





RIPE NCC
RIPE NETWORK COORDINATION CENTRE

Ethics in Technology

*Internet Measurements'
Ethical Dilemmas and
RIPE Atlas*

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Novi SAd, Serbia | September 2017 | BaICCoN2k17



Overview

- Part 1
 - Technical is political
 - Moral obligations of scientists, engineers, hackers
 - Our ethics determine our (technical) choices
- Part 2
 - Ethics of Internet Measurements & RIPE Atlas
- Part 3
 - Question Everything!
 - With great power comes great responsibility
 - Beyond techno-optimism, beyond anthropocentrism: re-connect



Main Inspirations

- [r] Phillip Rogaway: “The Moral Character of Cryptographic Work” (2015)
- [ensr] “Philosophy meets Internet Engineering: Ethics in Networked Systems Research” (2015)
- [art] Langdon Winner: “Do Artefacts Have Politics?” (1980)
- [p] Allison Parrish: “Programming is Forgetting: Toward a New Hacker Ethic” (2016)
- [u] Ursula K. Le Guin: “A Non-Euclidean View of California as a Cold Place to Be” (1989)



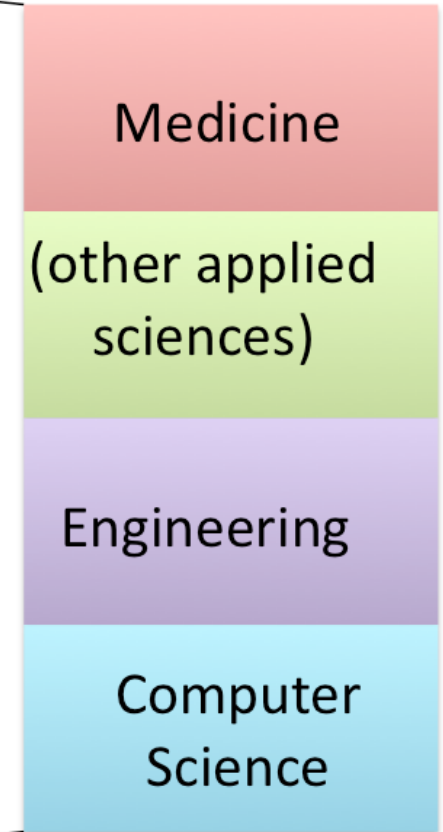
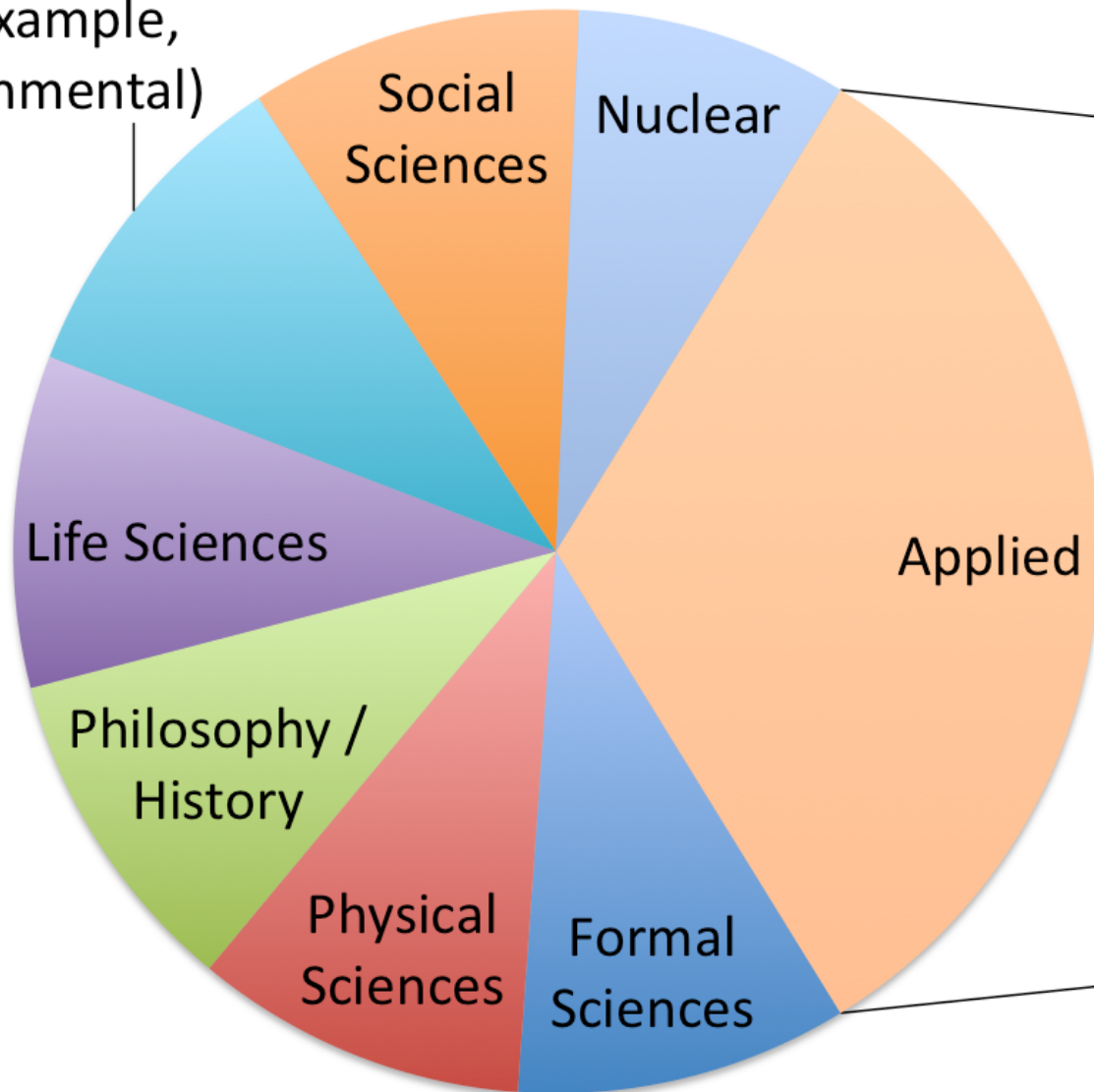
Ethics in Science & Technology

Ethics

[edit](#)

Ethics (via [Latin](#) *ethica* from the [Ancient Greek](#) ἠθική [φιλοσοφία] "moral philosophy", from the [adjective](#) of ἦθος *ēthos* "custom, habit"), a major branch of philosophy, is the study of [values](#) and [customs](#) of a person or group. It in simplest terms is the philosophy on how to act. It covers the [analysis](#) and employment of [concepts](#) such as [right](#) and [wrong](#), [good and evil](#), and [responsibility](#). It is divided into three primary areas: *meta-ethics* (the study of the concept of ethics), *normative ethics* (the study of how to determine ethical values), and *applied ethics* (the study of the use of ethical values).

Interdisciplinary
(for example,
Environmental)







The othe of Hippocratus
which he gaue vnto his disciples and scollers, which professing Phisicke and Chirurgerie, is very worthie to be obserued and kept faithfullie, of euerie true and honest Artefts, although he himselfe were but a heathen man, and without the true knowledge of the living God, yet for his noble and excellent skill in Phisicke and Chirurgerie, he ought not to be forgotten of vs his posteritie; but to be had in an honorable remembrance for euer.

Ethics

in the Environmental Movement



Classical Sciences Ethical Dilemmas



- Medical sciences
 - Hippocratic Oath, Nuremberg trials
- Technical sciences
 - Nuclear bomb & energy / Russel-Einstein Manifesto
 - Engineering ethics
- Environmental sciences
 - Silent Spring / animal rights



Technical is Political

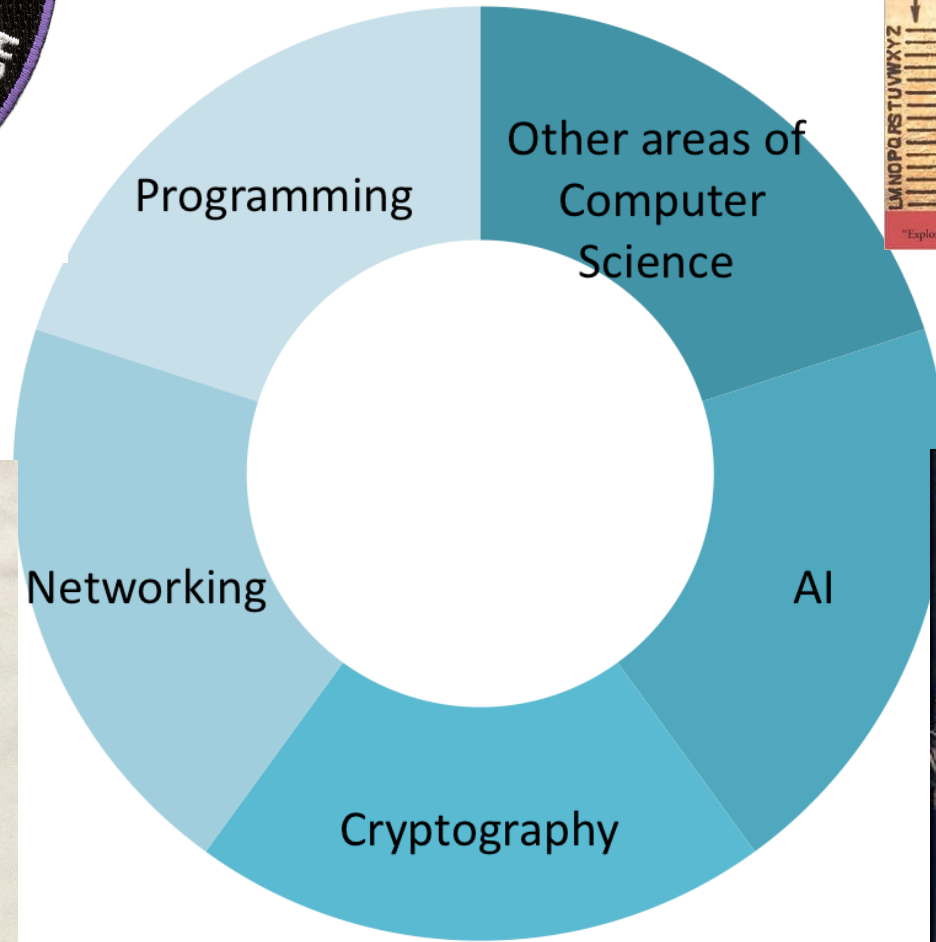
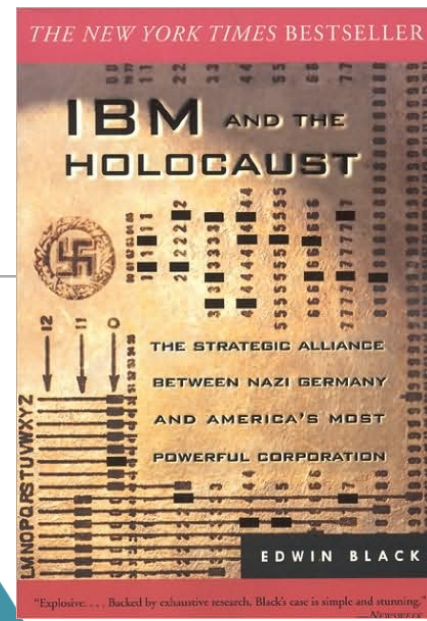
- The machines, structures, and systems of modern material culture are judged for their:
 - contributions of efficiency and productivity,
 - positive and negative environmental side effects,
 - the ways in which they can embody specific forms of power and authority.
- Technological ideas and technological things are **not** politically **neutral**: routinely, they have strong, built-in tendencies. Technological advances are usefully considered not only from the lens of how they work, but also **why** they came to be as they did, whom they help, and whom they **harm**. [r]



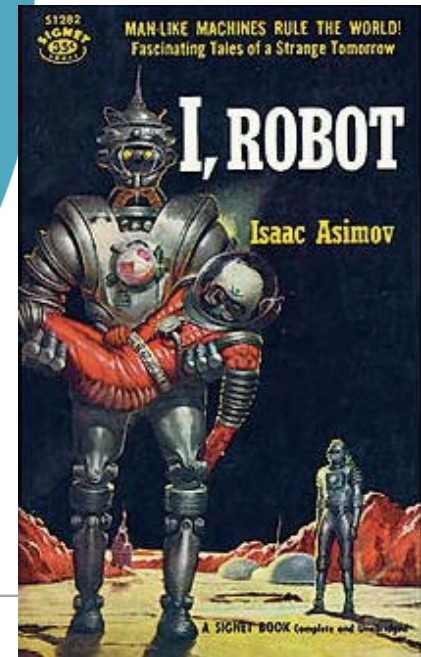
Programming is Political

- Language is political
- Artefacts are political [art]
- Transcription / translation is political [p]
- Crypto is political [r]
- Code Is Politics [how]

- “The Personal is Political” [feminism]



1/1 - "Edward Snowden" Xilografía (MDF) Felipe Crespo/2013



Modern Sciences Ethical Dilemmas



- Artificial Intelligence
- Nanotech
- Cryptography
 - Cyberpunks
- Cyberspace Manifesto
- Human Rights in Internet Protocols





Internet Ethics: FLOSS, Hackers, Cryptographers



“Free Software” Values

- Individual freedoms
 - to use the software as you wish ;
 - to study the program and how it works (perusing its source code) ;
- At a collective level:
 - the freedom to distribute exact copies of the program, so you can help your neighbor ; and
 - the freedom to modify the source code and distribute these modified versions under the same conditions.
- <https://gnu.org/philosophy/free-sw>
- Open Source vs Free/Libre Software?

Everybody needs a hacker





Levy's Hacker Ethic

- Access to computers should be unlimited and total.
- All information should be free.
- Mistrust authority—promote decentralization.
- Hackers should be judged by their hacking, not bogus criteria such as degrees, age, race or position, **gender**
- You can create art and beauty on a computer.
- Computers can change your life for the better.

Tips for Academic Cryptographers



- ◁ Attend to problems' social value. Do anti-surveillance research.
- ◁ Be introspective about why you are working on the problems you are.
- ◁ Think twice, and then again, about accepting military funding.
- ◁ Regard ordinary people as those whose needs you ultimately aim to satisfy.
- ◁ Use the academic freedom that you have
- ◁ Be open to diverse models. Regard all models as suspect and dialectical.
- ◁ Get a systems-level view. Attend to that which surrounds our field.
- ◁ Design and build a broadly useful cryptographic commons.
- ◁ Take adversaries seriously.



