Responsible Conduct in Research

Part 1: What are Ethics?

Part 2: Ethics and Society

Part 3: Environmental Ethics

Part 4: Responsible Conduct in Research

NSF – "The institution is responsible for certification that the RCR training plan is in place and verification that the students and postdocs have completed the RCR training."

Victory
Of Science
Over
Ignorance
Sculpture.
Carlo
Nicoli

"The Victory of Science over ignorance / Ignorance is the curse of God / Knowledge is the wing wherewith / We fly to heaven."

RCR Issues of Concern to NSF

- Collaborative research
- Conflict of Interest (personal, professional, financial)
- Data acquisition and laboratory tools: data management, sharing and ownership
- Human subjects, live vertebrate animals in research, and safe laboratory practices
- Mentor/mentee responsibilities and relationships
- Peer review
- Research misconduct and policies for handling misconduct
- Responsible authorship and publication
- Scientist as a responsible member of society

What are Ethics?

Social Interactions – How we interact with others
positive, neutral, negative?

Belonging to a group
Benefits of groups – safety, protection, efficiency
Penalties for bad behavior?
Altruism and evolutionary biology, genetics?

Altruism Interaction -/+
actor pays fitness cost, recipient benefits

In altruism, an individual reduces its own fitness to help other members of its social group.

- inclusive fitness
- kin selection

Genetic Basis for Altruism

Hamilton's rule: states that an allele for altruistic behavior will spread if the benefit to the genetic group is greater than the cost.

Hamilton in 1996

$$B \times r > C$$

B is benefit to recipient

r is the coefficient of relatedness

C is the cost to the actor

Unit of measurement for B and C is surviving offspring.

J.B.S. Haldane famously joked:

"I would willingly die for two brothers or eight cousins."

As siblings are on average 50% identical by descent, nephews 25%, and cousins 12.5%

Reciprocal Altruism

Cooperation among non-relatives: Vampire Bats

<u>Hypothesis</u>: Bats reciprocate blood sharing with frequent roostmates

<u>Experiment</u>: 9 bats held in captivity for several weeks
- each night, food was withheld from a different bat
- so who fed whom?…

<u>Result</u>: Bats fed other bats who had previously fed *them*

  - in other words, cooperation is based on reciprocity: I help you now, you help me later

Big Brains
Social Behavior
Group Hunting
Cooperation
Sharing
Communication

Socialization

- General process of acquiring culture
- During socialization, we learn the language of the culture we are born into as well as the roles we are to play in life
- Early childhood is the period of the most intense and the most crucial socialization. It is then that we acquire language and learn the fundamentals of our culture. It is also when much of our personality takes shape.
- We continue to be socialized throughout our lives.
- Formal education – controlled, structured
- Informal education – everywhere else
- Socialization practices vary markedly from society to society

http://anthro.palomar.edu/social/soc_1.htm

What is your Worldview?
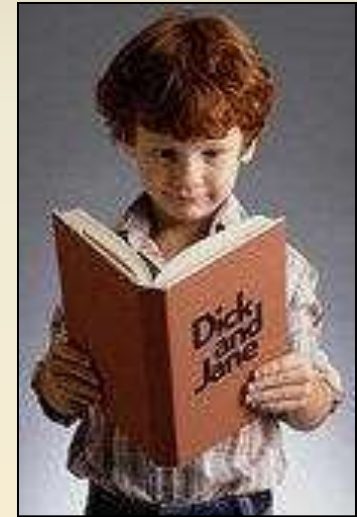
- The lens through which one "sees" and interprets all aspects of life.
- Awareness of *self*, O*ther*, and the *relationship* between the two
- Generally hidden from sight. Outside of one's awareness or tacitly assumed. Everyone has one.
- We are often wrong.
- Our views or picture of reality must always be readjusted to fit new situations we encounter.

Ethics includes a lot of things...
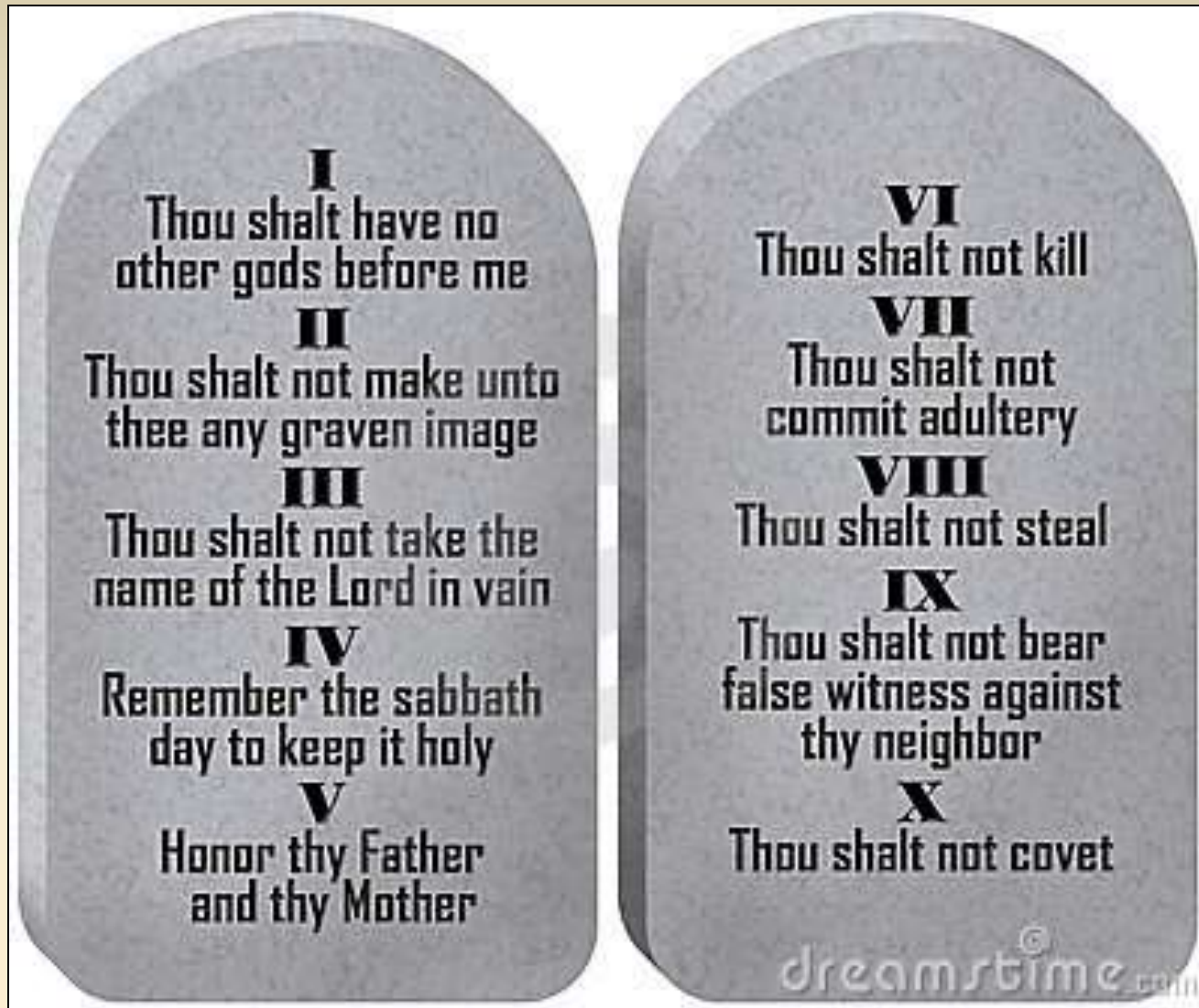
Some definitions of ethics…

- **Code** of behavior.

- **Norms** for conduct that distinguish between acceptable and unacceptable behavior.

- **Discipline** that studies standards of conduct, such as philosophy, theology, law, psychology, or sociology.

- **Method**, procedure, or perspective for deciding how to act and for analyzing complex problems and issues.

- Study and practice of "doing the right thing".

Laws

External
Imposed by society
Public Safety, Greater Good
Penalties for breaking

Laws/Code of Behavior: The Ten Commandments

I Thou shalt have no other gods before me

II Thou shalt not make unto thee any graven image

III Thou shalt not take the name of the Lord in vain

IV Remember the sabbath day to keep it holy

V Honor thy Father and thy Mother

VI Thou shalt not kill

VII Thou shalt not commit adultery

VIII Thou shalt not steal

IX Thou shalt not bear false witness against thy neighbor

X Thou shalt not covet

See also: Hippocratic Oath, Koran

Personal Values

the things in life that are important to us, and the things that we hold dear.

Values - What Are Your Core Values?

- **I am totally honest in all my dealings with others**
- **I treat everybody with respect and expect respect in return**
- **I am always supportive of family and friends**
- **I listen to the points of view of others**
- **I treat everybody with kindness. I do not knowingly hurt others**
- **I do everything as well as I can and have pride in my work**
- **I am working on being patient and gracious in all things**

Boy Scout Law
A Scout is:
Trustworthy,
Loyal,
Helpful,
Friendly,
Courteous,
Kind,
Obedient,
Cheerful,
Thrifty,
Brave,
Clean,
and Reverent.

Boy Scout Oath or Promise
On my honor, I will do my best to do my duty to God and my country and to obey the Scout Law:
To help other people at all times;
To keep myself physically strong, mentally awake and morally straight.

