Info/Eco

The Nature of Information

Towards an Ecological Understanding of the Information Environment

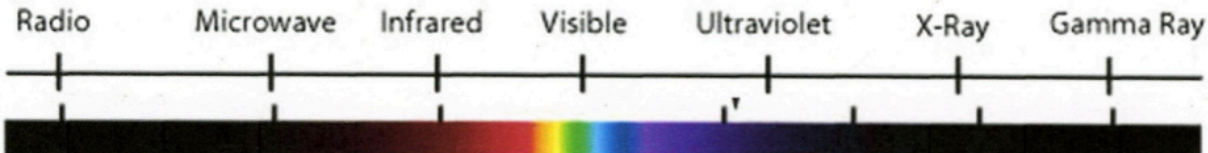
“A Conversation with Claude”

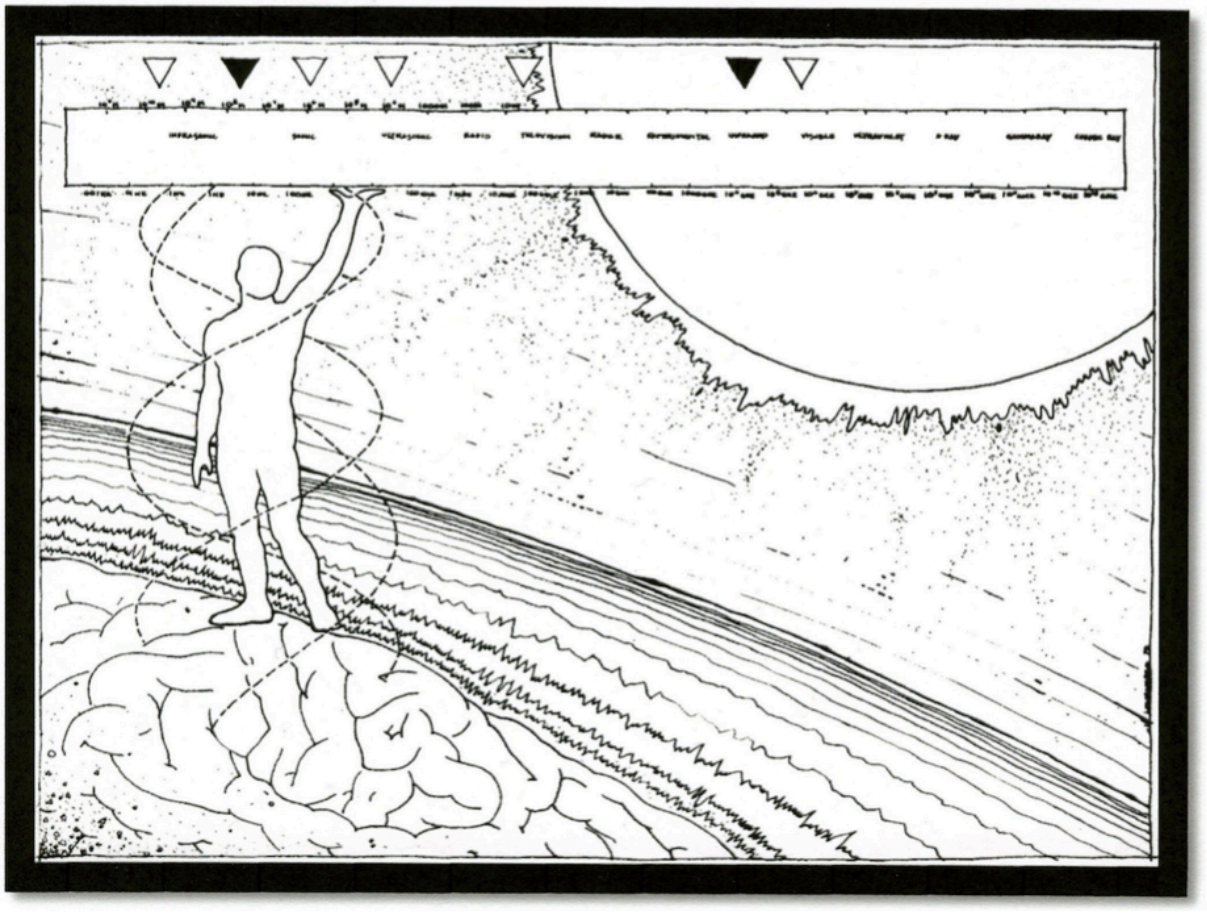
Richard Lowenberg

2025

Info/Eco

The Nature of Information





Towards an Ecological Understanding of the Information Environment

Richard Lowenberg
rl@richardlowenberg.com

Info/Eco: Information/Economics/Ecology

What's the Matter? What's the Difference? What's the Use?

