

Peter Geach on Abstractionism

By Peter Gibson

1.

Perhaps the most important link in our chain of understandings of reality is that between the physical world and the world of abstract ideas – if such a link exists. The history of the matter goes roughly as follows:

Plato seems to have been the first to take a serious interest in the status of abstractions, and he proposed their ontological separation from the physical world, with the only link between them being the mind, which could ascend his famous Line which extended between the two realities (*Rep* 509d–511e).

Aristotle, the rebellious pupil, had no truck with this, and so he seems to have been the first to flirt with what is now called ‘abstractionism’. His account is a subtle one, but he is most interested in definitions, and he builds those out of primitive concepts, which are arrived at by induction from experience (*P.An* 100b4). He surmises that mathematicians study items such as ‘unity’ by treating a man simply ‘*qua* man’, and studying the unity thereby conceived (*Met* 1078a). Concepts about the physical world are achieved by a series of selections of similarities, with extraneous aspects being ignored. (*P An* 97b7-14).

Thomas Aquinas expanded the thinking of the Philosopher, and offers a picture in which there are four levels of abstraction (*Sum Th* q 85.1-2). He divides our understanding of the physical world into two parts – ‘perceived matter’, which is a set of perceived qualities, and ‘thought matter’, which is the underlying imperceptible substances. In each case it is possible to abstract from ‘the particular’, or from ‘the general’. We might arrive in this manner at (roughly) a sequence of four concepts, of increasing generality: ‘red’ (from perceptible particulars), ‘colour’ (from general perceptibles), ‘property’ (from thought particulars), and ‘aspect’ (from thought generalities). He seems to have a partial commitment to abstractionism – the view that all abstract ideas are derived from perceptible experience, by omitting features of things – but he also sees the mind as adding its own creations to the conceptual scheme.

A comprehensive commitment to the idea that all abstractions arise from a filtering of sense experiences becomes evident in Locke (e.g. *Essay* II.ix.9) and J.S. Mill (1843, IV.ii), and was spelled out very fully in modern times by H.H. Price (1953).

Meanwhile, though, Frege had offered his view (1884). He approached the question as a mathematical logician, for whom concepts have their own logical relations which are quite independent of any thinking mind. The job of the philosopher is to study the truth relations in the world of abstraction, not to indulge in amateur psychology. The big objection to abstractionism was that it was too subjective and personal (§27), and the key argument is the claim that abstractions such as numbers are not to be found in physical objects (how can you find the number 1 by looking at the moon? §31).

Peter Geach finally took the debate by the scruff of the neck (1957), and wrote a forceful thirty pages denouncing ‘abstractionism’ in all its forms. He worked through a range of concept-types, including concepts of thought, logic, arithmetic, relations and colour, and argued that in no case was it plausible that these concepts were the result of a focus on one part of a sense experience while ignoring the rest of it. The remainder of this essay will examine Geach’s case, in the form of eight of his arguments, to see whether Abstractionism is as completely hopeless as he suggests.

[Since 1957 the debate has moved on, and now focuses on attempts by logicians to define abstraction in terms of a Principle of Equivalence, which specifies the respect in which two things are said to be the same.]

2.

Argument One: *abstractionism would only work for what is perceptible, so a concept such as ‘substance’ would be rendered meaningless (§6).*

This thought is exactly why empiricists began to doubt the concept of substance, and it fell out of most philosophical discourse for 250 years. However, we could consider the same point about

the concept of a 'quark'. The concept of a quark arrived in physics around 1960, through a combination of a love of mathematical elegance, and a quest for the best explanation of very diverse observations. There doesn't in principle seem any more difficulty in abstracting the concept of a quark from objects which are guessed to exist on the basis of observation, than abstracting 'brick' from directly seeing a brick. If abstractionism were right about bricks, one would have to hold the brick in imagination, while stripping away (say) its particular mottled colour. But once we allow that the visible brick must be first *imagined*, it is no step at all to holding the invisible quark in imagination in order to focus on its 'spin'. The same would apply to 'substance', though we may be less clear about the properties of a bare substance.

