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ACRONYMS

There'll also be an index of terms, I think, but it's not written yet.

NON-SCIENCE STUFF

FLOSS free/libre open source software

GPL GNU General Public License

GNU GNUs Not Unix

OS open science

FLOSS free/libre open source software

GPL GNU General Public License, the founding document of the Free Software Movement

OS open science

OA open access

IF Journal Impact Factor

CNS JOURNALS *Cell*, *Nature*, and *Science*

STEM Science, Technology, Engineering, and Math

Organizations

HEW Department of Health, Education, and Welfare

IRB Institutional Review Board

USPHS U.S. Public Health Service

PLOS Public Library of Science

PLOS Public Library of Science, a leader in open access publishing

OKF Open Knowledge Foundation

OECD Organisation for Economic Co-operation and Development

TREND Teaching and Research in (Neuro)science for Development in Africa

Places

FDA Food and Drug Administration

MIT the Massachusetts Instituite of Technology

NIH National Institute of Health

NYU New York University

OEAC Other Euro-American Countries, including Australia, NZ, and Canada

ROW "Rest of World", for what that's worth

BRICS Brazil, Russia, India, China, considered the rising economic and scientific powerhouse countries

OEAC Other Euro-American Countries, including Australia, NZ, and Canada

ROW "Rest of World", for what that's worth

OECD Organisation for Economic Co-operation and Development

UB FOH University of Botswana, Faculties of Humanities

UOM FOS University of Mauritius, Faculties of Science

UCT COMM University of Cape Town, Commerce

UNAM FHSS University of Namibia, Humanities and Social Sciences

STEM Science, Technology, Engineering, and Math

SCI Science Citation Index

WOS Web of Science

SCIENCE

FACS Fluorescence Activated Cell Sorting

GPCRS G-protein coupled receptors

G-PROTEIN guanine nucleotide-binding proteins

RA retinoic acid

5-HT 5-hydroxytryptamine

CNS central nervous system

GDP guanosine diphosphate

GTP guanosine triphosphate

LSD lysergic acid diethylamide

MESCALINE 3,4,5-trimethoxyphenethylamine

OCD obsessive-compulsive disorder

DMT *N*,*N*-Dimethyltryptamine

DOM 2,5-Dimethoxy-4-methylamphetamine

DOI 2,5-Dimethoxy-4-iodoamphetamine

STP Serenity, Tranquility, Peace

PFC prefrontal cortex

LC locus coeruleus

PET positron emission tomography

HTR head twitch response

DEA Drug Enforcement Administration

PPI pre pulse inhibition

1

SCIENCE STUDIES, FEMINIST THEORY, CULTURAL STUDIES

Science is an empowering technology. The sense of systematic inquiry satisfies some deep drive to understand and explain the world around us; "science" is part of a long and storied heritage of bold exploration, innovation, and human ingenuity.

rewrite intro sentence

The classic question in scientific philosophy classes, or history of science classes: "what is science?" While I'd love to spend time ruminating on what the word – or field, or method of knowing, or style of inquiry – is and is not, I move gravitate more quickly towards the practical implications of a science embedded in a culture. For our purposes:

"But boundary crossing in itself is not very interesting for feminist, multicultural, antiracist technoscience projects. Technoscience provokes an interest in zones of implosion, more than in boundaries, crossed or not. The most interesting question is, What forms of life survive and flourish in those dense, imploded zones?"

see Longino?

Science, a systematic enterprise that builds and organizes knowledge in the form of testable explanations and predictions about nature and the universe; *progress*

Science, an international weekly science journal, published by the American Association for the Advancement of Science

Science, a way of exploring the world from a specific cultural/philosophical/technical viewpoint; a practice and culture, but a "culture of no culture": domination and power relations through knowledge

Our second is tongue-in-cheek and the third is certainly controversial, so we'll start with troubling the notion of science as progress and as a systematic truth-building exercise.

Science is, simultaneously and harmoniously, a handmaid to progress and a crucial strut in upholding systematic societal inequities. It is both a compelling, evidence-driven narrative about biological and physical realities and a knowledge necessarily developed in a social context.

rewrite word choice of "progress"?

1.1 BIOPOLITICS OR SCIENTIFIC RESPONSIBILITY?

For the ethical duties and responsibilities of scientists, we have Institutional Review Board (IRB)s to manage human experiments, and the Republican party to manage stem cell and climate science. Ethics are relegated to the limited frame of experimental design and execution. Notions of informed consent, "do no harm", and the humanity of people are what I would call ethical responsiblities, are critical and basic scientific practices.

That is not, however, exactly what this dumb Div III is about.