8. The Critical Engineer looks to the history of art, architecture, activism, philosophy and invention and finds exemplary works of Critical Engineering. Strategies, ideas and agendas from these disciplines will be adopted, re-purposed and deployed.

9. The Critical Engineer notes that written code expands into social and psychological realms, regulating behaviour between people and the machines they interact with. By understanding this, the Critical Engineer seeks to reconstruct user-constraints and social action through means of digital excavation.

10. The Critical Engineer considers the exploit to be the most desirable form of exposure.



Internet Measurements Ethics



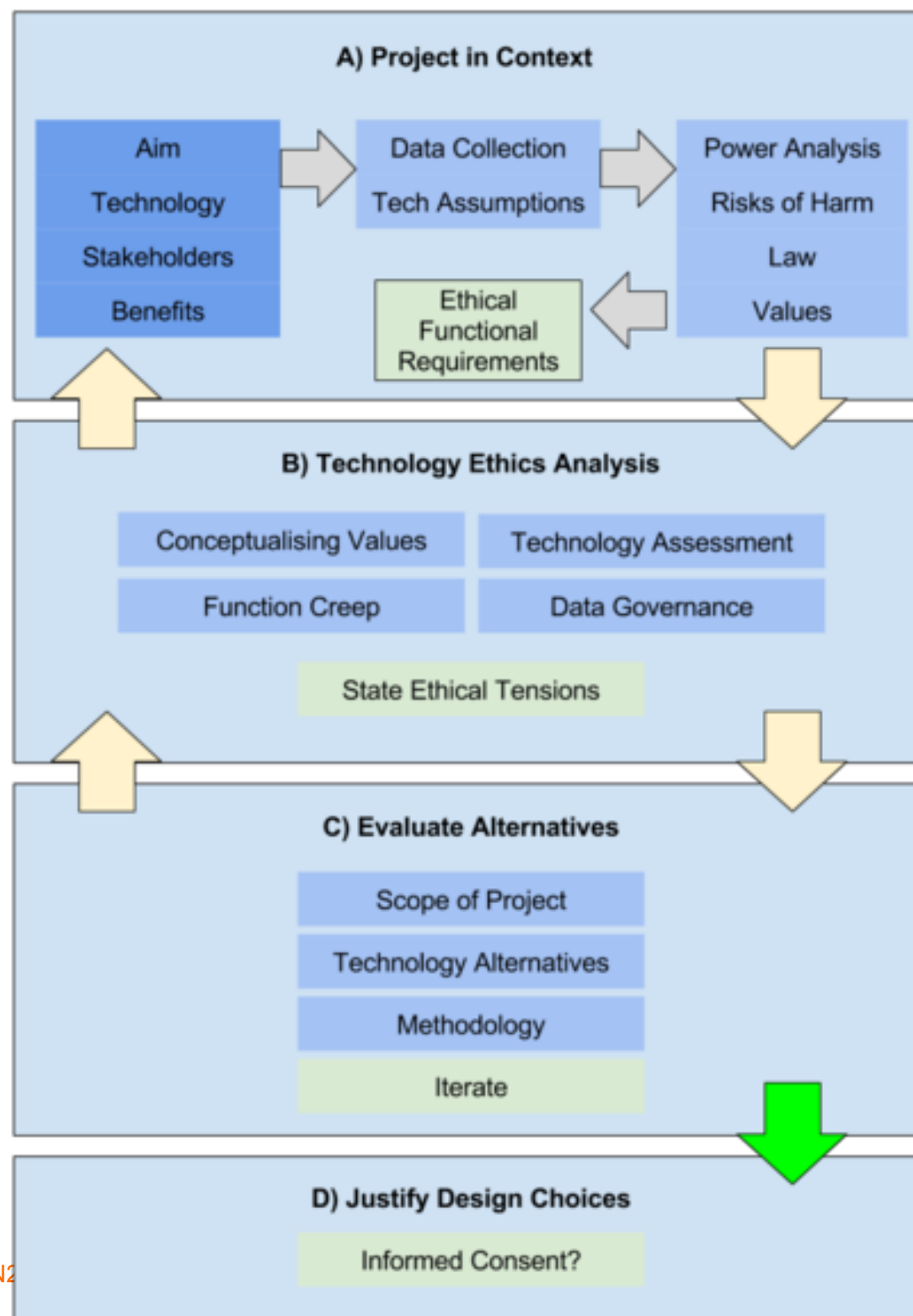
Theory of Applied Ethics

- Consequentialism
 - Utilitarianism
 - Act Consequentialism / Rule Consequentialism
- Deontology
- Virtue Ethics (“telos”)
- Principlism
 - respect for autonomy, beneficence, non-maleficence, justice
- Pluralism and casuistry

Measurements Ethics [ensr]



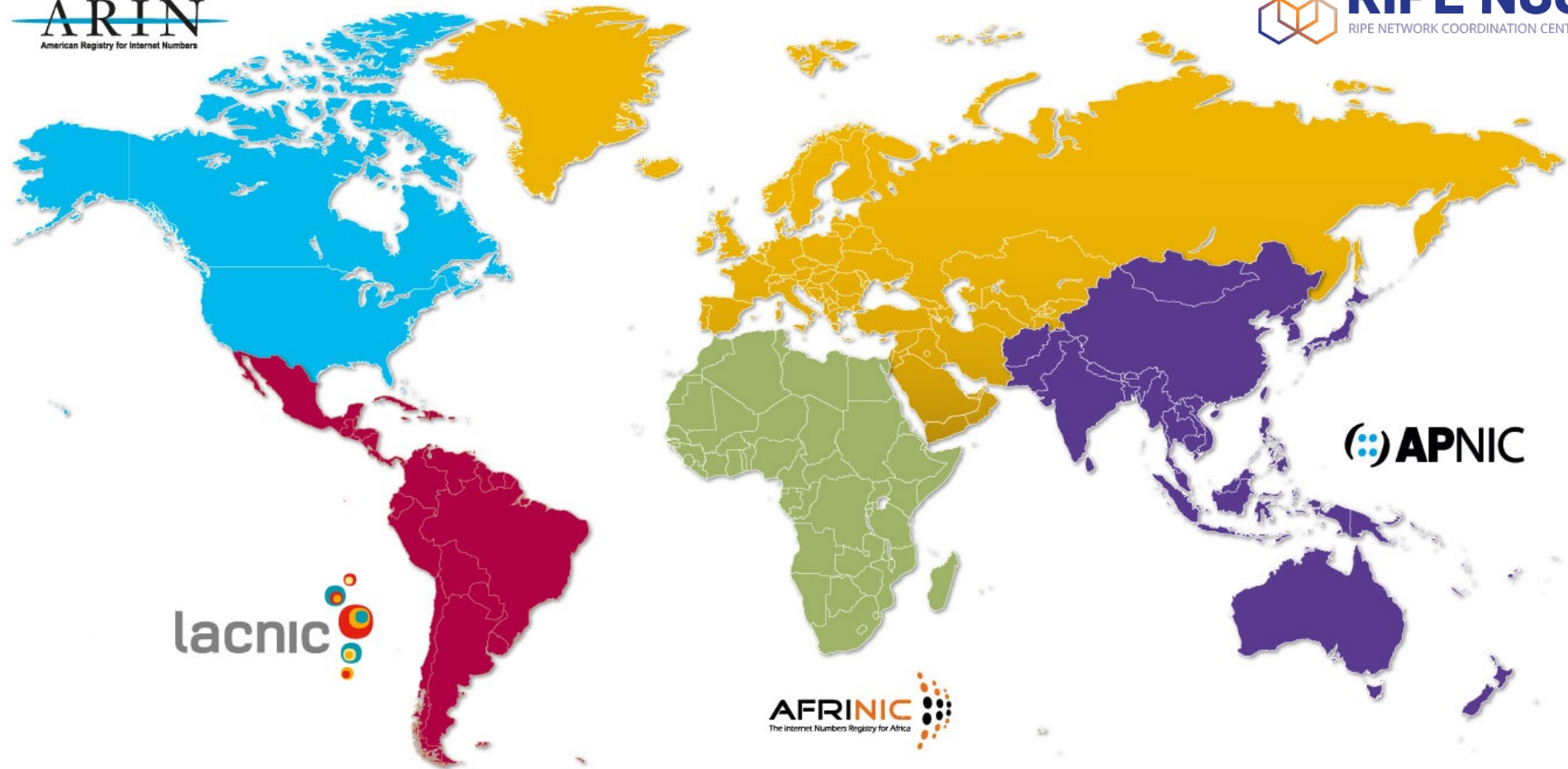
- Internet as socio-technical system
- Responsibilities resulting from power imbalances
- Meaningful informed consent
- Weighing risks, benefits and values for an ethical analysis
- Status of easily accessible data
- Not condoning potentially unethical research methods





RIPE NCC, RIPE Atlas, Ethics Implemented

The Internet Registry System



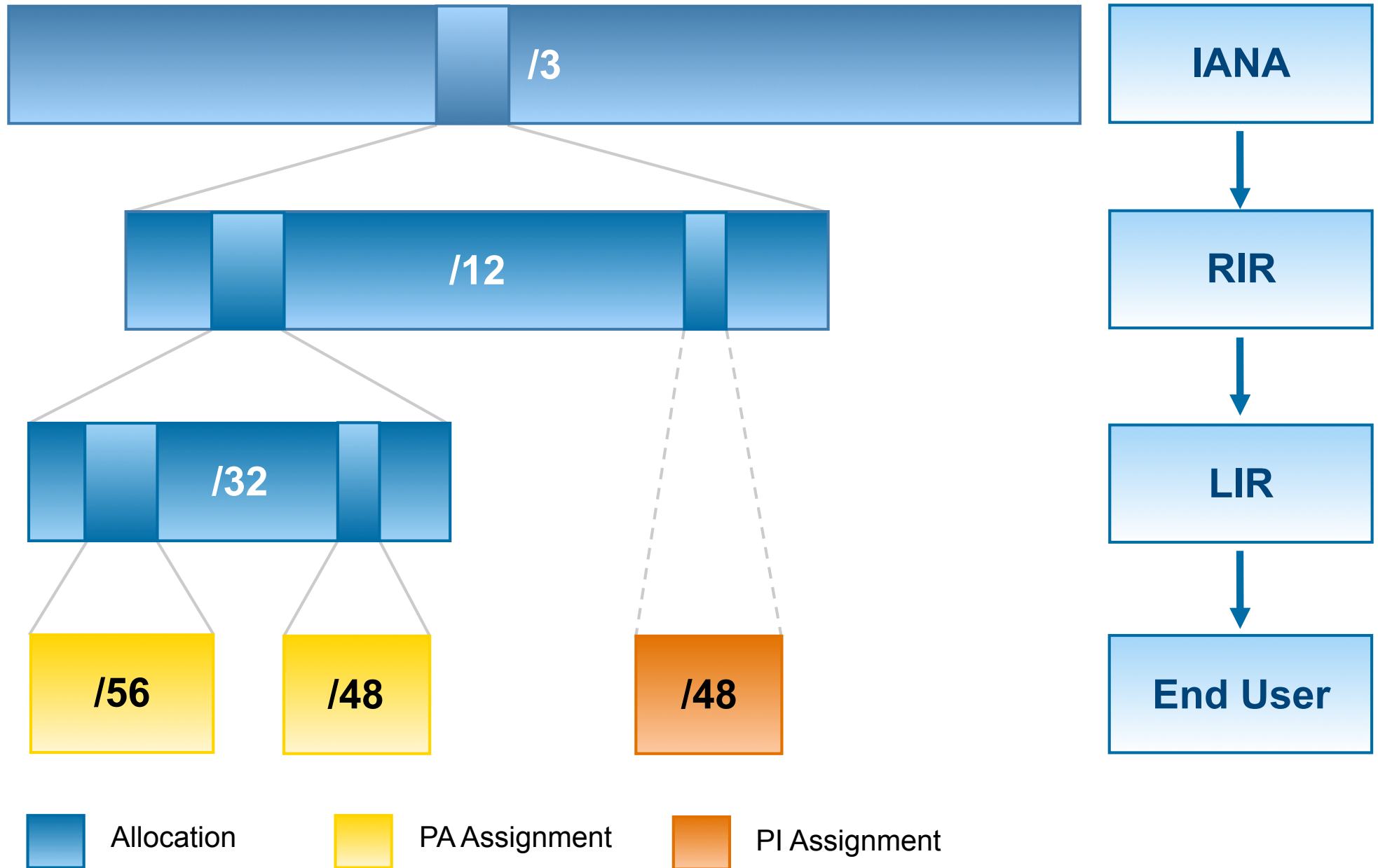


Regional Internet Registries

- Five RIRs worldwide
 - Not-for-profit organisations
 - Funded by membership fees
 - Distributing Internet resources & coordinating related activities
 - Policies decided by regional communities
 - Neutral, Impartial, Open, Transparent



