers---and wonders whether it would be proper to then rescind his/her acceptance to company A and accept the offer from company B. What should he/she do?

A company makes an offer of employment to graduate student A finishing his/her thesis, but just learns that student B has applied for the same job and it prefers him/her and wonders whether it would be proper to rescind or try to convince the offer to student A so it can make one to student B. What should it do?

Range of Discussion

Data and Research

Authorship

Papers and Theses - Content

Preparing Proposals

Reviewing Papers and Proposals

Employment and Conflicts of Interest

Responsible conduct of research

vs. professional conduct in procedures

vs. professional conduct in society issues

vs. professional courtesy

vs. ethics in other professions

What is the main “cost” of bad ethics (aside from $)?

The Public Trust

Let’s continue our discussion

http://www.columbia.edu/~iph1/teaching

Link to Ethics (Responsible conduct of research and professionalism) **seminar presented to department students**.

Link to Ethics (Responsible conduct of research and professionalism) **mini case scenarios**.

And more

Bones - Season 7, Episode 9 (Review): The Don't in the 'Do

http://www.poweredbyosteons.org/2012/04/bones-season-7-episode-9-review.html

FBI Special Agent (Seeley) Booth and Bones (Dr. Temperance Brennan)

Intern/lab assistant/grad student Arastoo Vaziri (Pej Vahdat) **with** Bones

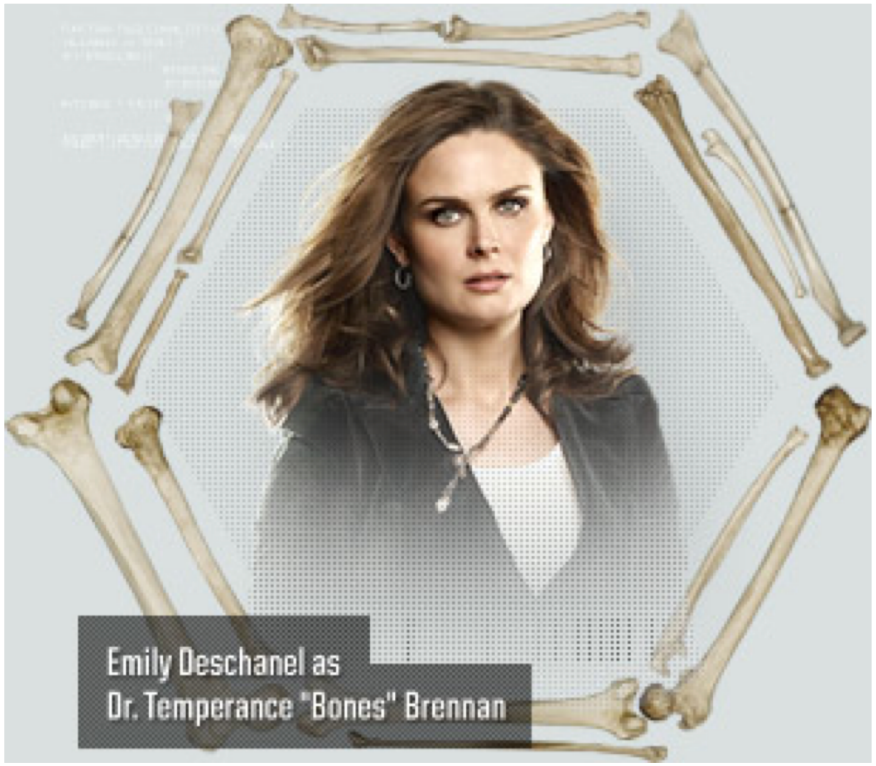
http://www.imdb.com/media/rm1591589120/nm1798530

Episode Summary… And in the C plot, (intern) **Vizidi gets an article accepted to the fictional *Journal of Forensic Anthropology***. *There is absolutely nothing factual about this plot, as the writers clearly have no idea how academic publishing works and didn't even bother to do a little research or ask one of their forensic consultants for some ideas.*

Bones - Season 7, Episode 9 (Review): The Don't in the 'Do

http://www.poweredbyosteons.org/2012/04/bones-season-7-episode-9-review.html

Brennan reveals that she was one of the peer reviewers. (Advisors and other supervisors generally don't review their students' papers unless there's a really good reason to do so. Brennan's reviewing it would be considered a conflict of interest by most journal editors.)



Bones is ethical to a fault.