Take, for example, the well-known Tuskegee Syphilis experiments. In 1932 Tuskegee, Alabama, the U.S. Public Health Service (USPHS) enrolled 400 syphilis-positive black men to observe the "natural" course of untreated, latent syphilis. The study heads began by enticing their participants with explicit promises of free health care and treatment, a promise they never intended to fulfill. To ensure the disease stayed "natural", the USPHS researchers took steps to prevent their subjects from

and they were testing with the Wasserman reaction!

being treated by local physicians. When the draft came through in 1941 and tested for syphilis, the USPHS reseachers supplied the draft board with a list of names to be excluded from treatment; the U.S. Army complied. In 1932, no effective syphilis treatment existed, although it was believed that certain mercury ointments could slow its course. Twenty years into the study, when penicillin *had* become established as an effective syphilis treatment, researchers increased their efforts to prevent interference by the outside world and to maintain the course of disease. Halfway through the study, more than 30% of the test group had died *directly* from advanced syphilitic lesions, with many more suffering from secondary complications.[2]

The "study" ceased forty years after it started, in 1972, after a whistle-blower publication in the *New York Times* and Congressional hearings.

In 1973, a year after the cessation of the study, the Department of Health, Education, and Welfare (HEW) released a damning report of the ethical failures over the course of the study. The report focused on the (1) lack of treatment, arguing that once penicillin had been discovered, it should have been used and (2) the "informed consent issue", wherein the report argued men had submitted to *an* experiment, without being told what the experiment entailed. This remains the dominant interpretation:

Wikipedia because it represents dominant views of culture/science

> "...controversial for reasons related to ethical standards, primarily because researchers knowingly failed to treat patients appropriately after the 1940s validation of penicillin as an effective cure for the disease they were studying."
>
> Wikipedia on the Tuskegee Syphilis experiments[16]

To our modern sensibilities, this was a complete ethical failure on the part of the scientists involved, their funding body, and the hospital. The criticism are founded in notions of what a *good* doctor would have done differently.

This is an ethical criticism, and an ethical lesson. It does not account for or consider the deep social structures that *allowed* the Tuskegee experiments to go forward. Doctors and reseachers discounted the socio-economics of black America, arguing that better medical care could not alter the "evolutionary scheme" of things. Researchers never *intended* to treat these men, because in their (white) eyes, black men were a subhuman species. The discovery of penicillin had no bearing on their decision to watch the natural course of death.[2]

All parties were deeply and irrevocably shaped by the anti-back racism in the post-Civil War Jim Crow era that continued, with only slight variation, until the Civil Rights movement. Only deep-seated knowledges about black culture and bodies could enable the Tuskegee Syphilis Study.

Reports were also published every two years by JAMA, so like, this wasn't HIDDEN. Many people saw and discussed this thing.

1.1.1 *Ah a section divider here probably?*

define modern science

Modern scientific systems evolved in an era of Western expansionism

and imperialism; the beginnings of biological classifications and phylogenies are rooted in exploratory voyages and speciment collection by Europeans.The Scientific Revolution enabled and fed on the expansion of European powers into new territory.

research scientific imperialism, bioprospecting, new forms

Discovery of the 'cure' for malaria (by indigenous tribes in the Amazon, transferred to the Jesuit, and eventually the expanding European empires) allowed European nations to make inroads into tropical areas, as their soldiers were no longer dying at the prodigious rates.

Racism – the peculiar brand of American racism, derived from slaveowners desperate to justify their brutality of human bondage – was created through the collusion of science and society, specifically a science that carefully cataloged and characterized the way black men and women differed, and were therefore lesser, than White slaveholders. Darwin's great proposal of evolution let scientists justify the status quo (White men, White Women, Black men, Black women, in that order) as a mere consequence of natural selection.

That was the 40's and 50's – today, we have genetic surveillance.[13]

rewrite genetic surveillance, 1000 genomes project

We have the sciences of homosexuality: if being gay is a genetic inheritance, then we should be careful to screen our pre-natal children and not allow gay men to donate sperm.. If it's cultural, we should be more careful to police the kind of culture we give our children, carefully isolating them in heterosexual spaces. We can cure the queers, if only we knew *why* they were homosexual.

intentionally focused on gay Men because patriarchy

The scientific heritage, the accumulated knowledge upon which we build our futures, is not exempt from criticism more commonly leveled at explicitly political institutions. At the same time, the undeniable power of science and technology to do "good" – hormone therapy for medical gender transitions, Internet communities for otherwise isolated activists, the reclamation of environmental sciences by Native communities, technologies that re-enable disabled bodies, pharmaceuticals that prolong lifespans and raise quality of life, and allow people to take control of their reproductive health* – means we need science to keep pushing. Not to mention the insatiable curiousty to understand and the delightful appeal of "basic" research, of discovering something new.

Science is not going away, and nor should it; but to ignore our scientific inheritance, the complicity between science and power, and the role of individual scientists in perpetuating and creating power dynamics is to be neutral in the face of injustice.

1.2 SCIENCE STUDIES

Expand historical section of science studies to generate a foundation for current critiques. Probably means a more explicit Fleck summary w/- page numbers, quotes

Both my historical time line and ideological foundation for science studies starts with Ludwik Fleck's *Genesis and Development of a Scientific Fact*, first published in 1935 pre-WWII Germany.[5] A practicing syphilis researcher and pathologist, Fleck proposes scientists as the creators of facts, rather than mere observers; or rather, that the act of observing also creates. He describes how certain *styles* of thinking permeate and circumscribe scientific collectives and the people within them. Scientific knowledge is only accepted as true fact once the evidence been thoroughly vetted, trimmed, mediated, and judged acceptable by experts in the field. This is not just the peer-review that drives science,

*Given access and governments that don't insist on fucking bullshit lookin' @ you, everybody.

but the presented facts must fit more-or-less neatly into pre-existing structures of thought.

