

# Background Theories and Total Science

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## Abstract

Background theories in science are taken both as proof and as disproof that theory choice is underdetermined by data. The proof is often thought to threaten the possibility of responsible scientific theory choice. Properly understood, it shows only that scientific inference is fallible and contextual. This is compatible with the disproof, which shows that no theory choice can be timelessly or noncontextually underdetermined. Philosophers have often replied to the disproof by focussing their attention on Total Sciences rather than theories. If empirically equivalent Total Sciences were at stake, then there would be no background against which they could be differentiated. I argue that Total Sciences are philosophers' fictions and that no respectable underdetermination can be based on them.

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