Ethics

- The rules of conduct recognized in respect to a particular class of human actions or a particular group, culture, etc. It defines how things are done according to the rules.
- Social system/External
- If we don't follow we will face peer/societal disapproval, or we can be fired from our job (not jailed).

Morals

- Principles or habits with respect to right or wrong conduct. Defines how things should work according to an individuals' ideals and principles.
- Individual/Internal
- Doing something against one's morals and principles can have different effects on different people, they may feel uncomfortable, remorse, or depressed.

Ethics Involves Decision Making
How do we make the right decision?
Personal versus Professional Conduct?

Solving Ethical Problems

When faced with an ethical issue, it is important to remember that there is seldom only one correct way in which to act.

Questions to answer:

1. What is the action or inaction that is the cause for concern?
2. Who or what may be affected?
3. How will they be affected? (i.e., what are the possible consequences?)
4. Are there any laws, regulations written or unwritten that may apply?
5. What actions might be taken and what would the consequences of these actions be?
6. Can anything be done to prevent this from reoccurring or to minimize the severity of the consequences?

Part 2: Ethics and Society

The major problems faced by our troubled globe -- extreme poverty, environmental sustainability, and international peace and security -- are not only technological in nature, but also ethical and moral.
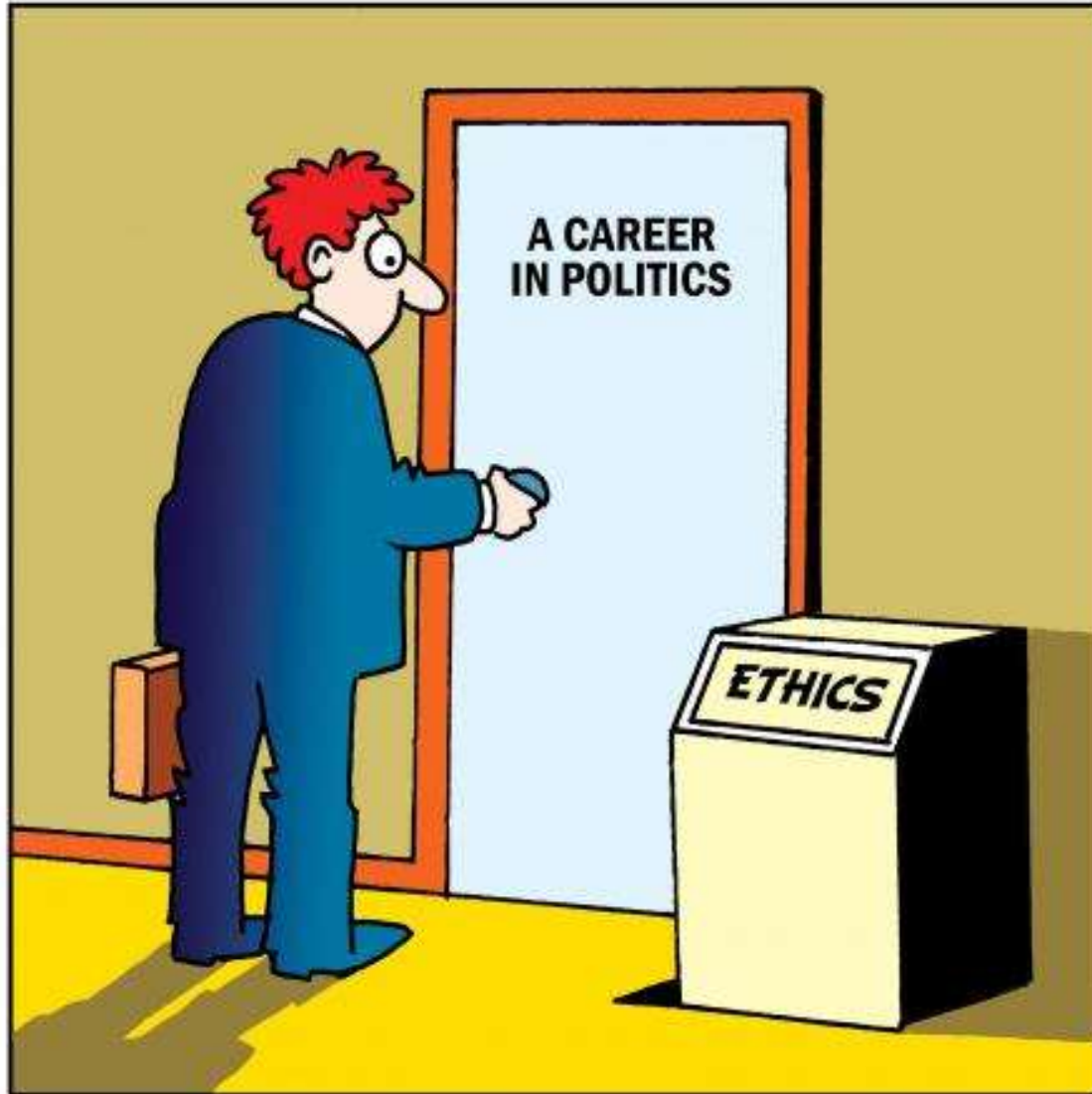
- poverty
- overpopulation
- food security
- energy
- unemployment
- wages
- climate change
- sustainability
- biodiversity
- pollution
- etc
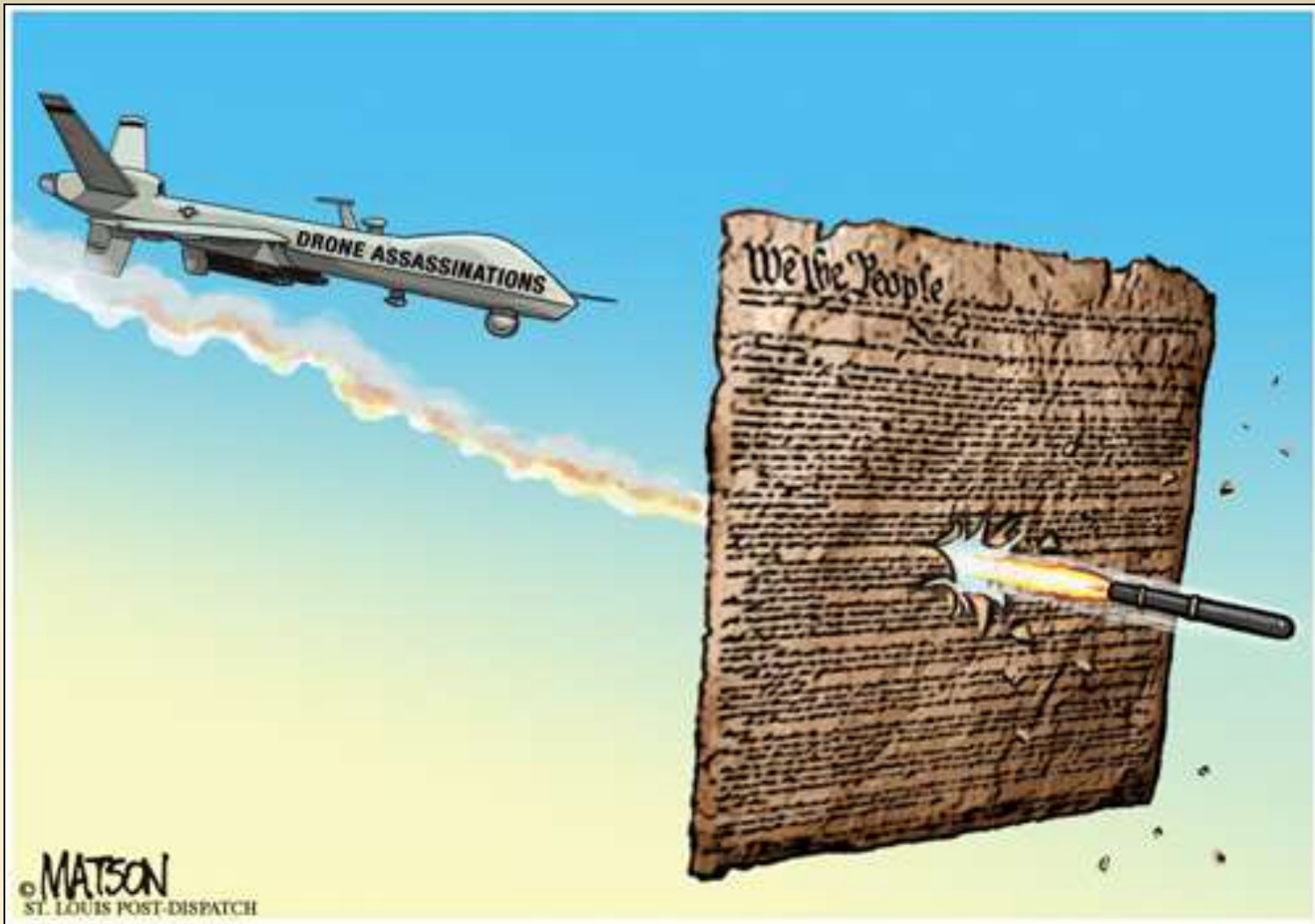
Ethics in Society: War, National Security, Surveillance
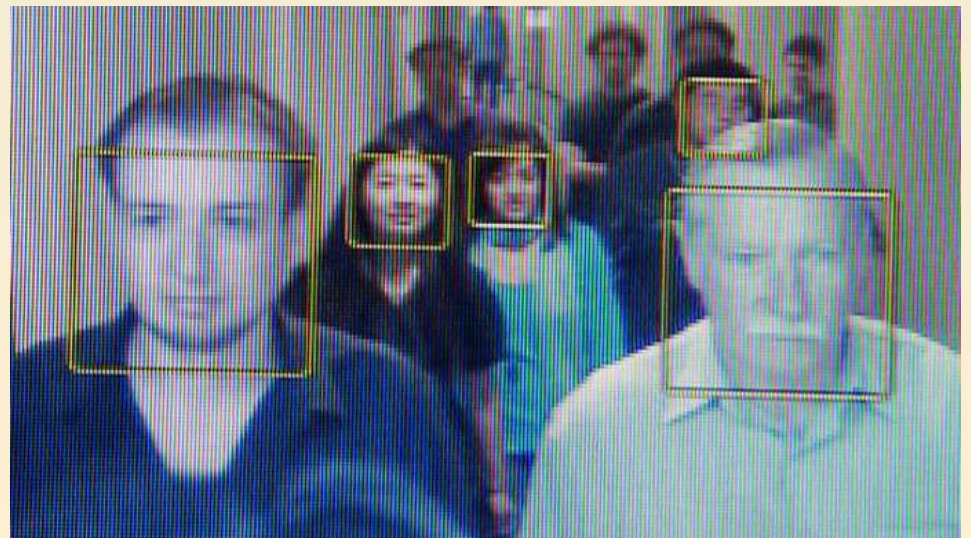
Ethics in Society: Politics

