Knowledge and Information from the Perspective of Evolutionary History

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Summary: It is surely a sign of the times that scholars from diverse and often non-scientific disciplines are turning to evolutionary history to confront, at least intellectually, the threat of human extinction at the heart of our new geological epoch, the Anthropocene. In the scholarly genre of "deep history," they are – as if from the viewpoint of our already-accomplished extinction – retrospectively narrating the course of human evolution on earth and determining how and when it became possible to imagine its end. We have books on the deep history of work, debt, money, music, design, technology, consciousness, and even knowledge itself (all of which I might summarize as the deep history of literacy as *the* distinguishing trait of the human species). The exercise is not exactly an autopsy, not wholly an act of writing from the position of "afterness." As a matter of professional conscience, many "deep-history" authors feel obliged to save a sliver of hope. "There's still time!" they all cry. But time for what exactly? And what is the problem for which we are seeking solutions through the general conceptual paradigm of evolution?

The problem is as follows: How did humanity come to give itself meanings and attachments that work at cross-purposes to its own survival? How did the skills that led to the institution of science and to our systemic dependence on technology create a world that will perish from those accomplishments? The possible solution: How must knowledge evolve so as realign humanity with its environment? To which we should add: What are the forces blocking that evolution? The answers to these questions, I suspect, can be found everywhere. Or rather: in our patterns of everyday behavior, we can isolate habits and commitments (from our attention spans to our consumer choices to our feeling for time and history) that reinforce – to be blunt – our environmentally suicidal tendencies.

These are the guiding questions for the project related to my work as an ASSETT Faculty Fellow, namely, the creation of a new course in the Program for Writing and Rhetoric: WRTG 2000 Information and Society. The course will run this fall for the first time.

That there is a deep interdependence between information and society is truism beyond dispute. Ask any number of scholars about the meaning and uses of information, however, and the possibility of consensus vanishes quickly. Witness the impressive recent collection, *Information: A Historical Companion* by Ann Blair et al. (Princeton 2021) Over the course of eight-hundred pages, we have

astonishing insights into the coevolution of information and society but cannot escape the sense that the concept – under the pressures of diverse disciplinary perspectives – fragments into non-communicating silos. Hence, the disappointing but also understandable refusal on the part of the editors to adopt a single definition for their object on analysis, information. Were one to teach from this excellent volume, one would have to choose from its thirteen major entries and from its dozens of minor entries. The selection would risk becoming arbitrary, when – to the contrary – what we seek is a systematic introduction to the uses of information in academic research.

My solution in WRTG 2000 is to pull back from too-narrow an emphasis on information and to analyze instead its function in the creation of knowledge – and this, through the adoption of a framework that pulls from evolutionary biology, cultural anthropology, and the history of science. Is there a general systematicity (a kind of global anthropology) to the production of knowledge and, if so, what role does the creation, organization, and transmission of information play therein? How must knowledge itself evolve to spur, coevally, the realignment of humanity with a damaged planet? As I'll show below, these are questions I inherit largely from Jürgen Renn, *The Evolution of Knowledge* (Princeton 2020) and are at the heart of this new PWR course.

Describe the challenge you addressed in your department with this project: The PWR is a practice-oriented department. From the mechanics of writing to the skills for academic research and on to the creation of multimodal projects, students should graduate from our courses with eminently practical composition techniques. Is there a place, however, for a larger theoretical perspective that would analyze writing and information organization from the perspective of cultural evolution? More narrowly, is there a role in the PWR for a course that would analyze the general formation of knowledge at the university, including the formation of disciplines as specialized form of knowledge development? A course pitched at the 2000-level is designed to complement our practical and performance-oriented courses with an evolutionary perspective that traces the general conditions of knowledge production, the emergence of truth and mind from out of those conditions, and the critique of disciplinary limits when we sense, as we do today, that our cognitive accomplishments need to be recalibrated in the face of self-defeating habits. It's not the most felicitous of expressions, but this course is a "meta"-course: grounded in the history of science, it is an introduction to the metalanguage necessary for understanding (I would hope) the production of knowledge in any department across campus.

Describe desired result: Earlier, I suggested that this course is a deep history of literacy, but the results should be measured practically as well as theoretically. Practically, all PWR courses will test a student's understanding and performance of information literacy, which can be summarized in six principles:

1. Authority is constructed and contextual.
2. Information creation as a process
3. Information has value
4. Research as inquiry
5. Scholarship as conversation
6. Searching as strategic exploration

I am suggesting that we can expand beyond these parameters, such that a course on the deep history of literacy would focus on:

- the history of "writing," understood broadly as all media of inscription
- the social and political upheavals that accompany new media inventions (the printing press, photography, digital media)
- the rise of the technical image in the 19th century (photography, film)
- technogenesis understood the humanization of the human mind and body under the pressures of media and technological interfaces
- the points of power in society as they are organized around the construction, access, and interpretation of information (including projects such as public education)
- the history of institutions that organize documents (libraries, archives, museums, corporations)
- an expanded understanding of media that would range from organic life to urban infrastructure and smart cities

These are broad areas of inquiry that anyone in any setting (or very nearly so) should use to understand an information system and its distribution of knowledge across a plurality of agents and media. To speak perhaps figuratively, information is ecological, and I am hoping that my students, in the mode of a self-ethnography, can trace the emergence of their minds from out of the "cultural bath" of cognitive and technological resources into which they were born (and from which, I am suggesting, they may perish under the pressures of the Anthropocene).

