Engineering and the Future of Philosophy

2014 ICест Engineering and the Future of Humankind

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Celebrating Engineering and the Chinese Academy of Engineering

• Honored to have been invited
  – Special thanks to Academician Yin Ruiyu and to Professor Li Bocong and their work creating philosophy of engineering
• No other national academy of engineering includes philosophy in its programs
Engineering and the Future of Humankind

• Being human involves philosophy
• Being human today also involves engineering
• As engineering transforms the world, what can be said about the relationship between engineering and philosophy?
Overview

• Introduction: Philosophy and the Axial Age

• Four relationships: Philosophy
  1. Conceptualizing engineering
  2. Helping engineering
  3. Using engineering
  4. Questioning engineering

• Conclusion: Toward a new Axial Age
Philosophy and the Axial Age

• What philosophy is
  – Feng Youlan (1895-1990)
  – Kongzi (551-479 BCE)
  – Sokrates (469-399 BCE)

• Axial Age, 500 BCE +/- 300 years

Human beings first began to think about what it means to be human — to realize there were different ways to be human and that they could choose.

Karl Jaspers (1883-1969)
Relationship #1: Conceptualizing Engineering

Engineering ≠ 工程 (gongcheng)
Engineering ≠ τέχνη (techne) / Roman ars
Engineering ≠ αρχιτεκτονική (architectonike)
Institution of Civil Engineers (1828)

- Engineering = “the art of directing the great sources of power in nature for the use and convenience of [humankind].”
- Art that involves drafting and modeling.
- Compare Vitruvius’s *De architectura* (c.15 BCE): Structures should exhibit the qualities of *firmitas, utilitas, venustas* — that is, *solidity, utility, and beauty.*
Relationship #2: Philosophy *stimulated by* Engineering

Industrial Revolution →

Anthropocene
Technocene
Engineerocene
Globalization → New Axial Age

- Tang Yijie – philosopher
- Tu Weiming – philosopher
- Robert Bellah – social scientist
- Karen Armstrong – historian of religions
Theodore von Kármán (1881-1963)

• Science is about understanding ... what is.
• Engineering is about creating what has never been.
Ethics of Engineering: Doing engineering the right way

Taking into account
• Professional peers
• Corporations and projects
• Societies and governments
• Natural world
Political Theory of Engineering: Doing the right engineering projects

• To engineer the world is like making laws or writing constitutions.
  – Both describes and prescribes social orders and ways of life.
  – Often has unintended consequences.

• Thinking about what kind of world we want to engineer is not a task for engineers alone.
  – Something about which all of us must think.
Duty *plus respectare*

- When thinking about engineering, engineers and non-engineers alike have a duty *plus respectare*, to take more into account.

- Applies to management as well.
Relationship #3: Philosophy using Engineering

- William C. Wimsatt
- John Dewey (1859-1952)
- Caroline Whitbeck
Engineering as the Best Way of Being Human

- Billy Vaughn Koen
- Samuel Florman
- Henry Petroski
Relationship #4: Philosophy questioning Engineering

1. Engineering is not able to judge the political orders into which it is enrolled.

2. In principle engineering can support many ways of life, yet in practice it has a tendency to be allied with money and power.

Erin Cech: How Technology Creates a "Culture of Disengagement"
• Savas Dimopoulos: “The things that are least important for our survival are the very things that make us human.”
3. Unintended Consequences

• Engineering often has unintended consequences.
Can Engineering Solve the Problems It Creates?

One contra indication: Albert Einstein’s 1946 argument that the “unleashed power of the atom has changed everything save our modes of thinking” and that “a new type of thinking is essential if mankind is to survive and move toward higher levels.”
Conclusion: In Praise of the Chinese Academy of Engineering

• These are hard questions and tough issues.
• Among national academies, the Chinese Academy of Engineering is the world leader in welcoming philosophical discussion.
• It deserves to be praised for doing so.