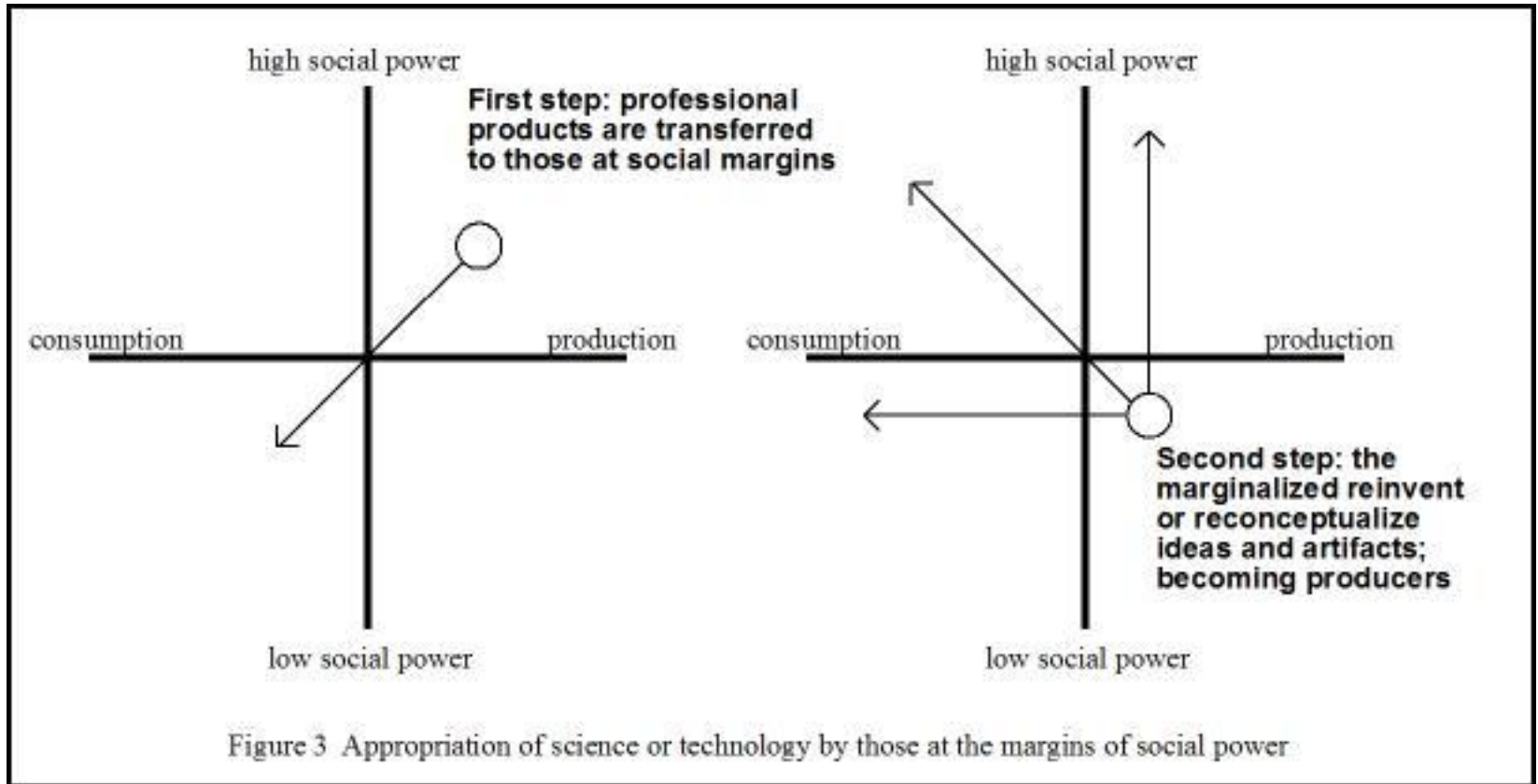# *When Self-organization Meets Appropriation: Collective Technological Flexibility and Social Power*

4S, Cleveland OH Nov 2011
Ron Eglash, RPI

Appropriating Technology

Figure 3 Appropriation of science or technology by those at the margins of social power

Appropriating Technology

Appropriating Technology

Consumption ── Production

Reinterpretation

change in semantic
association only

example: graffiti tag

Adaptation

change in semantic
association and use

example: Bedouin
cassette players

Reinvention

change in semantic
association, use,
and structure

example: Low rider
cars

Figure 4: The consumption-production dimension

Appropriating Technology

- Odumosu: "Constitutive Appropriation" (its "always already" appropriated)

- Williams: "Cosmopolitan Appropriation" (3rd world scientists appropriate across a "global-local" boundary)