Ethics in Society: Distribution of Wealth
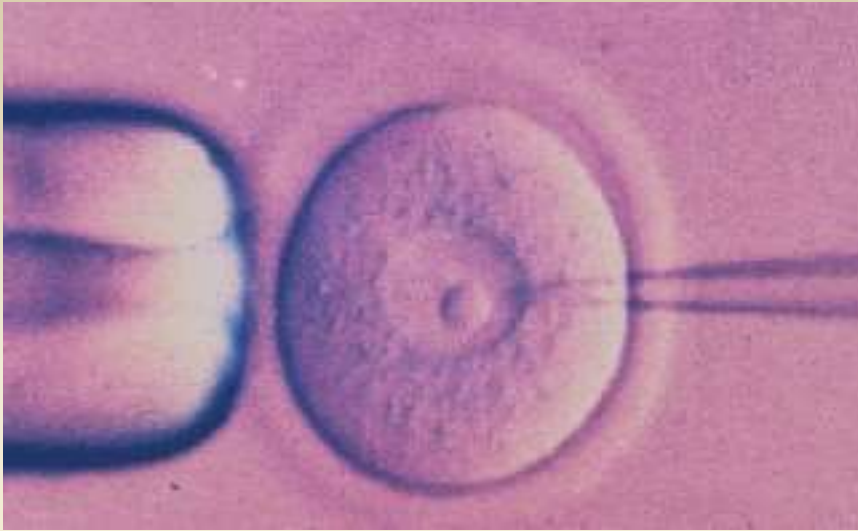
Ethics in Society: Domestic and Foreign Affairs
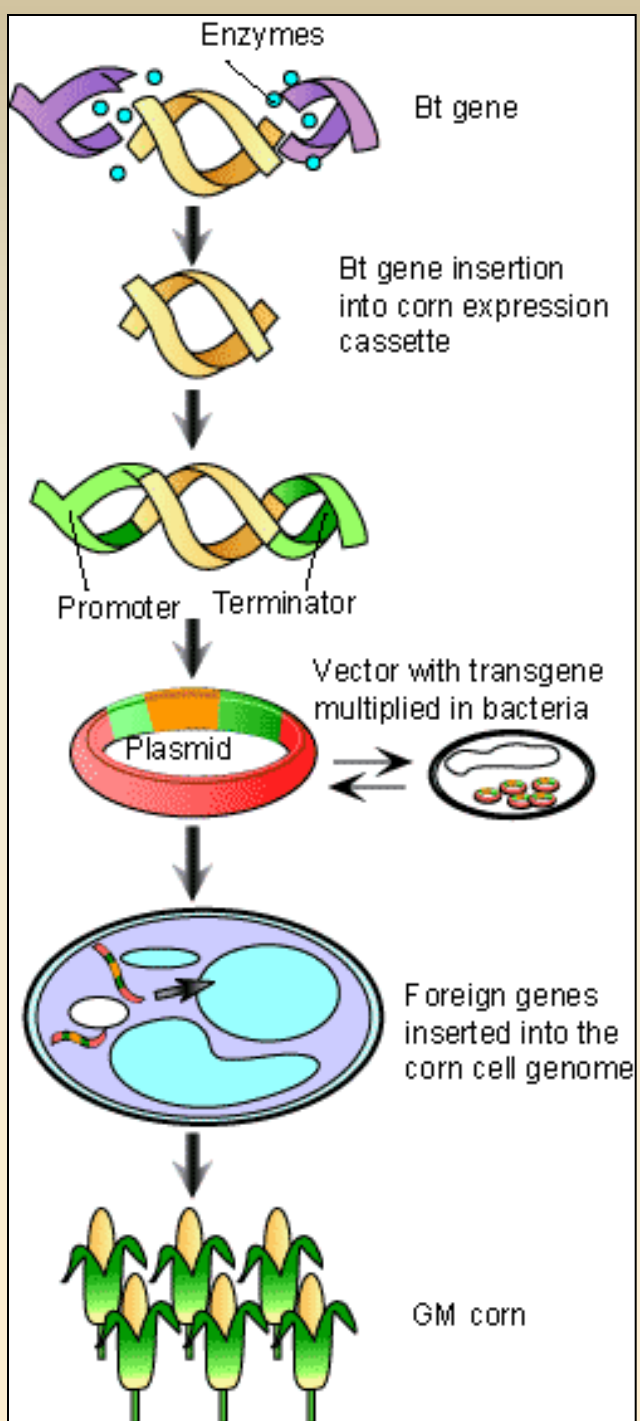
Ethics in Society: Science (Bioethics)

Ethics in Society: Cloning (Bioethics)

Genetically Modified Crops

# GM crops: solving the world's food problems?

Last year about 170 million hectares of GM crops were cultivated in 28 countries. Proponents argue that about half of the GM crops grown worldwide are produced by resource poor farmers. Apart from the US, the world's leading growers are Brazil, Argentina, Canada and India.
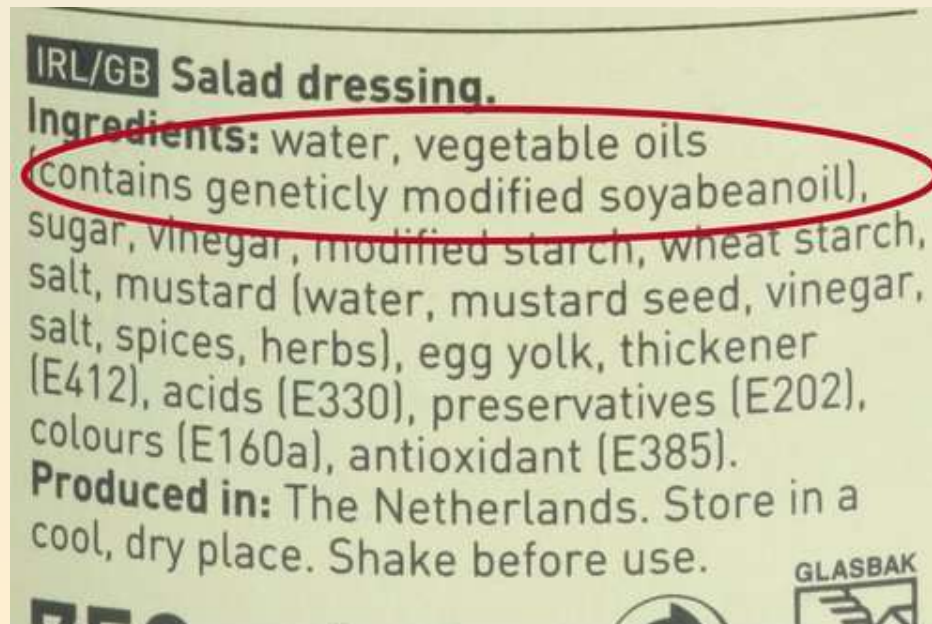
"The use of more precise technology and the greater regulatory scrutiny probably make GM crops even safer than conventional plants and food"