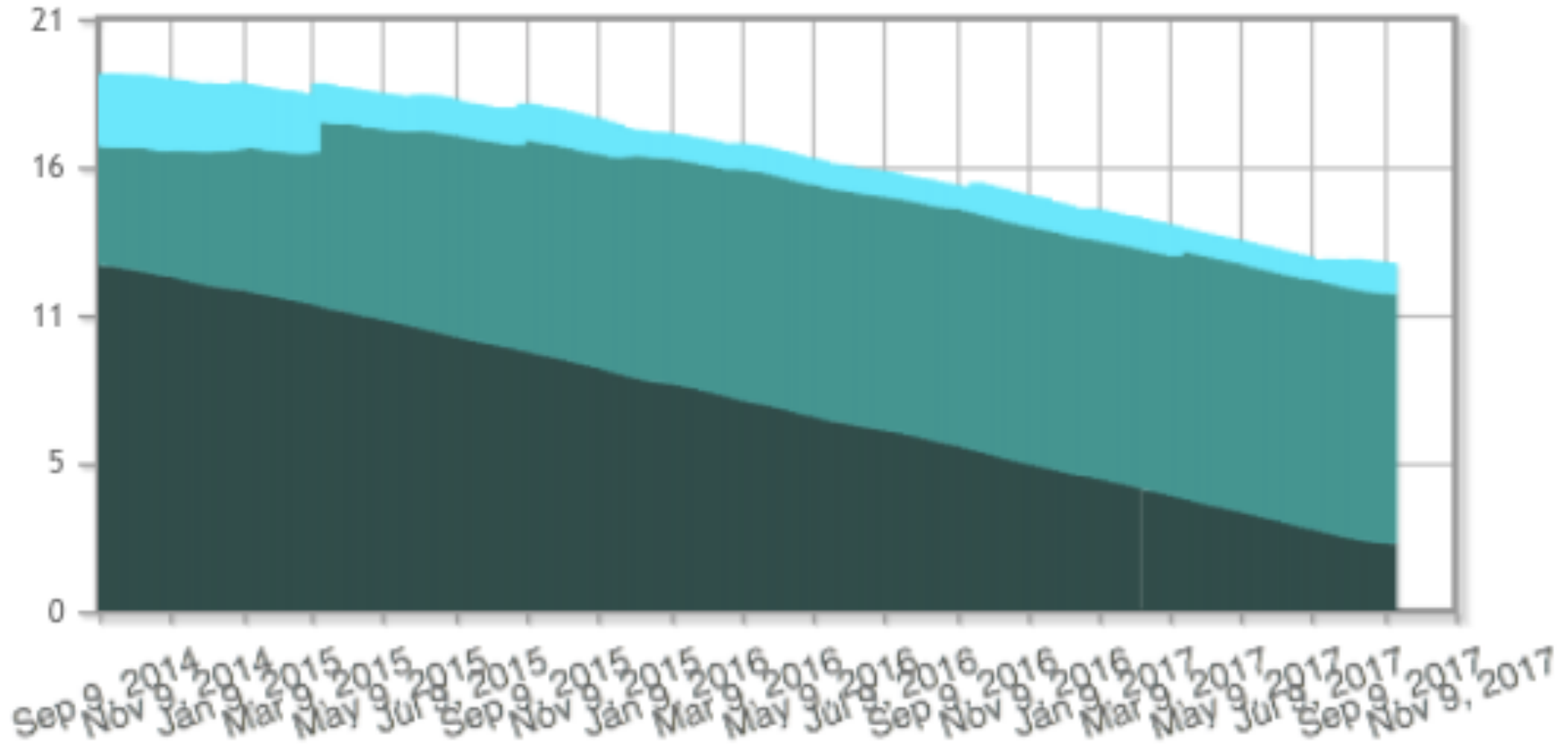
IPv6 Addresses Distribution



IPv4 Available pool



RIPE NCC IPv4 Pool – Last 36 Months



RIPE Atlas



From Wikipedia, the free encyclopedia

RIPE Atlas [↗](#) is a global, open, distributed Internet measurement platform, consisting of thousands of measurement devices that measure Internet connectivity in real time.



<https://atlas.ripe.net>

Most Popular RIPE Atlas Features



- Six types of measurements: ping, traceroute, DNS, SSL/TLS, NTP and HTTP (to anchors)
- APIs to start measurements and get results
- Powerful and informative visualisations: “Time Travel”, LatencyMON, DomainMON, TraceMon
- CLI tools
- Streaming data for real-time results
- Roadmap shows what’s completed and coming

Measurements Platforms Comparison



Platform	Flexibility	Coverage	Blocking resistance	Main use
PlanetLab [16]	High	Low/Medium	Medium	Network measurements
Atlas [18]	Low	Medium/High	Medium	Network measurements
M-Lab [6]	Low	High	Medium	Network measurements
Tor [5]	Medium	Medium	Low	Low-latency anonymity
OONI [10]	High	Low	Medium	Interference analysis
Herdict [11]	Low	Low/Medium	Low	Interference analysis
OpenNet [14]	Low	Medium	High	Interference analysis

Table 1: Comparison between several popular filtering analysis platforms.

- “Global Network Interference Detection over the RIPE Atlas Network” (FOCI14)

Ethics built into design of RIPE Atlas

- Active measurements only
 - No passive measurements
 - probes do not observe user traffic
- Data, API, source code, tools: **free and open**
- Kept set of measurements very limited, in order to prevent placing hosts in danger



RIPE ATLAS

Ongoing RIPE Atlas moral dilemmas



- 2013: Opening-up source code
- 2014: Keeping “non-public” measurements available
- 2015: Not allowing HTTP measurements to random targets
- 2016: Security audit

2017

ENSURING A FUTURE FOR DETECTING INTERNET DISRUPTIONS

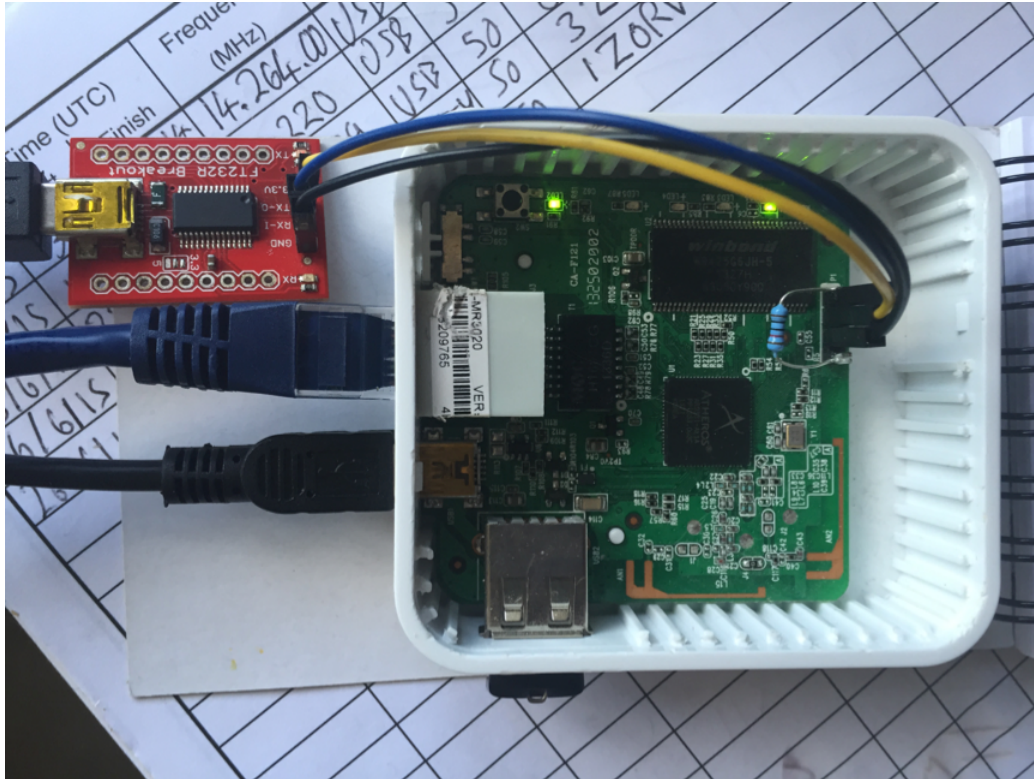
A Field Survey of the Ecosystem Around Internet Censorship, Disruptions, and Shutdowns



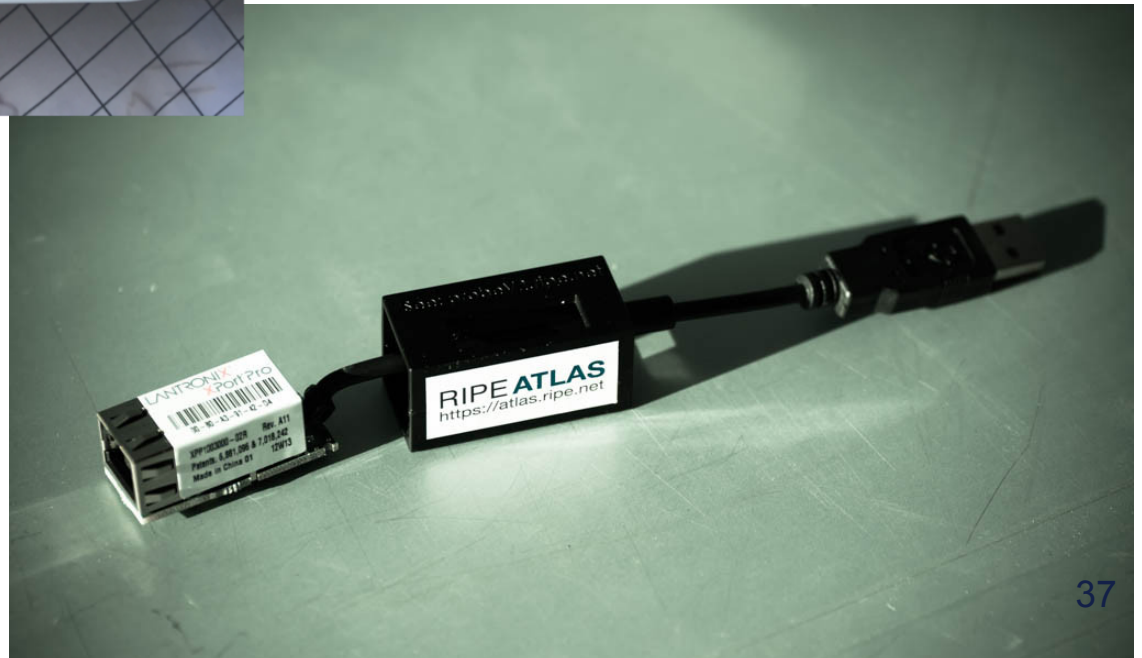
Category & Characteristics	Requirements	Example(s)
ECONOMIC		
Protecting business access	<ul style="list-style-type: none">• Attribution• Contextual	Online services combating censorship/disruption targeting their services or companies
Ensuring large-scale access	<ul style="list-style-type: none">• Attribution• Contextual• Compelling• Comparative	Department of State, international telecommunications bodies/groups [e.g., ITU, ICANN], RIPE Atlas , M-Lab



Hackers involvement

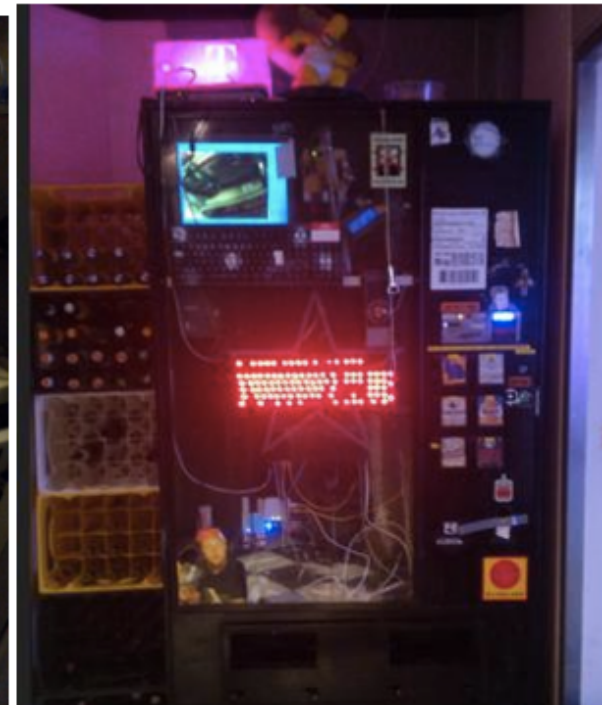


- Responsible disclosure





Probes at hackerspaces



<https://labs.ripe.net/hackathons>



AUTOMATE ALL THE THINGS





Powered by Stroopwafels!





Goals of the Hackathons

- Bring together operators, researchers, designers, coders
- Combine creative skills
- Get feedback for RIPE NCC
- Contribute useful tools for operators
- Make new connections
- Have fun!





IPv6 Hackathon!

- <https://labs.ripe.net/Members/becha/save-the-date-ripe-ncc-hackathon-version-6>
- Date: 4 and 5 November 2017
 - Saturday & Sunday
- Location: Copenhagen, Denmark
- Sponsor: Comcast
- Local support: DKNORG
- Still looking for participants!





- Students and researchers:
 - Present your Internet-related research at RIPE Meetings
 - Complimentary tickets, travel and accommodation
 - Topics: network measurement and analysis, **security**, IPv6 deployment, BGP routing, Internet governance, peering and interconnectivity, IoT
- ripe.net/raci



RIPE Labs

INNOVATIVE INTERNET TOOLS AND IDEAS
SHARE EXPERIENCE | SHOWCASE TOOLS | PRESENT RESEARCH

- Publish your research or use case
- Reach out to RIPE Community
- Read about latest analysis or conferences
- labs.ripe.net

Take part in RIPE [Atlas,NCC,community]!



- Join the hackathon!
- Come to the RIPE/ENOG/SEE/MENOG meeting!
- Write for RIPE Labs!
- Join RIPE Atlas community!
 - Host a RIPE Atlas probe!
 - Use our (open) measurements data !
 - Use, modify & improve our (FLOSS) software!
- @RIPE_Atlas, atlas@ripe.net, atlas.ripe.net



Beyond Hackers Ethics

Question Everything!

