Entry for *Encyclopedia of British Philosophy*: Abstraction

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Can we have ideas of triangles without any determinate features such as size, particular angles, or particular lengths for the sides of the figure? The process of forming such ideas is known as abstraction (from the Latin, *abs* 'away from' and *trahere* 'to draw'), removing characteristics from something in order to reduce an object to a set of essential features. Thus an abstract idea of a triangle includes only those features essential to all triangles. Both the nature and possibility of abstract ideas has been historically controversial.

In the British tradition, abstraction became an important independent issue during the early modern period. John Locke thought that we may successfully abstract either by omitting individual features to arrive at an abstract general idea (III.3.6), or by the partial consideration of an idea (II.13.13). Difficulties interpreting Locke, who appears to describe more than one form of abstraction, are highlighted in a celebrated passage where he claims that an abstract idea of triangle is no particular kind of triangle, but 'all and none of these at once' (IV.7.9). The possibility of abstraction interests Locke as abstract ideas ground his theory of general ideas and their meanings. The word 'triangle' gets its peculiar meaning and does classificatory work by being associated with an abstract idea.

Locke's contemporary George Berkeley rejected such ideas, arguing along two principal lines. He first alleged that abstract ideas were impossible. Both philosophers agreed all ideas were particular, determinate entities. Abstract ideas as Locke described them, however, were indeterminate, since there were properties for which an abstract idea

had neither it nor its complement. The abstract idea of triangle was neither right nor non-right. The point does not depend on ideas being images (although there is reason to think Berkeley thought of ideas as images), since the principle Berkeley invoked is a logical one. For every property, an object must possess either the property or its complement; and this applies to non-imagistic properties as well. Hence, Berkeley alleged abstract ideas were impossible entities. Second, Berkeley claimed that abstract ideas were unnecessary, since a particular idea could perform a general function in thought, fulfilling all the roles abstract ideas were intended to play.

Toward the end of the eighteenth century, David Hume accepted Berkeley's critique of abstraction and supplemented the account of how general ideas might work. The problem for Berkeley was how to distinguish between a particular idea used to represent triangles in general from the same particular idea used to represent an individual triangle. Hume argued that through habit we come to associate general words with particular ideas and specific terms with distinct ideas (*Treatise* 20-1). Thus one might associate an idea of a particular scalene triangle with the general word 'triangle' and a different idea (image) of one with the term 'scalene triangle.'

Arising from Locke's own phrase 'association of ideas,' in the following century philosopher-psychologists such as David Hartley and James Mill advanced new accounts of abstraction based on the theory that came to be known as associationism. Following Hume, the theory proposed that the mind forms habitual associations between experiences that are regularly related to one another. Thus if a word becomes causally associated with a certain kind of experience E, and E is associated with another kind of

experience F, then the original word essentially performs the same function that words representing abstract ideas did for the early moderns.

In twentieth-century thought, the dominant move has been to emphasize abstraction as a logical rather then purely psychological concept. The primary issue concerns whether to allow the existence of abstract objects. In contemporary usage, an object might be termed 'abstract' if it does not exist in space or time. One might ask, for instance, what mathematics is about. One plausible answer might be 'numbers.' Yet we typically do not think that numbers exist in the same fashion that chairs and apples do. Alternatively, philosophers think of some entities like tropes (property instances) as abstract in the sense of a contrast class to 'concrete' things that are independent existences. Tropes are thus sometimes called abstract particulars because they are ontologically dependent on something else (either a substance or a bundle of other tropes). Contemporary debates concern the reality of such abstract objects as possible worlds, mathematical entities, sets, laws, and universals.

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