Argument Two: *abstractionism is a superfluous explanation of how psychological concepts are derived from perceptual experience, since they are not 'perceived' by introspection but experienced directly (§6).*

Geach seems to regard all the experience that is invoked by abstractionists as sense experience, but empiricism founds knowledge on *all* experience, which includes experiences of emotions, propositional attitudes, proprioreceptive sensations, and even experiences of intellectual activity. A developed abstractionist view is bound to incorporate 'levels' of abstraction, after the Aquinas model, so that a concept such as 'red' will build in stages, through 'colour' and 'dazzling', to concepts such as 'visual' or 'visible' or 'striking'. If there is one thing philosophers of mind seem agreed on, it is that higher-order thought is a crucial feature of the human mind. Given a capacity to experience our own thinking, and reflect on it, there is no more surprise in the creation of concepts from that part of experience than there is from the creation of the concept 'brick'. The concept of *anger* would come from direct experiences (combined with observed behaviour), and the concept of an *emotion* would be a second-order abstraction.

Argument Three: *a logical connective such as 'or' has a determinate and universal meaning in all logical discourse, but can have quirky individual meanings within private experience, so abstractionism fails to account for the concept. (§7).*

This is Frege's central objection to abstractionism. Geach mocks Russell's attempt (1940: Ch.5) to give a psychological explanation of how simple logical relations emerge. To speculate about how language emerges is to invite ridicule, but what is the alternative? It is hard to imagine how any language in any possible world could function without (say) negation and conjunction. Why is this? One might take the platonist line, asserting that they are necessary fixtures in the structured world of eternal ideas, but it seems more likely that things failing to be a certain way, and things being conjoined together, will be aspects of any possible experience we can imagine. Geach offers a middle course, where concepts are creations of the mind, rather than the furniture of an intellectual world, or extractions from a physical world. But why would any being want to create the concepts of 'not' and 'and' if they had no negative or conjunctive experiences?

Argument Four: *numbers cannot be abstracted from experience, because one experience (of, say, a heroic couplet) can suggest many different numbers (§8).*

The starting point for this must be to consider the alternative, which would have to be some sort of platonism, if the numbers have somehow to be in place before we encounter the heroic couplet. But that seems unnecessary. Most of Geach's criticisms present a rather simplistic picture of how abstractionism is supposed to work. I don't think anyone has ever thought that you look at fifteen daisies and extract the number fifteen from them. Pattern-recognition seems to be integral to even fairly simple animal minds, and to spot a pattern is to spot how it would continue. Hume's Principle (of one-to-one correlation) is a formalized version of this, and such mapping of objects into patterns is the result of repeated experiences and imaginative comparisons. A heroic couplet is a nexus of several patterns. The key thought in replying to Geach is to emphasise that if abstraction begins in experience, it can only come to fruition in the imagination, with reason able to play a role in the analysis of complex experiences.

Argument Five: *learning the technique of counting numbers, and seeing that this can proceed without termination, must precede the actual counting of objects, so the technique can't be acquired from objects* (§8).

As Geach points out, one of the pleasures of childhood is indeed attempting to count to a million, well before any thought of a million objects in the world. Again, though, it doesn't follow that we must be platonists, or some sort of constructivists, about numbers. Although Mill's rather simple inductive account of learning numbers is not very satisfactory, it seems no more mystical to think that numbers might 'carry on in the same way' than it does to think that a road might go on forever beyond the brow of the next hill. Geach implies that the essential thing about numbers is the ability to count, but it would be a startling misunderstanding of numbers to be able to count to a million, without realising that you could apply your skill to counting objects. There is plenty of evidence that animals are aware of cardinality, while lacking any actual ability to count.

Argument Six: *if you can encounter a big elephant and a big flea, you can't very well learn the concept of 'big' from such experiences* (§9).

This objection implies a quite gross caricature of what is being proposed, and shows that Geach is frequently attacking straw men. When all the subtleties of abstraction have been completed (which would involve absorption into a language and into a culture, with the inevitable ironing out of a concept into an implicitly agreed standard that makes successful communication possible, with any private discrepancies smoothed over by a swiftly moving principle of charity) still no one would ever dream of thinking that 'big' was an absolute concept. There are contextual assumptions being made in its use, which can easily be spelled out if necessary. You directly 'see' that a flea is big, if it is the star of a flea circus, but no one thinks you could see bigness in a flea if it was the first one you had ever seen.

