PSYCHOLOGISM AND ANTI-PSYCHOLOGISM: AN HISTORICAL OVERVIEW

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Introduction: psychologism and anti-psychologism

According to Flew's (1979) *Dictionary of Philosophy* the term 'psychologism' was first used in the early nineteenth century by the German idealist philosophers J. K. Fries and F. E. Beneke as the name for a view of the nature of philosophical enquiry which they advocated. According to this view, philosophy is an empirical investigation of the contents of the mind which uses the method of *Selbstbeobachtung* or 'introspection', as it is usually called in English. In other words, psychologism on this view identifies philosophy with what used to be called 'armchair psychology.'

It is not, however, with psychologism in this sense that we are concerned in this symposium. The kind of psychologism that concerns us here is a view, not of the nature of philosophy, but of the nature of logic and mathematics. It is the view that the laws and principles of logic and mathematics are empirical generalisations about the way the human beings actually think, that they are laws in the sense that we speak of 'laws of nature', laws which, in so far as they are formulated correctly, admit of no exceptions. The contrasting anti-psychologism holds that the laws and principles of logic and mathematics are normative rather than descriptive, laws in the sense of the laws of the land, laws that can be and frequently are *broken*.

Formulated in this way in terms of the contrast between these two senses of the word 'law', psychologism is so obviously false that it is difficult to understand how anyone should be so misguided as to espouse such a view. For if the laws of logic and mathematics were laws of thought in the descriptive sense, it would be inconceivable that a human being should ever think in a way which contravenes those laws. Mistakes of reasoning and calculation would be impossible. Yet such mistakes are all too common.

Frege's anti-psychologism

In view of its manifest implausibility, it is not surprising to find that it is difficult to find anyone who openly advocates psychologism as a theory of the nature of logical and mathematical principles. In this sense, the term 'psychologism' occurs only as a term of abuse used by anti-psychologists to denote a defect which they detect in the writings of others.

The first and certainly the best known philosopher to use the term in this derogatory sense was Gottlob Frege (1848-1925). Frege shares with George Boole the distinction of having laid the foundations for modern formal/mathematical logic. But whereas Boole's contribution was purely technical, Frege was concerned to explore the implications of this revolution in logic for such fields as the philosophy of language, the philosophy of mathematics, metaphysics and the philosophy of science. It was these wider implications of Frege's logic which make him the founding father of the 'analytic' or 'linguistic' tradition in philosophy which was further developed by Russell, Wittgenstein and the Logical Positivists of the Vienna Circle, and, in the years immediately following the end of World War II, became the dominant brand of philosophising in the English-speaking world.

Frege's onslaught on the psychologism which he saw as endemic in the writings of his contemporaries in the fields of logic and the philosophy of mathematics appears in two publications:

(a) the Preface to his major work *Grundgesetze der Arithmetik* (1893), and

(b) his (1894) review of Edmund Husserl's (1891) *Philosophie der Arithmetik.*

In order to understand the source of Frege's anti-psychologism and at the same time to appreciate its limitations, we need to understand his own theory of the nature of logic and mathematics with which psychologism stands in stark cognitive dissonance. Unlike John Stuart Mill who thought that the truths of arithmetic were empirical generalisations based on observations of the behaviour of what Husserl in his book called "collectives", Frege held that logic and mathematics are pure *a priori* sciences in which the truth of the conclusion is guaranteed solely by its strict deduction from a set of premises which, when traced back to their ultimate source, consist in a set of definitions. This dependence of logical and mathematical truth on definition means for Frege that such truths are analytic. This is because his critique of the subject and predicate analysis of sentences had led him to reject Kant's account of the analytic/synthetic distinction which

is formulated in terms of the subject and predicate analysis and to substitute an alternative account of an analytic truth as one which is deduced from a definition or set of definitions.

The contention that the truths of logic and mathematics are analytic in this sense might be taken to suggest that, for Frege, logic and mathematics are simply a matter of exploring the implications of adopting certain arbitrary linguistic or other symbolic conventions. But this is not his view. Frege, in fact, held an extreme Platonic view according to which logic and mathematics are descriptive sciences, descriptive, not of the world of space and time, but of a timeless world of abstract objects.