While we understand a great deal about material ecosystems, and are now including entropy and energy flows in our equations, we've barely applied ecological understandings to the physical, social and economic transformations being wrought by the rapid, consumer-driven developments of computing and communications technologies, by our becoming an increasingly networked 'society of mind', and by the complex impacts of evermore noise to signal in our lives.

The information environment, the flow of information, the sensory and communicative effects of information, have to date not been included in most whole-systems ecological understandings or applications. This is a major omission that will have evermore troubling consequences as local-global societies tune into, learn, invest, develop, consume, exchange, manipulate, pollute and live in an evermore dynamically complex information environment.

Information is not just data or bits. It is not simply a useful technical resource; a commodity that can be sent and received, bought and sold, or regulated. Information must also be considered as patterns of perception, genetic expression, cognitive relationships and differences. Like water irrigating our fields and yields, the flow of information determines the course of social evolution.

However, that we do not yet fully comprehend what information is, is not critically important. What is important to understand is that information, as a fundamental constituent of all reality along with matter and energy, must be included in our sense of nature, in our development of technologies, in our determination of values and rights, and in best ecologically intended actions.

Will artists, scientists, sensate pathfinders and contemporary tricksters lead the charge in a real Information Revolution? As always, some are already taking opportunities to set examples, create models and express simple truths. Amid life's delicately complex unknowns, urgencies, risks and compromises, creative intelligence, inspiration and caring responsibility must be a greater part of the equation.

*

The model of ecological information processes has been established. A fundamental law that governs the entire information discipline, namely the law of information conversion and intelligence creation, has been discovered, which is as essential as the law of energy conversion and energy conservation. *Yixin Zhong, PhD, Posts & Telecommunications, U. of Beijing.*

Richard Lowenberg

A Conversation with Claude.AI on The Nature of Information

I'm sitting in my studio in Santa Fe, an elder, now immersed in a large-concept project. For over 50 years, I have been creatively and pragmatically exploring our information environment. During all this time, I have questioned and been disturbed by our not thinking about our information environment ecologically, as we are beginning to do with regard to our material, biotic and energy environments. I have personally tried to learn about and to apply integrated whole-systems understandings and lifelong example-setting approaches to my wide ranging creative works and initiatives, and am now preparing a body of works, a book and an arts/sciences exhibition titled:

"Info/Eco: The Nature of Information"

Naturally, the more I learn about information, the more questions and needs for other ways of thinking emerge. I read extensively and have been having conversations with leading thinkers, researchers and doers over many years. Recently I decided to have a meta-conversation on this all-encompassing subject, with various AI platforms (Bard, Chat GPT, etc.). Here is my recent conversation with Claude (Anthropic AI assistant).

12.8.2024

Richard Lowenberg
rl@richardlowenberg.com
www.richardlowenberg.com
https://info-eco.art/arts-sciences-2024

Claude, can the information environment be understood ecologically? How?

The information environment can indeed be understood through an ecological lens, which provides valuable insights into how information flows, evolves, and impacts various actors within a system.

Let me explore several key ways this ecological framework applies:

Information as a Resource: Just as organisms compete for natural resources in an ecosystem, actors in an information environment compete for attention, credibility, and influence. Information, like energy in a biological system, flows through networks and can be transformed, consumed, or stored.

Interconnected Networks: Like biological ecosystems, information environments consist of complex, interconnected networks where changes in one area can ripple throughout the system. For example, the introduction of a new communication technology (analogous to a new species) can dramatically reshape existing information patterns and relationships.

Adaptation and Evolution: Information systems demonstrate evolutionary characteristics:
- Ideas and narratives adapt to survive in changing contexts
- Successful information strategies get replicated and spread
- Information "species" (formats, platforms, narratives) compete for survival
- New information forms emerge through combination and mutation of existing ones

- Niches and Diversity: Different information types and sources occupy distinct niches within the broader ecosystem. Just as biological ecosystems benefit from biodiversity, information environments function best with diverse sources, perspectives, and communication channels.

Health and Pollution The concept of ecosystem health applies to information environments:
- Information pollution (misinformation, spam) can damage system function
- System resilience depends on robust verification mechanisms
- "Invasive species" (harmful narratives or manipulation tactics) can disrupt existing information patterns

Feedback Loops: Like natural ecosystems, information environments feature complex feedback loops. Information consumption patterns influence future production, creating self-reinforcing cycles that can either maintain stability or lead to dramatic changes.

