PHILOSOPHY

SCIENCE IS AN EMERGENT SYSTEM TOO

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We often try to understand problems by taking apart and studying their constituent parts. But emergent problems can't be understood this way. Emergent systems are ones in which many different elements interact. The pattern of interaction then produces a new element that is greater than the sum of the parts, which then exercises a top-down influence on the constituent elements.
Culture is an emergent system. A group of people establishes a pattern of interaction. And once that culture exists, it influences how the individuals in it behave. An economy is an emergent system. So is political polarization, rising health care costs and a bad marriage.
Emergent systems are bottom-up and top-down simultaneously. They have to be studied differently, as wholes and as nested networks of relationships. We still try to address problems like poverty and Islamic extremism by trying to tease out individual causes. We might make more headway if we thought emergently.

Science is an emergent system too with the "biosciences" being part of science. IMHO the relative importance of systems biology is largely underestimated and probably the reason for failure of genetics to explain any complex disease mechanisms. The only question is how to operationalize – defining a fuzzy concept so as to make the concept clearly measurable and understandable in terms of empirical observations, yea, yea.

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