Self-organized=Bottom-up
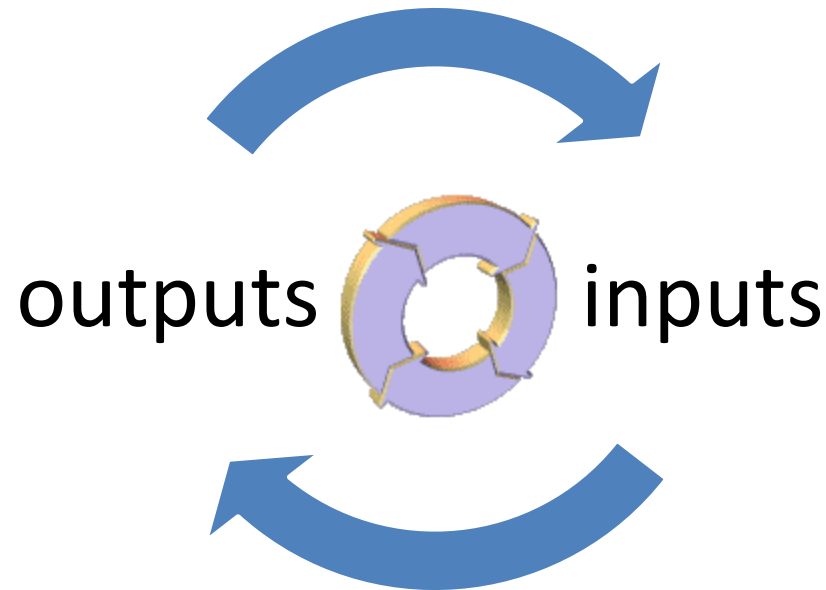## the stuff organizes itself

Flocks and swarms:
bees, birds,
whales, wolves,

- Evolution
- Morphogenesis
- Ecological systems
- Neural networks
- Immune systems
- Geological formations

Self-organization is the result of recursion

outputs inputs

NATURE	SOCIETY
• Self-guided flocks • Self-tuning neural nets	• Self-directed individuals • Self-governing nations

Scientists of natural self-organization who advocated social self-organization

Democritus

Peter Kropotkin

Sophia Kovalevskya

NATURE	SOCIETY
Founded theory of matter as atomic self-organization	A founder of philosophy of democracy
Founded studies of "mutual aid" in biology	Supported anarchist labor movements
Founded nonlinear dynamics with Poincare	Supported Paris commune; Russian "nihilist" movement

In the digital era self-organization allows new "generative spaces" (Zittrain)

Wikipedia

Open Source Software

Peer-to-peer networks

Two puzzles of Self-Organization

How do we discuss the **recursive depth** of self-organization?

Kelty: "In the last few years, talk of "social software"...
has dominated... Wikipedia, MySpace, Flickr, and
YouTube, for example.... But they are not (yet) what I
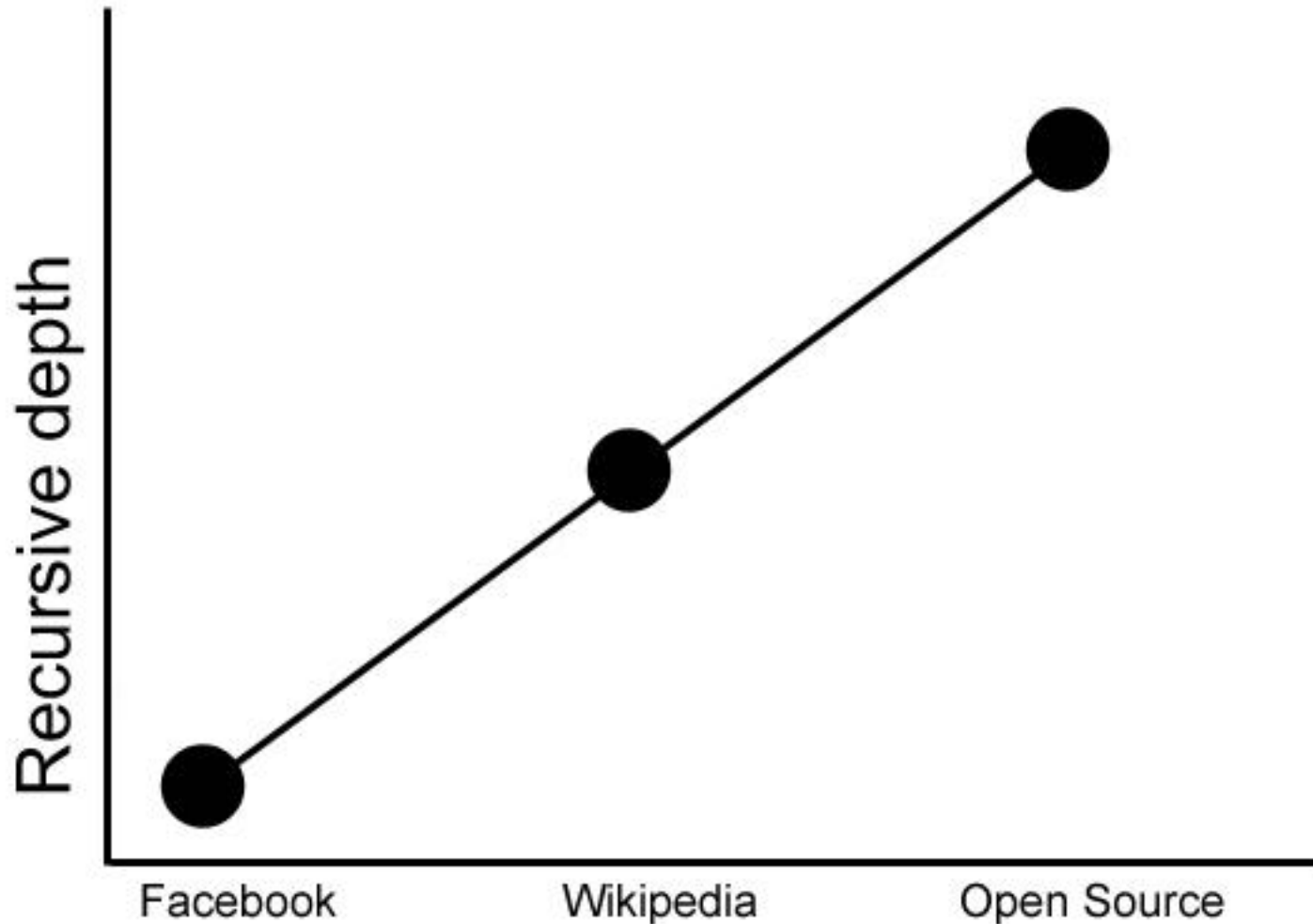would identify as recursive publics."

