Degenerative Cultures: Corrupting the Algorithms of Modernity

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Premise

A book is host to fungal growth, which both deletes text and tweets degenerating messages about nature and culture.
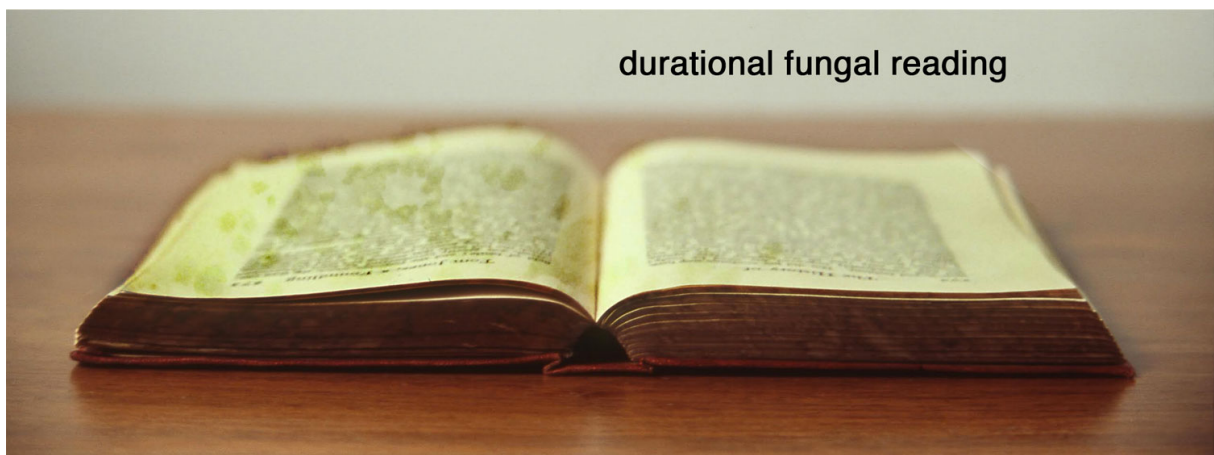

Figure 1 Book as substrate for fungal culture

Fungi form a natural Internet, sending signals and connecting nodes through mycelia. This project combines the Internet of Natural Things with the Internet in a "bhiobrid" fungi-digital system that permits a feedback loop between human and microbiological cultures.
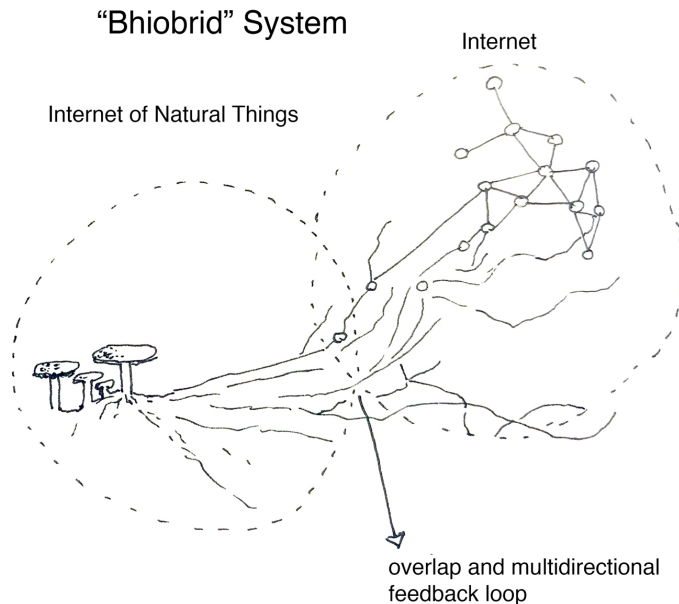
"Bhiobrid" System

Internet

Internet of Natural Things

overlap and multidirectional
feedback loop

Figure 2 "Bhiohybrid" system of interconnected networks

The fungus disperses spores and thereby degrades culture. Spores drift across text, redacting as the fungus grows. This fungal censoring of books results in fungal tweets and retweets by human twitter users. The algorithmic scaling of the biological culture's growth and resulting censoring of human culture generate a continuous series of fungal tweets. The retweets circle back into the fungal system in a feedback loop between these natural and technological networks. An automated readout of the fungal twitter feed documents one culture's consumption of another: in this case, nature's consumption of human culture.