<http://linnytu.com/hacker>



linnytu.com/hacker

this is what a hacker looks
like.

or is it?

the image of the white,
male hacker in a hoodie is
harmful and exclusive to
people who don't fit that
mold.

what if you could change
that image?

lights

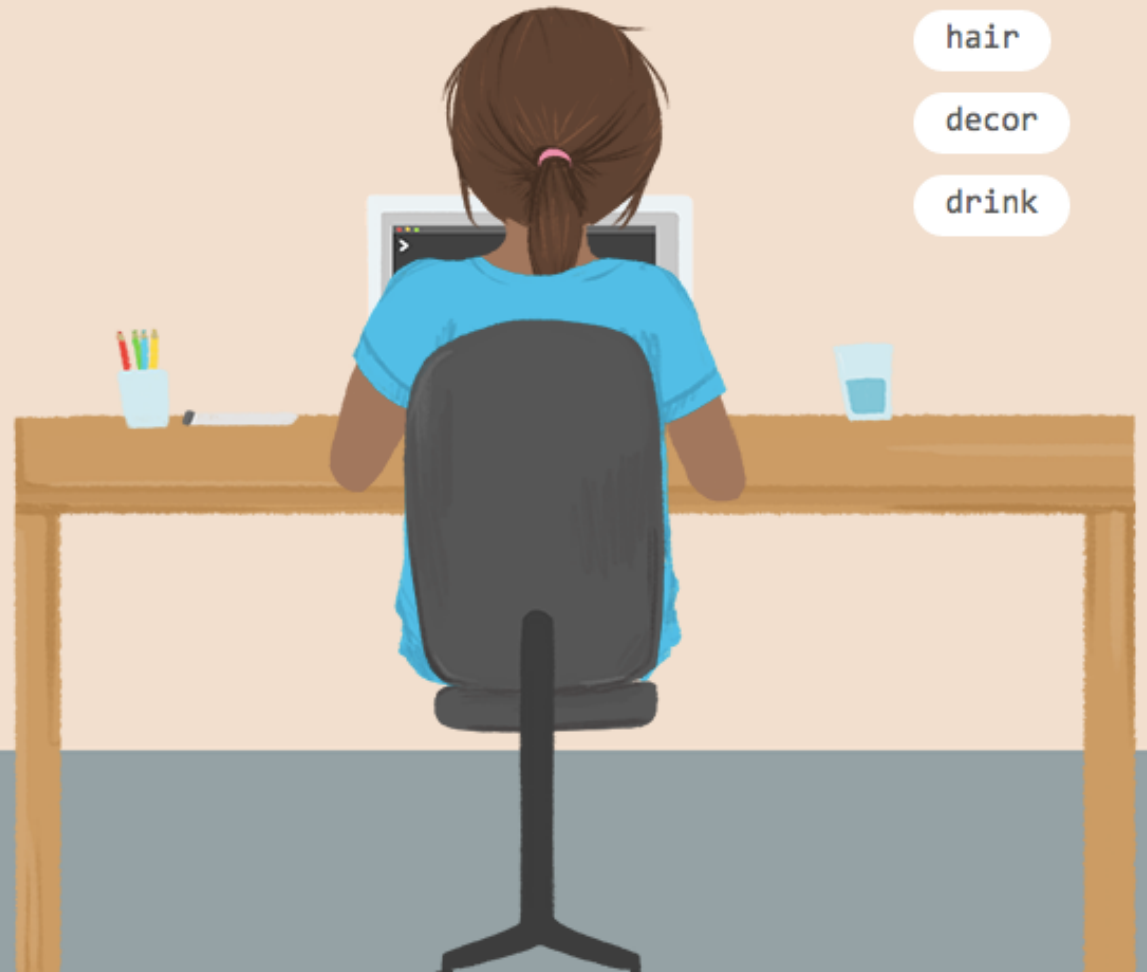
clothing

skin

hair

decor

drink



Hacker ~~Ethic~~ Questions

- ~~Access to computers should be unlimited and total.~~ Who gets to use what I make? Who am I leaving out? How does what I make facilitate or hinder access?
- ~~All information should be free.~~ What data am I using? Whose labor produced it and what biases and assumptions are built into it? Why choose this particular phenomenon for digitization/transcription? What do the data leave out?
- ~~Mistrust authority—promote decentralization.~~ What systems of authority am I enacting through what I make? What systems of support do I rely on? How does what I make support other people?
- ~~Hackers should be judged by their hacking, not bogus criteria such as degrees, age, race or position.~~ What kind of community am I assuming? What community do I invite through what I make? How are my own personal values reflected in what I make?

Allison Parrish: “Programming is Forgetting: Toward a New Hacker Ethic” (2016)



- **Context:** How would you describe the context within which data is collected (or affected), or phenomena are measured?
- **Aims:** What are the aim and benefits of the project?
- **Benefits:** Why are the benefits good for stakeholders?
- **Purpose limitation:** Can the scope of data collection be limited whilst still
- **Politics and Power:** Are particular stakeholders empowered or disempowered?
- **Risk of Harm:** Could the collection of the data in this study be reasonably expected to impact to any person's well-being?
- **Law:** Which bodies of law are likely to be applicable to the operation of the project?
- **Values:** Which values will the project conceivably impact?
- **Burdens:** Who carries the burden of harms or impacted values, and how?
- **Technology Ethics:** Can the harms and impacted values be traced to particular parts of the project?
- **Function Creep:** Does the project potentially set a precedent for unethical



Question Everything!

“Technological advances are usefully considered
not only from the lens of
how they work,
but also
why they came to be as they did,
whom they *help*, and
whom they *harm*.” [r]





Possible Alternatives / Additions to Hackers Ethics



1. A feminist internet starts with and works towards empowering more women and queer persons – in all our diversities – to dismantle patriarchy. This includes universal, affordable, unfettered, unconditional, and equal **access** to the Internet.

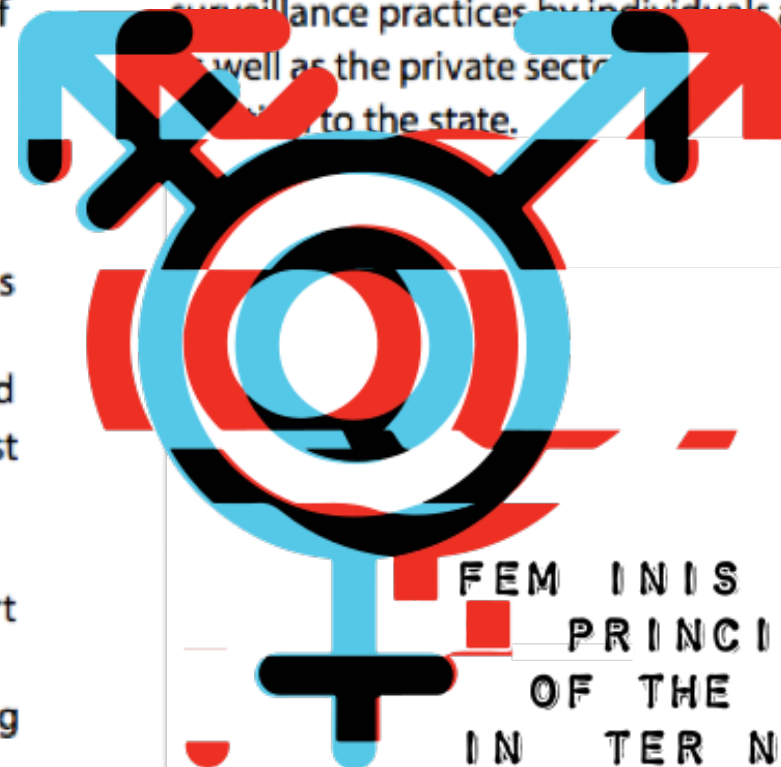
2. A feminist internet is an extension, reflection, and continuum of our movements and **resistance** in other spaces, public and private. Our agency lies in us deciding as individuals and collectives what aspects of our lives to politicize and/or publicize on the internet.

3. The internet is a **transformative** public and political space. It facilitates new forms of citizenship that enable individuals to claim, construct, and express our selves, genders, sexualities. This includes connections across territories, demands for accountability and transparency, and significant opportunities for feminist movement-building.

4. **Violence** online and tech-related violence are part of the continuum of gender-based violence. The misogynistic attacks, threats, intimidation, and policing experienced by women and LGBTQI people are real, harmful, and alarming. It is our collective responsibility

9. The internet's role in enabling access to critical **information** - including conversations on health, pleasure, and risks - is essential, and must be supported and protected.

10. Surveillance by default is the tool of patriarchy to control and restrict rights both online and offline. The right to **privacy** is a critical principle for a safer, open internet for all. Equal attention needs to be paid to surveillance practices by individuals against each other as well as the private sector and state actors, in addition to the state.



(Tech) Ethics of Nonviolence

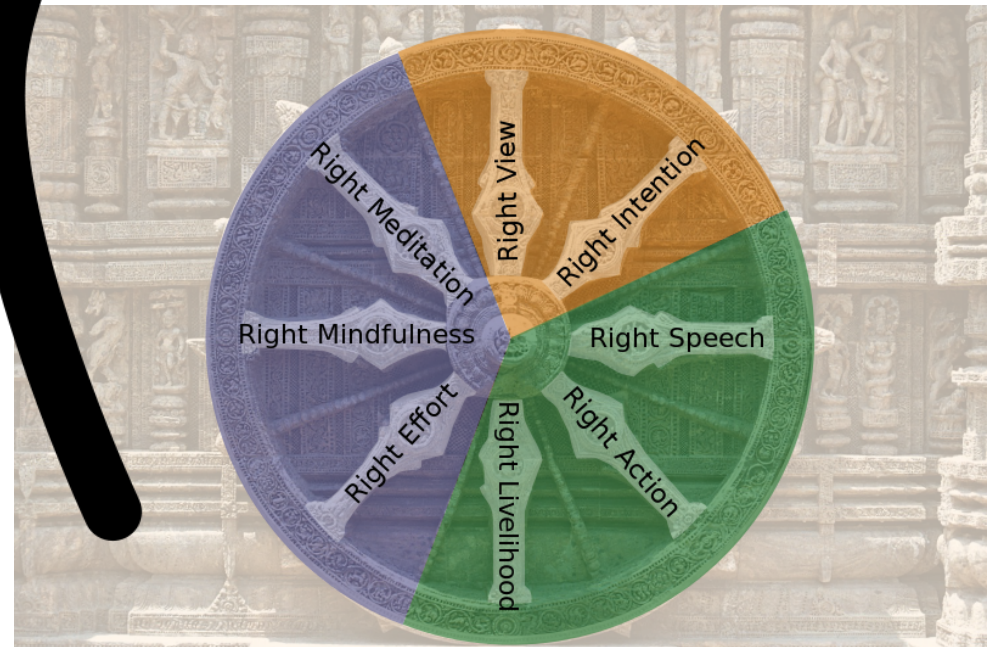


- Nonviolent resistance philosophy of Gandhi & Martin Luther King Jr
- Algorithmically-geeky “Non-violent Communication” by Marshal Rosenberg
- “Guide to Empathetic Technical Leadership”
<http://empathetictechnicalleader.com>
 - FREE to read online: <https://leanpub.com/littleguide/read>
- Open Source and Feelings (#OSSfeel)
 - <http://www.osfeels.com/>



Internet of Empathy

- Positive freedom of connectivity, interaction and involvement
 - Instead of libertarian “freedom” as independence and self reliance
- This freedom comes at the price of greater responsibility
- *“ the intrinsic value of a network does not lie in the sovereignty and independence of its nodes, but in their connectedness, ”*
- Empathy is willingness to engage with the Other, and willingness to enrich network with our contributions
- From: “To Our Friends” by The Invisible Committee
<https://mitpress.mit.edu/books/our-friends> “





Beyond Techno-Optimism

Mobile phone as a tracking, spying device?!



A PROJECT OF THE ELECTRONIC FRONTIER FOUNDATION

SEARCH

LANGUAGE

MENU



The Problem with Mobile Phones

Mobile phone as a tracking, spying device?!



“In our times,
people are often willing to make drastic
changes in the way they live
to accord with **technological innovation**;
at the same time,
they would **resist**
similar kinds of changes
justified on political grounds.” [art]

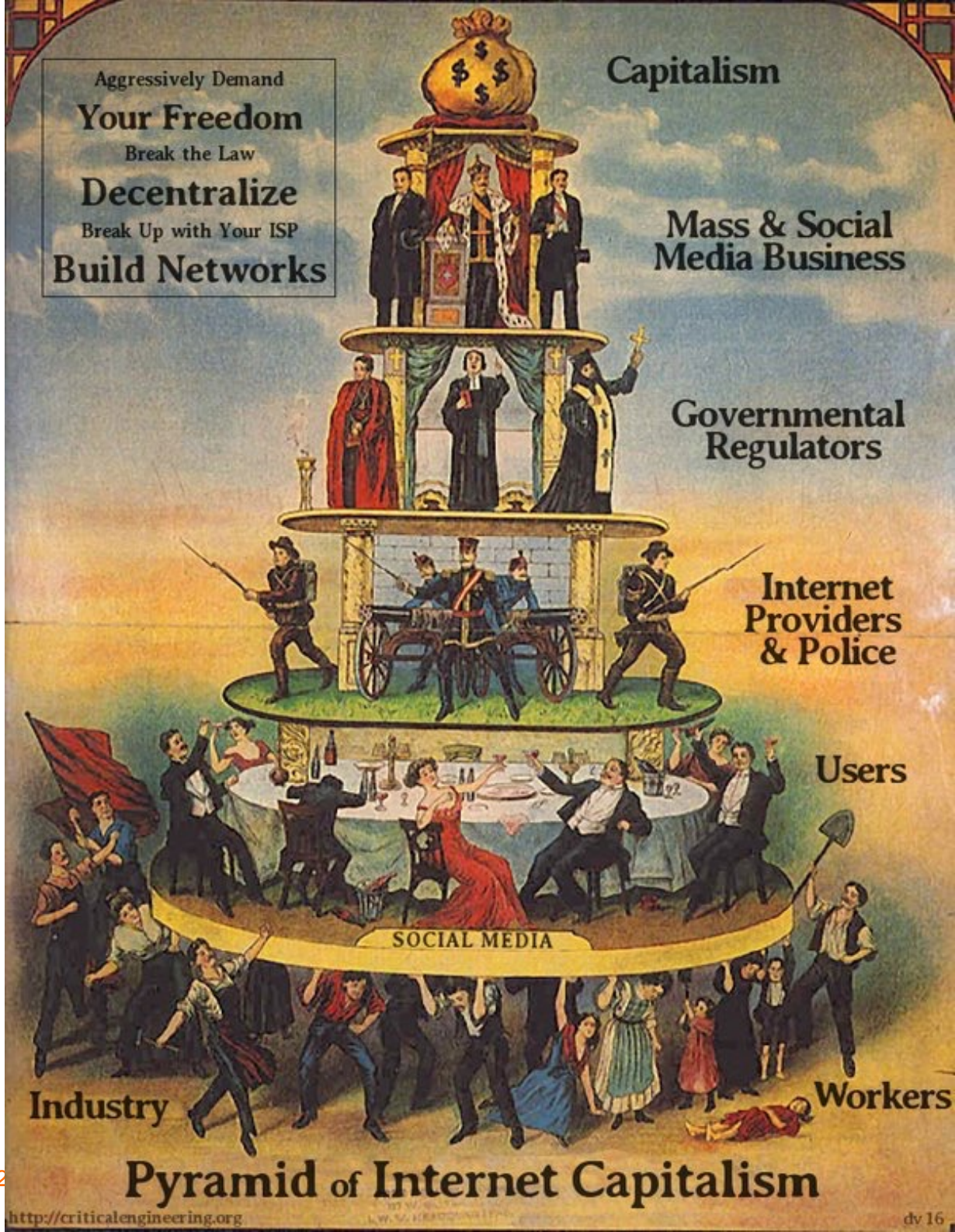


A NATURAL PAIRING A data center in Ashburn, Va., seen past a Dominion Virginia Power substation serving it. Worldwide, such centers use the rough equivalent of the output of 30 nuclear power plants.
Brendan Smialowski for The New York Times



