

The Philosophy of Nature

Brian Ellis¹

Notes and commentary

Overview

'New essentialism' (NE) is pitted against 'the dominant metaphysics of the present age', characterised as Humean and 'essentially those of the mechanistic world-view' of the 17th/18th centuries instead of a 'modern scientific' view. It is an 'emerging metaphysical perspective' that embodies a number of key contentions:

- i. The laws of nature are immanent in natural things, not extrinsically imposed.
 - (NE) rejects any **divine command theory** of laws.
 - (NE) also rejects **passivism** (the supposedly passive, powerless nature of material things).
 - Objects' identities depend on how they are disposed to act; behaviour is not something separate and superimposed by the laws of science on things that have their identity otherwise
 - ii. Anything constituted from the same basic components would behave the same in any other possible world.
 - What things do or could do is of their **essence**.
 - The kinds of things that exist determine what the laws are.
 - Therefore, **the laws of nature are not contingent**, but hold necessarily of all such things.
 - iii. Causation involves causal powers.
 - If one thing causes another to do something, it is because it has the causal power to do so. Natural things with causal powers are sources of activity.
 - Forces of nature, by contrast, are always external to the objects on which they act. Natural things are never a source of activity. The laws of nature fix all dispositional properties.
- (NE) is characterised by a general rejection of **Humeanism** and **mechanism**.
 - Voluntarism*, divine command theory, 13th century →
 - Divine command theory* applied to nature, Descartes & Newton 17th century →
 - Secularised divine command theory*, 18th century ("forces of nature") →
 - Humeanism* (elimination of forces), 18th century.

Passivism is closely associated with mechanism². However, whilst mechanism³ began to give way to QM and relativity in 20th century, passivism has survived.

- (NE) is characterised by a **realist** orientation in the philosophy of science.
- (NE) triumphs *scientific* over *Aristotelian* forms of essentialism.
 - Distinctions between natural kinds depends on scientific facts (like quantum discreteness).
 - Aristotle's theory of *biological* kinds, and Aristotelian teleology, is rejected.

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² Ellis alludes to 'a mechanistic world of things having only the attributes of extension and impenetrability'.

³ Wikipedia defines *mechanism* as 'the belief that natural wholes (principally living things) are like complicated machines or artifacts, composed of parts lacking any intrinsic relationship to each other. Thus, the source of an apparent thing's activities is not the whole itself, but its parts or an external influence on the parts'.

1 Essentialist Philosophies of Nature

1.1 Classical (Aristotelian) essentialism

A theory of nature developed in ancient Greece by Aristotle (4th century BC) to provide a metaphysical foundation for the science of that time.

- Aristotle divided the things that exist into
 - i. things existing by nature – having within themselves various **principles of change** / resistance
 - possess principles that are intrinsic causes of its formal development (**formal causes**) and of its role in nature (**final cause**)
 - principles possessed are peculiar to the various **kinds** of thing that exist by nature, and are definitive of them (their **essences**).
 - are the products of nature rather than human artifice or chance (**efficient cause**).
 - ii. things existing by artifice, and
 - iii. things existing by chance.

Material objects are distinguished by the substances of which they are composed (**material cause**), their structures (**formal cause**), by what brought them into existence (**efficient cause**), and the purposes for which they exist (**final cause**).

▪ The metaphysics of natural kinds

- Members of **different natural kinds** must be *essentially* different from each other, ie. have different intrinsic determinants of their characteristics and development.
- Members of the **same natural kinds** should possess in common certain distinctive characteristics as a direct consequence of their essential sameness.
- Actual development may be hindered by accidental circumstances, but these are **extrinsic (efficient) causes** modifying a natural development that is intrinsically determined.
 - Eg. a four-legged animal may lose a leg, but it is still four-legged *essentially*.
- We must distinguish, then, between **essence** (characteristics something must have by nature) and **accident** (characteristics acquired accidentally, or that depend on particular circumstances, which can be lost without loss of identity).
- **Identity through change** is thus secured for two things that are just different *stages* of what is *essentially* the same thing (eg. acorn and oak tree).

Comment.

Aristotle also recognises a category of properties called *idia* (Greek) or *propria* (Latin). These are non-essential properties that 'flow from the essence' of a kind: they are *necessary* without being *essential*. Eg. for Aristotle, *being rational* is essential to human beings, but *being capable of grammar*, though necessary, is not. *Being rational* is more basic, and asymmetrically explains *being capable of grammar*.