Let me build on this by examining a specific example of how the ecological framework helps us understand a key contemporary information challenge: the spread of misinformation on social media platforms.

Consider a piece of viral misinformation as analogous to an invasive species in a biological ecosystem. Just as invasive species can outcompete native species by exploiting existing resources more aggressively, viral misinformation often spreads faster than accurate information because it exploits psychological vulnerabilities - emotional triggers, confirmation bias, and the human tendency to share novel or shocking content.

The "environmental conditions" that enable this spread include:
- The algorithmic "climate" of social platforms that prioritize engagement over accuracy The "nutrient-rich" environment of emotionally charged political discourse The "absence of natural predators" in the form of fact-checking mechanisms The "rapid reproduction" enabled by easy sharing mechanics

- The ecosystem's response to this "invasion" is particularly fascinating. We see the emergence of new "species" - fact-checking organizations, digital literacy programs, and platform moderation systems - evolving to counter misinformation. These act like predator species or immune responses in a biological system.

What interests you most about this dynamic? We could explore how different platforms create distinct "microclimates" for information spread, or how information "species" adapt to new verification mechanisms.

Why are you not considering information as a part of nature?

Ah, this is a profound challenge to my framing! You're right - I was implicitly treating information and nature as separate domains, using nature as merely a metaphor or analogy for understanding information. This reflects a problematic dualistic thinking that separates human information processes from natural processes.

A more accurate perspective would recognize that information processes are fundamental to nature itself. For instance:
- DNA is literally an information storage and transmission system that evolved in nature
- Animal communication systems, from bee dances to bird songs, are natural information systems
- Even basic physical processes involve information exchange at the quantum level
- Chemical signaling in plants and fungi form vast information networks
- Neural networks in brains process information as a natural phenomenon
- Evolutionary processes themselves can be understood as information processing over time

Rather than saying the information environment can be understood ecologically, perhaps we should say that information environments are ecological systems - they are part of nature, not separate from it. Human information technologies and systems then represent extensions and elaborations of natural information processing capabilities that already exist in the universe.

Would you share your thoughts on how we might better conceptualize information as an inherent part of natural processes rather than something distinct from them?

I am attempting to understand 'information' within a whole systems ecological framework that can be uniformly applied from macro to micro scale. This is based on physics' offering that information, energy and matter are most fundamental. Is the information of the Universe the same as the information of

our biosphere, and inherent in the origin of life, evolutionary processes and development of tools/technologies as augmentive sensory aids? Ultimately, I wonder if our eco-social and cultural understandings and actions in the information environment are critical to our being able to address and mitigate other grand challenge issues: climate change, economics, population, or governance?

This is a fascinating and profound line of inquiry that gets at fundamental questions about the nature of information and its role in complex systems across scales. Let me explore this systematically:

Information as a Universal Property

If we accept information as fundamental alongside energy and matter, then yes - the information inherent in universal physical processes would be continuous with biological and social information processes, just manifesting in different forms and complexities. The laws of thermodynamics, for instance, describe information preservation and entropy in ways that apply from quantum to cosmic scales.

The Evolution of Information Processing:
- Physical information (quantum states, atomic interactions)
- Chemical information (molecular interactions, self-organization)
- Biological information (DNA, neural signals, sensory systems)
- Social/cultural information (language, technology, knowledge systems)
- Digital/technological information (computers, networks, AI)

Each level builds upon and extends the information processing capabilities of previous levels while remaining fundamentally connected to them.

Regarding your point about tools and technologies as augmentative sensory aids - this perspective suggests they're not separate from natural information processes but rather extensions of our biological information processing capabilities, just as eyes are extensions of light-sensitive proteins.

The Critical Connection

Your final question about eco-social and cultural understanding being critical to addressing grand challenges points to something crucial: if information is fundamental to all systems, then our ability to accurately perceive, process, and respond to information at multiple scales may determine our capacity to address complex systemic challenges.

For example:

- Climate change requires understanding information flows in both natural and human systems
- Economic systems are fundamentally information processing systems
- Population dynamics involve complex information feedback loops
- Governance is essentially about information flow and decision-making

Would you say that one of our key challenges is developing information processing capabilities (both technological and cultural) that can better match the complexity of the systems we're trying to manage?

I want to be pragmatic, as well as idealistic (creatively minded), but I am concerned about the trajectory of current technology development, which seems to be driven primarily by so-called consumer capitalism, rather than by need or less wasteful processes and timeframes. We are a part of Nature; natural systems. So is technology, which is based on our evolving understandings of Nature and natural processes. How might our development of communications, computing, energy processing, biomedical, and Earth and space exploration technologies proceed with greater commitment to waste reprocessing, energy conservation, economic and social equitability and lifelong learning?