or GMO Nightmares?
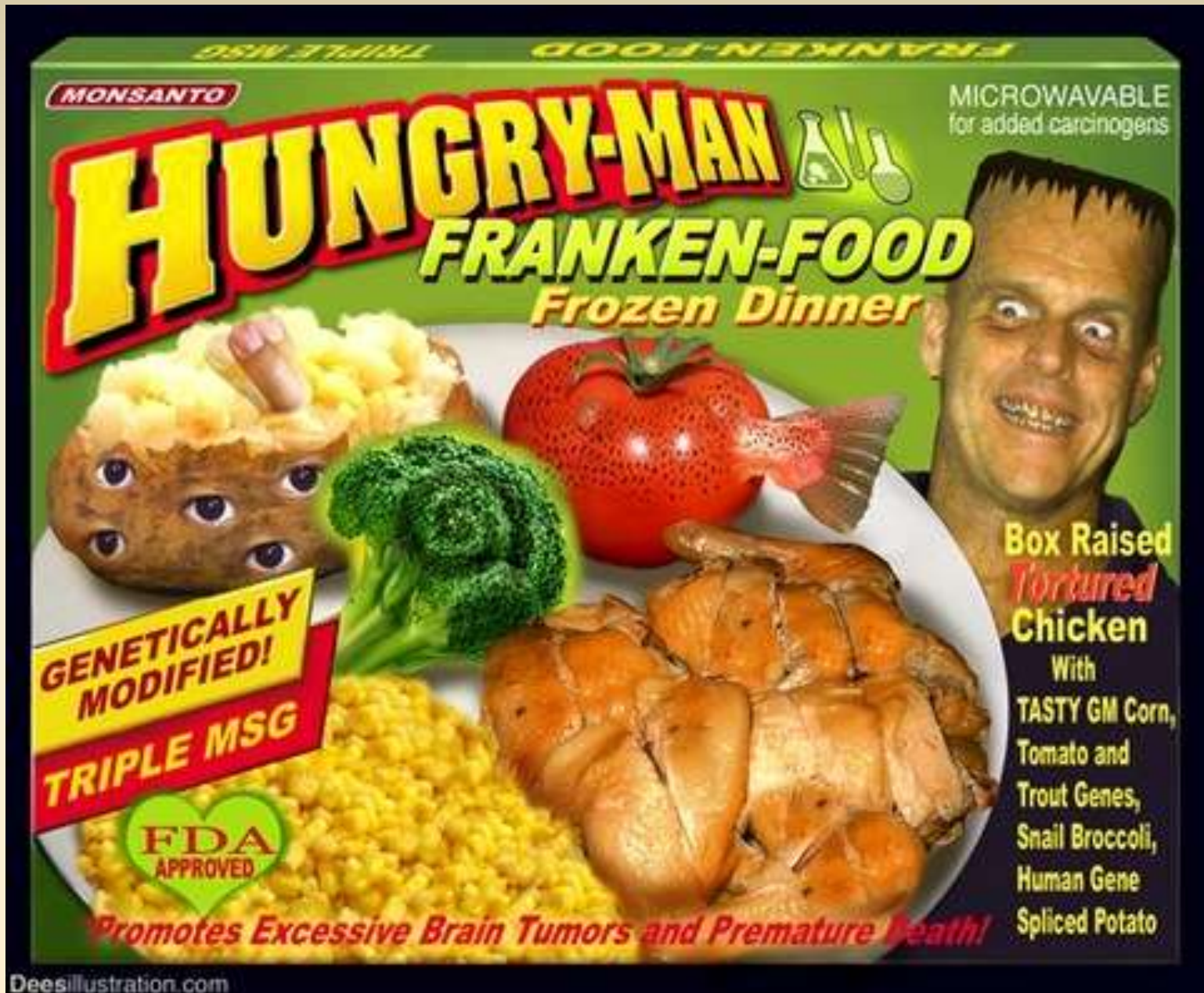
Solutions? Labeling GMO in foods?

Part 3: Ethics and the Environment

- Environmental ethics is a branch of environmental philosophy, that studies the <u>ethical relationship between human beings and the environment</u>.
- Environmental ethics has given a new dimension to the conservation of natural resources.

World View Modification

What is the relationship between humans and nature?
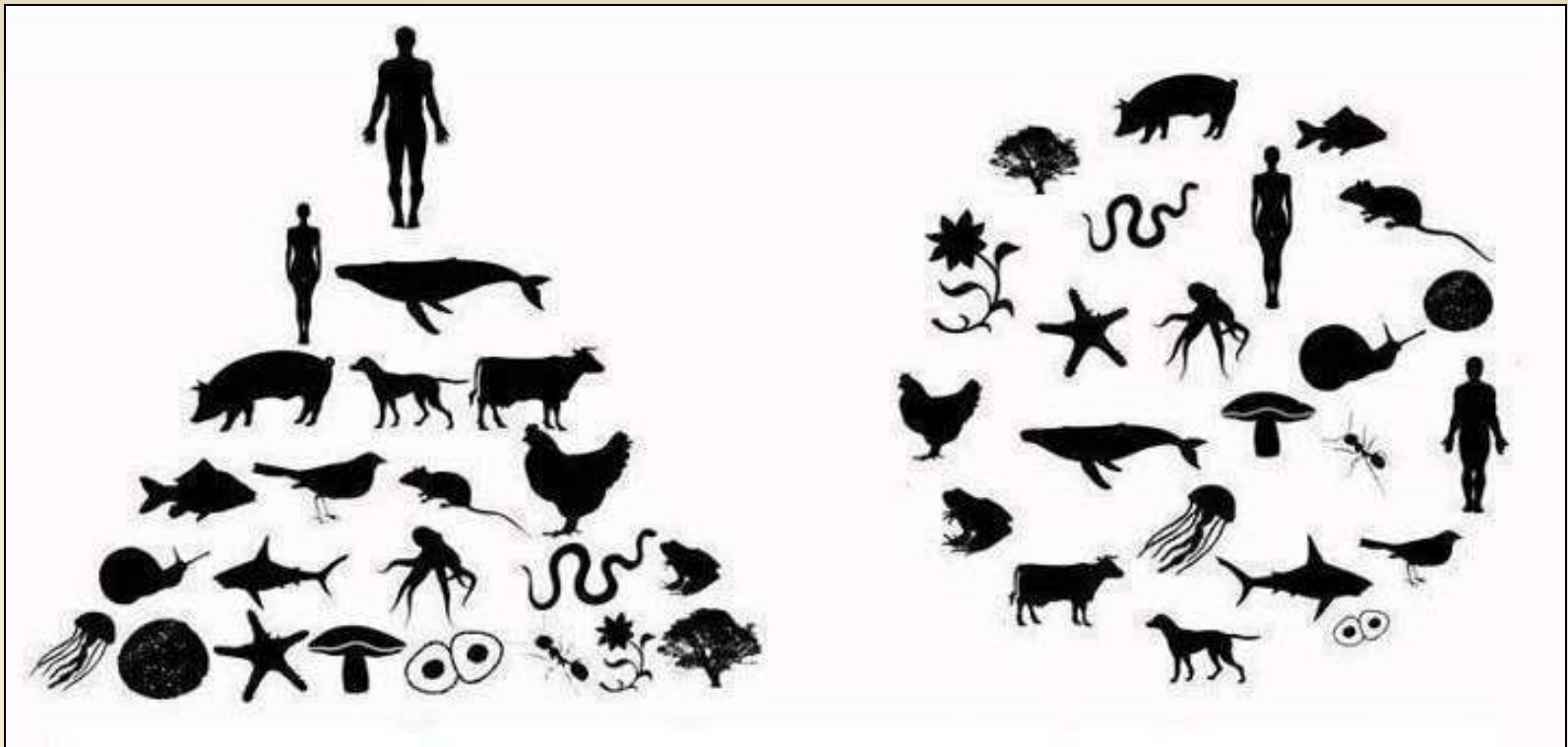
"…a land ethic changes the role of Homo sapiens from conqueror of the land-community to plain member and citizen of it." -Aldo Leopold

Aldo Leopold - the Land Ethic

- 1887–1948
- Ecologist, forester, and environmentalist
- Professor University Wisconsin
- Emphasized biodiversity and ecology
- A founder of the science of wildlife management
- Author: **A Sand County Almanac** (1949)

"A thing is right when it tends to preserve the integrity, stability, and beauty of the biotic community. It is wrong when it tends otherwise."

"The land ethic simply enlarges the boundaries of the community to include soils, waters, plants, and animals, or collectively: the land."
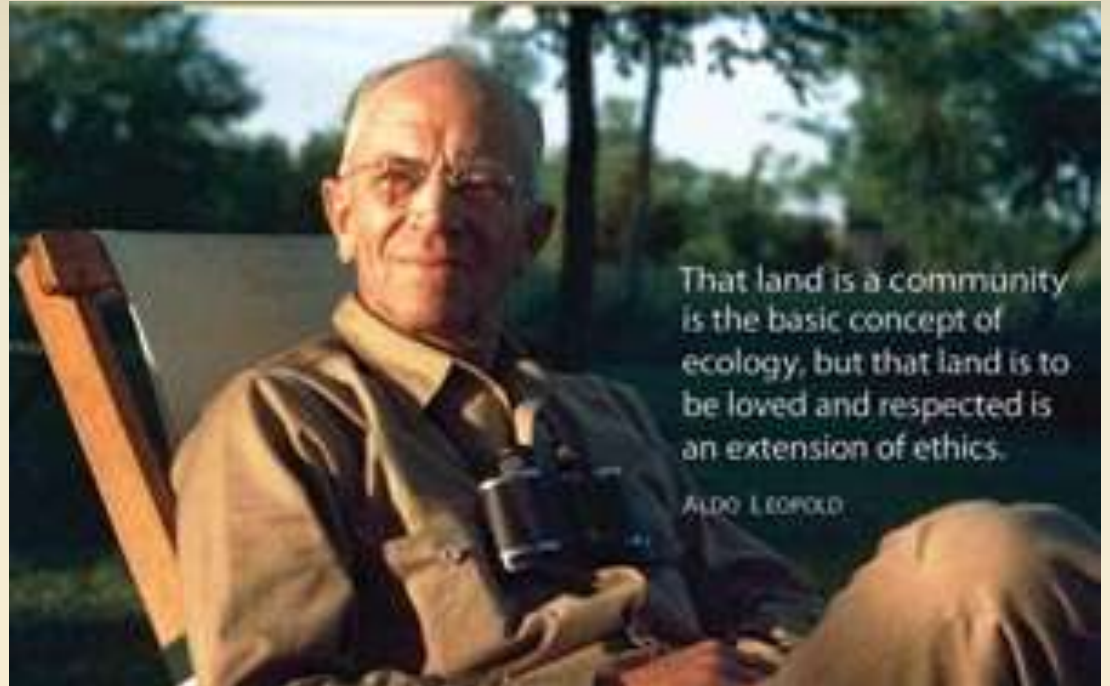
- Aldo Leopold

