



Unification in Physics and
Philosophy
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Ontological and Methodological Reflections on the Virtues of Unification

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Metaphysics

Metaphysics seeks to answer, in an abstract and general way:

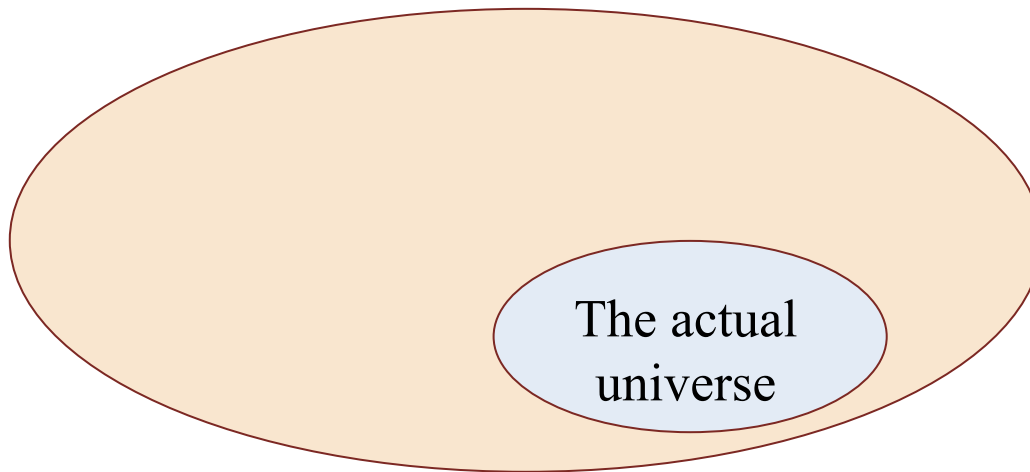
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|---------------------|-----------------|--|--------------------|
| 1. What is there? | <i>Ontology</i> | | <i>Metaphysics</i> |
| 2. What is it like? | | | |
- Existence
 - Objects and their properties,
 - Space and time,
 - Causation,
 - Necessity and *possibility*



Metaphysics as Continuous with Science

- Both are trying to figure out what the world is really like
 - as opposed to what it *appears* to be like
- Reality = The World?

Reality?



How define reality?

