Agenda

Political economy of science and technology

1. Administrative
2. Overview of the next two weeks
3. Political economy
4. “Old” vs. “new” science
5. Intellectual property and globalization

NEXT TWO WEEKS

Science as power

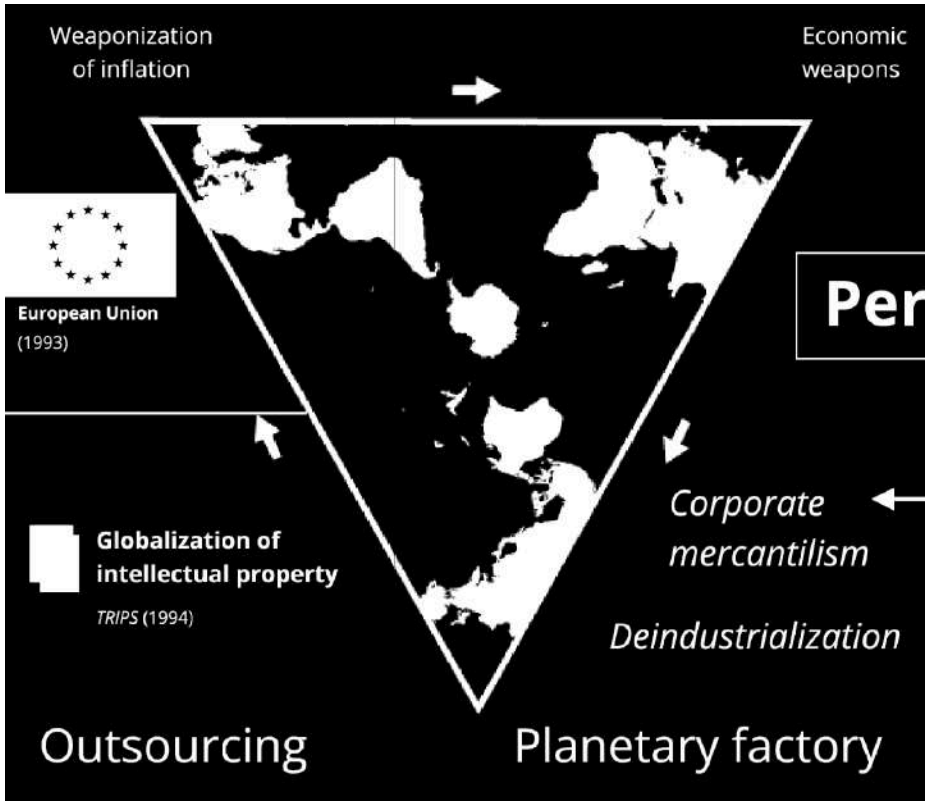
Scientific knowledge in the context of large-scale historical, political, and economic forces.

Today	***Political economy of science*** Influences of economic and political interests on scientific knowledge production and consumption
Wed Nov 6	***Science, colonialism, and postcolonial science studies*** Science as result of *and* support for colonial projects
Mon Nov 11	***Scientific racism and the construction of race*** Role of science in defining racial categories
Wed Nov 13	***Standardization, bodies, and society*** Scientific objectification of bodies, especially in the context of gender and disability

Political economy of science and technology

What is the political economy of science and technology?

- Broadly, the role of **poltical** and **economic** interests on the production, transmission, and use of technoscientific knowledge
- E.g.:
  legal restrictions, funding structures, trade secrets, government partnerships, globalization, …



Exerpt from *Calculating Empires A Genealogy of Technology and Power Since 1500* (2003) by Kate Crawford and Vladan Joler

"Knowledge economy"

- "Knowledge economy" is a way of framing technoscientific knowledge in an economic framework
- ***Often***: economic production that depends on knowledge-intensive labor
- ***But also***: the treatment of knowledge itself as tangible good that can be produced, traded, shared, etc.
- Knowledge has *value*, and is a good to be *controlled*

The ideal of a "free-market" knowledge economy

Knowledge economy is often assumed to behave as a free market

- No *exogenous* constraints on the hproduction, exchange, or consumption of knowledge

Value of knowledge determined by "market" forces in response to knowledge consumers

- In a free knowledge economy, scientists are both the producers and consumers of knowledge

