RAMSEY, FRANK PLUMPTON (1903–1930)

Before Ramsey died at the age of 26 he did an extraordinary amount of pioneering work, in economics and mathematics as well as in logic and philosophy. His major contributions to the latter are as follows. (1) He produced the definitive version of Bertrand Russell's attempted reduction of mathematics to logic. (2) He produced the first quantitative theory of how we make decisions, e.g. about going to the station to catch a train. His theory shows how such decisions depend on the strengths of our beliefs (that the train will run) and desires (to catch it), and uses this dependence to define general measures of belief and desire. This theory also underpins his claim that what makes induction reasonable is its being a reliable way of forming true beliefs, and his equation of knowledge generally with reliably formed true beliefs. (3) He used the equivalence between believing a proposition and believing that it's true to define truth in terms of beliefs. These in turn he proposed to define by how they affect our actions and whether those actions fulfil our desires. (4) He produced two theories of laws of nature. On the first of these, laws are the generalisations that would be axioms and theorems in the simplest true theory of everything. On the second, they are generalisations that lack exceptions and would if known be used to support predictions ('I'll starve if I don't eat') and hence decisions ('I'll eat'). (5) He showed how established, e.g. optical, phenomena can be explained by theories using previously unknown terms, like 'photon', which they introduce. (6) He showed why no grammatical distinction between subjects like 'Socrates' and predicates like 'is wise' entails any intrinsic difference between particulars and universals.

1 Mathematics

The British philosopher Frank Plumpton Ramsey graduated in mathematics from Trinity College Cambridge in 1923, became a Fellow of King's College in 1924 and a University Lecturer in Mathematics in 1926. In his short life he did work in mathematics and economics which created new branches of those subjects. But his

vocation and greatest achievements were in philosophy, influenced by and influencing his Cambridge colleagues, especially RUSSELL, WITTGENSTEIN and KEYNES. His first major work, on 'The foundations of mathematics' (1925), makes two key improvements to the attempted reduction of mathematics to logic in Whitehead's and Russell's *Principia Mathematica* (see LOGICISM). First, Ramsey tightens *Principia*'s definition of mathematical propositions as purely general by requiring them also to be tautologies in the sense of Wittgenstein's *Tractatus*. Second, he shows that it need deal only with purely logical paradoxes, like that of the class of all classes which are not members of themselves, not semantic ones like 'this is a lie', which depend on the meanings of words like 'lie'. This lets Ramsey simplify *Principia*'s complex hierarchy of propositions, since it no longer needs to make 'this is a lie' ill-formed by making '*p*' and '*p* is a lie' propositions of different types. This in turn lets him drop the 'axiom of reducibility' (of propositions of higher types to equivalent ones of lower types) that *Principia* needs to validate 'many important mathematical arguments' (p. 190). Dropping this axiom is essential to logicism, since 'there is no reason to suppose [it] true; and if it were true, this would be a happy accident and not a logical necessity, for it is not a tautology' (p. 191, see THEORY OF TYPES and SEMANTIC PARADOX AND THEORIES OF TRUTH).

In 'Mathematical logic' (1926) Ramsey defends his logicism against 'the Bolshevik menace of Brouwer and Weyl' (p. 219, see INTUITIONISM) and the formalism of Hilbert (see HILBERT'S PROGRAMME AND FORMALISM). The former he attacks for denying that all propositions are either true or false ('Brouwer would refuse to agree that either it was raining or it was not raining, unless he had looked to see', p. 228), the latter for reducing mathematics to 'a meaningless game with marks on paper' (p. 233). But he remains embarrassed by logicism's need to assume that there are infinitely many things; and R. B. Braithwaite, introducing his edition of Ramsey's papers in 1931, reports that in 1929 Ramsey 'was converted to a finitist view which rejects the existence of any actual infinite aggregate'. Despite this,

and logicism's general rejection by mathematicians, Ramsey's version of it remains of great interest to logicians (Chihara 1980).

2 Probability and knowledge

If Russell and Wittgenstein prompted Ramsey's work on mathematics, Keynes prompted his work on economics and probability. The latter was provoked especially by Keynes's *A Treatise on Probability* (1921), which extends the deductive logic of conclusive inference to an inductive logic of inconclusive inference by postulating a relation of 'partial entailment', knowable a priori. This, when measurable, enables a probability measure of the strength of an inference from one proposition to another. But in 'Truth and probability' (1926) Ramsey attacked the idea of an a priori inductive logic so effectively that Keynes abandoned it, although it was later revived (see CARNAP and PROBABILITY, INTERPRETATION OF).

