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THE DEVELOPMENT OF EMERGING SYSTEMS AND TRANSDISCIPLINARY ENGINEERING COMMUNITIES

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Topic: Engineering Societies

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Engineering Evolution at “Boston Tech” (MIT)

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- 1890: students busy learning to mine, to weld, to machine, to control boilers, to design generators. Civil engineering and mechanical dominate, with a new electrical engineering department born in 1902 after 20 years of curriculum development in Physics.
- Decades pass before science became significant in the life of MIT. 50 years until the Lewis Report called for School of Humanities and more well-rounded students. Systems engineering subjects, first from Bell and Lincoln Labs, in that same decade.
- Every ~20 years the Engineering curriculum reviewed and new organization units emerge. Recently Biological Engineering, College of Computing, and the Academy of Design.
- This evolution continues…

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“What are your first laws?”

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Asked of Bryan about systems and transdisciplinary engineering, with concern that its not enough to be categorized as a discipline.

Yet, which comes first? Practice? Theory?
Laws? Common methods?

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The Development of Emerging Systems and Transdisciplinary Engineering Communities

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1.

Societies which promote and regulate engineering disciplines, when viewing **engineering as evolving and dynamic**, allow for a range of identities: from the accepted mature engineering communities to nascent engineering disciplines.

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2.

Established disciplines, with first laws, accepted methods, and norms of membership should **intentionally promote dual citizenship** of systems and transdisciplinary engineering in their societies. Invoking “free trade zones” at the boundary between, these societies should embrace, rather than exclude, those who live professionally across the boundaries of the well-established disciplines.

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3.

Systems Engineering societies can learn from the history and evolution of established disciplines, reflecting on the centuries of practice, failures and advances, and cross-pollination amongst practitioners, engineers, and natural and social scientists. While ambition is admirable, **we may be but teenagers in the arc of engineering disciplines**, and indeed the evolutionary path on which we are experimenting might not lead directly to a conclusive set of first laws, methods, and norms.

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