"Facts" are then not so much realities of the world but interpretations of it, made by collaboration between individual, collective, and evidence; they only take shape in a matrix of other beliefs and discoveries about the world. Like a group of people who together produce an idea where the origin is never really clear, scientific facts are held in a common tension, without distinctly available origin stories.

Fleck and Kuhn and many of their concurrent and subsequent philosophers, historians, and sociologists of science offer compelling arguments that science is, yes, evolution, but not evolution *towards* anything.

link P

[[Linking paragraph about how dissatisfying it is to deconstruct science without talking about the *implications* of a value-laden science]]

1.3 FEMINIST THEORY

"...Questioning representation with a vengeance."

rewrite feminist science studies chronology; ways it is or is not western; academic feminism, co-option of grassroots

New ways of knowing overlaps with technology and science studies overlaps with philosophy of science overlaps with uncountable modes andof analysis. What I now call feminist science studies emerges out of academic activists against white supremacy, patriarchy, heteronormativity, and ecological destruction working on ways to critique science as a social institution, and using that critique to forge new ways of asking and answering scientific questions.

Feminist science studies is then at confluence of many ideas, summed in Donna Haraway's 1994 *Cat's Cradle: Science Studies, Feminist Theory, Cultural Studies.*[7]

> **"Cultural studies**... Not culture only as symbols and meanings, not comparative culture studies, but culture as an account of the agencies, hegemonies, counter-hegemonies, and unexpected possibilities of bodily construction... Relentless attention to the ties of power and embodiment... location and knowledge. Unconvinced by claims about insuperable natural divides between high and low culture, science and everything else, words and things, theory and practice.
>
> **Feminist, Multicultural, and Antiracist Theory/Projects**... situated knowledges, where the description of the situation is never self-evident, never simply "concrete," always critical; the kind of standpoint with stakes in showing how "gender," "race," or any structured inequality in each interlocking specific instance gets built into the world–i.e., not "gender" or "race" as attributes or as properties, but "racialized gender" as a practice that builds worlds and objects in some ways rather than others... gender and race are built into practice and have no other reality, no origin, no status as properties ...questioning representation with a vengeance.
>
> **Science Studies**... reflexivity, constructionism... science in the making (not science made), actors and networks... science

> as practice and culture... the culture of no culture, the nature of no nature... All the disciplines of science studies: history, philosophy, sociology, semiology, and anthropology; but also the formation of science studies out of the histories of radical science movements, community organizing, and policy-directed work. These histories are regularly erased in the hegemonic accounts of disciplinary and interdisciplinary development in the academy and the professions."
>
> -Donna Haraway, *Cat's Cradle*, p. 66-68

So now that we know what we're dealing with (sort of, although it's a slippery web of concepts), that brings us to: so what? Why bother? Why shouldn't we, as one professor urged me, "cut the sociology, focus on the science"?

1.4 WHAT DOES THIS DO IN A PRACTICAL SENSE?

Because I have to at least try to be an Emma Goldman, not Margaret Sanger.

1.4.1 *"Asking Different Questions"*

Feminist science studies both allows and demands practicing scientists engagement with more than "just" science. It lets us ask questions of representation in our labs, our literature, and our students: "Where are the women? *Who* is practicing science, and who is deciding what science is important?" This extends to questioning not just gender, but about race, physical ability, nationalities, and other sociological classifications.

Or should *extend...*

Feminist science studies also lets – and again, demands – that we ask questions on another level about the nature of the knowledge produced. This includes (among many other things),

Representationally weak.

- an examination of the scientific *construction* of race and gender perpetuated by the perceived objectivity of the sciences[6,4,3]
- the deep paradoxes involved in the ab/use of women's bodies in pursuit of reproductive technologies[12,1]
- the shaping of science by gendered and racialized metaphors and languages,[9,10] and the historical complicity between scientific exploration and colonialism, misogyny, and racism (all at once, not as isolated variables)[8,11,14]
- challenging the artificial boundaries between "basic research" and nature/culture to explain a rapidly-growing scientific-industrial complex, and then linking basic research to community activism for women's rights and environmental movements.[15]

It asks us to look at science as a practice inseparable from culture, and what that might mean for knowledge and for scientists as the future producers of that knowledge.

rewrite this? maybe with sources or more emotions

do they though?

Because feminist science asks questions that are fundamentally geared towards addressing socialized inequalities in science, it can (and has) help scientists take those inequalities into account. Scientists (in theory) care about helping people. It can't help people if it's racist, misogynistic, and not considerate of how work will be ab/used downstream.

1.5.1 *The point of the thesis*

Scientists should care about where their work is coming from and where it's going, and we *need* good – read: concerned and activist – people everywhere if we want social progress. This div is (hopefully) a road map and detailed exploration into doing (good) value-laden science. Figure out *how* to apply all of that stuff to everything else I care about: namely, open science, open neuroscience, molecular neuroscience and then write about what did and did not work.

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