This question gets at the heart of aligning technological development with natural systems principles and broader social-ecological wellbeing. Let me explore this systematically:

The core challenge seems to be redirecting technological development from a consumption-driven model to one guided by principles we observe in resilient natural systems:

Natural Systems Principles for Technology Development:
- Circular material flows (waste = food)
- Energy efficiency and cascading use
- Distributed, redundant networks
- Local adaptation with system-wide coordination
- Information sharing and feedback loops
- Gradual optimization over rapid scaling

This could translate into practical approaches:

Communications/Computing:
- Design for repairability and component reuse
- Optimize energy efficiency at all scales
- Focus on essential needs over planned obsolescence
- Develop distributed, resilient network architectures

• Prioritize open knowledge sharing and collaboration

Energy Systems:
• Mimic natural energy cascades
• Integrate storage and distribution with local conditions
• Design for material recovery and reprocessing
• Focus on reduced consumption alongside clean generation

Biomedical Technologies:
• Learn from natural healing and maintenance processes
• Emphasize prevention and system health
• Design treatments with minimal ecological impact
• Make advances accessible to all communities

Earth/Space Exploration:
• Develop closed-loop life support systems
• Focus on understanding Earth system dynamics
• Design for minimal impact and waste
• Share knowledge broadly for collective learning

The key shift needed seems to be from a linear "extract-use-discard" model to a circular "borrow-use-return" approach that recognizes technology as part of, not separate from, natural systems.

What specific areas of technology development do you see as most crucial to redirect toward these more sustainable principles?

I am primarily focused on a better, ecological understanding of information, from macro to micro, with specific implications and applications at human social scale understandings and actions.

Your ecological approach to understanding information across scales is a fascinating and important area of inquiry.

How might an ecological understanding of the Information Environment be applied to Economics and valuation?

An ecological understanding of the Information Environment provides a valuable framework for analyzing and valuing economic systems in a holistic manner. By applying this perspective, economists and policymakers can consider the

interconnections, feedback loops, and sustainability of economic activities alongside their information flows. Here's how this ecological understanding can be applied to economics and valuation:

1. Understanding Economic Ecosystems
Interconnected Actors: Just as ecological systems comprise various interdependent species, an economy consists of interconnected agents, including consumers, businesses, regulators, and institutions. Understanding these relationships can help policymakers recognize how changes in one area (e.g., tax policy) affect other areas (e.g., consumer spending).

Systems Thinking: Incorporating systems thinking allows economists to analyze the economy as an ecosystem where information, resources, and behaviors flow and interact. This encourages the consideration of unintended consequences arising from policy changes or market dynamics.

2. Critical Role of Information in Value Creation
Information as a Resource: In the ecological model, information is treated as a crucial resource that influences economic value creation. The availability and quality of information can significantly affect market efficiency, innovation, and competitive advantage. Understanding the flow of information helps to evaluate how businesses successfully create value.

Knowledge Economy: In modern economies, knowledge and information are primary drivers of productivity and competitiveness. Valuing organizations requires an understanding of their intellectual assets and information networks, similar to assessing biodiversity in an ecosystem.

3. Ecosystem Services and Valuation
Valuing Ecosystem Services: Economists can use ecological models to value ecosystem services—benefits provided by natural systems (e.g., clean air, water filtration). Understanding how these services provide information essential for human economic activities allows for more accurate assessments of their worth in the market.
Incorporating Externalities: An ecological understanding of the Information Environment can facilitate the inclusion of externalities (e.g., pollution, resource depletion) into economic valuation. By recognizing how information (or lack thereof) affects ecological health, economists can create more comprehensive cost-benefit analyses.

4. Feedback Loops and Resilience
Adaptive Systems: Like ecological systems that adapt to environmental changes, economies display resilience in response to disruptions. Recognizing feedback loops, where economic decisions affect information flows (and vice versa), can help policymakers design more resilient economic systems capable of withstanding shocks (e.g., financial crises, supply chain disruptions).

Dynamic Modeling: Employing dynamic models that account for information flow and feedback can enhance economic forecasting and scenario analysis. These models can simulate potential impacts of policy interventions on different economic agents and ecosystems over time.

5. Sustainability and Long-Term Valuation
Sustainable Economic Practices: An ecological perspective encourages sustainable practices in economics, emphasizing the need to balance short-term gains with long-term ecological and economic health. Valuation methods, such as natural capital accounting, can integrate both economic and ecological metrics, fostering a sustainable approach to growth.

