

AI processor Claude's summary of "Rise," with some human adjustments

Lowney

## The Rise of the Machine

### Body-Knowing, Neural Nets, and Emergent Freedom<sup>1</sup>

Charles W. Lowney

This **essay [abridged version]** by Charles W. Lowney explores whether machines learning human skills (like driving or speaking) means humans are reducible to mere matter and fully pre-determined, or whether animals, humans and AI machines share irreducibility and value.

**Historical Retreat:** Philosophers have repeatedly drawn lines to distinguish humans from machines—first through life itself, then reason and language, then body-knowing ("knowing how" vs. "knowing that"), then social intelligence. Each line has been challenged as machine technology advanced. For instance, Hubert Dreyfus claimed computers could never drive cars; Harry Collins said they'd never navigate under conditions of complex traffic. Both were wrong, continuing this pattern of philosophical retreat about what makes humans exceptional and irreducible to mere physically sufficient bottom-up causes.

**Polanyi's Alternative:** Instead of drawing a single line, Michael Polanyi identifies a process of "tacit knowing" that exists at multiple levels—from simple organisms to human society. This process involves moving from subsidiary clues to focal meanings through an irreversible, unspecifiable integration that can't be fully made explicit.

**Main Argument:**

**Neural Networks Mirror Tacit Knowing and Tacit Learning:** The essay demonstrates striking parallels between:

- How tacit knowing "from-to" structures integrate clues into joint meanings (like seeing Ida B. Wells's portrait emerge from a collection of individual photos).

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<sup>1</sup> "The Rise of the Machine: Body-Knowing, Neural Nets, and Emergent Freedom" Carol Vernallis, Holly Rogers, Selmin Kara & Jonathan Leal (eds), *Cybermedia: Explorations in Science, Sound, and Vision*, New York: Bloomsbury Publishing Inc. 2022, pp. 97-127.

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- How neural networks have a similar structure and process inputs through hidden layers to outputs, and how the input of signs or physical marks can output recognizable symbols.
- "Backpropagation" is like "intuition" seeking and "invention" adjusting skill learning.
- Both tacit knowing and neural networks display "intentionality" and "irreducibility"—they can't be fully explained by breaking them down into parts. This is described as a "logical gap" by Polanyi, and a "dimensional shift" by Paul Smolensky.

### **The Irreducibility Debate:**

- **Collins argues:** If machines can do it, it's reducible to material "strings" (causal chains). Only social/Collective Tacit Knowledge (CTK) remains irreducible.
- **Polanyi argues:** Even simple machines and living bodies are irreducible "dual control systems"—higher-level principles (delineating a machine's function) can't be understood purely through lower-level physics.
- And so, if Polanyi is right, the body-knowing that machines might model is still irreducible, as well as higher cognitive and social knowing.

**Key Insight on Dual Control:** Physical laws leave "boundary conditions" open that higher-level systems can control. A steam engine follows physics but can't be understood as "working" or "broken" through physics alone—you need engineering principles. Similarly, bodies and AI machines operate with multiple dual control levels simultaneously.

### **Implications:**

1. **For animals:** They possess forms of tacit knowing, proto-intentionality, and proto-freedom, giving them intrinsic value.
2. **For evolution:** Telic fields (goal-oriented forces) emerge naturally as dynamical systems create "attractors," giving the freedom for active centers drawn by differing forces to deliberate and make choices.

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3. **For AI:** Current AI mimics but doesn't truly "dwell in" its processes. There is "nothing that it is to be like" an AI processor, and it is incapable of understanding, valuing, or making moral decisions. Future conscious AI might be possible, according to the emergentist principle of multiple realizability, but would require the right sort of embodiment and social interaction.

### **Conclusion:**

Rather than reducing humans to machines, we should recognize irreducible tacit knowing exists at many levels—from lower organisms to higher zoology to human minds. What makes us special isn't a sharp line separating us from everything else, but types and degrees of freedom, creativity, and meaning that emerge at different levels of complexity. Connectionist/neural network machines model the irreducibility of somatic and cognitive knowing, but do not have embodied knowing and the emergent freedom to make moral choices. If we, in the future, construct conscious AI with the right sort of affordances, it won't diminish human value—it will extend the family of beings that share this irreducible quality.