Child miner in Burkina Faso - PBS NewsHour





Aggressively Demand
Your Freedom
Break the Law
Decentralize
Break Up with Your ISP
Build Networks

Capitalism

**Mass & Social
Media Business**

**Governmental
Regulators**

**Internet
Providers
& Police**

Users

SOCIAL MEDIA

Industry

Workers

Pyramid of Internet Capitalism



📍 A child at the Agbogbloshie electronic waste dump in Ghana. Photograph: Andrew McConnell/Alamy





Squirrels Winning the Cyber-War ;-)



TOTAL SUCCESSFUL CYBER WAR OPS
AS OF 2017.01.08 - 1748

Agent	Success
Squirrel	879
Bird	434
Snake	83
Raccoon	72
Rat	36
Marten	22
China	0
Russia	0*
USA	1



- https://wiki.techinc.nl/index.php/Hackers_tribes#Squirrels_against_technology

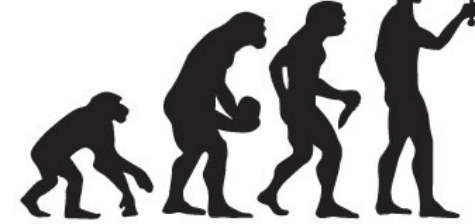


With Great
Power
Comes
Great
Responsibility

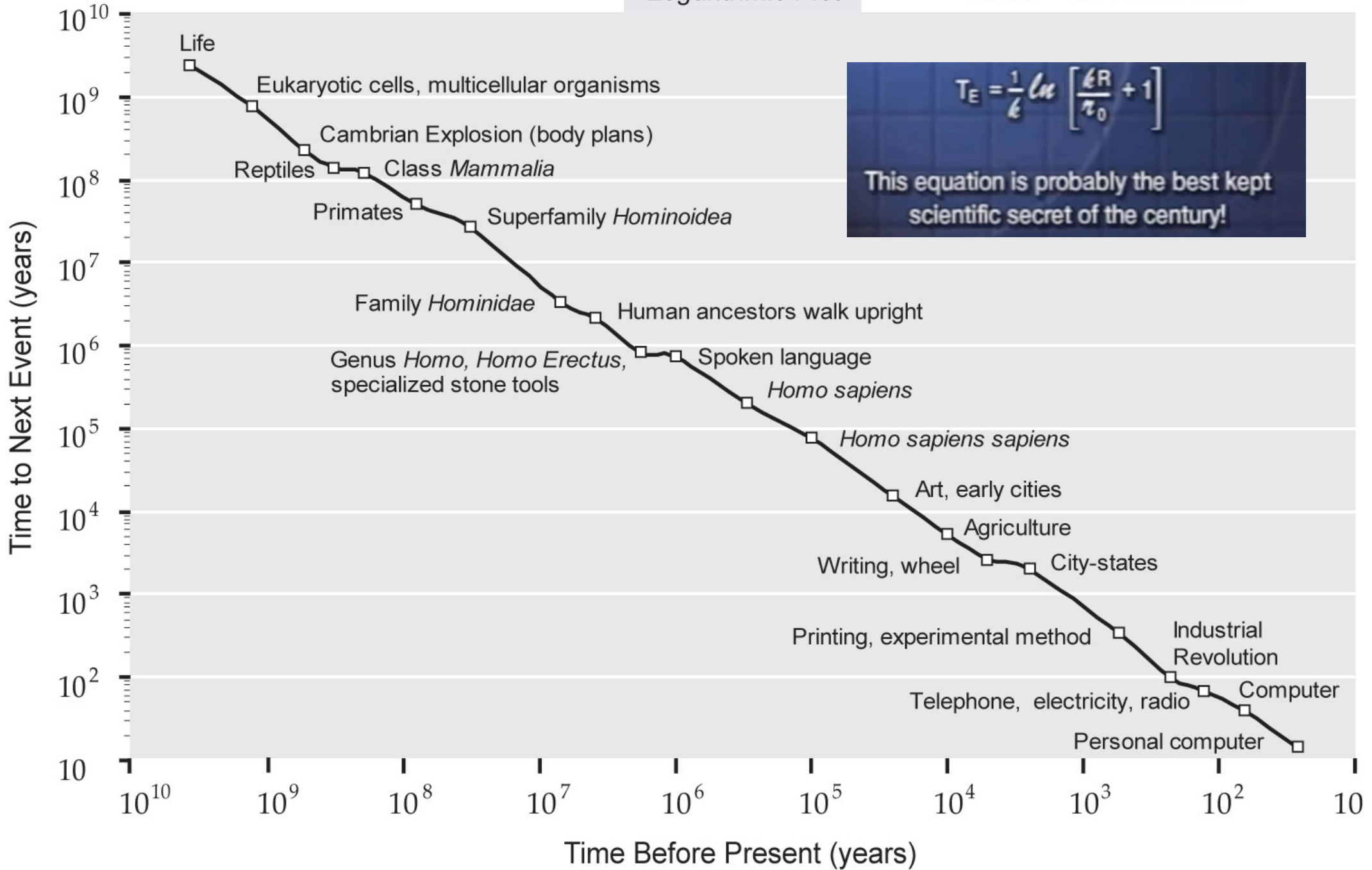


Beyond Myth of Progress, Beyond Anthropocentrism

Countdown to Singularity



Logarithmic Plot



$$T_E = \frac{1}{\epsilon} \ln \left[\frac{\epsilon R}{\pi_0} + 1 \right]$$

This equation is probably the best kept scientific secret of the century!

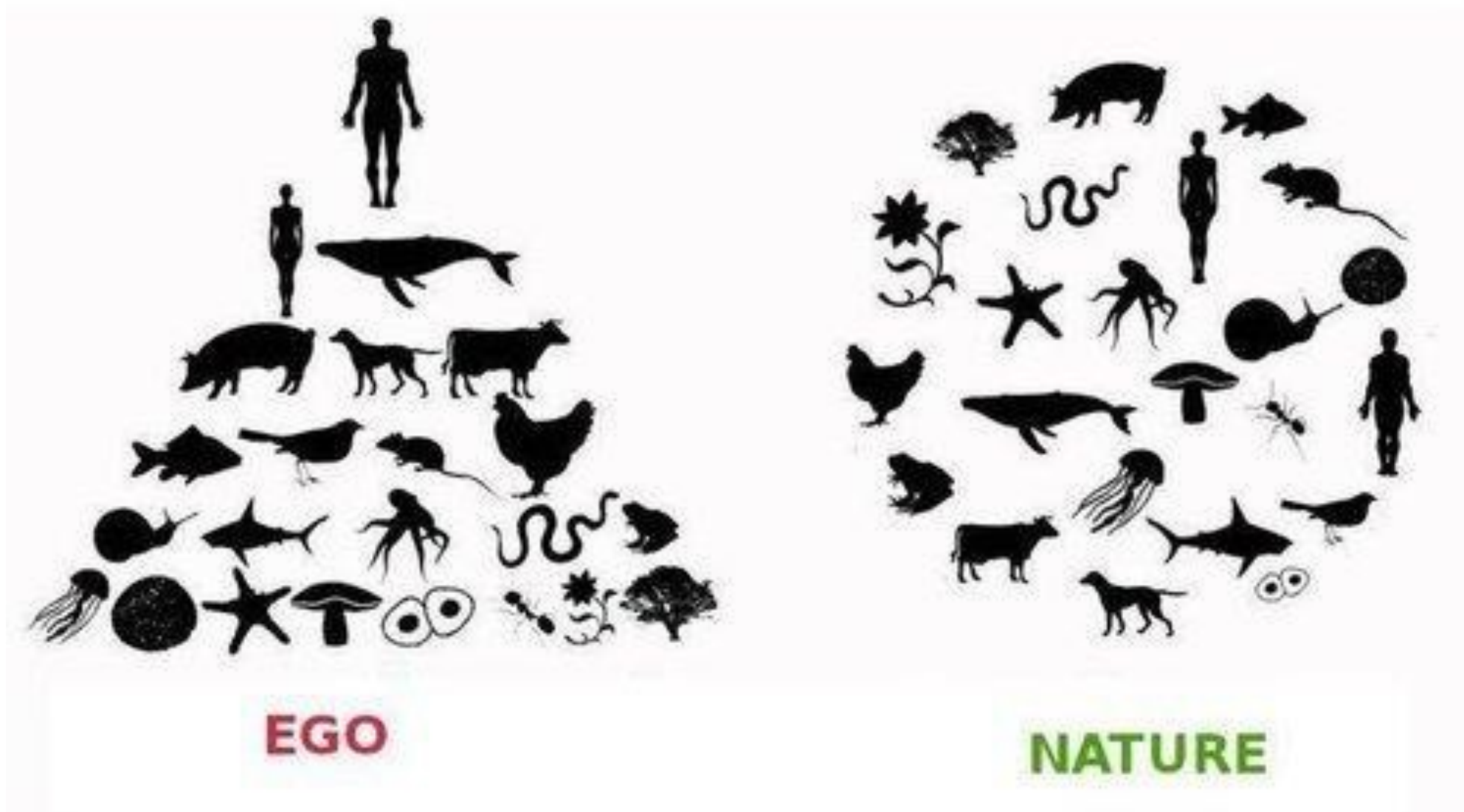
Imagine: Society > Science > Internet



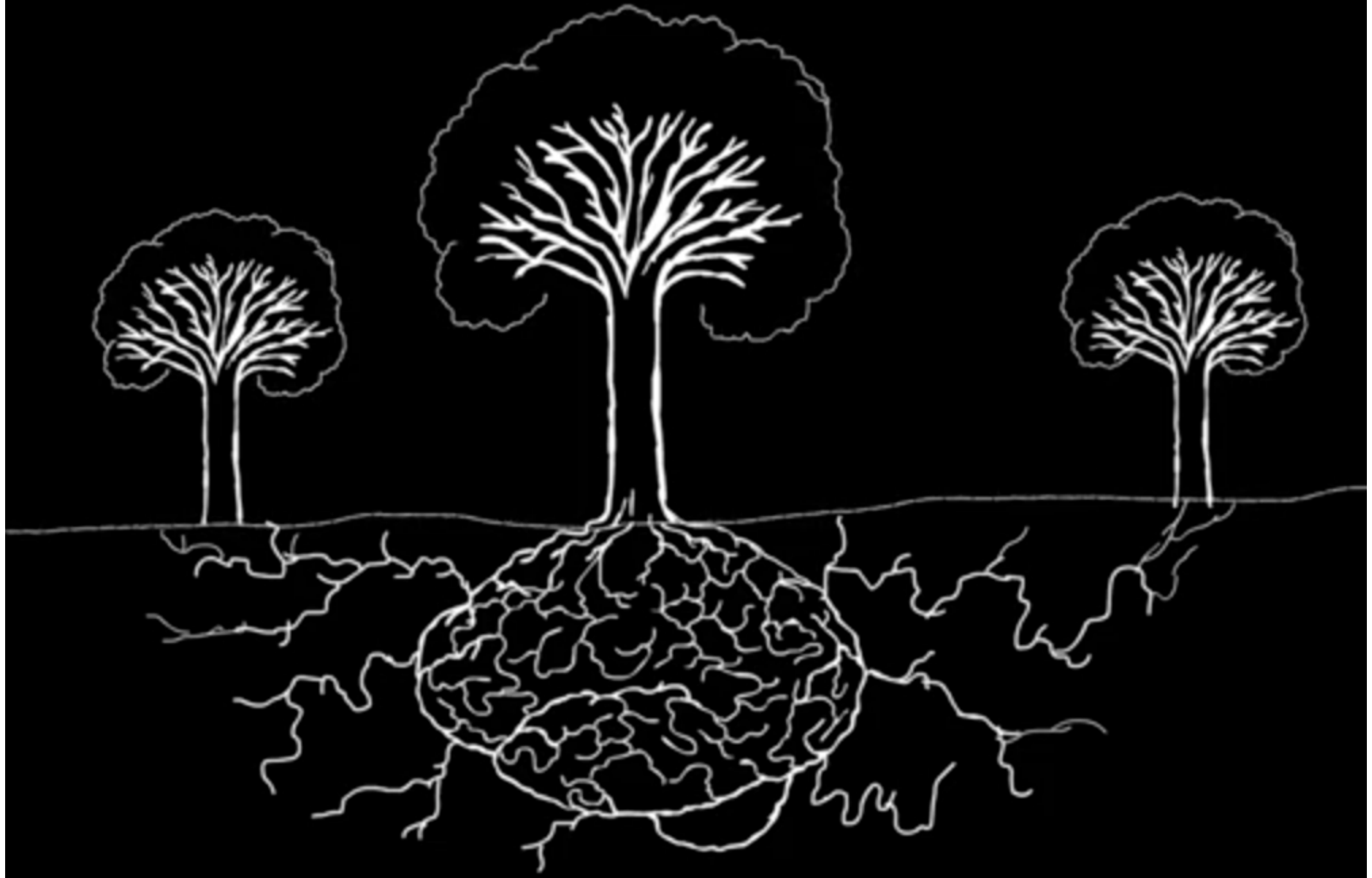
- ... a society predominantly concerned with preserving its existence (but *not endlessly expanding*)
- a society with a modest standard of living,
- conservative of natural resources,
- with a low constant fertility rate and
- a political life based upon consent;
- a society that has made a successful adaptation to its environment
- and has learned to live without destroying itself or the people (*or squirrels*) next door.