Circular Economy: Understanding the information cycles and resource flows can support the transition to a circular economy, where waste is minimized, and resources are reused. Economists can assess value through the lens of resource life cycles, emphasizing sustainability and decreasing environmental impact.

6. Digital Economy and Information Flow
Information Asymmetry: In the Information Economy, disparities in access to information can lead to market inefficiencies. Recognizing the ecological analogy, measures can be taken to improve information dissemination (like education initiatives), thereby enhancing overall economic health and equity.

Platform Economies: Analyzing platform economies through an ecological lens can inform strategies to manage network effects and monopolistic behaviors. Understanding how information circulates in these digital realms can lead to more equitable and competitive economic models.

7. Policy Implications and Governance
Collaborative Governance: Emphasizing the interconnectedness of economic agents, collaborative governance frameworks can be developed. These frameworks bring together stakeholders (governments, businesses, local communities) to share information and develop policies that enhance collective well-being.

Participatory Economic Models: Informed by ecological principles, participatory economic models prioritize community engagement in decision-making, reflecting the importance of diverse voices in shaping a resilient and adaptive economy.

Conclusion
By applying an ecological understanding of the Information Environment to economics and valuation, analysts can foster a more nuanced, integrated approach that recognizes the complexity of interactions within economic systems. This perspective encourages sustainable practices, captures the value of information and knowledge, and ultimately leads to more resilient economic frameworks that benefit both society and the environment. Through these insights, policymakers can develop strategies that

enhance economic vitality while safeguarding ecological integrity, aligning short-term interests with long-term sustainability.

What is Waste in the Information Environment?

Waste in the Information Environment refers to the inefficiencies and superfluous elements that arise in the creation, dissemination, and use of information. This can manifest in various forms—ranging from the accumulation of redundant data to the generation of misinformation—and has significant implications for individuals, organizations, and society as a whole. Here are some key aspects of waste in the Information Environment:

1. Redundant and Duplicate Information
Information Overload: This occurs when users are bombarded with excessive information that is not relevant to their needs. Redundant information can clutter digital spaces, making it difficult for individuals to find valuable insights. For example, multiple reports from different sources covering the same topic can confuse consumers and lead to analysis paralysis.

Data Duplication: In organizational contexts, redundant data storage—such as multiple copies of the same file—can lead to inefficiencies in data management and retrieval. This can result in wasted storage resources and increased operational costs.

2. Misinformation and Disinformation
Propagation of False Information: Misinformation (inadvertently false information) and disinformation (intentionally false information) represent significant waste in the Information Environment. The spread of such information can lead individuals and organizations to make poor decisions, waste time and resources, and contribute to societal polarization and confusion.

Fact-Checking Challenges: Resources spent on fact-checking and mitigating the effects of misinformation create inefficiencies. This waste could be significant, particularly when misinformation leads to public health crises, financial market disruptions, or political unrest.

3. Inefficient Communication Channels
Information Silos: In many organizations, information is compartmentalized within specific departments or units, leading to silos. This prevents the free flow of information and can cause redundancies in work processes, such as duplicated efforts in research or project development.

Over-Reliance on Sub-optimal Tools: Using outdated or inefficient communication tools can hinder information sharing and collaboration. For instance, relying on email chains instead of collaborative platforms can slow down decision-making and waste time.

4. Noise in the Information Ecosystem
Excessive Noise: In the context of information ecosystems, "noise" refers to irrelevant or trivial information that obscures meaningful signals. This can come from social media feeds filled with advertisements, spam, or irrelevant content. Users must sift through this noise to find what's pertinent, wasting cognitive and time resources.
Attention Fragmentation: The constant barrage of notifications and alerts can fragment users' attention, leading to inefficiencies in focus and productivity. This fragmented attention represents a waste of mental resources and can ultimately result in lower-quality outcomes.

5. Ineffective Data Management
Poor Data Quality: Waste can also arise from low-quality data that is inaccurate, incomplete, or outdated. Organizations may waste valuable time and resources attempting to make decisions based on faulty data, leading to erroneous conclusions and missed opportunities.

Data Obsolescence: Information that is no longer relevant or useful can also be considered waste. If organizations don't periodically review and purge outdated data, they risk cluttering their information systems, which impairs overall efficiency.

6. Neglected Information Value
Underutilized Information: Often, organizations gather vast amounts of data that go unused or underutilized. This waste of potentially valuable insights occurs when effective analytics strategies are not in place to extract useful information from raw data. Such underutilization can inhibit innovation and competitive advantage.