Frege was led to adopt this platonic view by similar considerations to those which, in our own day, have led Quine to populate the space-time universe with such abstract objects as numbers and sets. Frege held a view of what it means to say of something that it exists according to which, in Quine's words - "To exist is to be the value of a variable." In other words, to exist is to be the value of the variable x in a proposition of the form which is expressed in Russell's notation by the formula

$$(\exists x)(Fx),$$

or, as Frege himself would have put it, to say that something exists is to say that the class defined by some concept (in this case, the concept represented by the predicate F) has at least one member (the object designated by the variable x).

Despite what in Frege's terms is the analyticity of its propositions, many of the truths of mathematics involve just such an existential claim. An example is the proposition

There is one and only one even prime number.

This proposition is analytic in Frege's sense in that it is a straightforward deduction from the definitions of 'even number' and 'prime number.' But it is also existential, according to the Frege-Quine account of what it is to assert the existence of something. Such existence, according to Frege, is just as 'objective', just as independent of the individual's 'subjective' assessment, as is the existence of the concrete particulars which occupy the universe of space-time. Statements asserting such existence differ from those asserting spatio-temporal existence in that they are analytic, their truth is determined *a priori*, and the existence they assert is independent of time and space. In his (Frege, 1918) essay 'Der Gedanke' ('The Thought') he refers to the realm occupied by these timeless abstract objects by what, in the light of subsequent events, is the

somewhat unfortunate title "der dritte Reich", the other two realms being the objective spatio-temporal world and the subjective world of private experience.

From Frege's perspective, psychologism is the result of failing to recognise the objective existence of this third realm of timeless abstract objects. Those philosophers who, like Mill, deny the existence of such a realm, are compelled to treat the truths of logic and mathematics either as features of the world of space-time in which case their analyticity and deduction *a priori* makes no sense, or as features of the subjective world (psychologism) in which case their objectivity, the independence of their truth from the beliefs and judgments of the individual, is unintelligible. The timelessness of their truth is equally unintelligible on either view.

Husserl's conversion to anti-psychologism

Frege's critique of the psychologism he detected in Husserl's (1891) *Philosophie der Arithmetik* in his (Frege, 1894) review had the remarkable result that Husserl was compelled to concede that Frege was right and he had been wrong. So complete was Husserl's conversion in fact that in his *Logische Untersuchungen* (1900) he made anti-psychologism a central feature of the philosophical phenomenology which he expounded in that book. Husserl's phenomenology came to dominate philosophical thinking on the European Continent during the twentieth century in much the same way as does the analytic tradition which stems from Frege in the English-speaking world. Consequently by his conversion to anti-psychologism Husserl ensured that anti-psychologism was to become one of the very few features which were common to these otherwise very different and antagonistic philosophical traditions.

Reasons are not causes

With both the dominant philosophical traditions in Western world committed to anti-psychologism, it is perhaps unsurprising that little more was heard of psychologism, in philosophical circles at least, until comparatively recently. Nevertheless, although the terms 'psychologism' and 'anti-psychologism' were never used, what was in effect a significant re-statement of the case against psychologism emerged around the middle of this century within the analytic tradition. This 'new wave anti-psychologism', as we may call it, first

manifested itself in print in Ryle's (1949) book *The Concept of Mind*. It appears in the shape of the doctrine that reasons are not causes and that to suppose that they are is to be guilty of what Ryle calls "a category mistake" or what Wittgenstein stigmatises as "conceptual confusion." As presented by Ryle, the doctrine that reasons are not causes is part of a two-pronged assault on the doctrine which he attributes to Descartes and refers to with deliberate irony as "the doctrine of the Ghost in the Machine."

Ryle is not content, as most subsequent critics of mind-body dualism have been, to deny the existence of "the Ghost." He is equally concerned to deny that men (and presumably, though he does not say so, women) are not machines either. According to Ryle what distinguishes men from machines is that their behaviour is governed in a non-causal way by reasons, whereas that of the machine is controlled in a deterministic way by mechanical causes.

It is typical of Ryle that he tells us nothing about the sources of his ideas. In the case of the doctrine that reasons are not and cannot be causes, there are two possible sources either or both of which may have influenced him in this direction. One possible source is Husserl's anti-psychologism. We know that, before he came under the influence of Wittgenstein's later philosophy, Ryle had a brief, but none-the-less significant, flirtation with Husserl's phenomenology. However, as became apparent with the posthumous publication of Wittgenstein's *Philosophical Investigations* in 1953, the doctrine that reasons are not causes was already being advocated by Wittgenstein in his lectures at Cambridge and, doubtless, in conversations with Ryle at the time when *The Concept of Mind* was being written. Certainly those, such as Richard Peters (1958), Peter Winch (1958) and A. I. Melden (1961), who were responsible for popularising the doctrine in philosophical circles in the late nineteen fifties and early nineteen sixties looked to Wittgenstein rather than Ryle as the authority for their position.