- ***Ursula K. Le Guin***

Right place and the right role in the symphony of life



Mature cultures have found balance with Nature

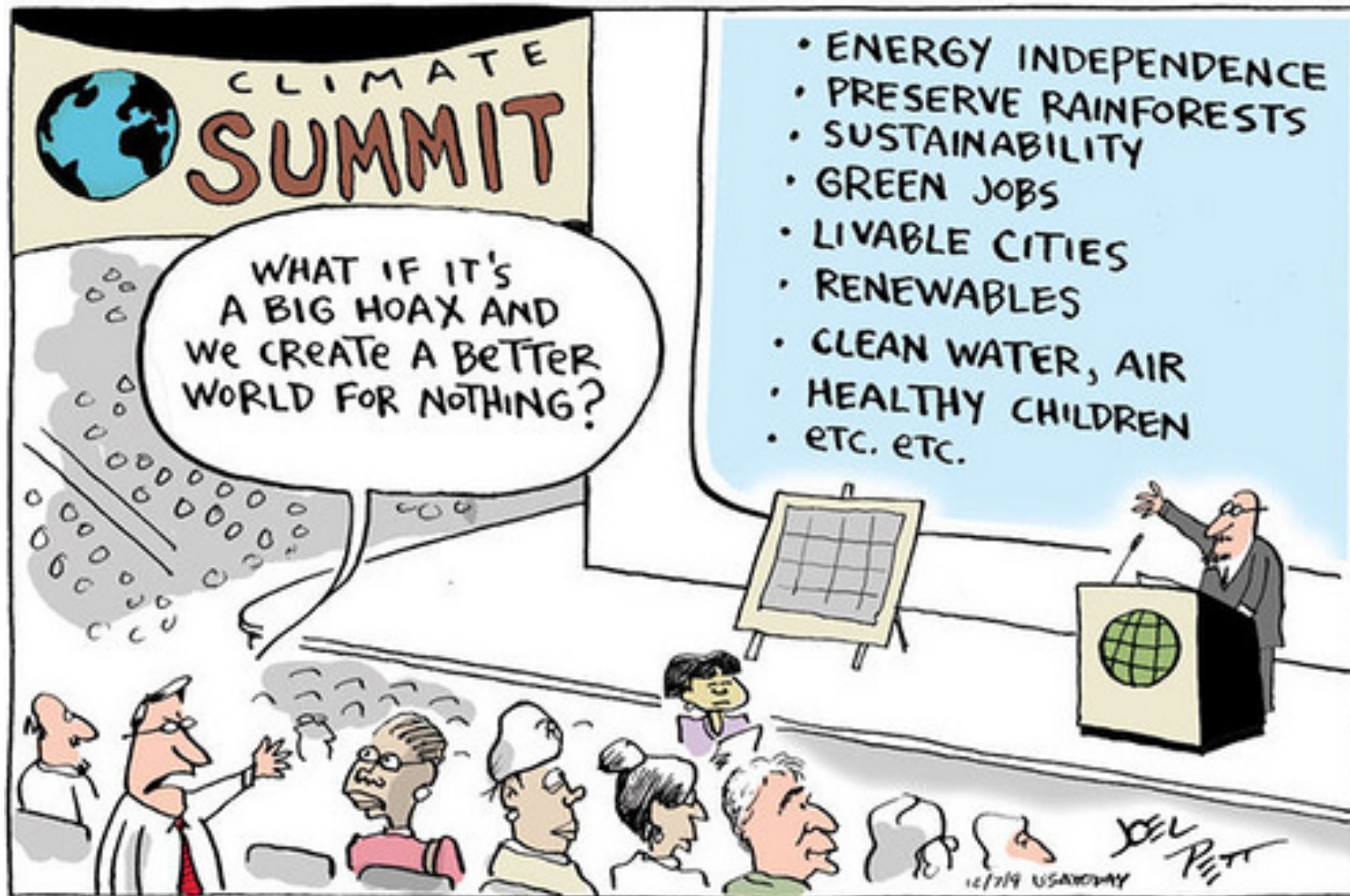


Imagine If Trees Gave Off
Wifi Signals, We Would
Be Planting So Many Trees
And We'd Probably Save
The Planet Too.



Too Bad They
Only Produce The
Oxygen We
Breathe.

What If We Create a Better World?



Responsibility



At a time when science plays such a powerful role in the life of society, when the destiny of the whole of mankind may hinge on the results of scientific research, it is incumbent on all scientists to be fully conscious of that role, and conduct themselves accordingly. I appeal to my fellow scientists to remember their responsibility to humanity.²¹⁰

- Responsibility
- ... to humanity...
- ... to the planet...
- ... and to squirrels!







Acknowledgements



Main Inspirations

- [r] Phillip Rogaway: “The Moral Character of Cryptographic Work” (2015)
- [ensr] “Philosophy meets Internet Engineering: Ethics in Networked Systems Research”
- [art] Langdon Winner: “Do Artefacts Have Politics?” (1980)
- [p] Allison Parrish: “Programming is Forgetting: Toward a New Hacker Ethic” (2016)
- [u] Ursula K. Le Guin: “A Non-Euclidean View of California as a Cold Place to Be” (1989)



More references

- [w] <http://networkedsystemsethics.net/>
- [Philosophy of Hacking, by Groente](#)
- [Digital Tailspin: Ten Rules for the Internet After Snowden](#)
- [Tor, Technocracy, Democracy](#)
- Heather Marsh
- [\[how\] Software Freedom your Way](#)
- Sebastian Olme
- <http://guymcpherson.com/2013/12/hackers-ethic-for-the-world-after-collapse/>
- <http://becha.home.xs4all.nl/hackers-philosophers-utopian-network-dec-2012-becha.pdf>

Even more references, July 2017



- IETF & Human Rights & <https://www.rightscon.org/>
 - <https://www.ietf.org/proceedings/99/slides/slides-99-hrpc-presentation-milton-mueller-requiem-for-a-dream-00.pdf>
 - <https://www.article19.org/resources.php/resource/38819/en/ethical-approaches-to-artificial-intelligence-and-autonomous-systems-at-ieee-seas-2017>
 - <https://datatracker.ietf.org/doc/html/draft-nottingham-for-the-users-05>
- “To Our Friends”, by The Invisible Committee
 - <https://mitpress.mit.edu/books/our-friends>
- “I Hate the Internet” <http://weheardyoulikebooks.com/releases/i-hate-the-internet/>
- Geoff Huston: "The Internet's Gilded Age" (March 2017) <http://www.potaroo.net/ispcol/2017-03/gilding.html>



RIPE Atlas references

- <https://atlas.ripe.net>
- <https://labs.ripe.net/hackathons>
- “Global Network Interference Detection over the RIPE Atlas Network”
- [a] “Ethics of RIPE Atlas Measurements” (2016)
- “Ethics in Network Measurements” (2017)
- “A Field Survey of the Ecosystem Around Internet Censorship, Disruptions, and Shutdowns” (June 2017)

Not Part of THIS Talk:

Nature Strikes Back

Squirrels Winning Cyber-War

TOTAL SUCCESSFUL CYBER WAR OPS
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Rat	36
Marten	22
China	0
Russia	0*
USA	1



- https://wiki.techinc.nl/index.php/Hackers_tribes#Squirrels_against_technology

The background of the slide is a photograph of numerous jellyfish in an aquarium. The jellyfish are illuminated with a blue light, giving them a glowing appearance. They are scattered throughout the frame, with some in the foreground and others in the background. The overall color palette is dominated by various shades of blue and purple.

Jellyfish Attack Nuclear Power-Station

- Reality: <https://www.theguardian.com/world/2013/oct/01/jellyfish-clog-swedish-nuclear-reactor-shutdown>
- Fiction: [http://en.wikipedia.org/wiki/The_Swarm_\(novel\)](http://en.wikipedia.org/wiki/The_Swarm_(novel))



**Red Squirrels
Drive slowly**

There is a particular *Armillaria ostoyae* mycelium in Oregon, spread over 890 hectares, estimated to be at least 2,400 years old.



Important things you need to know - Earth user guide

1. This is where you live

***2. You and the other 15 million
plants and animals are
Earth's family***

***3. 50,000 of these plants
and animals become
extinct each year***

***4. We are consuming all other
species and causing Earth's 6th mass extinction***

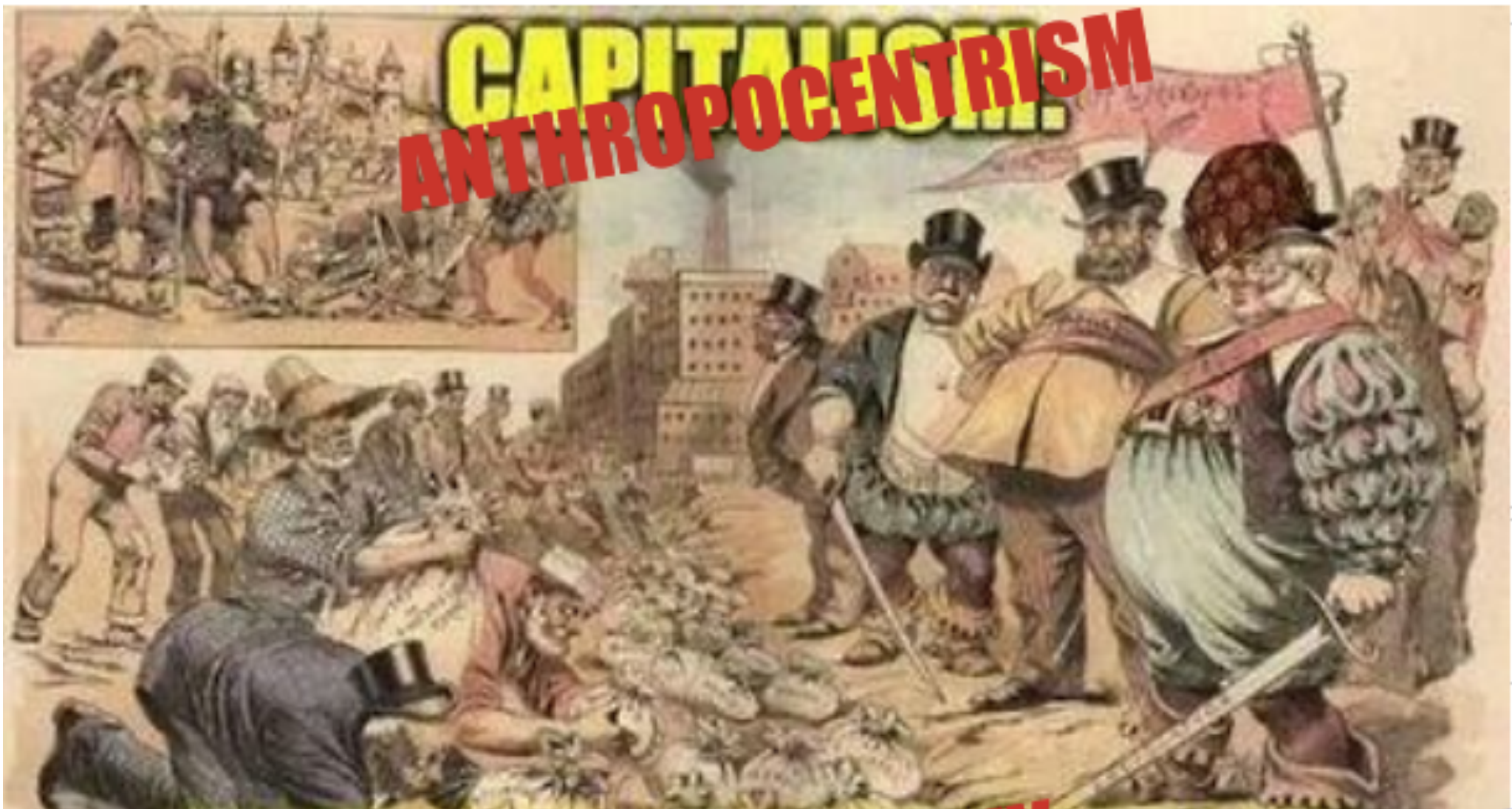
5. This is comparable to a large asteroid strike

6. Lifestyle changes can stop this happening



SYSTEM

CAPITALISM!
ANTHROPOCENTRISM



THE PSYCHOPATHIC IDEA THAT ANY PEOPLE ARE MORE ENTITLED TO FOOD/WATER/SHELTER THAN OTHERS

OTHER BEINGS

ALIEN INTELLIGENCE TO HUMANS:



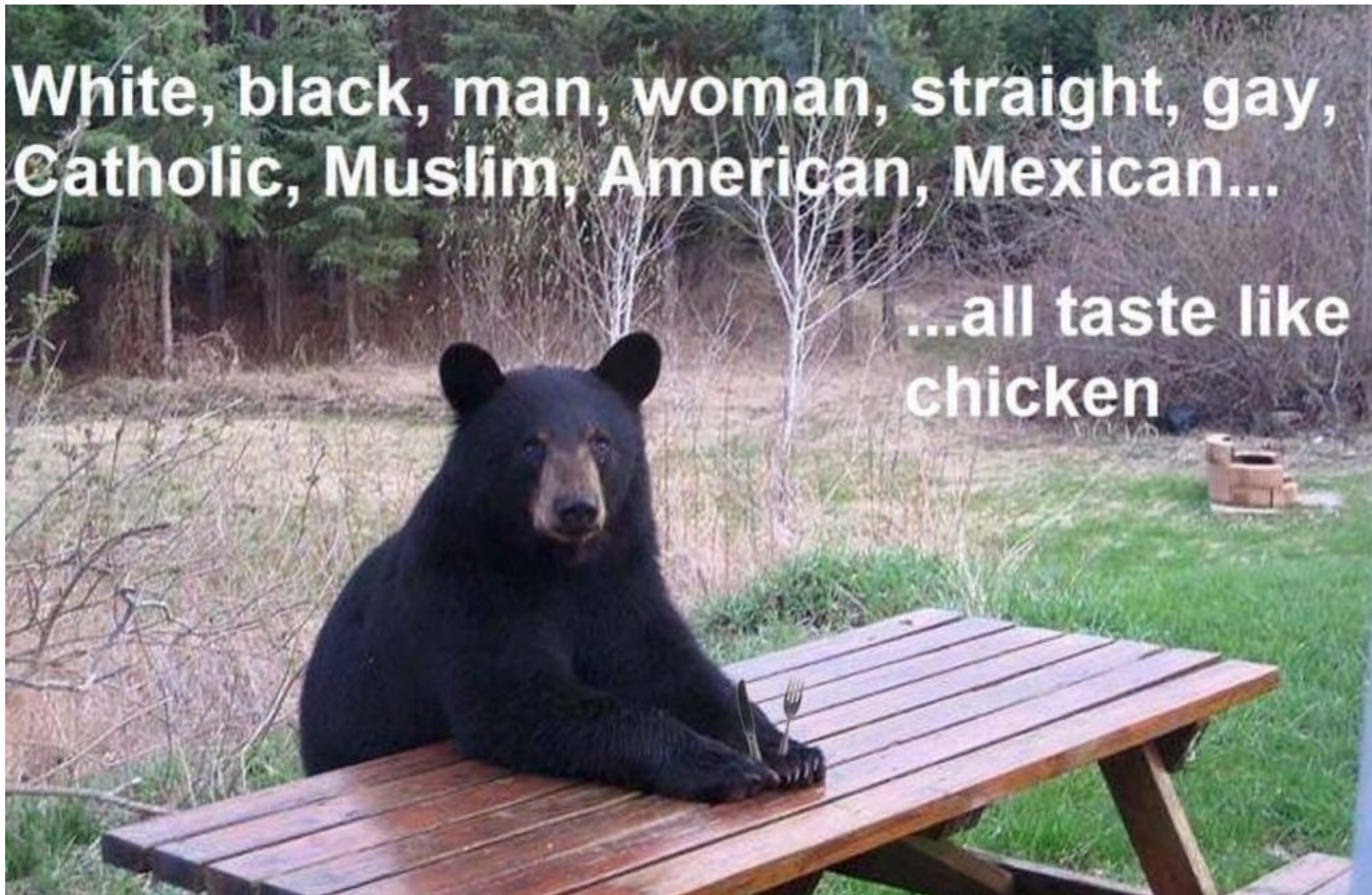
**"FEED THE PIGS AND
DON'T TOUCH ANYTHING"**

"When you're
accustomed to
privilege,
equality feels
like
oppression"

**AFRO
PUNK.**

**White, black, man, woman, straight, gay,
Catholic, Muslim, American, Mexican...**

**...all taste like
chicken**



OCTOPI WALL STREET



Invertebrates are 97% of animal diversity!

