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2017 : WHAT SCIENTIFIC TERM OR CONCEPT OUGHT TO BE MORE WIDELY KNOWN?

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Ashby's Law of Requisite Variety

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W. Ross Ashby was a British cybernetician working in the 1950s who became interested in the phenomenon of *homeostasis*—the way in which complex systems operating in changing environments succeed in maintaining critical variables (for example, internal body temperature in biological systems) within tightly-defined limits. Ashby came up with the concept of *variety* as a measurement of the number of possible states of a system. His "Law" of Requisite Variety stated that for a system to be stable, the number of states that its control mechanism is capable of attaining (its variety) must be greater than or equal to the number of states in the system being controlled.

Ashby's Law was framed in the context of his interest in self-regulating biological systems, but it was rapidly seen as having a relevance for other kinds of systems. The British cybernetician and operational research practitioner Stafford Beer, for example, used it as the basis for his concept of a *viable system* in organizational design. In colloquial terms Ashby's Law has come to be understood as a simple proposition: if a system is to be able to deal successfully with the diversity of challenges that its environment produces, then it needs to have a repertoire of responses which is (at least) as nuanced as the problems thrown up by the environment. So a viable system is one that can handle the variability of its environment. Or, as Ashby put it, only variety can absorb variety.

Until comparatively recently, organizations coped with environmental challenges mainly by measures to reduce the variety with which they had to cope. Mass production, for example, reduced the variety of its environment by limiting the range of choice available to consumers: product standardization was essentially an extrapolation of Henry Ford's slogan that customers could have the Model T in any color so long as it was black. But the rise of the Internet has made variety-reduction increasingly difficult. By any metric that one chooses—numbers of users and publishers, density of interactions between agents, pace of change, to name just three—our contemporary information ecosystem is orders of magnitude more complex than it was forty years ago. And its variety, in Ashby's terms, has increased in proportion to its complexity. Given that variety reduction seems unfeasible in this new situation, the implication is that many of our organizations and social systems—ones that

that evolved to cope with much lower levels of variety—are no longer viable. For them, the path back to viability requires that they have to find ways of increasing their variety. And the big question is whether—and how—they can do it.

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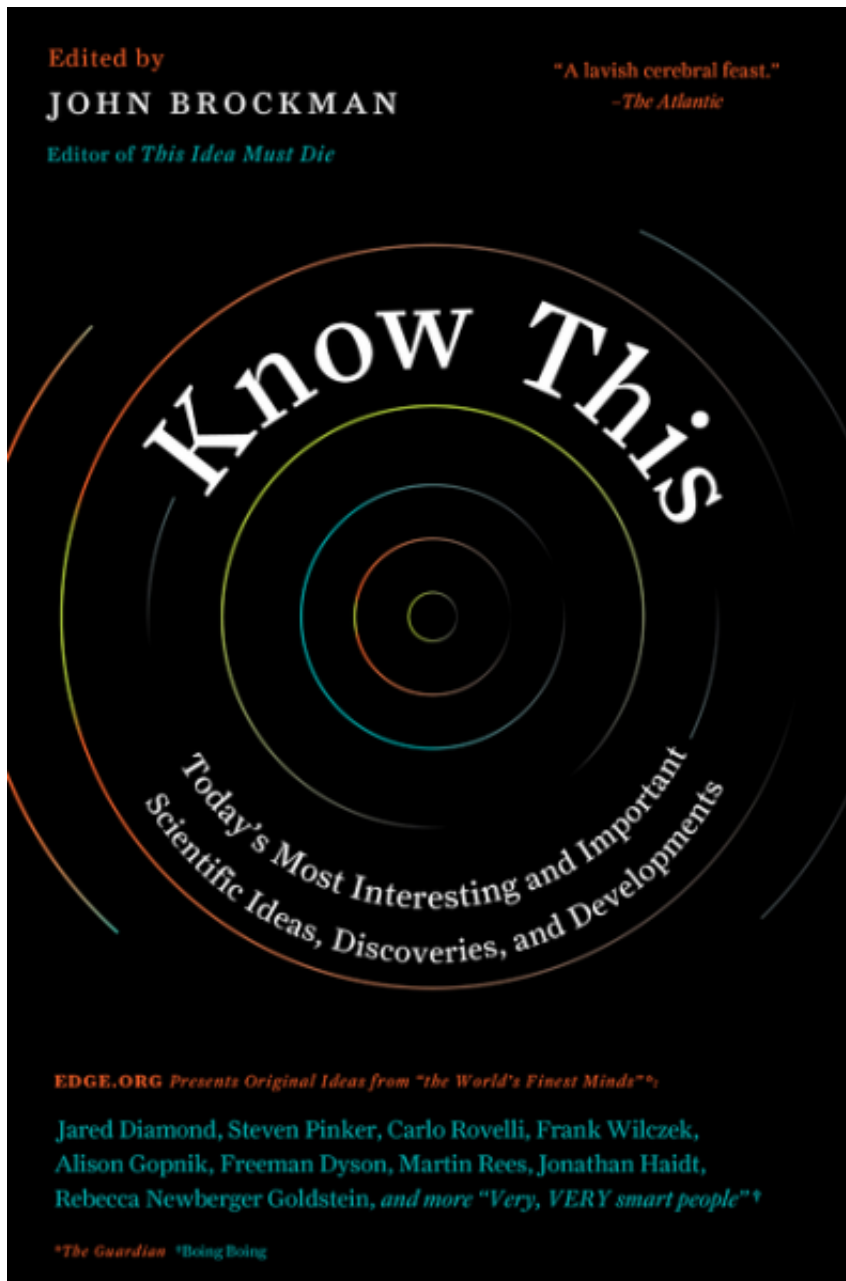