Idealized form of technoscientific knowledge production

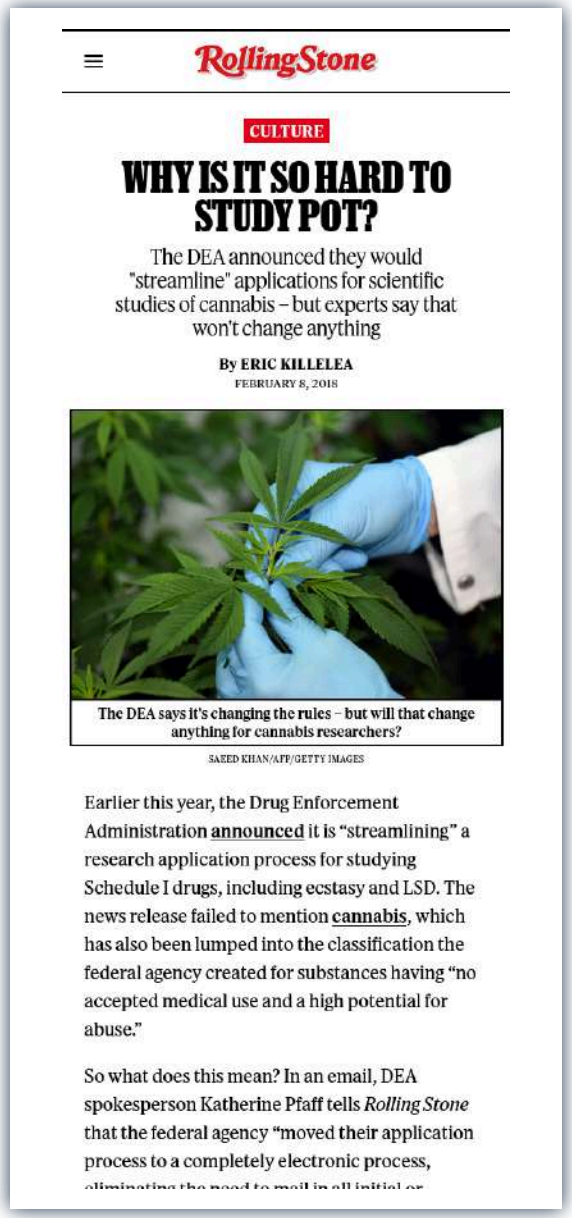
- Incentive structures for the producers/consumers of knowledge (eponymy, awards, etc) maintains skepticism and allows only 'good' knowledge production to flourish (Merton).

Contemporary STS: Knowledge economy is rarely a free market

E.g. cannabis research in the U.S.

- Until very recently (2019), scentific research on cannabis was *heavily* restricted
- Only ***certain scientists*** were allowed to research cannabis (a 'Schedule-1' drug).
- Only ***certain research questions*** were allowed to be investigated (focus on the harmful effects of cannabis).
- Only ***one source*** of cannabis could be used —provided by the National Institute on Drug Abuse (NIDA) at the University of Mississippi.

The Knowledge economy is at the whim of cultural, political, and legal frameworks



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CULTURE

WHY IS IT SO HARD TO STUDY POT?

The DEA announced they would "streamline" applications for scientific studies of cannabis – but experts say that won't change anything

By ERIC KILLELEA
FEBRUARY 8, 2018

The DEA says it's changing the rules – but will that change anything for cannabis researchers?

SAEED KHAN/AFP/GETTY IMAGES

Earlier this year, the Drug Enforcement Administration announced it is "streamlining" a research application process for studying Schedule I drugs, including ecstasy and LSD. The news release failed to mention cannabis, which has also been lumped into the classification the federal agency created for substances having "no accepted medical use and a high potential for abuse."

So what does this mean? In an email, DEA spokesperson Katherine Pfaff tells *Rolling Stone* that the federal agency "moved their application process to a completely electronic process,

Old vs. new science

OLD VS. NEW SCIENCE

"Old" science

- WWII – 1980s (or later…)
- Focus on solving ***theoretical and technical problems***
- Basis for existing ***scholarly disciplines***
- Universities and university research seen as contributing to the ***public good***
- Funding primarily from ***governments***, especially ***military***
- ***"Big science"***
- Origin of contemporary ideals of science as a ***pure***, ***disinterested*** enterprise

OLD VS. NEW SCIENCE

"New" science

- Focus on solving ***technological applications***
- Encourages ***cross-disciplinary*** research
- Embraces role of ***non-scientists*** (industry, government, public) in steering research
- Funding from ***industry and government***
- Focus on ***patents***, corporate partnerships, and ***direct sources of revenue***
- ***"Academic capitalism"***

Explaining the shift from "old" to "new"

Part of a widespread shift in culture affecting government, industry, and universities

- "Governments are demanding that universities be relevant, universities are becoming entrepreneurial, and industry is buying research from universities." (Sismondo 2009: 193)

Diminishing focus on *ideal* of science

- There is less focus on the modern ideal of science as isolated, disinterested, and universal.

Neoliberalism

- Change in ideals is part of a larger shift toward market-based institutions.
- New regime is consistent with historical processes of science supporting dominant global power structures (e.g. enlightenment ideals, colonial control, military dominance).

Intellectual property & globalization

Intellectual property & commercialization in science

Intellectual property rights (IPR)

- Patents, trademarks, copyright, etc.
- IPR allows scientific and technological ***knowledge*** to be treated as ***property***

Historically

- The current conception of intellectual property is ***relatively new***.
- IPR has been around for most of the 20th century, but its role in trade and knowledge economies was not regularized until the 1980s.