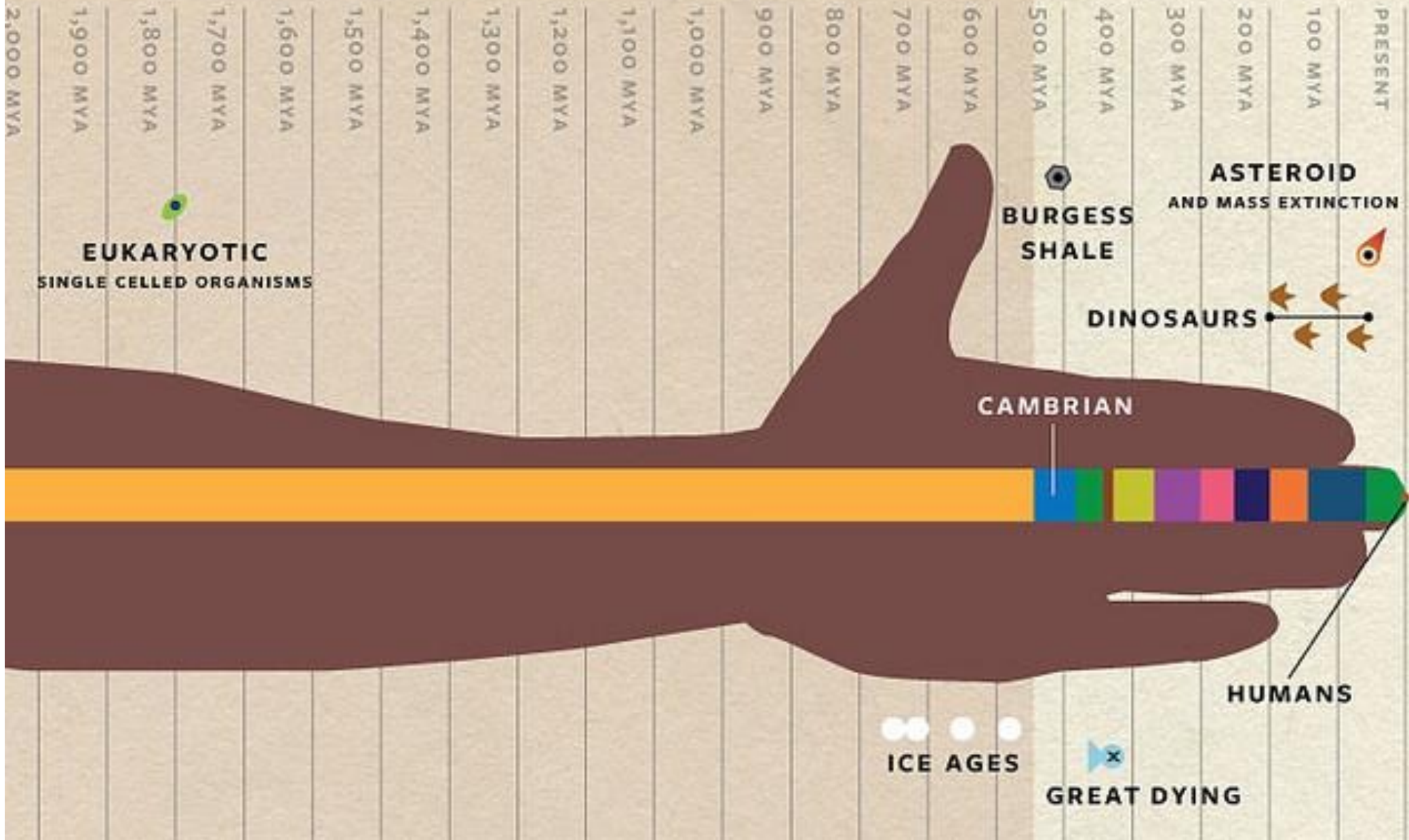
Brought to you by Oregon Institute of Marine Biology, University of Oregon

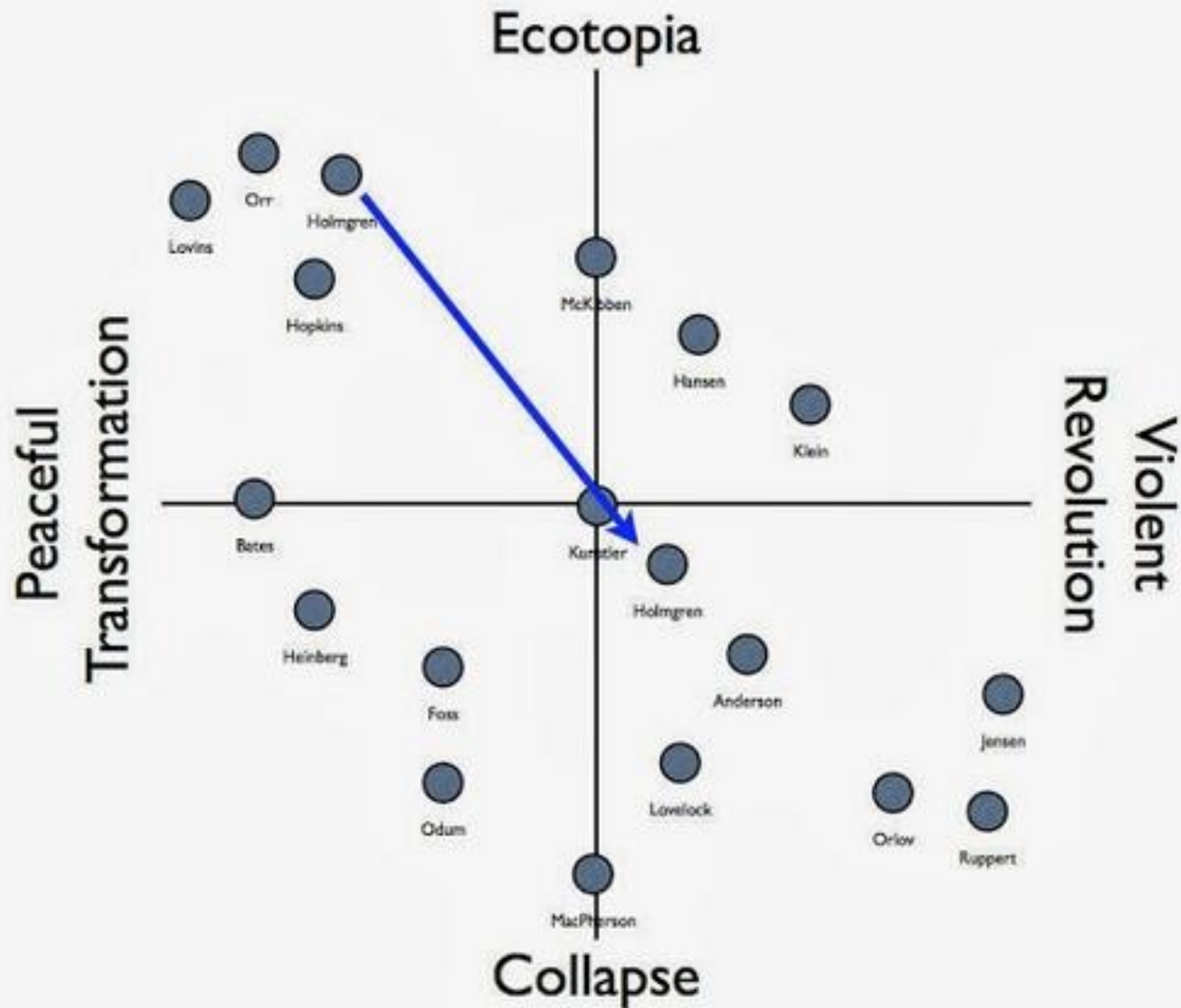
PROTEROZOIC EON

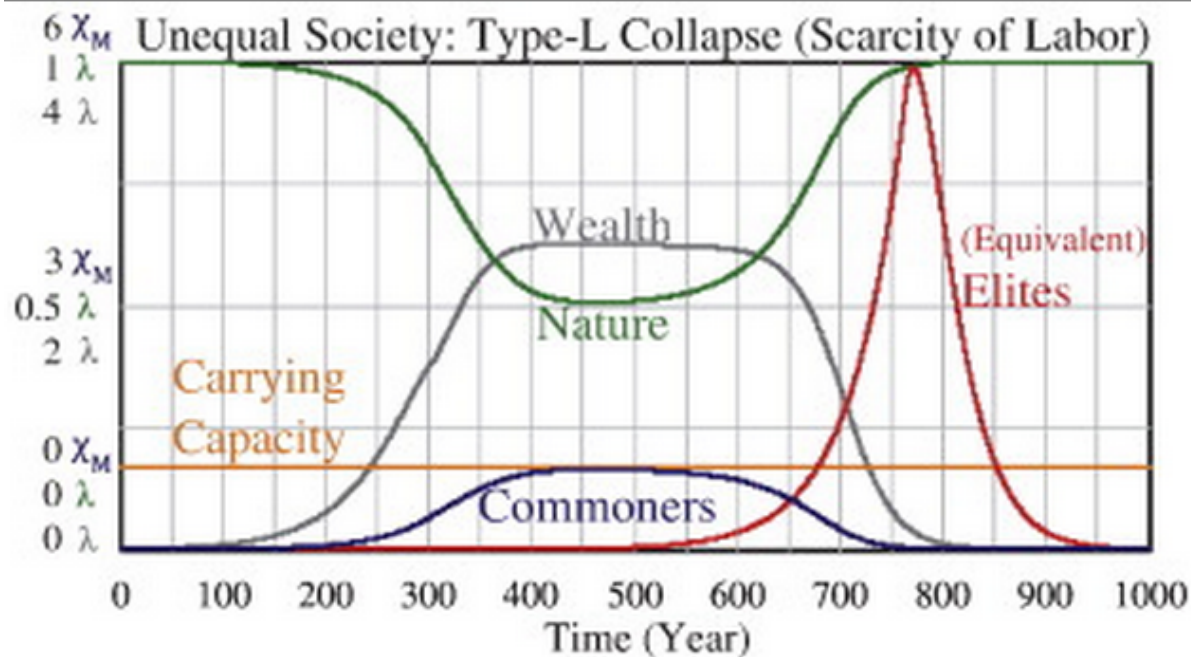
2500-542 MYA

PHANEROZOIC EON

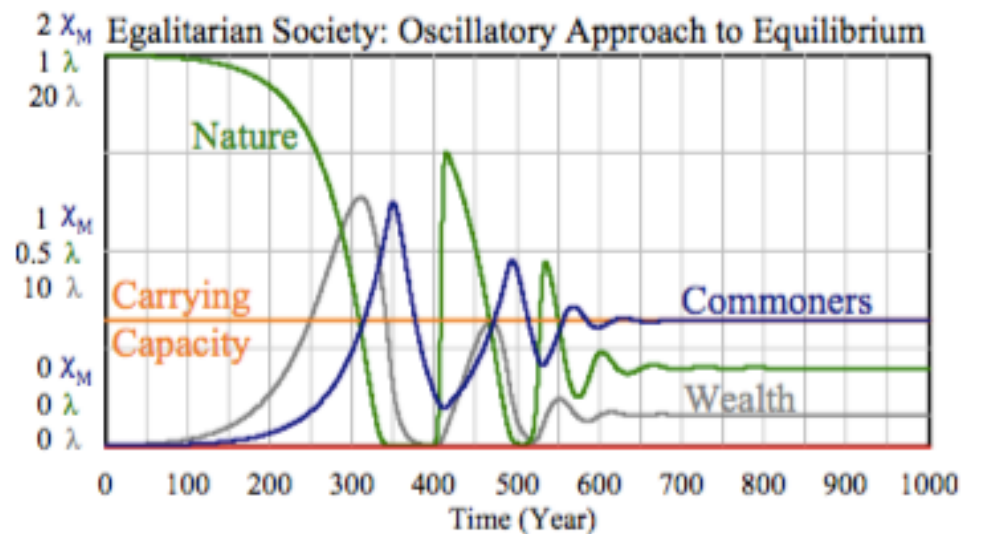
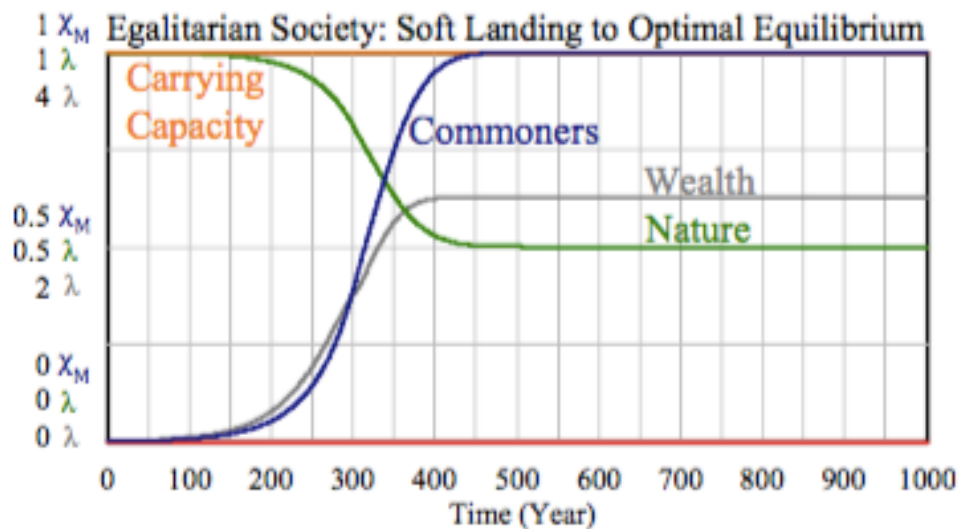
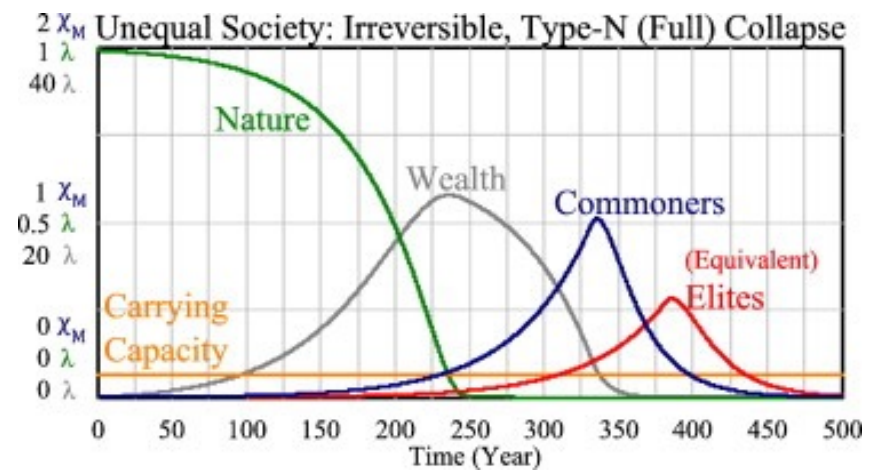
542 MYA-PRESENT