Aldo Leopold

WE ABUSE LAND BECAUSE WE REGARD IT AS A COMMODITY BELONGING TO US. WHEN WE SEE LAND AS A COMMUNITY TO WHICH WE BELONG, WE MAY BEGIN TO USE IT WITH LOVE AND RESPECT.
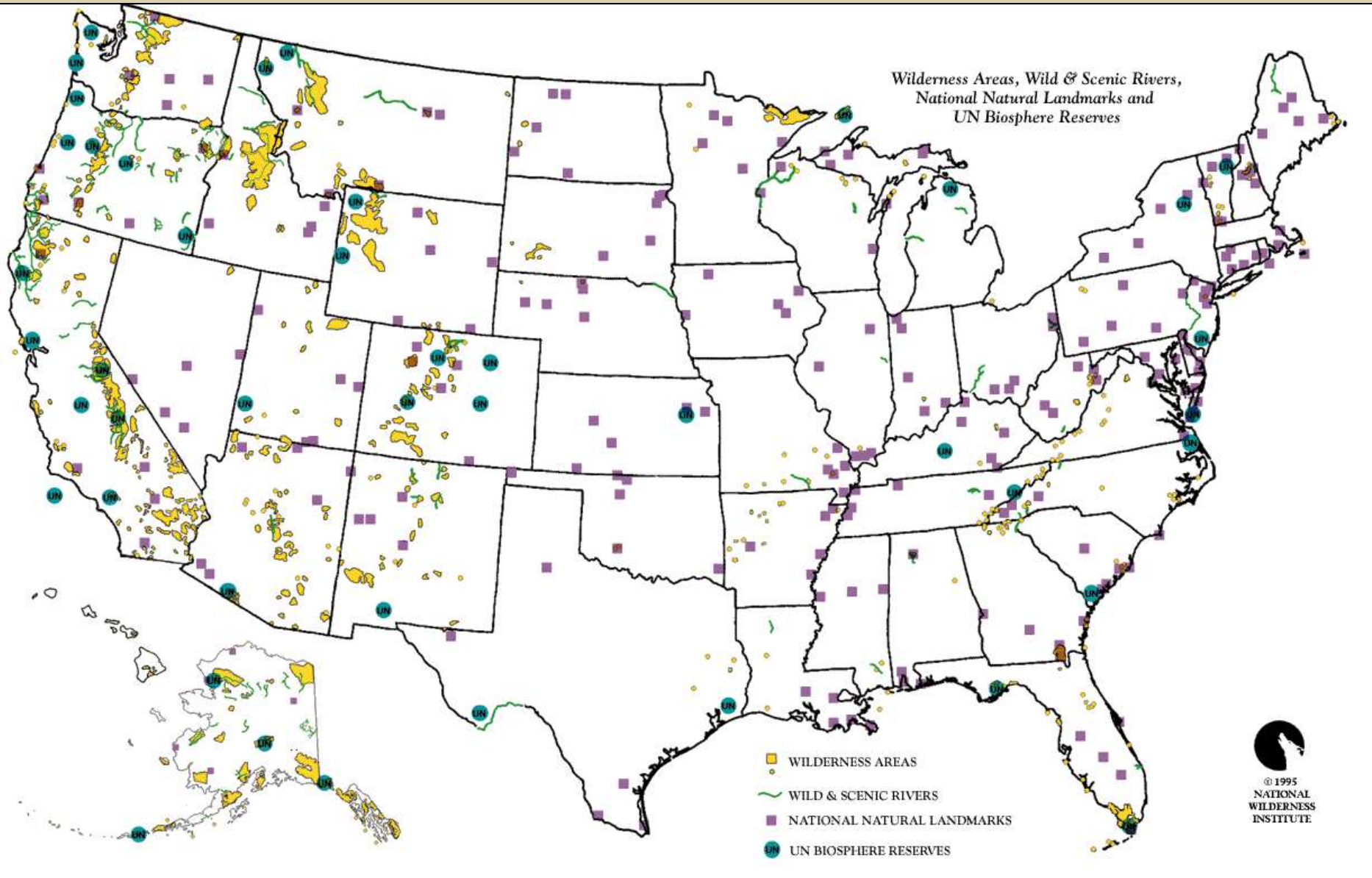
ALDO LEOPOLD

QuotePixel.com

That land is a community is the basic concept of ecology, but that land is to be loved and respected is an extension of ethics.

ALDO LEOPOLD

Protecting Wilderness Areas

Wilderness Areas, Wild & Scenic Rivers,
National Natural Landmarks and
UN Biosphere Reserves

WILDERNESS AREAS

WILD & SCENIC RIVERS

NATIONAL NATURAL LANDMARKS

UN BIOSPHERE RESERVES
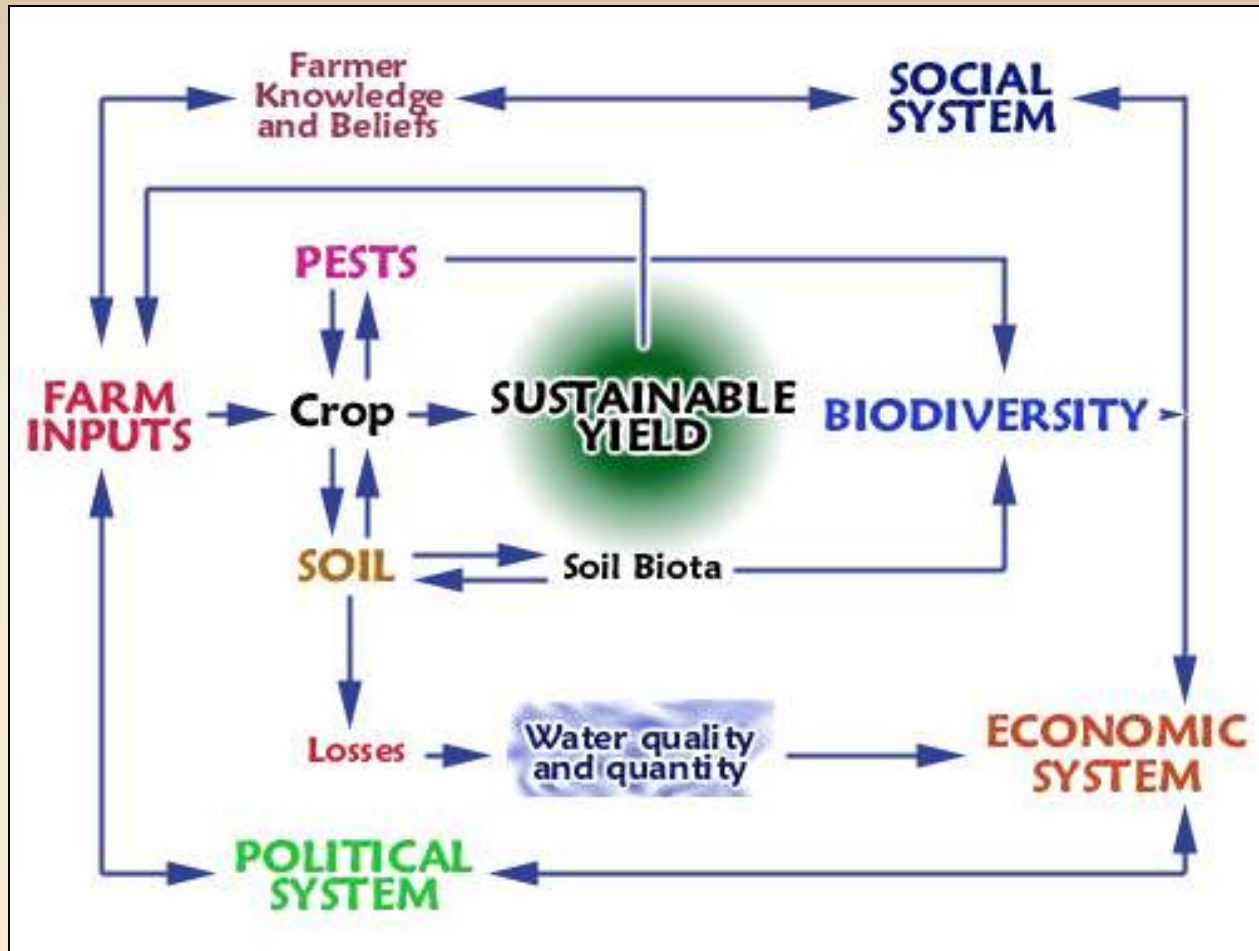
© 1995
NATIONAL
WILDERNESS
INSTITUTE

Empower Indigenous Communities

Natural resource plans are created through collaborative decision-making, and provide tools for self-governance and participatory management that harnesses the collective wisdom of the community

Sustainable Agriculture/Forestry

A holistic approach to agriculture would recognize the linkages between the soil, vegetation, air and water and the way that these both influence, and are influenced by, the farmer's beliefs, perceptions, ambitions, skills and knowledge, and the social, economic, cultural, and political systems in which the farm operates.