What was she thinking?

http://www.fox.com/bones/

Bones - Season 7, Episode 9 (Review): The Don't in the 'Do

http://www.poweredbyosteons.org/2012/04/bones-season-7-episode-9-review.html

And finally, as portrayed in Bones, this is NOT how academic publishing works:
- Vizidi gets galley proofs for his Journal of Forensic Anthropology article. (Galley proofs are electronic, not printed.)
- He's not allowed to tell anyone about the article acceptance until the journal comes out. (Articles are published online after peer-review as early view. In some journals, articles are published even before copyediting, or immediately after acceptance. No one is ever surprised by the contents of a published journal volume.)
- Vizidi excitedly shows Hodgins a footnote citing one of his papers. Hodgins is excited. (Most anthro journals don't use footnotes, they use parenthetical references. The footnote to Hodgins is incomplete. And if Hodgins is as much a bad-ass as he claims, another citation to his work wouldn't even make a dent in his h-index.)
* **- Brennan reveals that she was one of the peer reviewers**. (Advisors and other supervisors generally don't review their students' papers unless there's a really good reason to do so. Brennan's reviewing it would be considered a conflict of interest by most journal editors.)
- In the end, Vizidi's paper is not published. (Journals don't retract papers except in the case of data mismanagement or other ethical violations.)
- Instead of Vizidi's paper, the Journal of Forensic Anthropology plans to run a puff piece on Selena Gomez on a fossil hunt. (Peer-reviewed journals don't run "puff" pieces. And even if they did, an article on a fossil hunt is completely inappropriate for a forensic journal. But now my life's goal is to get AJPA to publish pictures of me and The Biebs riding a dinosaur at the Creation Museum.)
- Brennan thinks that Vizidi is too immature to understand what "being published" means. (Anthropology graduate students routinely come out of school with 3 or more publications these days. Vizidi is pretty far behind if this is his first article. Also, "being published" means just that - you've told other people about something you did, and a few people agreed with you that it was neato keen. It's not the end all be all.)
- Oh, right, and Vizidi's awesome article? "New Methodologies for Osteometric Analysis in Human Remains." (Because what we need is another article to tell us how to measure the length of a bone?) His follow-up? The hilariously non-specific, "Advances in Forensic Odontology."

Death in Paradise (2013)

Season 2, Episode 7, #15 overall,
"A Stormy Occurrence", February 19, 2013

A meteorologist dies during a hurricane, and three other team research scientists and the team leader, the professor, who is about to publish a major book in the field, are suspects, in what is found to be murder.

Was the murder motivated by wanting to be the second author on the paper, which is that of the highest respect, after the first author, the professor?
Maybe not a compelling enough reason for murder.

Was it motivated by the professor's interests in money and research funds?
He proclaimed: "I am a man of science, inspector, not a corporate shill."

The career of the professor has suddenly bloomed because he took credit for the brilliance of the murdered junior scientist, without sharing. In fact, he was publishing the murdered scientist's work as his own book. The murder victim was about to tell the dean the truth about the professor.
The inspector exclaimed: "Plagiarism is abuse, Professor." after declaring that the professor was "a plagiarist and a murderer."
(Wasn't this really intellectual theft and not strictly plagiarism?)

Tom Lehrer Facetious Song Extolling Plagiarism (1)

Nikolay Ivanovich Lobachevsky:
Russian mathematician and founder of non-Euclidean geometry, which he developed independently of János Bolyai and Carl Gauss.

http://www.youtube.com/watch?v=qU_j5cQ2sfQ

For many years now, Mr. Danny Kaye, who has been my particular idol since childbirth, has been doing a routine about the great Russian director Stanislavsky and the secret of success in the acting profession. And I thought it would be interesting to stea... to adapt this idea to the field of mathematics. I always like to make explicit the fact that before I went off not too long ago to fight in the trenches, I was a mathematician by profession. I don't like people to get the idea that I have to do this for a living. I mean, it isn't as though I had to do this, you know, I could be making, oh, 3000 dollars a year just teaching.

Be that as it may, some of you may have had occasion to run into mathematicians and to wonder therefore how they got that way, and here, in partial explanation perhaps, is the story of the great Russian mathematician Nicolai Ivanovich Lobachevsky.

Tom Lehrer Facetious Song Extolling Plagiarism (2)

Who made me the genius I am today,
The mathematician that others all quote,
Who's the professor that made me that way?
The greatest that ever got chalk on his coat.

One man deserves the credit,
One man deserves the blame,
And Nicolai Ivanovich Lobachevsky is his name.
Hi!
Nicolai Ivanovich Lobach-

I am never forget the day I first meet the great Lobachevsky.
In one word he told me secret of success in mathematics:
Plagiarize!

Plagiarize,
Let no one else's work evade your eyes,
Remember why the good Lord made your eyes,
So don't shade your eyes,
But plagiarize, plagiarize, plagiarize -
Only be sure always to call it please 'research'. ….

Tom Lehrer Facetious Song Extolling Plagiarism (3)

Of note, Lehrer explained that Lobachevsky's name was used for prosodic* reasons and was not intended to slur the character of the renown mathematician.

* relates to the rhythm, stress, and intonation of speech

The decision to use the name of a real scientist of presumably high character could itself be the topic of an ethics discussion.

Also, doesn’t this song really describe theft and not plagiarism?