Considered as a version of anti-psychologism, the doctrine that reasons are not causes arises not, as does that of Frege and Husserl, in the context of the philosophy of logic and mathematics, but as part of an attack on mechanistic and determinist theories of the causation of human behaviour. Consequently, this version of anti-psychologism is not tied, as is the Frege-Husserl version, to the platonic doctrine that numbers and other universals exist timelessly as abstract objects independent of their instances in their own third realm. Nevertheless the underlying argument is the same. Causal laws describe how events or states of affairs

of one kind follow or are followed by events or states of affairs of another kind. They admit of no exceptions. If exceptions are found, they show that the law as currently accepted has been incorrectly formulated. The laws of logic and mathematics are prescriptive, not descriptive. They tell us how we ought to think, not how we actually think. Exceptions to such laws are common. When they occur, it is not the law which is judged to be defective, but the exception which fails to conform to it. Confusing these two types of law is a gross error. It is this error, so it is alleged, that is being committed both by those who argue that logic and mathematics are descriptions of our mental life and by those who attempt to give a causal explanation of rational human action.

Fodor and the serial digital computer model

The importance of this Wittgenstein/Rylean reformulation of anti-psychologism is that it is this version of the doctrine which has been the principal target for those who in recent years have been led into a defence of psychologism as part of the attempt to provide a mechanical and hence. causal account of the role of reason in the control of human action based on the serial-digital computer as a model for the functioning of the brain.

The philosopher who has most clearly seen, most warmly embraced and most persuasively argued in favour of the psychologistic implications of the serial-digital computer model is Jerry Fodor. In the abstract for this paper, I cited his 1975 book *The Language of Thought* as the place where Fodor argues that the computer model provides a knock-down refutation of the traditional arguments against psychologism. This is a mistake. In *The Language of Thought* Fodor advocates the computer as a model of how a machine such as the brain is taken to be, can incorporate logic and rationality into its causal structure. He also argues in that book against a number of what he regards as unjustified taboos imposed on theorising in the psychological domain by the Wittgensteinian and ordinary language traditions in the philosophy of mind and language, particularly of course, Wittgenstein's repudiation of the concept of a private language in his well known argument to that effect. But the taboo on assigning a causally generative role to logical principles is not amongst them, as I assumed when I wrote the abstract.

Indeed, I have not been able to locate the argument from the computer model to the refutation of anti-psychologism as stated in the abstract in any of Fodor's published work to which I have access. I seem to remember having come across the argument somewhere in his writings, or in some paper I have heard him or one of his disciples give; but where that was, if I haven't fabricated the whole thing, I know not. The nearest thing to it is a passage in his book *Psychosemantics* (Fodor 1987) where he argues -

> Computers show us how to connect semantical with causal properties for symbols. So, if having a propositional attitude involves tokening a symbol, then we can get some leverage on connecting semantical properties with causal ones for *thoughts* .... this is in my view - the only aspect of contemporary cognitive science that represents a major advance over the versions of mentalism that were its eighteenth and nineteenth century predecessors. Exactly what was wrong with Associationism for example, was that there proved to be no way to get a *rational* mental life to emerge from the sorts of causal relations among thoughts that the 'law of association' recognised'. (Fodor 1987, p. 18)

This is as near as Fodor gets, in that book at least, to claiming that the computer model refutes anti-psychologism. But, whether or not Fodor has actually made it, the claim that the computer refutes anti-psychologism, at least in the form in which it is defended by Ryle and Wittgenstein, cannot be denied. For if, as Fodor argues, both logical principles and logical connections between symbolic formulae, play a causally generative role in a standard serial-digital computer, in the face of that evidence it cannot seriously be argued that to suppose that such principles and connections should play a causally generative role is to be conceptually confused or to commit some kind of category mistake.

Searle's Chinese Room argument

There is, of course, an argument, Searle's (1980) so called Chinese Room argument, which asserts that computers are simply mechanical symbol-manipulators which do not understand and do not need to understand the symbols they manipulate.

That is certainly true, But it is also an implication of the Chinese Room example that the symbol manipulator cannot do its job properly unless it understands and follows the rules and instructions it is given as to how and when the symbol manipulation operations are to be carried out. In other words, the computer does not and does not need to understand the symbolic formulae it generates for the benefit of his human operator. But it does and must understand and follow the symbolic formulae in the digital code of the machine which constitute its programming instructions.

