Philosophy of Science // Fall 2015

Handout 13

Naturalism: Quine

Failures of reduction. Traditional epistemology aspired to locate a solid foundation of human knowledge. In the tradition of empiricism, reduction has long been recognised as the way forward. We can distinguish between the conceptual and the doctrinal parts of reduction. Conceptually, reduction proceeds by explicating the terms for bodies by the terms of sense-data, private primitive experiences. Doctrinally, reduction paraphrases, *salva veritate*, sentences about bodies into sentences about sense-data.

In pursuing his epistemology, Hume identified bodies with sense impressions. So far, so good. But he was unable to accomplish doctrinal reduction, since there he encountered (or rather, discovered) the problem of induction. Statements about future behaviour of the bodies could not be paraphrased into statements about sense impressions.

Carnap's *Aufbau* is the next major milestone in the history of reduction. It has a greater degree of sophistication, and it avails itself of the superior device of contextual definitions. Yet the problem of induction is alive: 'Humean predicament is human predicament'.

Psychological foundation. Reviewing these heroic efforts, one can ask: why not try a simpler way? Why cannot we rest epistemology on psychological foundations? A straightforward answer is that psychology itself is part of natural science. Thus, to found natural science (or indeed, mathematics) on psychology would be blatantly circular. However, any such circularity is a threat only if wish to deduce scientific statements from observations. Instead, we can merely pretend to understand, to explain the links between observation and science. This kind of understanding can be provided by science itself. Circularity ceases to be a threat.

Meaning holism and underdetermination. There is a deeper reason why reductionist translations should have failed. Statements are not assigned meaning piecemeal, a claim familiar to us from the 'Two Dogmas'. The unit of cognitive significance is a chunk of theory. We have a relaxation of holism urged in the 'Two Dogmas', so far as it is not a whole theory, let alone the whole of science, that is supposed to be assigned meaning. In fact, further concessions are on the way.

This molecular holism of meaning entails empirical underdetermination of theories by evidence. The same evidence—same stimulus—can be interpreted coherently, but incompatibly, by two different theories.

Example 1. Underdetermination by evidence is abound in history of science. Geocentric astronomy can accommodate observations of planetary paths by introducing epicycles. Heliocentric astronomy accommodates same observations, but without epicycles. (See illustrations on the board.) Darwinism and creationism may be another example (if creationism is accorded scientific status, of course!).

Full-fledged naturalism. Once we give up the idea of deducing science from observation, old questions can be seen in a new light. Science is part of the natural world, as is language. Acquisition of scientific knowledge, just as linguistic learning, can only be understood as a natural process. Empirical psychology thus offers the only entry into epistemology.

Observation sentences. A question arises whether the very distinction between observation and theory is part of the old epistemological baggage and must, therefore, be abolished. That is the route taken by Hanson (as we saw) and by Kuhn (as we shall see later). Quine resists this move. The category of observation sentences explains how a child learns the language. Clearly, Quine seems to imply, the child is in possession of no theory at that early stage.

Remark 2. This last claim has been repeatedly challenged in psychology research.

Secondly, observation sentences are crucial links between theory and evidence. We still cling to the old empiricist claim that real knowledge is based on evidence.

And at this stage Quine makes another major concession when he claims that observation sentences, unlike the rest of sentences in the language, are meaningful in isolation. The VTM is alive and well, at least so far as its scope is restricted to observation sentences.

However, there is a key divergence. The category of observation sentences is not delimited by the notion 'true by virtue of meaning alone' or any such formula. It is rather that they are identified by the responses of the given community. If a sentence commands universal assent or dissent from every member of the linguistic community in the presence of the same stimulation, we have an observation sentence. Membership in the community is, again, identified pragmatically via fluency of conversation.

Mathematical knowledge. Mathematics has long been held as a discipline not about the natural world. Its sentences were to be justified by methods discontinuous with the methods of natural science. From Plato, through Hume and Kant, down to the present time, everyone seems to have been in agreement with that.

Quine demurs. Mathematics is part of the scientific enterprise. It *is* about the world, so long as its statements feature in scientific theories. Individually, of course, they are not testable, but so are many theoretical statements of science. Moreover, we *could* choose to abandon certain mathematical claims in the face of experience, but we simply do not—for pragmatic reasons. There are, of course, parts of mathematics that are not applied. Well, they are truth-apt by courtesy: we would find tiresome and inconvenient to artificially separate applied and non-applied mathematics. So far as non-applied mathematics inherits its methods and concepts from applied mathematics, it is regarded as truth-apt.