

# Session 10. Pluralism II: Cartwright

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Last week we looked at Kuhn and **incommensurability**.

Kuhn's "pluralism" is **diachronic**; we get incommensurability (and hence, for Hoyningen-Huene strongly opaque ignorance) **at difference times**.

We're now going to start with looking at kinds of pluralism that can be **synchronic**.

Aims for today:

- (1.) Present Cartwright's pluralism.
- (2.) Set up some oft given objections against pluralism in general.
- (3.) Discuss some possible implications of the pluralistic approach.

## 1 Cartwright's Pluralism

### 1.1 Motivation

It's good to understand Cartwright's pluralism in the context of what she's arguing **against**.

**Correspondence Realism** (a term I got from Hasok Chang) claims that the following are true:

1. **Monist Realism**. There is a *single* way the world is.
2. **Correspondence Theory of Truth**. A statement is *true* iff it corresponds to this way the world is.

**Note:** **Correspondence Realism** has both a **metaphysical** and a **semantic** component.

**Fundamentalism**. There is "one grand scheme" to which "all facts belong", which is privileged.

**Note:** These is a claim about scientific **systems/theories**.

There's a number of motivations for Cartwright's view.

**Political motivation.** The commitment to fundamentalism has resulted in poor policy choices and resource allocation.

e.g. **Intra-science.** Allocation of resources to string theory.

e.g. **General policy.** IMF's use of economic models used to discourage welfare expenditure (see Ch. 7 of *The Dappled World*).

**Prima facie heterogeneity of science.** Science is heterogeneous and it's not clear how to move from one area to another.

This can occur **between** disciplines (e.g. it's not clear how to move between quantum mechanics and cell biology), but also within disciplines (e.g. Hooke's law in beam mechanics fails when the beam gets too small).

**Unpredictability/unmodellability.** There are phenomena for which we have no reasonable model.

e.g. the falling dollar bill.

**Ceteris paribus laws.** Generally speaking, the laws of physics are of the form "If such and such conditions are met, then the following holds".

e.g. Snell's law concerns the angles of incidence and refraction in isotropic media (when the refractive index same in all directions).

e.g.  $F = ma$ .

Ceteris paribus laws serve to *delimit* the range of application.

Cartwright claims that *all* current laws are ceteris paribus.

**Link to explanation.** There is a link here to scientific explanation (see also Cartwright's "The Truth Doesn't Explain Much").

A general assumption (e.g. Hempel) explanations have to be *true*.

Cartwright denies this

e.g. Snell's law can explain how light is refracted in *nearly* isotropic media.

e.g.  $F = ma$  can explain acceleration behaviour even in the case where there are other causes at play ( $F = ma$  can be used to predict a vector in this case).

**Cartwright's Conclusion.** Fundamentalism (and possibly **Correspondence Realism**) is an article of *faith* and is not justified.

## 1.2 Pluralism explained

In Cartwright's words:

**Metaphysical nomological pluralism** is the doctrine that nature is governed in different domains by different systems of laws not necessarily related to each other in any systematic or uniform way: by a patchwork of laws.

**Note:** Distinguish the **anti-fundamentalism** from the additional **metaphysical** claim.

Recall the picture we've been contending with.

**Propositional absolutism** states that there is an "absolute" domain of propositions.

Assuming that propositions need to be expressed, this entails that there is a privileged language/conceptual scheme (whether learnable or not).

Cartwright's position seems to lean in the direction of rejecting **Propositional Absolutism**.

## 2 Standard criticisms of pluralism

### Anything goes?

We've talked about different theoretical virtues.

But does Cartwright have to accept that any empirically adequate theory provides us with a "patch"? (Even if it's "bad" in various respects.)

### Is this just constructive empiricism?

**Constructive Empiricism** is (roughly speaking) the claim that we aim at *empirical adequacy* (and not truth).

By accepting Cartwright's metaphysical pluralism, do we just effectively lapse into a version of constructive empiricism? (Who cares if we call the theory "true" in the end?)

**Question.** What are some *additional questions* that are differed upon by the constructive empiricist and Cartwright?

**Realism by a different name?** Interestingly, perhaps one can push in the *opposite* direction.

Consider the "union" of all patches.

Could this qualify as a realist or fundamentalist description of the world?

(Albeit we'll need a non-classical logic to handle this, and we get very close to dialethism, so this is very different from "standard" realism.)

### Is this just a case of intractability of computation?

Consider the dollar bill example.

We do have ways of modelling systems probabilistically (**Note:** Cartwright argues this at length in *The Dappled World*), even when we don't have explanation.

Indeed we have mathematical theories (e.g. Chaos theory) concerning how unpredictability can arise out of a deterministic system.

So why not say it's an issue of **computational intractability** rather than pluralism in the ordinary sense?

Cartwrightian response: This is just an **article of faith**.

**Question.** Is there just a **clash of intuitions** here? (What makes Cartwright's position any less an article of faith than fundamentalism?).

## 3 Further Questions

### 3.1 "Theoretical"

**Question.** How should we handle the patchwork approach in science?

Can we do any better than a case-by-case approach (contrast Newtonian/Leibnizian analysis).

**Question.** How might future developments affect our assessment of Cartwright's position?

e.g. Does the patchwork change as we discover more theories? Does this make the approach more "human-dependent"? Would this matter?

e.g. Suppose we get an ever more successful "theory of everything". Would this change our assessment of Cartwright's position?

### **3.2 "Practical"**

**Question.** Are there political ramifications of the approach?

e.g. Intra-science, resource allocation.

e.g. More broadly (e.g. use of models in public policy decisions)?