- *Conceivability?*
- *Laws of nature*
- *Mathematics?*

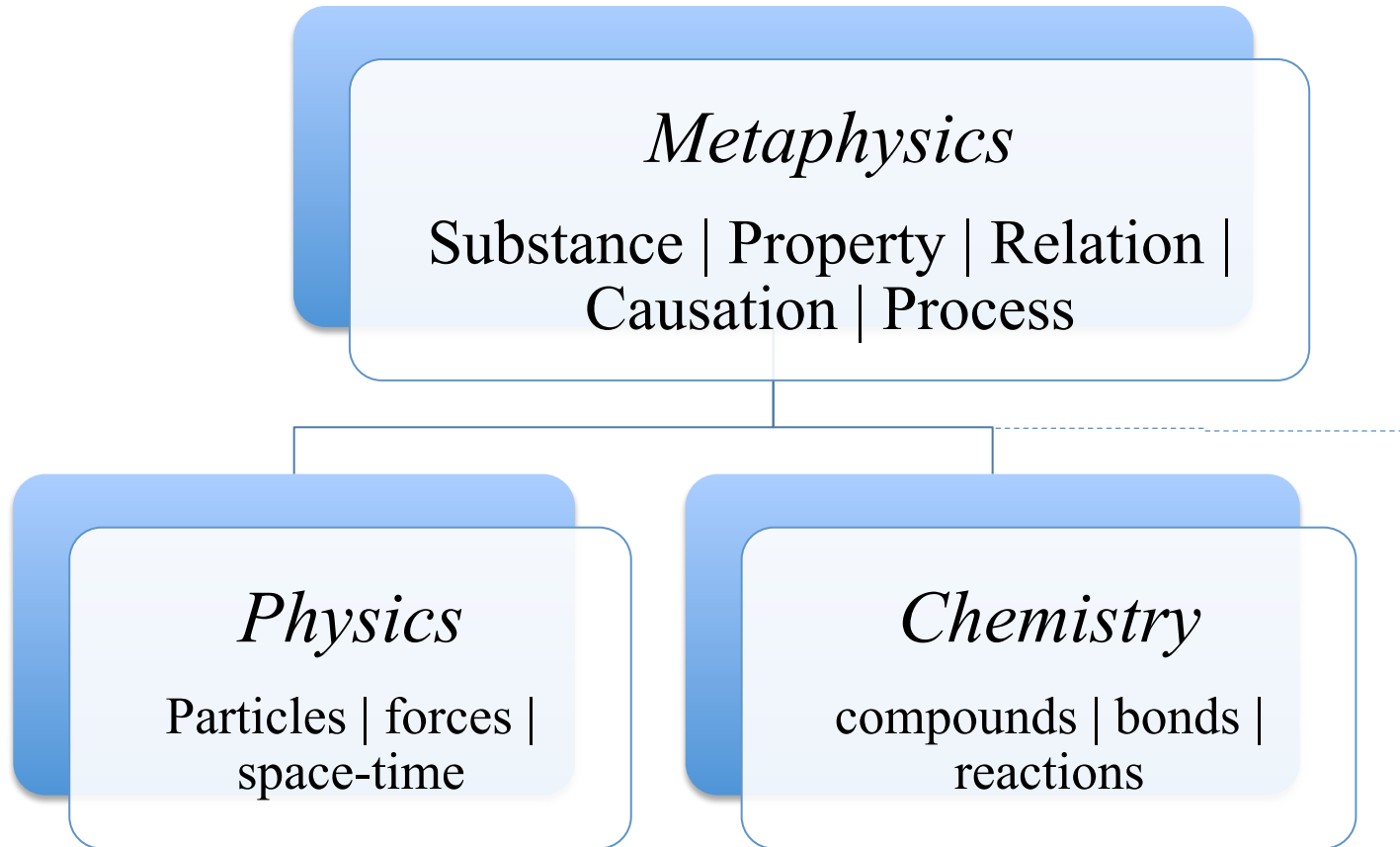


The Physical vs. Being

- Science is a method used to discover facts about the material world. Metaphysics, however, deals with the whole of reality, or put in philosophical language, *being* as such. Where science discloses the properties of the physical world, metaphysics ventures beyond the physical and explores the fundamental nature of all that is.
- —Aaron Neil, *Quillette* May 8, 2019