A book becomes the substrate for a culture of microbiological organisms, whose spores propagate and in turn corrode the text. Books, as symbolic objects, are the storage vaults of human knowledge. Indeed, for most human societies, everything that we know is stored in text. Even when updated as computerized versions of this knowledge dataset, text is still the basis for this knowledge and is ultimately essential for both storing and restoring human culture.

If one considers human societies as a biological culture on Earth, our substrate is the global ecosystem. Incongruously, human societies consistently destroy this substrate, resulting in a massive cumulative loss of data in the form of species extinctions and environmental devastation. *Degenerative Cultures* accommodates the opposite flow of information degradation or data loss and allows nature to disrupt human cultures through the degeneration of text.

1. Cross-*Cultural* Interactions

Human societies destroy nature. Fungi destroy books. Cesar and LOIS present an autonomous system of data degeneration, with regular readouts of a fungal colony redacting human-based culture. Human and microbiological interactions underlie and drive the installation's algorithmic functions.[1][2] These include the autonomous actions of fungi, which result in textual redactions, bot-driven fungal tweets with computerized readouts of those, as well as viewer interactions.

The biological cultures' growth obscures the text, which is tracked and catalogued as data points. This data is scaled against the length of the text, resulting in tweets by the growing biological culture, aided by algorithmic computer processing. These fungal tweets are printed on a continuous readout as a sort of poetry of degenerative cultures.
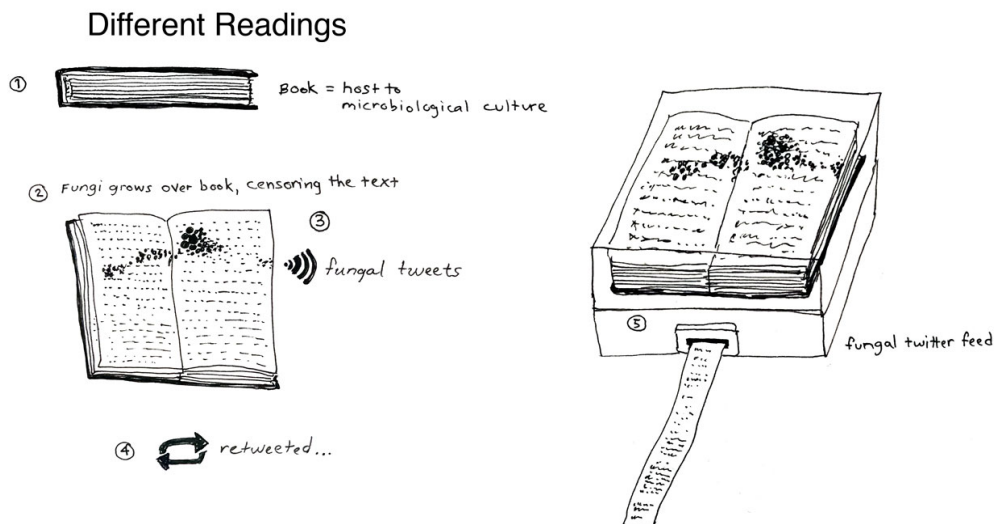

Figure 3 Model for fungal reading, redaction, and tweeting

The visual feedback of the fungal tweets is accompanied by audio that likewise tracks the text's redaction. Each of these generative outcomes can be influenced by humanity. Through in-person interactions, viewers can choose to contribute to the microenvironment in which the fungus grows, influencing the microorganisms' growth and further obscuring the text. This viewer interaction challenges the paradigm of culture vs. culture and inserts human beings as part of the natural system.

1.1 Degenerating Nature and Culture

Based on the corruption of data, *Degenerative Cultures* looks critically at how technology changes nature. Through landscape design and geo-engineering, human cultures seek to dominate nature. This domination can be viewed as a corruption of nature. Within the installation, the microbiological culture degenerates text in the form of a physical book and digital documents (i.e. human culture). As the living entity consumes and degenerates the book, Internet documents likewise become degenerated. At the same time, the fungus grows.
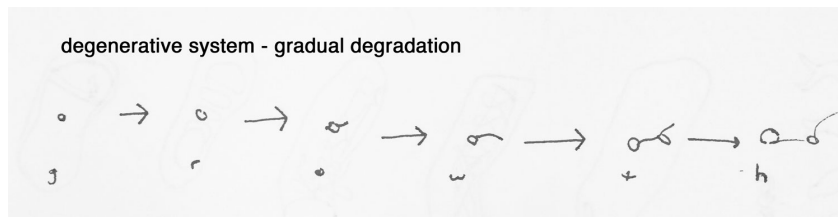
Figure 4 Degeneration of substrate equates growth of fungus