Shift in scientific incentives

- **Formerly**: individual recognition and technical invention
- **Currently**: patents and profitability

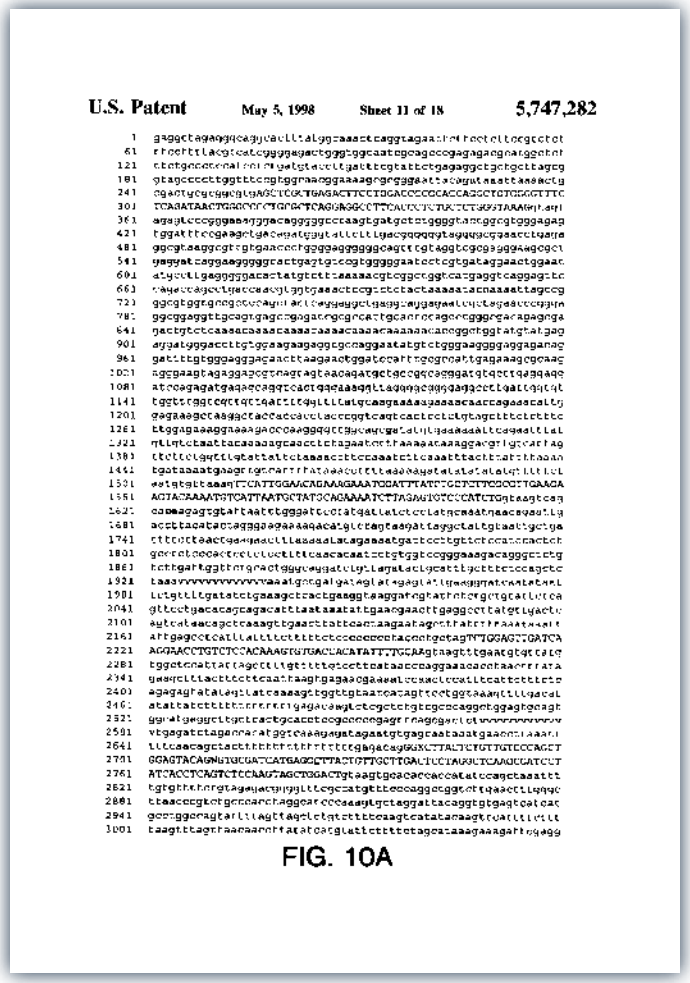

U.S. Patent May 5, 1998 Sheet 11 of 18 5,747,282

FIG. 10A

Figure 10A from US patent 5,747,282 (1998), covering the human gene BRCA1 linked to breast and ovarian cancer

Intellectual property rights as a tool for market control

Legal frameworks

- IPR often claimed to promote innovation and competition by ensuring monetary rewards for expensive or risky research
- Patents on essential drugs, biological species/genes, and 'common knowledge' may undermine such benefits

Global control

- 1994 TRIPS agreement enforces IPR in international trade
- Imposes Western IPR regime upon the rest of the world, restricting access to beneficial and life-saving technology
- Facilitates neocolonial exploitation

Intellectual property from biological sources

Species and genes as IP

- Current global IPR regime allows companies to patent biological organisms (e.g. plants, animals, bacteria) and specific genetic sequences (including human)
- Controversial in part because patent extends to ***offspring*** of organisms
  E.g. Monsando's "roundup ready" seeds

Bioprospecting & biopiracy

- *Bioprospectors* seek out commercially valuable species and genetic material (e.g. seeds and plants)
- Often use traditional knowledge of indigenous peoples to identify such material, but claim ownership through patents

Controlling global knowledge systems

Technoscience and state-making

- Tools of science and technology are fundamental to (neo)colonial processes of global control
- Regulation, trade, inter-state dependency allow powerful states to dictate what counts as ***legitimate knowledge***

Traditional (Indigenous) knowledge

- Global IPR regime controlls specific technologies, but also a **model of what knowledge *is***.
  Knowlege that is not owned, isolated, and Modern is not considered legitimate (e.g. Adams 2002)
- Indigenous technologies and categories *redefined* through the lens of Modern, Western science

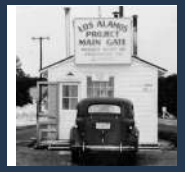
> "What is considered scientific knowledge in a dependent context is only that which has been made legitimate in the centre. It is then imitated in the periphery through the operation of pervasive dependent social and cultural mechanisms … The fundamental and the basic core knowledge grows largely in the West and is transferred to developing countries in the context of a dependent intellectual relationship"
> (Goonatilake 1993: 260, quoted in Sismondo 2011: 201)

Science, colonialism, and postcolonial science studies

- **Required**:
  Adams (2002)
  Randomized Controlled Crime
- **Supplementary**:
  Whitt (1998)
  Biocolonialism and the commodification of knowledge

Image credit

Still from Dr. Strangelove (1964), via rogerebert.com



Los Alamos National Laboratory, 1943. US Dept of Energy via National Parks Service

Exerpt from *Calculating Empires* (2003) by Kate Crawford and Vladan Joler

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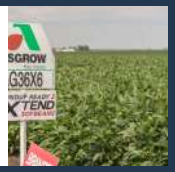

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