Connectionism

I conclude from this that Searle's Chinese Room provides no escape from refutation for anti-psychologism when presented, as it is by Ryle and Wittgenstein, as the claim that to suppose that logical principles and relations should have such a causal role is to be conceptually confused or category-mistaken. But while the computer model is a decisive *a posteriori* refutation of the *a priori* claim that logical principles and relations cannot play a causally generative role, it does not show that psychologism is *true* as an account of the generation of human thought. It only shows *that*, when supplemented by an additional premise to the effect that there is no plausible alternative to the computer model as an account of the generation of human thought. Up until very recently, it was possible for the likes of Jerry Fodor to argue, as he repeatedly has done (Fodor 1975, 1987), that there *is* no plausible alternative to the computer model in this respect. But, all this has changed with the recent advent or, as it really is, revival of the neural network or parallel distributed processor (PDP) as an alternative model for the way the brain operates.

It is true that most neural networks which are in actual use are implemented on a suitably programmed serial-digital device. Nevertheless, considered as an independent unit, a connectionist network is a device which transforms an input into an output without involving anything resembling a syntactically organised symbolic formulae or a set of logically ordered step-by-step transitions of one formulae into another. Instead, the input-output transformation is achieved by the relative weights of the various synaptic connections linking the neuron-like units or 'nodes', as they are called, of which the network consists.

Considered as an alternative to the serial-digital computer in its classical form as a model for the way the brain works, the connectionist network resembles the brain far more closely than does the serial-digital machine, not only in its architecture which is deliberately modelled at the microstructural level on that of the brain, but also in its functional properties.

Unlike the serial-digital machine which is designed from the outset to perform quickly and efficiently those computational tasks which even the best brains perform slowly and inefficiently, if at all, and is slow and inefficient when it comes to performing those tasks, such as pattern recognition learning, which the brain is particularly good at, the connectionist network is good at the same kind of tasks that the brain is

good at, pattern recognition learning in particular. It is relatively poor at the kind of symbol manipulating tasks where the brain fails and the serial-digital computer reigns supreme.

While recognising the virtues of the connectionist network as a pattern recognition learning device, Fodor and Pylyshin (1988) have argued that unless it incorporates the so-called 'classical architecture', a connectionist network cannot hope to compete with the serial-digital machine as a model for human thought processes. More recently Bill Bechtel, who some of you may remember from his participation in the Section's first Annual Conference at Ilkley in 1987, has attempted to answer Fodor and Pylyshin's challenge, by teaching a network both to discriminate between valid and invalid forms of argument and to generate proofs in the propositional calculus. While even Bill concedes that the remarkable success he has achieved with this venture, does not provide us with anything approaching an adequate model for human thought processes, this study does have, I believe, one very important implication for our present topic. For in this study logical principles do not occur, as they do in a serial machine, as generative principles incorporated into the machine's computer program which, once properly installed, produces an errorless performance. They are normative principles imposed on the device from outside by the error-correction feedback supplied by the human trainer.

What is important about that for our present purposes is that it suggests that there may be a way of acknowledging the normative character of the laws of logic and mathematics which is the strength of anti-psychologism without succumbing to its weaknesses, its commitment in the hands of Frege and Husserl to a Platonic world of abstract objects and in the hands of Wittgenstein and Ryle to a denial of the possibility of the causal efficacy of the rational and the logical. It suggests that the rules of syntax, logic and mathematics are located, not in Frege's *dritte Reich*, not on a computer program in the brain, but in the error-correcting practices of the linguistic community. As Bill Bechtel puts it, we can think of a neural network, whether artificially constructed or naturally occurring as in the brain, as a Turing Machine, but one whose programming tape is the organism's environment, particulary its social environment.

But that, of course, is only part of the answer. For how, on this view, the Fregean will protest, do you account for the objectivity of logical and scientific truth. For if logical consistency is only achieved by a process of supervised social learning, what is it that ensures that the errors that are stamped in, the rules that

are imposed, are something more than arbitrary and ephemeral rules of etiquette which happen to pertain within a particular linguistic community. I think there is an answer to that objection, and that it has to do with the need for consistency within a symbolic system, if it is to function and accurately represent features of reality which lie beyond the reach of current sensory inspection. But that's another paper.

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