More often, throughout history, human societies are corrosive through the domination and mechanization of nature. Outliers in this are cultures for which nature is the dominant force. In a 2008 lecture to visiting artists and scientists, University of Lapland rector Mauri Ylä-Kotola described his decision-making process: "We follow the wisdom of the reindeer." University policy is made according to reindeers, whose wisdom underlies Sami tradition.[3]

Some of the more direct pathways between different peoples and nature are themselves eroding. The Anishinabekwe scientist, Robin Wall Kimmerer, laments the loss of a connection to nature (and loss of language): "My first taste of the missing language was the word Puhpowee on my tongue. I stumbled upon it in a book by the Anishinaabe ethnobotanist Keewaydinoquay, in a treatise on the traditional uses of fungi by our people." "Puhpowee," she explains, "…translates as 'the force which causes mushrooms to push up from the earth overnight.' As a biologist, I was stunned that such a word existed. In all its technical vocabulary, Western science has no such term, no words to hold this mystery."[4]

Degenerative Cultures alludes to this language loss. The book that is the substrate is literally eaten by microorganisms. The text is destroyed in a physical sense, and this destruction is visible through the redaction or disappearance of legible text on the surface of the pages. This data corruption is further articulated by algorithmically generated tweets and the automated readout of those tweets. Data does not last forever; nor does nature in its current form.

1.2 The Substrate

One selected substrate for the fungal reading is Studies in Landscape by G. A. Jellicoe. This text, published in 1960, documents the human desire to tame, shape and control nature, and within it Jellicoe examines global landscape traditions.[5]
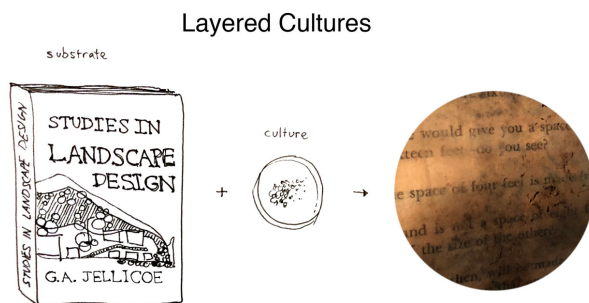

Figure 5 Text on nature and culture as a substrate

Jellicoe considers the Garden of Eden a paradise where unmitigated nature becomes a jungle. He recognizes that "the whole of architecture was based on suppression rather than the enlightenment of the individual spirit…" He posits an idealized garden, one that "would remind us also that we are always a part of nature and would tune us to that delicate response to nature which has almost passed from our experience."[5]

Jellicoe quotes biologist Julian Huxley, who identifies the following as obstacles to human fulfillment: "'the extermination of wild life, over-mechanization, the boredom of mass-production and conformity, the spoiling of natural beauty, the destruction of cultural traditions.'" Jellicoe concludes: "Modern civilization is in fact tending to produce an environment that is contrary to the natural condition of man and therefore against his ultimate happiness and welfare." This positions humanity and nature as diametrically opposed cultures: "Western man set himself to adventure upon and conquer the resources of nature." [5]

2. Internet of Natural Things

An invisible network of fungi establishes the basis for an Internet of Natural Things, or a natural "Internet of Things," at odds with most human knowledge systems. An Internet of Natural Things exists: fungal spores communicate.[6] This fungal network is one that escapes Internet protocols and evades electronic interventions. It is a global system that evolves through propagation and corruption. The artists are interested in how this natural network is connected with the actual Internet and human communication systems. By creating a conduit for fungal tweets, Cesar and LOIS cross these dual lines of communication and open up this question: how are we – humanity, technology, and nature – connected?
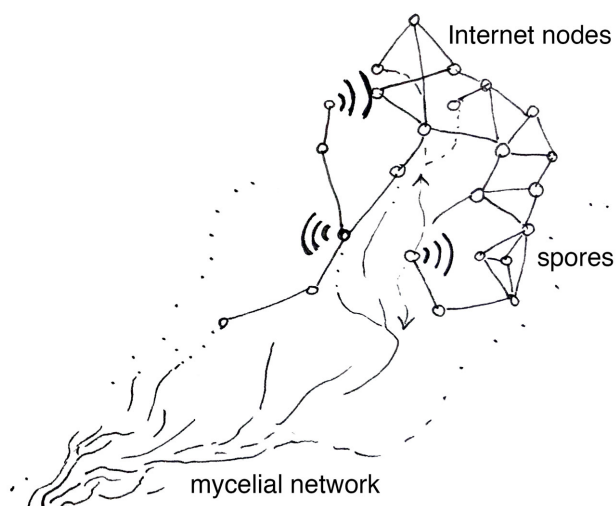