Ethics: Fair Trade Certification

- Rainforest-friendly
- Fair trade means a fair price for products
- Focuses on requiring companies to pay prices at or above market price for workers, environmentally sustainable practices

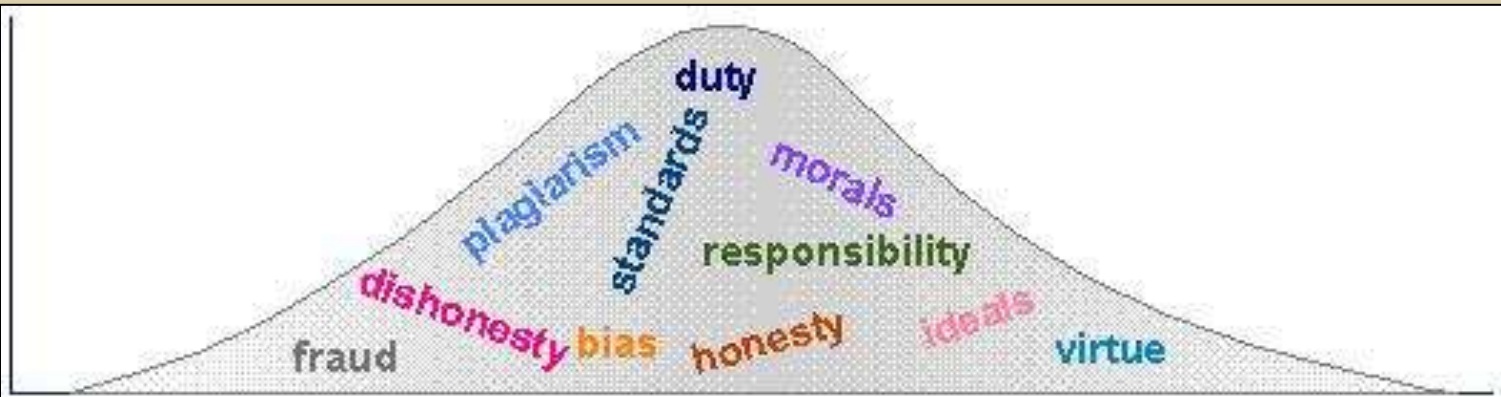

http://www.fairtrademag.com/

Is the environmental movement failing?

On virtually every measure, the environmental movement is not keeping up with the needs - species extinction, deforestation, climate change

Part 4: Responsible Conduct in Research

Modern Biomedical Research Ethics (Bioethics)

- Grew out of desire to protect human subjects involved in research projects.
- Nuremberg trials for Nazi doctors and war criminals.
- The field has expanded to encompass all parts of research design to truthful reporting of results.
- Research is a public trust that must be ethically conducted, trustworthy, and socially responsible if the results are to be valuable.

RCR Topics of Special Concern to NSF

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Collaborative Science

- A lone researcher tends to be the exception in academia these days.

- Researchers work with others in and out of their areas in order to obtain complementary expertise, save time, or decrease expenses.

- Collaborations with researchers in differing subjects is a way of finding innovative approaches to solving problems.

- Private and federal funding sources (NSF) encourage collaborative and multidisciplinary projects.

Conflict of Interest (COI)

- A conflict of interest is a situation in which financial or other personal considerations have the potential to compromise or bias professional judgment and objectivity.

- All members of the scientific community are faced with balancing conflicting interests.

- There is growing concern by many that a commitment to profit has resulted in a loss of confidence in the integrity of institutions of higher education and research.

Data Acquisition and Management

- Data are the foundation of research and science. Integrity is paramount.
- Proper data collection, retention, and sharing are vital to the research enterprise. If data are not recorded in a fashion that allows others to validate findings, results can be called into question.

- **Who actually owns data collected** is an issue often subject to misunderstanding.
- In federally sponsored research, the university or institution owns the data but allows the principal investigator (PI) on the grant to be the steward of the data.

Assigning and ensuring responsibility for collecting and maintaining data is one of the most important ethical considerations when conducting a research project.

Responsibilities include the following important issues:
- Oversight of the design of the method of data collection
- Protecting research subjects from harm
- Securing and storing data safely to preserve the integrity and privacy of data
- Delegating work with data to others and responsibility over the work of others
- Responsible use of data and truthful portrayal of data results

Human Subjects Protection

- When conducting research on human subjects, minimize harms and risks and maximize benefits.
- Respect human dignity, privacy, and autonomy.
- Take special precautions with vulnerable populations.
- Strive to distribute the benefits and burdens of research fairly.

Testing drugs on prisoners and soldiers……..

Common practice in 1940s, 1950s
Doctors at the time did not find the experiments unethical

Informed consent means that people approached and asked to participate in a research study must:

a) know what they are getting involved with before they commit;
b) not be coerced or manipulated in any way to participate; and,
c) must consent to participate in the project as a subject.

Informed Consent
-Nature of Treatment
-Risks
-Benefits
-Alternatives
-Opportunity for Questions

Witness Infor
Name :
Date:
Signature:

Owners Permission and Right
As owner or authoriz
Assign

Animal Care

- Show proper respect and care for animals when using them in research.
- Do not conduct unnecessary or poorly designed animal experiments.

Responsible Mentoring

- Help to educate, mentor, and advise students.
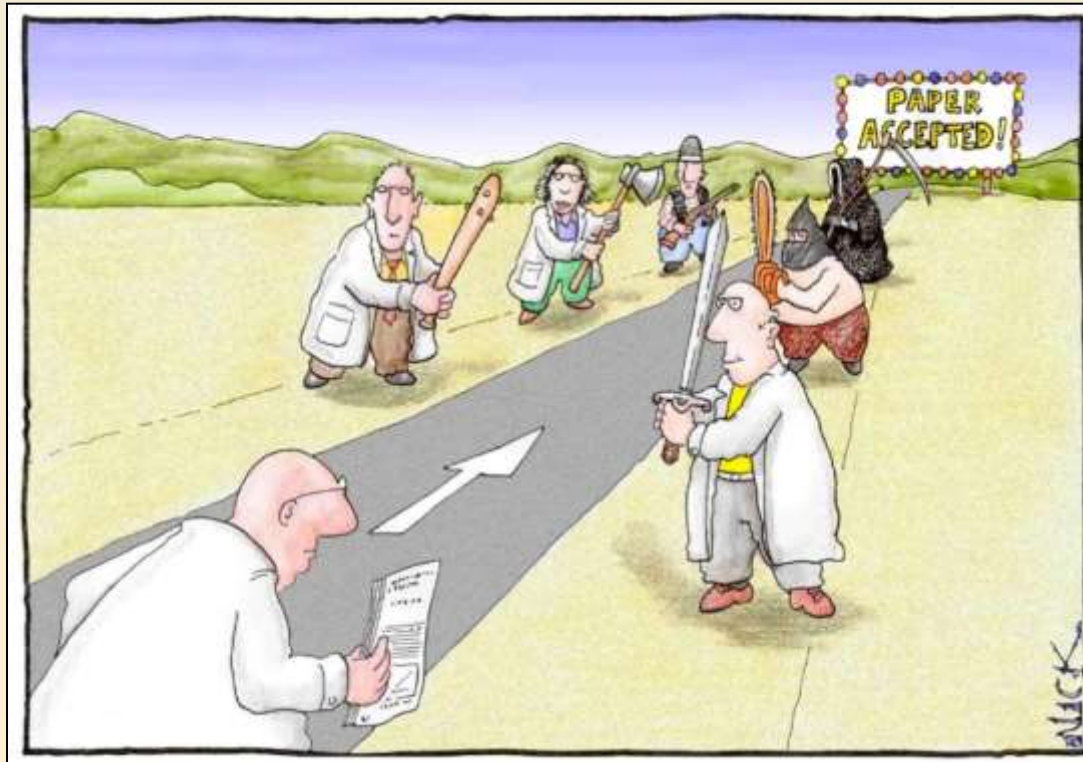- Promote their welfare and allow them to make their own decisions.
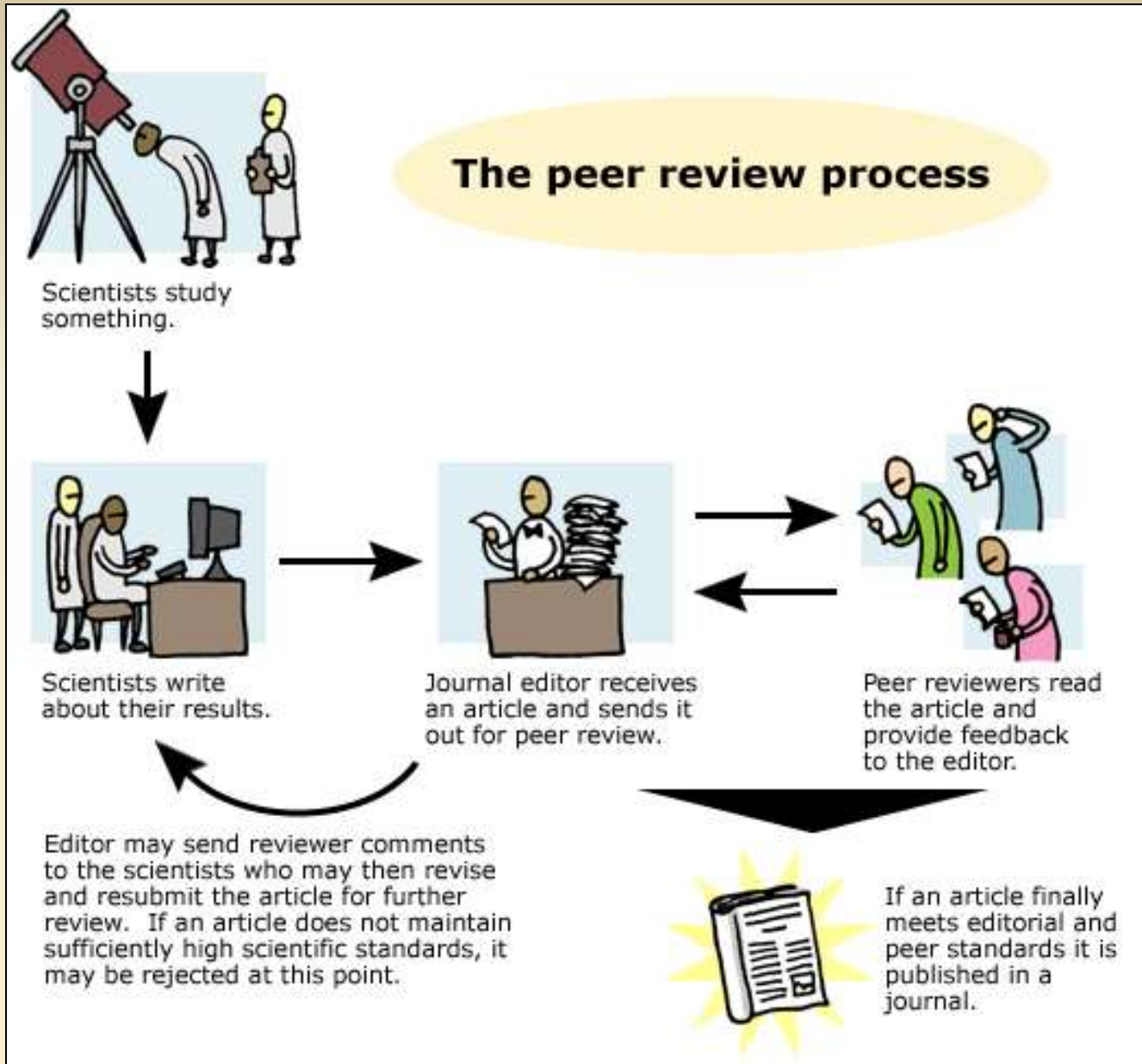
Mentoring