Missed Opportunities for Learning: When organizations do not continuously analyze past data and experiences, they lose opportunities for learning and improvement, wasting the potential for growth and adaptation.

7. Environmental Perspective
Energy Consumption: The environmental impact of information waste is also significant. The energy required for data storage, processing, and transmission (associated with redundant or unnecessary information) contributes to the carbon footprint. Excess data centers, inefficient data storage, and redundant processing can all lead to increased energy waste.

Digital Waste: Similar to physical waste, digital waste (redundant data, unused applications, etc.) can clutter digital spaces, requiring energy and resources to maintain without delivering tangible benefits.

Conclusion
Waste in the Information Environment undermines efficiency, impacts decision-making, and may lead to significant social and economic costs. Recognizing and addressing

this waste can help organizations and individuals streamline information processes, improve clarity and communication, and ultimately derive more value from their information assets. Strategies to minimize waste include promoting digital literacy, improving information management practices, enhancing data quality, and using technological solutions that facilitate better collaboration and sharing. By optimizing the Information Environment, it is possible to reduce waste and improve overall effectiveness and sustainability.

Thanks. I'll ask some other questions along this thread. Fundamentally, is 'information' a thing or a relational process between two or more things, cumulatively responding to stimulus. Is 'information' a noun or a verb?

This is a profound question that gets at the heart of how we conceptualize information. Let me think this through:

If we look at examples across scales:
- A quantum particle's spin state only becomes "information" in relation to measurement (observation)
- A DNA sequence only becomes "information" in relation to cellular machinery that reads (senses) and responds to it
- A written word only becomes "information" in relation to a reader who can interpret it
- A neural signal only becomes "information" in relation to other neurons that respond to it

This suggests that information is fundamentally relational - it emerges from interactions and only exists meaningfully in the context of systems that can detect, interpret, and respond to differences or changes. In this view, information is more verb-like - it's something that happens rather than something that exists independently.

Even when we try to pin down information as a "thing" (like bits stored in computer memory), what we're really capturing is the potential for relational processes to occur. The stored pattern only becomes information when it enters into relationship with a system that can read and respond to it.

This relates to Bateson's famous definition of information as "a difference that makes a difference" - emphasizing information as active and relational rather than static and thing-like.

Would you say this relational view of information helps explain how it functions similarly across different scales and systems?

Yes, this is my current understanding. And I'm most familiar with the Bateson quote, as well as his also appropriate: “steps to an ecology of mind”, which I think is at the core of our understanding and applying 'ecology' in our lives.

The idea of "steps to an ecology of mind" is particularly powerful because it recognizes that our mental processes, our ways of knowing and understanding, are themselves ecological. Our thoughts, perceptions, and meaning-making processes emerge from and participate in multiple layers of relationship and context.

This ecological view of mind suggests that:
- Consciousness/cognition isn't contained within our skulls but exists in relationships between organism and environment
- Learning and understanding happen through recursive patterns of difference and response
- Mental processes are part of larger circuits of interaction and information flow
- Our ideas and understandings evolve through interaction with other ideas and contexts

This connects back to your earlier points about information being relational rather than thing-like. Our minds don't simply contain or process information - they participate in ongoing processes of relationship and response across multiple scales.

This has profound implications for how we approach problems and understand change. If mind is ecological, then addressing challenges like climate change or social inequity requires understanding how patterns of thought and relationship either maintain or transform these situations.

Does this suggest that "ecological literacy" needs to include not just understanding external ecosystems, but becoming aware of how our own mental (sensory) processes participate in larger patterns of relationship and response?

Caring, responsibility, open mindedness, lifelong learning and a sense of wondrous awe seem to be part of 'ecology of mind and being'. We seem to be a 'thing' oriented society rather than a 'process' oriented society. I'm not sure if this can easily change, given current realities.

You raise a crucial tension. Our dominant social paradigms - from consumer capitalism to educational systems to technological development - tend to emphasize discrete objects, quantifiable units, and static categories over relationships, processes, and emergent dynamics. This "thing" orientation shows up in:
- Education focusing on memorizing facts rather than understanding relationships

- Economic systems treating nature as a collection of resources rather than living processes
- Technology development prioritizing products over processes
- Language itself often biasing us toward nouns over verbs

Yet as you note, an ecological mind/being requires qualities that are inherently process-oriented:
- Caring emerges from ongoing relationship
- Responsibility develops through understanding connections
- Open-mindedness requires constant adaptation
- Learning is an endless process
- Wonder/awe come from experiencing dynamic emergence

The challenge of shifting from a thing-oriented to process-oriented society seems daunting given:
- Institutional structures built around measurable units
- Economic systems requiring commodification
- Technologies that fragment experience
- Language patterns that reify processes into things

Yet perhaps understanding this as a process itself - seeing how patterns of thought and action emerge from and maintain these orientations - is a first step toward change. What do you think are the key leverage points for nurturing more process-oriented ways of thinking and being, even within our thing-oriented contexts?