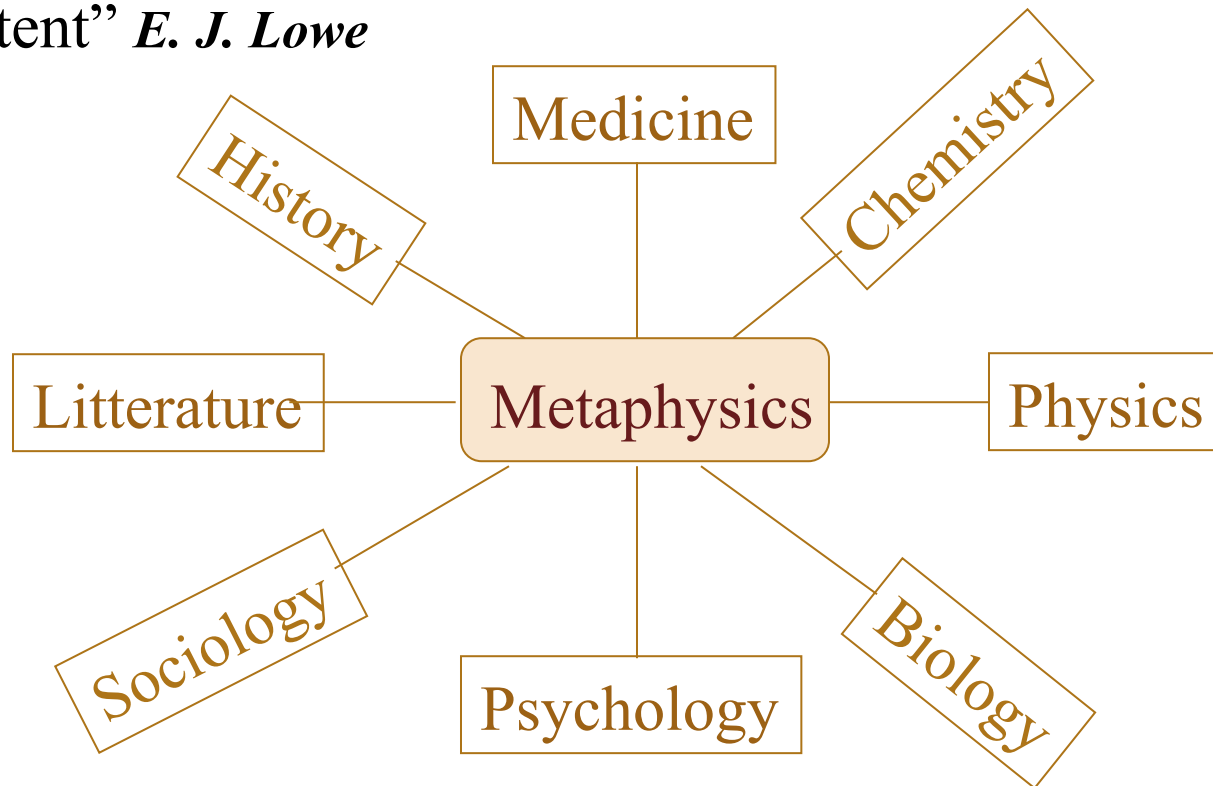


Different Levels of Abstraction



The Spider in the Web of Science

Metaphysics...is ineliminable and conceptually necessary as the intellectual backdrop for every other discipline... because... the world or reality as a whole is unitary and necessarily self-consistent” *E. J. Lowe*



Unified view of the levels of reality



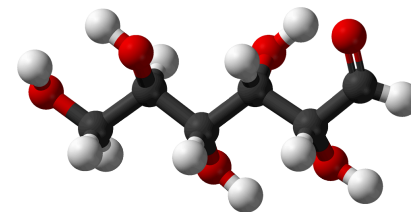
*Social level
(sociology)*

*Consciousness
level (psychology)*

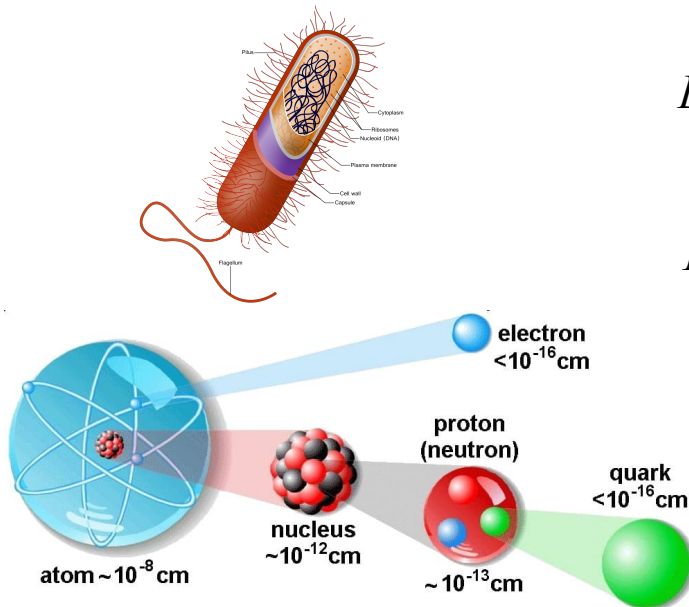
*Biological level
(biology)*

*Molecular level
(chemistry)*

*Atomic level
(physics)*



Glucose



Unitary and necessarily self-consistent?

- Principle of Continuity
 - *Nature contains no gaps, and takes no leaps*
 - » It is one connected whole
- Principle of Ontological Determinacy
 - *Everything always has a perfectly determinate nature*
 - » If the world is one unitary whole, the world has a perfectly determinate nature
 - » If it has determinate nature it cannot be fragmentary



Methodological Consequences

- If everything is connected then to find out about A is to find out about its connection to B, C, D..., and vice versa
 - To find out about A is to find out about its place in the whole
- This has been a guiding principle in Classical Physics — to define everything in terms of everything else
 - It is proving difficult to understand relativistic and quantum phenomena in the same way
- Should we give up?



The Mind in Nature

- Whether we like it or not then experience is our interface with the world

J. M. E. McTaggart

- Experience provides one kind of indubitable knowledge: knowledge by acquaintance of our own inner states
 - But its validity is confined to our inner states
- Any theory about the world that fails to explain how our inner states can arise is inadequate
- *Don't forget the mind in unification*