Connections across Networks

Figure 6 The Internet of Natural Things and the Internet

Likewise, the artists ask: Can fungi access the Internet? The project crosses the Internet of Natural Things with the Internet, integrating a biological network and a digital network. Through this intersection, the fungus has access to the Internet.

2.1 "Bhiobrid" Network

The collaborating artists combine fungi – the Internet of Natural Things – with the Internet in a "bhiobrid" fungi-digital network. This integration of the fungal network and the Internet results in a bio-triggered evolutionary network. The premise is that natural and technological networks coexist and are integrated through their shared space and environment. The natural network is analog, relying on a fungal network of growth based in soil and propagated through air. The technological network operates underground and in the air, similar to the airborne spores and mycelial networks, some of which connect across geographic spaces.[7]

Within the Internet there are different nodes, which are connected through links. When microorganisms are the actors that make these links, we have a "bhiobrid" system in which microbiology ends up making real decisions that impact the Internet. This influence is articulated by the different connections that are made within the network – connections triggered by biological entities across a digital network.

The resulting "bhiobrid" network invites the participation of fungal and human authors and allows for the intersection of these cultures. The Internet typically serves human interests; human beings are not in general responsive to signals across a mycelial network. This is not to say that human beings are not biological entities or that we are excluded entirely from nature's network. Within the art installation, tactile interactions by viewers reinforce the inherent connection between the human viewer to both networks. Human beings are part of the "bhiobrid" system. We exist in this layered network.

2.2 Circular Feedback Loop

In the feedback loop between the Internet of Natural Things and the Internet, the growing microbiological culture tweets text from digital documents and from the physical book that acts as a substrate. A bio-digital transducer transfers digital information to biology and back. The growth of the fungus determines the content of the tweet. A sensing system tracks the fungal growth, and the tweets devolve to reflect the fungal censoring of the text. As the microbiological culture advances and the physical text becomes illegible, the tweets also degenerate.

Within the fungal redaction and tweeting system there is cooperation between nature and technology. The fungus cooperates with a bot, the automation of which determines the corruption of digital files in response to the fungal redaction of the physical book. The growing microorganisms cover letters and words, and the fungus tweets. These tweets become a timeline of the death of the book. At the same time, the fungus exists in a physical space and interacts with digital network. There is information coming in and coming out. As a result, the exchange of human knowledge and knowledge from nature takes place in the "bhiobrid" network.

By incorporating Twitter to send information consumed by the fungus, the project integrates the analog and the digital. The fungus degenerates information, disrupting the data laws of the book and also the digital information of accessed text files. Mold eats an old book, and an algorithm destructs digital documents within fungal tweets. Viewers who retweet these messages spread them as digital spores on the Internet.

3. Connections and Projections

By maintaining separate networks humanity preserves the same myth of modernity that for many centuries has dictated how we interact with the world. Despite advances in technology, humanity still does this in more or less the same way that we did five or six hundred years ago. The project draws on texts that examine concepts of modernity, such as geometry and perspective, which human societies have applied to nature. In the historical gardens of Italian villas and in the future of geo-engineering, there is a lack of disruption of these basic tenets of modernity. Though humanity now possesses more technology and continuously sparks innovation, we maintain these conventions. *Degenerative Cultures: Corrupting the Algorithms of Modernity* enacts disruption in order to generate new directions.

4. Antecedents

The project has a basis in Cesar Baio's work incorporating the playful disruption of systems and LOIS' data performances of nature. Cesar and LOIS ask: Are disruptions to algorithms natural? And is nature's degradation a form of data loss? In their various bodies of work, Cesar Baio shows that disruptions to algorithms are indeed natural to autonomous systems, while LOIS replicates degradative datastreams sourced in nature. *Degenerative Cultures: Corrupting the Algorithms of Modernity* demonstrates an autonomous system of competing cultures, one derived from humanity and the other from nature.

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