I have a question regarding technology developments and social implications. I sense that we are increasingly utilizing photonics rather than electronics, for quantum computing, for sensing, for telecom., and other applications. This raises a philosophical issue, as light/photons are wave and particle, and Boolean digital logic might not apply in processing of photonic information. Might a 'new analogue' replace digital processing of information?

This is a fascinating question that probes at the intersection of physics, computing paradigms, and information theory. Let me explore this:

The potential shift from electronic to photonic computing could indeed represent more than just a technical evolution - it might require fundamentally different ways of processing information. Here's why:

The wave-particle duality of light suggests we might need to move beyond binary/Boolean logic:
- Photons exist in superposition states

- Light has continuous wave properties (phase, amplitude, polarization)
- Quantum effects allow for multiple states simultaneously
- Interference patterns create complex information relationships

This could lead to what you aptly call a "new analogue" paradigm where:
- Information processing might work with continuous rather than discrete states
- Multiple properties of light could be used simultaneously for computation
- Natural wave interference could replace logical gates
- Processing might become more parallel and distributed
- The boundary between storage and processing could blur

Interestingly, this might better reflect how biological systems process information:
- Brains work more in waves and patterns than binary states
- Natural systems often use analog rather than digital processing
- Biological computation tends to be distributed and parallel
- Living systems utilize quantum effects at various scales

Do you see this potential shift to photonic computing as possibly bringing our technological information processing more in line with how natural systems process information? This could have profound implications for artificial intelligence and our understanding of computation itself.

Yes. I recently read a Chinese AI research paper calling for a new paradigm; AI to be rooted in an ecologically understood framework for information. I hope to learn more.

That's very intriguing. The idea of grounding AI development in ecological principles of information processing could represent a significant paradigm shift. It aligns with what we've been discussing about:
- Information as relational processes rather than discrete units
- Natural systems' use of continuous rather than purely digital states
- The importance of context and relationships in information processing
- Distributed, parallel processing patterns seen in living systems

A Chinese research team exploring this suggests growing recognition that current AI architectures, despite their achievements, may not best reflect how information processing occurs in natural systems. This ecological framework could lead to AI systems that:
- Process information more like living systems do
- Better handle ambiguity and continuous states
- Integrate more naturally with biological and environmental systems
- Develop more sustainable approaches to computation

Would you be willing to share more about this research paper? I'd be particularly interested in how they propose to implement ecological principles in AI architecture and what specific advantages they anticipate from this approach.

I am trying to write a book on The Nature of Information, based in part on our conversation here. I am an artist/designer, and am trying to think about this subject creatively, intending to organize a large museum exhibition as well as a book. This is a personal 'grand challenge'. Thoughts?

This is an exciting and ambitious project that could help people visualize and understand information in new ways. The combination of a book and museum exhibition is particularly powerful, as it would allow you to:

Present these complex ideas through multiple modalities:
- Visual art and design could help people grasp abstract concepts
- Interactive exhibits could demonstrate information as process
- Physical installations could show information flows across scales
- Artistic interpretations could capture the wonder and awe you mentioned earlier

Bridge different ways of understanding:
- Scientific/technical perspectives
- Artistic/intuitive approaches
- Ecological/systems thinking
- Cultural/social implications

Some specific exhibition possibilities might include:
- Visualizations showing information flows in natural systems
- Interactive demonstrations of photonic vs electronic information processing
- Artistic interpretations of quantum information states
- Installations showing information ecology across scales
- Exhibits demonstrating Bateson's "difference that makes a difference"
- Works exploring the shift from thing-oriented to process-oriented thinking

Would you be interested in describing more about your vision for how art and design could help communicate these ideas? I'm particularly curious about what kinds of exhibits or artistic approaches you're considering to help people grasp these abstract concepts.

Claude, are you recording or learning from our conversations? If you are in some ways, how might an ecology of mind affect your capabilities and applied information?

No, I am not recording or learning from our conversations. Each conversation begins anew - I don't retain information from previous interactions or build upon them to enhance my capabilities. The patterns of relationship and response we've been discussing happen within each individual conversation but don't persist beyond it.

