Irrelevant but ~~that's all right~~ interesting

1) Old view: Dyson, Tomonaga, Feynman
Cut-off is a mathematical artefact.
Theories should be renormalizable in order to make sense (& meaningful predictions).
Luckily, QED & weak/strong theories were renormalizable.

2) New view: Wilson.
Cut-off is a physical limit of applicability.
Renormalizability not a contraint on theories but a consequence of integrating the heavy modes out. Predictability possible even if not renormalizable.

3) Top-down. He_4 example. Can be surprising.

4) Bottom-up. $\mathcal{L} = \sum_{n \geq 0} \frac{\mathcal{I}_n}{\Lambda^n} O_n$
Constraints: symmetry. Also naturalness ($\lambda \sim 1$).
Totalitarian principle.
Simplicity not required & not expected.

5) Reduction: a tower of quasi-autonomous layers.
Ontological pluralism? Emergence?
Appelquist & Carrazzone: must have renormalizable high-energy th
4 types of statements (cf. Bain):
a) reduces to; b) predicted by;
c) caused by; d) explained by.
on AUTONOMY
if causal autonomy
nomic (law-like) connection
a) & d): Nagelian definitional extension

Shifting statuses (my text).

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+ S matrix