Argument Seven: *relational concepts often necessarily involve their converse (e.g. left/right), so you would have to see both simultaneously to abstract them from a situation* (§9).

This seems reminiscent of the creationist view that the eyeball or the giraffe's neck are evolutionarily impossible. A pair of concepts such as 'left' and 'right' are clearly complex in origin, and in logic, because they are (in the first instance) indexical, and in common usage are understood as relative to an orientation. Any concept of their origin by abstraction will find it challenging to pin down exactly what experience is the source of the abstraction. I would surmise (risking ridicule) that the notions of 'left' and 'right' were quite late developments in human language, because they are subtle and quite hard to learn (though one might reply that they are no harder to learn than the word 'I'). To spot that 'up' implies 'down' doesn't seem to be a transcendent feat of intellection, but is probably implicit in the thinking of any squirrel.

Argument Eight: *staring at a red patch can't deliver the concept of 'red', and if it did it couldn't deliver the concept of 'colour', and if it managed that it certainly couldn't generate the distinction between 'monochrome' and 'chromatic colour'* (§10).

Geach is right that the paradigm cases of supposed abstraction are physical objects (his example is 'cat'), and their properties (such as 'red'). Frege seems happy to accept this sort of abstraction for physical objects (e.g. the concept of 'satellite', and even 'object', derived from the moon, in §44), reserving his polemics for attempts to derive numbers in this way. These cases seem to me to be the heart of the argument, because they would get the abstractionist account of thought off the ground, and one would only have to permit the process of 'higher-level' abstraction to fill in the rest of our conceptual scheme, including numbers and logical operators.

There seem to be two issues here – whether the most basic concept of a primitive property can be abstracted, and then whether generalised higher concepts can emerge at a later stage. The second issue seems easier: children obviously learn properties in interconnected groups, and we say a child has 'got it' when they get the hang of numbers, or fractions, or countries, or relatives. It is inconceivable that a child could 'get' *red*, but then be baffled by *green* for another year. To see that a patch is *red* is partly to grasp the concept of it having a *colour*, so it may even be that the concept of *colour* precedes the concept *red* in the learning and abstracting process. The first step in learning might indeed be the realisation that it is possible to imagine one aspect of an object changing while

the rest remains the same. The concept of *colour* is certainly not stamped on red objects in large friendly writing, but we routinely experience objects such as fruit or the sky, which remain of the same form while their colour changes. This is an experience which cries out for concepts, for words and for communication.

The most basic question of all in this area is whether it is plausible to abstract the concept of *red* from the simple experience of a red patch. At this point we have to acknowledge a probable gulf between the minds of animals and of humans. Humans are *very* observant. A child will study a toadstool for several minutes, and a scientist might devote a lifetime to it. Intellectual resources are needed to make this experience tolerable. This is, of course, Geach's point: that we have the resources to *create* the conceptual apparatus that makes our world interesting. But concepts are not whimsical inventions. The concept of *evolution*, for example, is one that simply emerged from an extended knowledge of the world's fauna and flora, an exploration of geology, and the discovery of fossils. It takes a sophisticated intellect and a keen sense of observation to arrive at such an idea, which involves weighing of evidence, comparison of remembered experiences, and a feeling for probabilities. Such layered and convoluted meta-thought seems certain to spot patterns in the world which will cry out for conceptualisation.

3.

This essay does not attempt the task of proving abstractionism correct, and it may be false. The aim is to establish two points. It does not seem that Peter Geach's fiercely presented case against abstractionism is successful, despite his triumphalism. It largely fails because it does not address the implications of higher-order abstractionism, even though Aquinas initiated discussion in that area, and because it does not recognise that abstractionism is seen as operating on a huge range of repeated and diverse human experiences, over lifetimes and over the histories of human cultures. The brand of empiricism he attacks is too simplistic and crude to be actually held by anyone.

The second point is that the front line of discussion on abstraction should not be focused (as presently seems to be the case) on clarifying the distinction between 'abstract' and 'concrete' in logic, but on physical objects and their properties. However, any abstractionist account of concepts must answer Frege's challenge, that the derived concepts form propositions which are controlled by the laws of truth and inference, rather than by the quirks of individual psychology. So an explanation is required of how our conceptual scheme can be rooted in the muck of individual experiences, but can blossom into the pure impersonality of reason.

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