▪ The purpose of Aristotle's essentialism

One of the goals of Aristotelian essentialism was to explain the persistence of distinct species of animals and plants, their adaptation to their environment, and the function of their parts.

Aristotle sought to explain these features by positing an intrinsic capacity for development transmitted through generation, and accounted for in terms of formal and final causation. The **essence** of an animal of plant kind consists of the **formal** and **final** causal powers of its 'soul'.

Thus Aristotle argued for the existence of **intrinsic causal powers**.

1.2 Modern (scientific) essentialism

Modern essentialism carries over the idea of intrinsic causal powers and essential properties, but jettisons final causes and restricts the concept of natural kinds.

▪ Restriction of natural kinds

True natural kinds of substances exist only at the deeper level of physical and chemical substances (eg. atoms and molecules). It is modern science that discloses the true natural kinds.

Biological species, on the other hand, are **cluster concepts**. They have some similarity with natural kinds, but are not true natural kinds.

▪ Strictness of natural kinds

Ellis charges Aristotle with a 'certain looseness about membership of a natural kind... properties that are said to be essential to a kind may occasionally not be present'.

By contrast, (NE) requires a stricter conception of natural kinds in which any two members of the same natural kind must be identical in all essential respects.

Comment.

For Aristotle there are organic as well as inorganic natural kinds. This introduces the ideas of flourishing and proper function, and concurrently the ideas of being stunted or defective. A person who is brain-damaged may fail to display certain powers that pertain to human nature, without thereby ceasing to be a member of humankind. This is probably why Aristotle's conception of natural kinds seems looser. In the inorganic world, by contrast, the lack of essential properties (usually) implies the absence of the essence.

▪ Distinction of individual and kind essences

For science, the most important is the **kind essence** – ie. the set of properties in virtue of which it is a thing of a certain kind – rather than the individual essence, which sets apart one particular thing from another.

▪ Rejection of final causes

The **functional** role of something *is* important to biology, but functional role should be distinguished from **final cause (purpose)**, which includes the additional idea of being brought into being *in order to* fulfil a certain role.

(NE) rejects final causes:

‘The parts of animals do not exist for the sake of the animals of which they are parts... nor organisms for the sake of the ecological systems in which they are found. Nor do modern essentialists conceive of the world as a grand teleological system in which the parts exist for the sake of the whole.’

Ellis characterises the world of (NE) as ‘integrated’ as opposed to ‘organismic’ (Aristotelian):

‘... it is never true to say that its parts exist for the sake of any greater wholes. But it is an integrated world, nevertheless, in which things are intrinsically disposed to interact with each other in various ways, depending on their essential natures.’

▪ **Fundamental causal powers**

The basic dispositions of anything derive from the intrinsic causal powers of its most fundamental constituents, which are among its *essential* properties (and, therefore, possessed *necessarily*).

Essential properties may include their dispositions to act in one way or another depending on their circumstances (**potentialities**).

For the passivist, a thing’s behaviour can only depend on its categorical (non-dispositional) properties and on what the laws of nature happen to be. A thing’s dispositional properties are therefore *excluded* from its essential properties.

▪ **Metaphysical necessity**

Formal logical necessities, and linguistic (analytic) necessities are *a priori*. In addition, (NE) recognises **metaphysical** necessities (propositions that are true *in virtue of the essences* of things).

We must distinguish between

- the set of properties in virtue of which it is *described* as being a thing of that kind (**nominal essences**),
- the set of properties of structures in virtue of which it *is* a thing of that kind (**real essences**).

Metaphysical necessity is a genuine form of ***a posteriori*** necessity, discovered in nature by scientific investigation.

- Cf. Putnam’s Twin Earth. The water-like stuff on Twin Earth may be *called* water, but it is *chemically* different, so the word ‘water’ on Twin Earth actually refers to something other than water.
- If the stuff on Earth is in fact H₂O, then it is so necessarily.

For anything to be logically possible, it must also be metaphysically possible. If so, and there are ***a posteriori*** necessities, then merely *a priori* considerations (like conceivability) do not establish logical possibility.

‘The new essentialism must therefore bring with it a new, more realistic, and more down to earth style of philosophy, which stays much closer to the world as we know it.’