Describe the project. What did you do? I planned and received approval for the new course in the fall of 2020. Again, it will be offered in the fall of 2021 for the first time and will be organized in four modules:

(1) What is knowledge?

- Here, we will set out the disciplinary framework for the course, borrowing from the evolutionary methodologies in Jürgen Renn, *The Evolution of Knowledge: Rethinking Science for the Anthropocene* (Princeton 2020). A historian of science at the Max Planck Institute in Berlin, Renn is summarizing in this volume approximately thirty years of collective research into the organization of scientific knowledge. Here is a fair summary of his central goal: "Can [an] overarching, integrative, and explanatory framework be found for the history of knowledge as an integral part of cultural evolution?" This question, I think, should interest all researchers for it suggests that knowledge, no less than related cultural levers such as technology and language, spurs the forms of cultural evolution through which humans assign themselves historical meanings and purposes. At the current moment, at our "anthropocenic" crossroads, we are wondering whether and how knowledge can evolve so as to inaugurate a stage in our cultural evolution that would extricate humanity from its present path toward extinction.

(2) What is information?

- Clearly, the most vexing question of our course. To approach the definitions and usages of information, we will study the rudiments of library science; review the ACRL information literacy guidelines; study some of the social and technical forces that contribution to misinformation, specifically where climate science is concerned; analyze the virtues and limitations of open source infrastructures; and, finally (for the moment), investigate the hypothesis (inspired by the work of Daniel Dennett) that both evolution and information are organized algorithmically.

(3) Institutional-Informational Ethnography

- Students will conduct an institutional ethnography of an organization like the Rocky Mountain Institute, interview at least two experts from the RMI, analyze its internal "knowledge architecture" and determine the effectiveness of its role within a larger "knowledge economy." The point is less to study the climate science that underpins their work than the informational infrastructures through which it accomplishes its mission.

(4) Persuasive academic argument

- In addition to assessing the credibility of information and its roles within a knowledge economy, students should be able to assert an original claim that builds upon or corrects previous research. How can they learn to ask the "provocative questions that foster inquiry" and lead to the construction of original claims? Here, students will produce a "classic" persuasive argument (3000 words), with the customary requirements and research skills: lateral reading, annotated bibliography (identifying and paraphrasing core claims), effective quoting and attribution, synthesizing (finding patterns, summarizing distilling), contextualizing. Again, I am working with the hypothesis that there are many aspects of contemporary reality that can be connected to the Anthropocene, understood as a global set of habits, commitments, and experiences that lock us into our own destruction.

Describe the outcome. What worked, what didn't work, lessons learned. I will update this report in late December 2021.

Reflect on your experience in the Faculty Fellows program and working on your project: Several meetings from our first semester have stayed with me. First and foremost, our discussion on diverse learning styles and the need to offer multimodal access (textual, visual, aural) to course materials. This fits very well with my interest in the relation between learning and technology, indeed with the idea of "techno-genesis," dear to N. Katherine Hayles who defines it as the coevolution of technology and cognition. It reminds us that learning is always media-based, that information is always embodied and transmitted in a specific medium, and that multiple forms of access may make an important difference in meeting the learning goals of a course. Most importantly, it also serves to check hidden ableist assumptions about "normal" learning that may be reinforcing pernicious epistemic patterns at odds with confronting the Anthropocene. Again, if we have meanings and attachments that contribute to our own extinction, how and why might certain of those attachments stem from an ableist posture that privileges a certain kind of learner, a certain kind of education? Here, I am touching on the core intention of WRTG 2000: to invite collective reflections on aspects of contemporary experience that seemingly have no connection to the Anthropocene and to ask, how might analyses of mental health, disability design, race, education, journalism, war, and even academic writing protocols contribute to patterns of conduct that enable or prevent greater reflection on our "anthropocenic" predicament?

Second, I appreciated the introduction to backward design which, in its prioritization of broad goals, helped expand my usual approach to course building. Typically, I assemble readings and

assignments first because, in themselves, "they are important! And students should know this!" Now, I am more inclined to begin with (i) enduring understandings and learning goals, (ii) knowledge transfer from module to module (and course to course), (iii) major ideas, and (iv) the ability of students to ask provocative questions.

If appropriate, please include other artifacts and visuals: Not applicable.

References:

Ann Blair et al., *Information: A Historical Companion* (Princeton 2021)

Michael Buckland, *Information and Society* (MIT 2018)

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N. Katherine Hayles, *How We Think: Digital Media and Contemporary Technogensis* (Chicago 2012)

Joseph Ledoux, *The Deep History of Ourselves: The Four-Billion-Year Story of How We Got Conscious Brains* (Viking 2019)

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Bernard Stiegler, *The Neganthropocene* (Open Humanities 2018)

James Suzman, *Work: A Deep History, From the Stone Age to the Age of Robots* (Penguin 2020)

Gary Tomlinson, *A Million Years of Music: The Emergence of Human Modernity* (Zone 2015)