- Mentoring is the **social foundation of research**.

- The mentor draws the best from the junior person by acting as an adviser, teacher, role model, motivational friend and supportive advocate.

- Mentoring is certainly the ideal way to pass ethical values to the generation following, and yet most research organizations neglect it as a core responsibility.

Peer Review

- When a manuscript is submitted for publication in a peer-reviewed journal, the reviewers must keep the contents of the manuscript confidential—they must not share the manuscript's ideas with others.

The peer review process

Scientists study something.

Scientists write about their results.

Journal editor receives an article and sends it out for peer review.

Peer reviewers read the article and provide feedback to the editor.

Editor may send reviewer comments to the scientists who may then revise and resubmit the article for further review. If an article does not maintain sufficiently high scientific standards, it may be rejected at this point.

If an article finally meets editorial and peer standards it is published in a journal.

http://undsci.berkeley.edu/article/howscienceworks_16

Communicating Results

- A scientific article must tell the reader
- **what** the question to be answered is,
- **why** the question is important or relevant,
- **background** information, a
- **precise** description of how the work was done, the
- **data** that were collected, and the
- **scientist's evaluation** of what the data mean.

Misconduct - Honesty

- Strive for honesty in all scientific communications.
- Honestly report data, results, methods and procedures, and publication status.
- Do not fabricate, falsify, or misrepresent data.
- Do not deceive colleagues, granting agencies, or the public.

The Grey Area of Questionable Research Practices
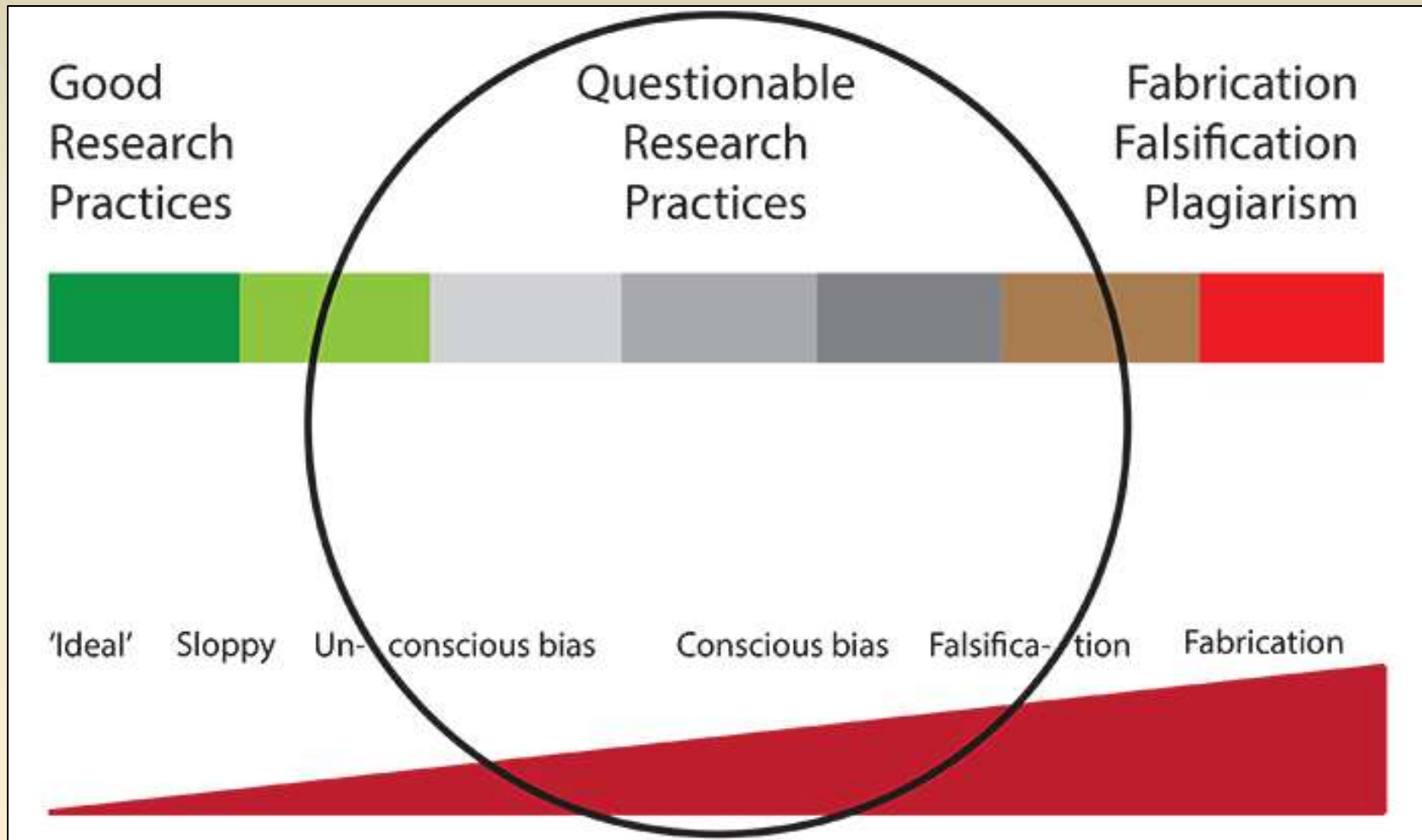
RISE IN RETRACTIONS FOR MISCONDUCT
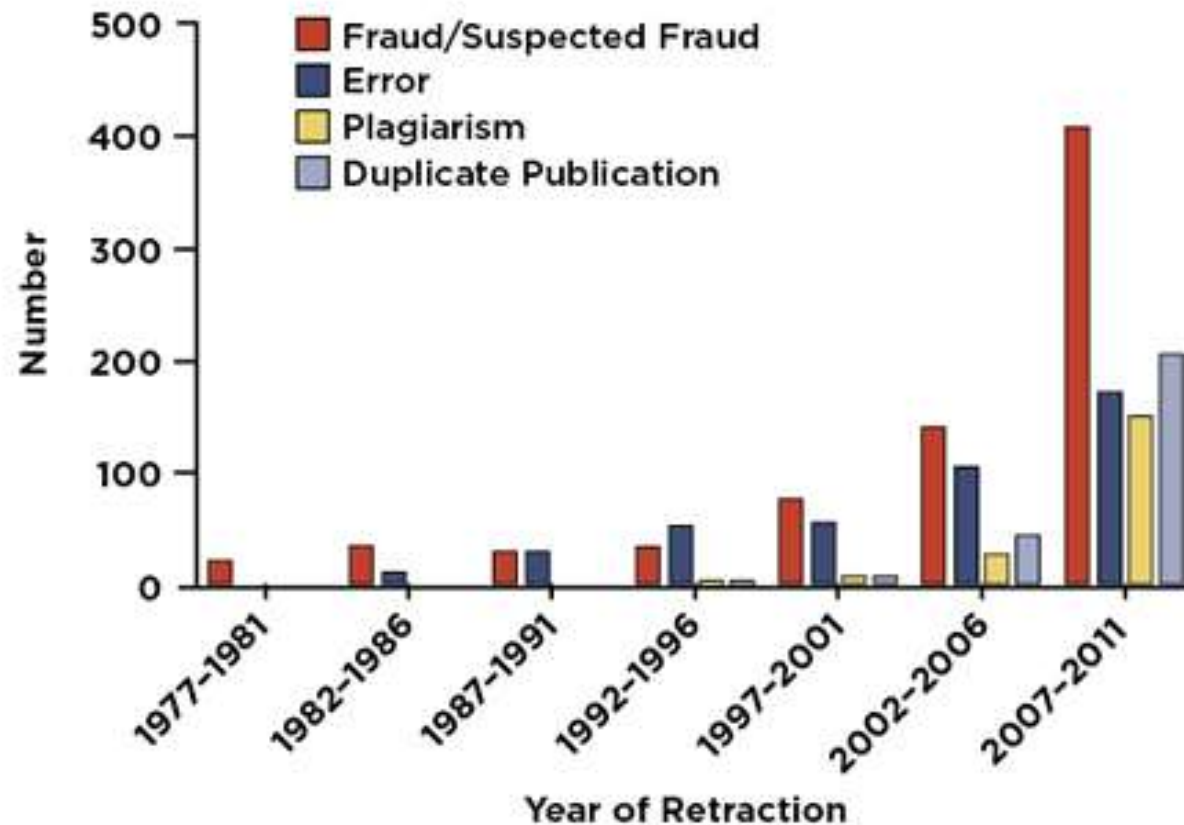
Number of retracted articles for specific causes by year of retraction.

