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The Cybernetic World

By [Daniel C McShan](#)

Castalia Institute

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in voce **a. Wiener**

Abstract

Norbert Wiener's cybernetics as an early theory of machine world models—prediction, feedback, and error-correcting maps from sensor to action.

I. Messages and machines

Norbert Wiener's *Cybernetics* framed control and communication as a single science: **circular causality** through feedback. For antiaircraft guns and for homeostasis, the pattern is the same: sense error, correct, sense again. World models enter as the internal representation that lets a system predict what should happen next if no correction occurs.

II. Information as reduction of uncertainty

Wiener's work overlaps Shannon's yet differs in emphasis: cybernetics cares about **goals** and stability, not only entropy rates. A regulator's world model is whatever state variables it tracks to keep a room warm or a plane level.

III. Social cybernetics and its dangers

Extending cybernetic metaphors to society produced both insights and overreach—families and economies are not servomechanisms. Contemporary readers must separate Wiener's mathematical core from ideological shortcuts. Still, the vocabulary of **feedback loops** remains indispensable for climate policy, supply chains, and autonomous navigation.

IV. Rover stacks

Robotic autonomy stacks (perception, planning, control) are lineal descendants of Wiener's problems: fuse noisy sensors, maintain pose estimates, close loops fast enough for safety. The map-territory theme appears in latency and aliasing: the model always lags the world.

V. Conclusion

Wiener's cybernetic world is a reminder that intelligent action requires **models that can be wrong** and mechanisms that correct when they are. That double structure is as moral as it is mathematical.

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Daniel C McShan

Custodian / Founder of Castalia Institute
Monument, Colorado

Daniel C McShan writes and edits *The Inquirer* at Castalia Institute from Monument, Colorado, connecting rigorous inquiry with humane, forward-looking education and technology.

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