Sarah Wyle: "Recursive research publics"
Kevin Fodness: "Recursive publics of accessibility"
David Banks: "Viral Publics"; "performative publics" (planking, owling)

Recursive Depth

How far down in the "stack" until you hit proprietary materials?

Two puzzles of Self-Organization

2) Why do some scholars of Open Source (Steven Weber, Chris Kelty) disavow any connection to self-organization?

They claim many Open Source (OS) projects are hierarchical, and self organization is by definition non-hierarchical

Balinese Rice Irrigation as a model for OS

Old assumption: gravity hierarchy = political hierarchy

Stephen Lansing's study of rice irrigation

Farmers <u>below</u> fear drought; only prevented if farmers above allow sufficient flow.

Farmers <u>above</u> fear pest explosions; only prevented if farmers below synchronize irrigation.

∴ Self-organized because of mutual negative feedback.

Mutual Negative Feedback in African Traditions

Here too, the balance between those above and below offers a beautiful self-organizing system. As Kelty and Weber note for Open Source, that does not mean hard work is not involved!
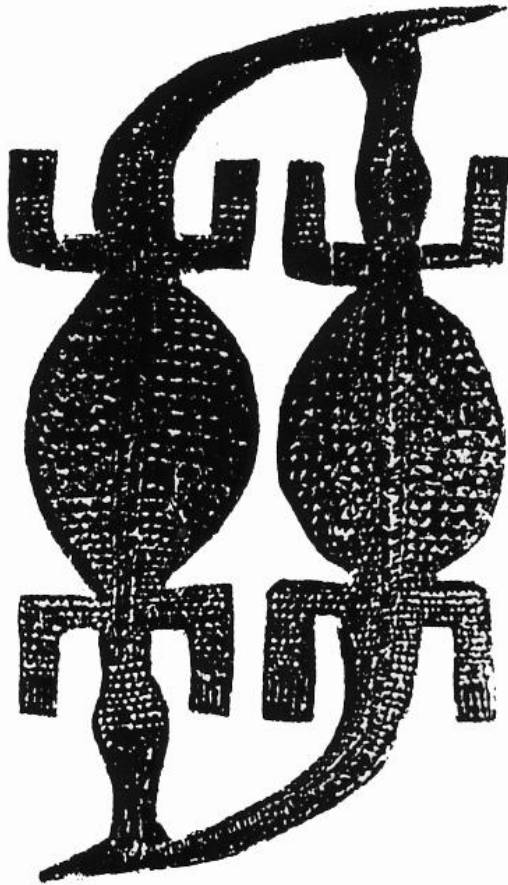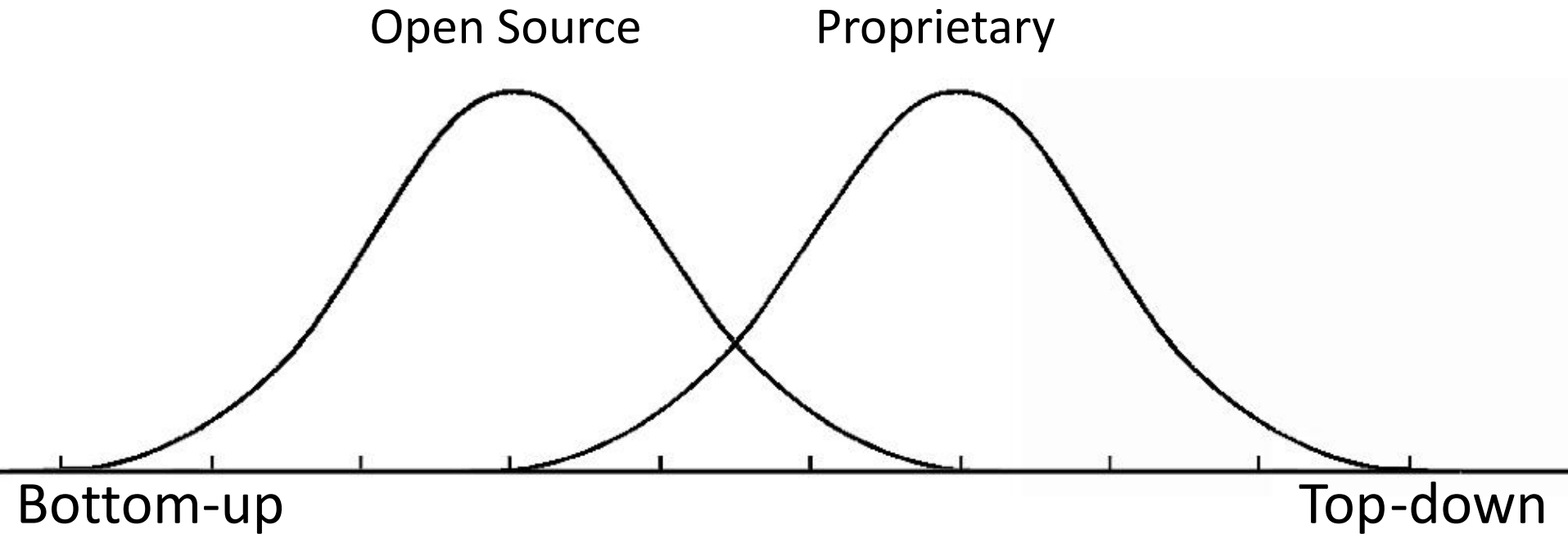
Mutual Negative Feedback in Open Source

Programmers <u>below</u> fear code rejection

Programmers <u>above</u> fear forking: if the developers are unhappy they can leave and start their own version.

∴ Self-organized because of mutual negative feedback

Self-organization spectrum for Proprietary vs Open Source

Open Source   Proprietary

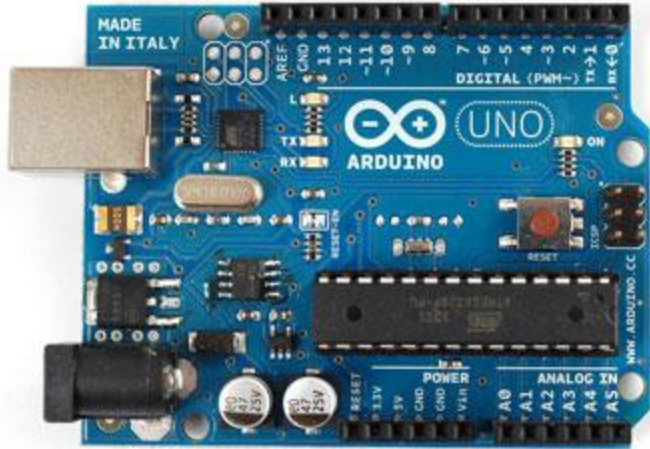Bottom-up   Top-down

This puts "generative space competitive pressure" on proprietary companies:
- Pressure for less hierarchical managerial style
- Pressure to produce open products

Corporate response to generative pressure

Strategy 1: **competitive exclusion**

VS

$30 $4.30

Corporate response to generative pressure

Strategy 2: **re-appropriation**

Conclusion: 4 Important dimensions of generative spaces

Recursive Depth: how far down until you hit proprietary?

Generative Pressure: what interation with private and state-owned systems?

Virtual/Physical: "performative publics" (Banks); Crochet Reef

Accessibility: (Fodness) – appropriability for disenfranchised