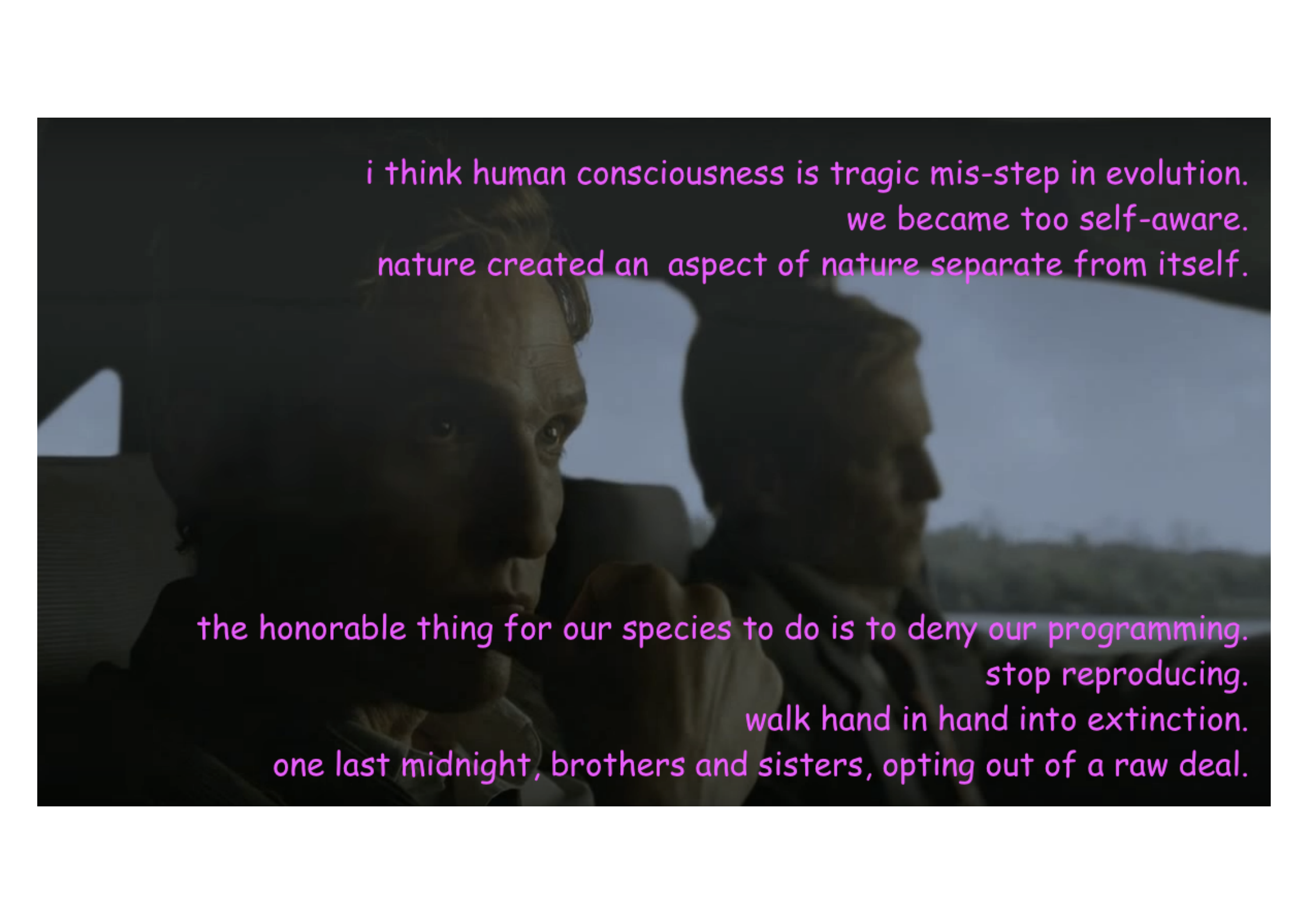






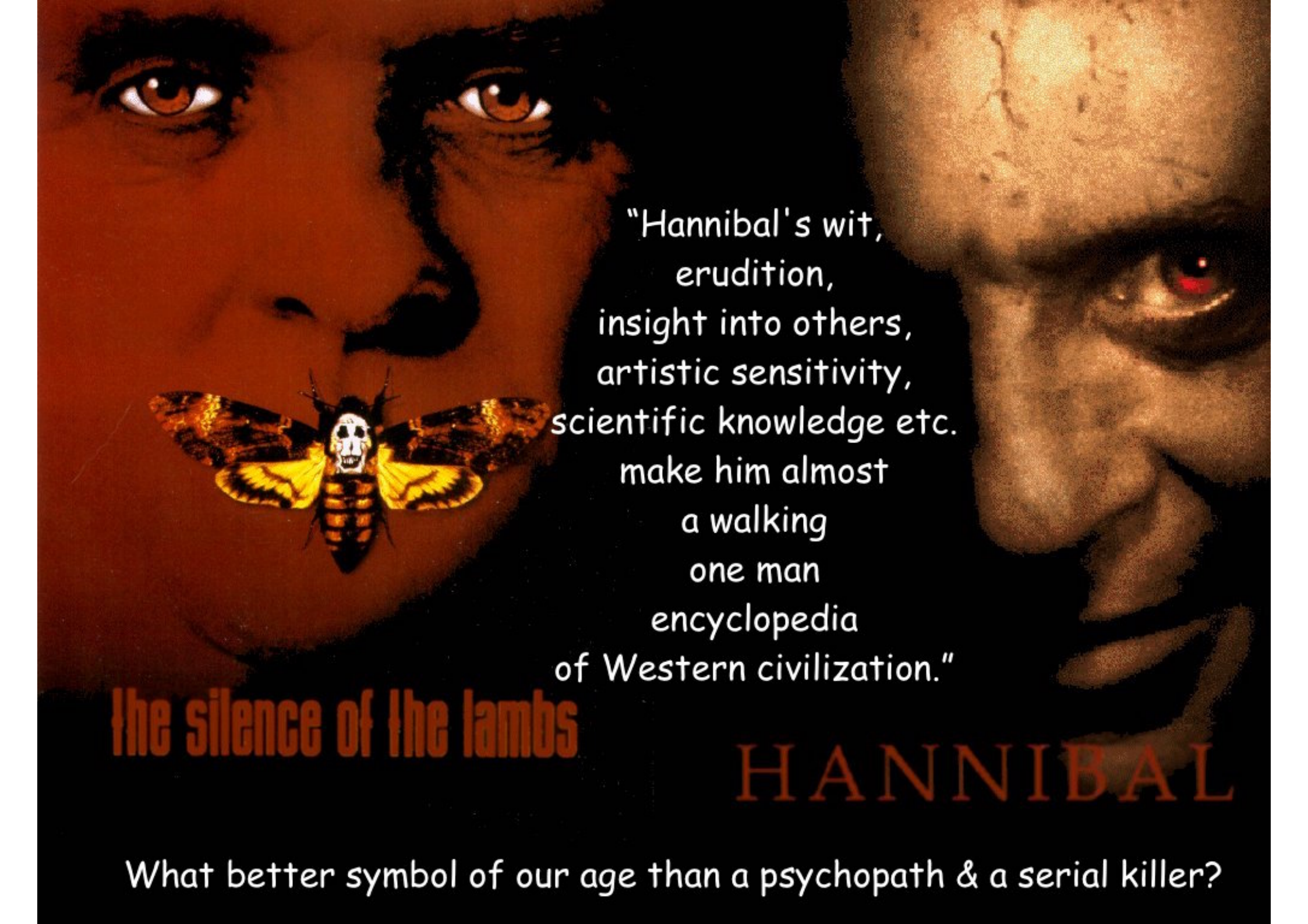
a) Population collapse following an apparent equilibrium due to a small initial Elite population when $\kappa = 100$. This scenario also shows a different route to a collapse, in which, although Nature eventually recovers, population does not.





i think human consciousness is tragic mis-step in evolution.
we became too self-aware.
nature created an aspect of nature separate from itself.

the honorable thing for our species to do is to deny our programming.
stop reproducing.
walk hand in hand into extinction.
one last midnight, brothers and sisters, opting out of a raw deal.



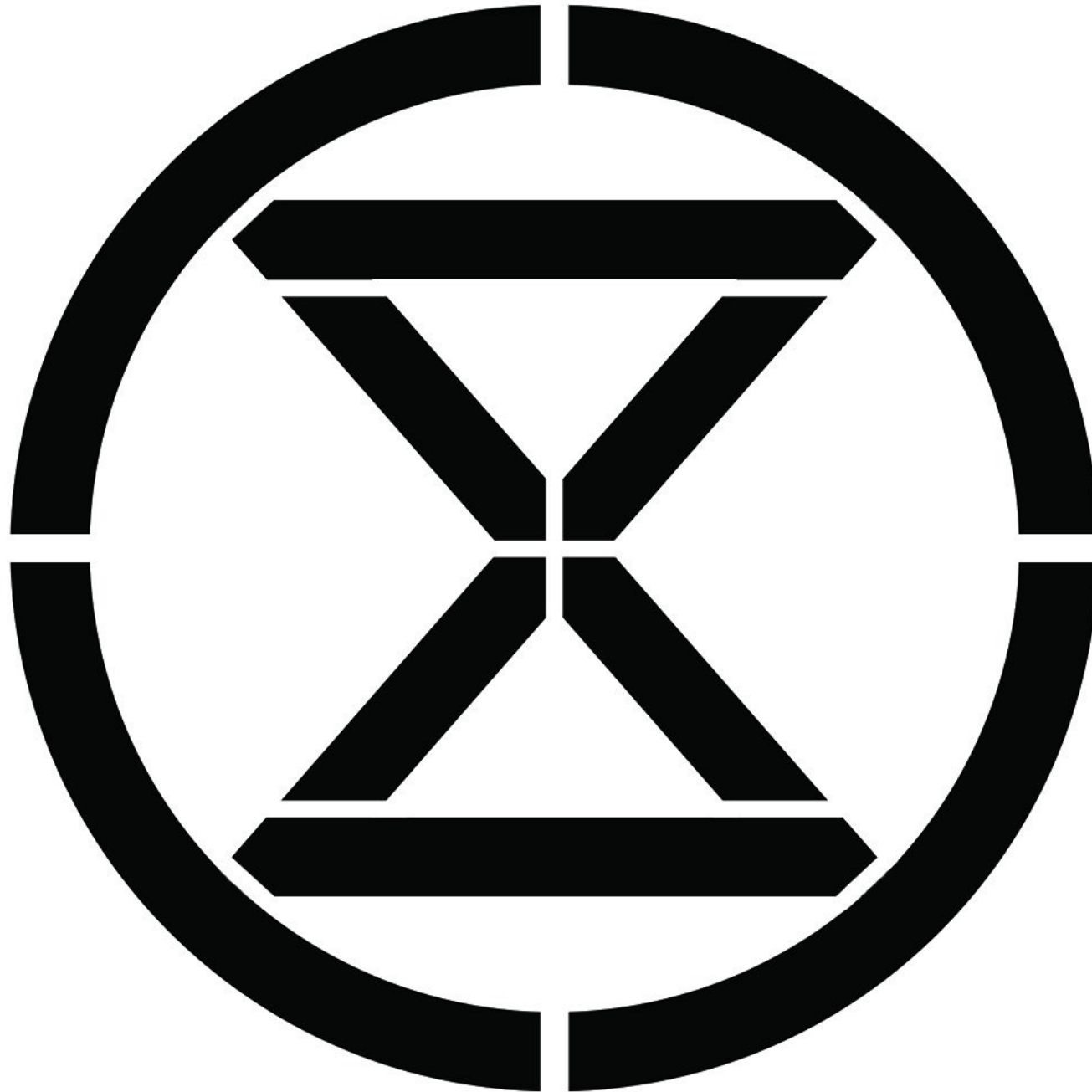
"Hannibal's wit,
erudition,
insight into others,
artistic sensitivity,
scientific knowledge etc.
make him almost
a walking
one man
encyclopedia
of Western civilization."

the silence of the lambs

HANNIBAL

What better symbol of our age than a psychopath & a serial killer?

extinctionsymbol.info



https://en.wikipedia.org/wiki/Holocene_extinction



yes yes ohh yes

http://UnCiv.NL



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