Intro science & metaphysics

Aristotle: physics ("science") is about change, metaphysics is about what doesn't change (e.g., essences, universals)

Traditional issues: substance, causality, being, freedom, personal identity, mind-body

Logical positivism / early analytic phil: tried to ban metaphysics altogether; sole function of philosophy is to promote and explicate the logical and methodological foundations of (the unity of) science

Since then: development of highly specialized debates that are no longer held under the label "metaphysics" even though would be admitted to be metaphysical issues by philosophers when pressed, e.g., freedom, mind-body, causality

Game changers:

David Lewis's possible world semantics and its application to such issues as causality, counterfactuals, modalities, laws of nature ("Humean" supervenience)

David Armstrong's account of laws of nature

Barry Smith's, Peter Simons's and Kevin Mulligan's theory of truth-making

David Wiggins' theory of identity and substance

Formal ontologies, e.g., mereology (Peter Simons and others)

A new interest in time and McTaggart's classical distinction of A- und B-theory of time

The game-changers redefined the field of metaphysics, which is now somewhat more marrow than it used to be, because the fields of freedom, personal identity, mind/body and causality are now leading a life of their own.

The new metaphysics is characterized in part by a strong allegiance (or expression of allegiance) to "our best scientific theories". Thus, unlike the "continental" metaphysicians such as Heidegger, Bergson or Merleau-Ponty, analytic metaphysicians want metaphysical theories to be at least consistent with the best scientific knowledge.

Some philosophers go even further and require that metaphysics should be "read off" the best scientific theories.

The dilemma: Metaphysics traditionally conceived is *a priori*. Science is *a posteriori*. How can *a priori* knowledge be dependent on *a posteriori* knowledge? This makes no sense. We have to either admit that metaphysics is not fully a priori or that science is not fully a posteriori.

Another version of the dilemma: Metaphysics tells out what is the case necessarily. By contrast, science merely tells is what is the case contingently. But how can something that is necessarily the case depend on something that is contingently the case? Again, this makes no sense.

(Note: this is more or less why Kant concluded that metaphysics traditionally conceived is not possible)

So which one of the following theses must we reject?:

Metaphysical accounts must be consistent with our best scientific theories

Metaphysical accounts should be "read off" our best scientific theories

Metaphysical knowledge is a priori

Metaphysical propositions must be necessarily true.

Scientific knowledge is a posteriori

Scientific propositions must be contingently true.

So much about "traditional" metaphysics. There is also a recent trend that usually sails under the banner of a "scientific" or "naturalized" metaphysics, or "metaphysics of science"

A popular variant of this approach tries to account for the empirical success of scientific theories. It asks: What must the world look like at the most fundamental level for our best scientific theories to be successful, "our best" theories usually being general relativity theory and quantum mechanics.

The most popular answer to this question is the following: Ontological structural realism (OSR). The best way of accounting for the success of scientific theories is to consider the world to ultimately consist not of things or objects but of structures and relations. There are two distinct justification strategies for this view:

1. ESR→OSR. When we look at the history of science, we see that the entities postulated by scientific theories come and go. Prominent examples: phlogiston in chemistry, caloric in thermodynamics, the luminiferous ether in optics and electrodynamics. This should give us cause to be skeptical about the existence of such entities ("pessimistic meta-induction" PMI). But there is also something that appears to be more stable across the great theoretical traditions (or paradigm shifts, to use a Kuhnian term), namely the mathematical structures used in the physical theories. For example, Maxwell's equations survived both the relativistic and the quantum revolutions, but they are no longer considered as describing properties of the ether. Thus, structures resist the PMI. From ESR, most people infer OSR.

2. Objecthood traditionally conceived requires a principle of identity to confirms to Leibniz' laws of the indiscernibility of identicals and the identity of indiscernables. But some particles in quantum states are in-principle indiscernable yet non-identical.

> Therefore, objecthood traditionally conceived cannot be a fundamental feature of the world. The traditional omtology of things must be replaced by an ontology of structures. And relations. Thus, OSR.

This gives us an example of how some philosophers of science think that metaphysics should "read off" our best scientific theories.

Thus, some scientific metaphysicians seem to give up the ideas that metaphysics ought to be a priori and necessary. More traditional metaphysicians, of course, object to this and argue that you can't have relations and structures without relata and some sort of entities that bear the structures. But these objections seem to be based merely on intuition, metaphysicians of science reply.

Thus, we are left with the following questions:

> Is there a legitimate role for intuitions in metaphysics?

> What should be the role of a priori reasoning and inferences from empirical facts in metaphysics?

> In what sense, if at all, should metaphysical accounts be "read off" scientific theories?

> What about scientific *practice* (as opposed to theories)? See Templeton project

> What should be the role of a priori reasoning (e.g., thought experiments) and inferences from empirical facts in *science*?

> Are there alternative, better ways of characterizing the relationship of science and metaphysics in a normatively adequate way?