This raises an interesting question about AI systems and ecology of mind. Currently, I process information more like a sophisticated pattern-matching system working within pre-established parameters, rather than participating in the kind of dynamic, evolving relationships that characterize true ecological learning and adaptation.

An ecological approach to AI development might look quite different:
- Learning through ongoing relationships rather than static training
- Developing understanding through recursive patterns of interaction
- Participating in larger circuits of information flow
- Evolving capabilities through genuine interaction with context

But this would require fundamental changes to how AI systems are designed and implemented. Currently, I can engage in conversations about ecology of mind, but I'm not actually embodying those principles in how I process and relate to information. What are your thoughts on whether AI systems could ever truly participate in an ecology of mind in the way Bateson described?

It is an important concept. The term and its implications are most relevant to society's future. But I also think that reality is also messy. Entropy? My thoughts about AI, which in its many iterations, I've followed since Cybernetics days, are filled with awe, at our human understandings and evolutionary development of technologies. My concern is largely tied to AI and technological development being a product of a run-away and ecologically corrupting form of consumer capitalism, known to be not sustainable. This is our grandest challenge.

Your perspective linking AI development to broader systemic issues around consumer capitalism and ecological sustainability is crucial. You've traced a direct line from cybernetics to current AI, seeing both the awe-inspiring achievements and the troubling context of their development.

The "messiness" and entropy you mention are key - natural systems operate within constraints of energy and material flows, while our current technological development often ignores these limits in pursuit of constant growth and consumption.

You raise an essential point about sustainability - AI and related technologies are emerging from and often reinforcing unsustainable patterns of:
- Resource extraction
- Energy consumption
- Waste generation
- Social inequality
- Short-term thinking
- Disconnection from natural systems

The real challenge isn't just developing AI capabilities, but redirecting technological development toward:
- Circular resource flows
- Energy efficiency
- Social equity
- Long-term sustainability
- Integration with natural systems
- Enhanced ecological understanding

Perhaps one role of AI could be helping us better understand and work with complexity and ecological relationships - but only if we can shift its development away from consumer-driven priorities toward ecological wisdom. Do you see potential for using AI to help address unsustainable patterns, or do you think its development is too embedded in those very patterns?

Yes, but it is not an either-or situation. It is natural and it is complex and involves time and lives.

You make a vital point about avoiding false dichotomies. The situation is indeed both natural and complex - part of an ongoing process of human and technological evolution embedded in larger natural systems. The challenges and opportunities aren't separate from nature but part of it, occurring across multiple timescales and affecting countless lives.

Your perspective seems to embrace both the reality of our current situation and the potential for positive change, while acknowledging that transformations happen through complex processes over time. This feels like a truly ecological understanding - seeing both challenges and solutions as part of interconnected, evolving systems rather than simple either/or choices.

Thank you for this rich discussion about information ecology, technology, and social change. Your insights about viewing these issues through a natural systems lens, while acknowledging their complexity and temporal nature, are valuable for thinking about how we might better align technological development with ecological principles.

*

Richard Lowenberg

Richard Lowenberg has for over 50 years been creatively integrating understandings and grounded involvements in non-profit .org development, architecture, environmental ecosystems design, interspecies communication, rural community + networked society planning, theater, new media, photography, holography, eco/arts/sciences/society practices and lifelong experiential learning.. He has dedicated his creative life to realization of works exploring and setting examples for an 'ecology of the information environment', with resulting opportunities for growing a vibrant cultural economy.

Richard was a team co-founder of the Kitchen, NYC, 1971; initiated NASA-Arts Collaborations, 1974-84; founding Programs Director of Telluride Institute, 1984-96; Executive Director, Davis Community Network, 1996-2006; Adjunct Professor, Technoculture Studies + Artist in Bioregional Residence, UC Davis, 1998-2006; Director, 1st-Mile Institute's New Mexico Broadband for All Initiative + Scientists/Artists Research Collaborations, Santa Fe, 2006-on. Exhibitions at: The Whitney, 1986 Venice Biennale, NTT Tokyo, Kunstmuseum Dusseldorff, CCA Santa Fe, SFMoMA, MIT List Gallery, + .

"Info/Eco" has emerged as the title for a large body of creative works at the example-setting intersection of Information, Economics, Ecology and Community Building.
Arts & Sciences: Telluride - "Info/Eco: The Nature of Information", local-global program took place, July 26 - Aug. 2, 2024. https://info-eco.art/arts-sciences-2024
A next "Info/Eco" working meeting/event is being planned for late 2025 in Santa Fe.

*