Objectivity

- Strive to <u>avoid bias</u> in experimental design, data analysis, data interpretation, peer review, personnel decisions, grant writing, expert testimony, and other aspects of research where objectivity is expected or required.
- Avoid or minimize bias or self-deception.
- Disclose personal or financial interests that may affect research.

Integrity

- The willingness to live by our beliefs and standards
- Keep your promises and agreements; act with sincerity;
- Strive for consistency of thought and action.
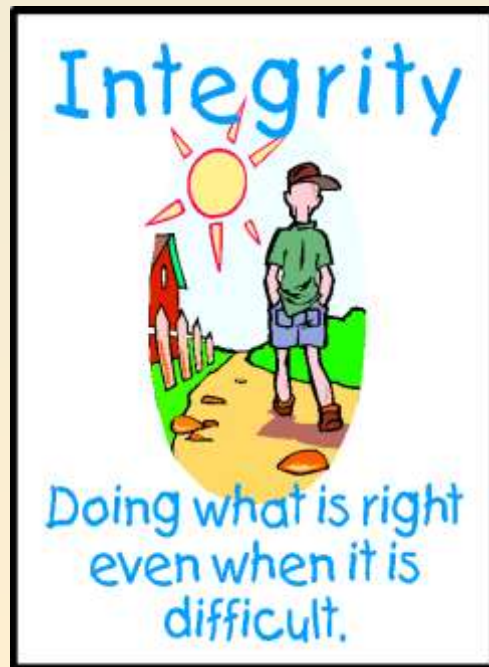
Carefulness

- Avoid careless errors and negligence; carefully and critically examine your own work and the work of your peers.
- Keep good records of research activities, such as data collection, research design, and correspondence with agencies or journals.

Responsible Publication

- Publish in order to advance research and scholarship, not to advance just your own career.
- Avoid wasteful and duplicative publication.

Authorship of Papers

- Often leads to conflict. Should be established early in collaboration.
- Many scientific disciplines look at the first author as the most significant contributor to a research paper. Takes responsibility and keeps records. Other authors listed in degree of contribution.
- Authorship should be limited to those who have contributed substantially to the work.
- *Honorary authorship* is sometimes granted to those who played no significant role in the work, supervisors, department heads, however this is generally discouraged.
- Many journals now demand that each new manuscript must include a statement of responsibility that specifies the contribution of every author.

Respect for Intellectual Property

- Honor patents, copyrights, and other forms of intellectual property.
- Do not use unpublished data, methods, or results without permission.
- Give credit where credit is due.
- Give proper acknowledgement or credit for all contributions to research.
- Never plagiarize.

Plagiarism: the act of presenting another's work or ideas as your own.
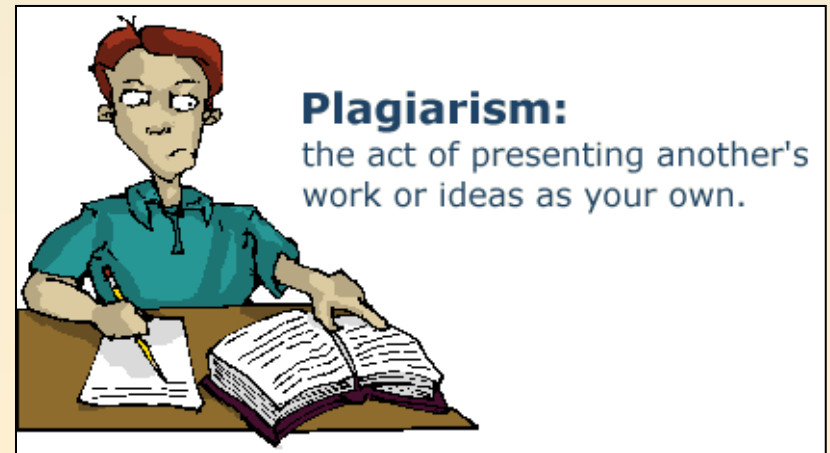
Plagiarism

- Plagiarism is using another person's words or ideas without giving credit to the other person.

- When you use someone else's exact words, you must put quotation marks around them and give the writer or speaker credit by revealing the source in a citation.

- Even if you revise or paraphrase the words of someone else or just use their ideas, you still must give the author credit in a citation.
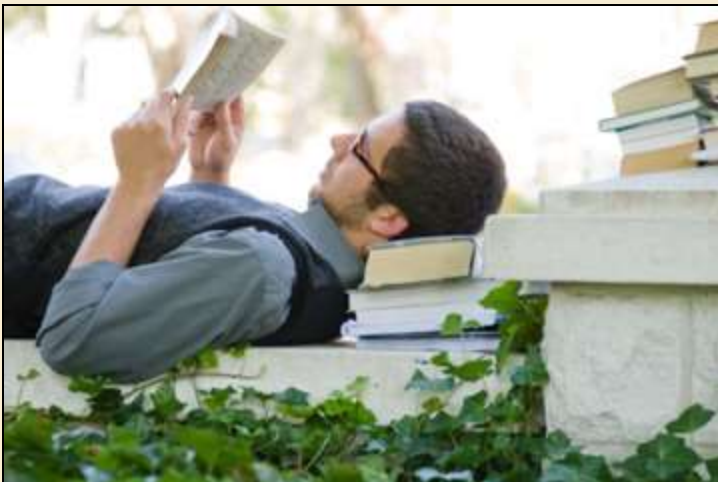
Social Responsibility

- Strive to promote social good and prevent or mitigate social harms through research, public education, and advocacy.

Competence

•Maintain and improve your own professional competence and expertise through lifelong education and learning;
•Take steps to promote competence in science as a whole.

What is Ethics in Research & Why is it Important?
by David B. Resnik, J.D., Ph.D.
from website at
http://www.niehs.nih.gov/research/resources/bioethics/whatis/

Provides good summary of major points

Includes additional ethical conduct ideas

Openness

- Share data, results, ideas, tools, resources.
- Be open to criticism and new ideas.

Confidentiality

- Protect confidential communications, such as papers or grants submitted for publication, personnel records, trade or military secrets, and patient records.

Respect for colleagues

- Respect your colleagues and treat them fairly.

What Is Respect?

- To treat with positive regard
  - Praising in public
  - Paying compliments
  - Focusing on process first instead of people when problems occur
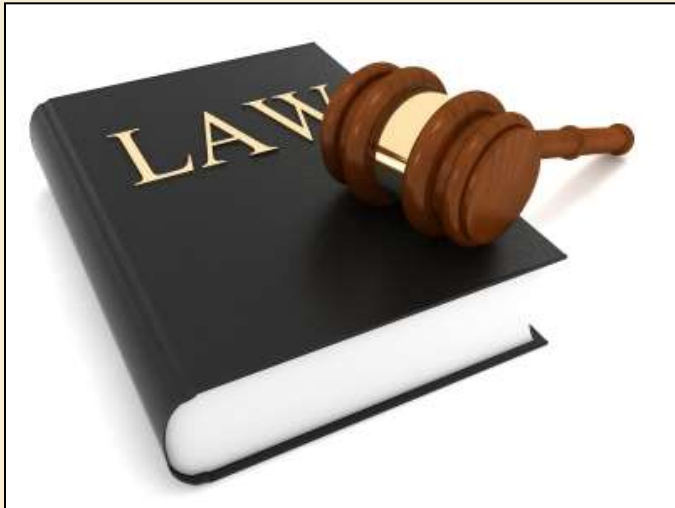

GAIN RESPECT
BY GIVING IT

Non-Discrimination

- Avoid discrimination against colleagues or students on the basis of sex, race, ethnicity, or other factors that are not related to their scientific competence and integrity.

Legality

- Know and obey relevant laws and institutional and governmental policies.

Questions about RCR?

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End