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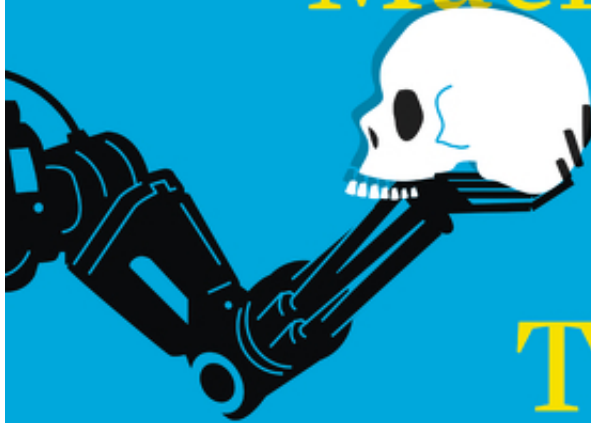
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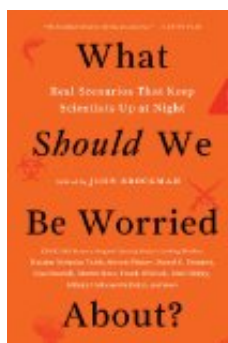
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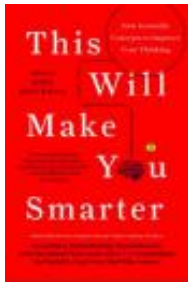


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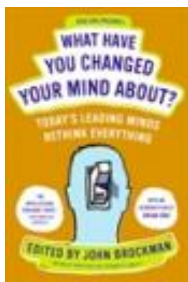
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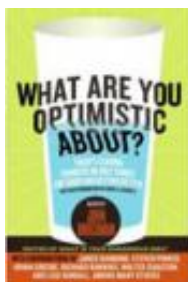
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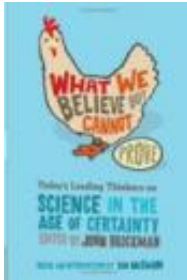
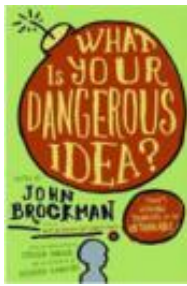
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