Lecture 21: Theoretical terms

Carl Hempel, "The theoretician's dilemma" (1958)

1. The context
   – The problem of empirical content
   – No universally accepted understanding of the interpretation of theoretical terms
2. What's the goal of scientific theorizing? To systematize empirical phenomena. (Really?)
   (a) Deductive systematization
   (b) Inductive systematization
3. Two types of generalizations
   (a) Empirical
   (b) Theoretical — hidden entities/structures are invoked
   e.g. quarks, electromagnetic field, spacetime, genes, neurons
4. The theoretician's dilemma: why the detour through the theoretical edifice?

   Why should science resort to the assumption of hypothetical entities when it is interested in establishing predictive and explanatory connections among observables. (p. 43)

   (A) If theoretical terms serve their purpose they are unnecessary. (B) If theoretical terms don't serve their purpose they are unnecessary. In either case, theoretical terms are unnecessary. (pp. 49–50)
5. Premise (A)
   (a) Case 1: explicit definability
   (b) Case 2: partial interpretation
      i. Hempel's general schema: p. 73
      ii. A simple argument for eliminability: pp. 75–76
      iii. More subtle arguments for eliminability: Craig & Ramsey
6. Possible responses
   (a) Theoretical terms aren't necessary!
   (b) Elimination doesn't preserve theoretical virtues
   (c) Not eliminable for inductive systematization