Ramsey's main achievement in 'Truth and probability' is his probability measure of the strength (degree) of a belief. This starts from 'the old-established way of measuring a person's belief, [i.e.] to propose a bet, and see what are the lowest odds which he will accept' (p. 68). Refining this by invoking 'the theory that we act in the way we think most likely to realise the objects of our desires' (p. 69), Ramsey derives measures both of desires (subjective utilities) and of beliefs (subjective probabilities), thereby founding the now standard use of these concepts (see DECISION AND GAME THEORY).

Ramsey himself uses his theory to extend 'the lesser logic … of consistency' (p. 82) from full to partial beliefs. Thus to the injunction not to believe both *p* and not-*p* he adds, for example, that anyone who believes *p* to degree 1/3 must believe not-*p* to degree 2/3. Otherwise what these beliefs will make him do 'would depend on the precise form in which the options were offered him, which would be absurd': e.g. they would make him bet at different odds on *p* and against not-*p*, so that 'he could have a book made against him by a cunning better and would then stand to lose in any event' (p. 78).

Ramsey also uses his theory to develop 'the larger logic … of discovery', applied (following PEIRCE) to belief-forming 'habits of inference … observation and memory' (p. 92). He shows why such a habit is good or bad 'as the degree of belief it produces is near or far from the actual proportion in which the habit leads to truth', and hence why the fact that 'the world is so constituted that inductive arguments lead on the whole to true opinions' makes our inductive habits reasonable (p. 93).

Hence also Ramsey's claim in 'Knowledge' (1929) that 'a belief [is] knowledge if it is (i) true, (ii) certain [i.e. a full belief], (iii) obtained by a reliable process … [i.e. one] that can be more or less relied on to give true beliefs' (p. 110). This claim anticipates later accounts of knowledge (see EXTERNALISM, RELIABILISM), showing amongst other things how we can know things we do not know we know. This in particular enables Ramsey to evade several well-known objections to knowledge, conceived of as true belief that the believer could justify, which need to assume that I can only know something if I know I know it (Sahlin 1991).

In 'Truth and probability' Ramsey does not apply his subjective reading of probability to physics. Unfortunately he later, in 'Chance' (1928), anticipates de Finetti (1937) by taking even physical chances to be only 'in another sense objective, in that everyone agrees about them' (p. 106). To this we may reply by adding to his objection to Keynes, that determining the right probabilities 'in molecular mechanics … is a matter of physics rather than pure logic' (p. 85), that it takes more than mass psychology to explain (e.g.) the random decay of radioactive atoms.

Fortunately Ramsey does not make all his successors' mistakes. In particular, unlike many later decision theorists (e.g. Jeffrey 1983), he never *prescribes* acting 'in the way we think most likely to realise the objects of our desires'. He claims only that the theory that we do so is 'a useful approximation to the truth … like Newtonian mechanics' (p. 69). Here he is right: for even when I in fact do something because 'it seemed a good idea at the time', this fact about my action does not suffice to make it rational.

3 Belief and truth

In defining a belief's strength by its effects on our actions, Ramsey foreshadows later theories which define mental states by their causes, effects and interactions (see FUNCTIONALISM). In 'Facts and propositions' (1927) he extends this idea from degrees to contents of beliefs, taking (e.g.) 'the equivalence between believing "not-*p*" and disbelieving "*p*" … to be defined [by their sharing] many of their causes and … effects' (p. 44). But after failing to define the contents of beliefs as effectively as their degrees, Ramsey concludes that his view, that 'the meaning of a sentence [expressing a belief] is to be defined by reference to the actions to which asserting it would lead', remains 'very vague and undeveloped' (p. 51).

It is however developed enough to stop Ramsey's theory of truth being, as is usually supposed, that truth is definable by the fact that for all *p*, it is true that *p* iff *p* (see TRUTH – REDUNDANCY THEORY). He does say that 'there is really no separate problem of truth' since (e.g.) '"it is true that Caesar was murdered" means no more than that Caesar was murdered', so that 'if we have analysed [belief] we have solved the problem of truth' (pp. 38–9). But the solution will not be the redundancy theory if our analysis of beliefs includes a substantive analysis of their truth conditions, as Ramsey's needs to do.

Ramsey starts by observing that we can 'say that a chicken believes a certain sort of caterpillar to be poisonous, and mean by that merely that it abstains from eating such caterpillars on account of unpleasant experiences connected with them'. Since this action is 'such as to be useful if, and only if, the caterpillars were actually poisonous … any set of actions for whose utility *p* is a necessary and sufficient condition might be called a belief that *p*, and so would be true if *p*, i.e. if they were useful' (p. 40, see TRUTH – PRAGMATIC THEORY).

Unfortunately Ramsey drops this idea when dealing 'with those beliefs which are expressed in words … or other symbols, consciously asserted', although it can apply to them too. In fact its only fault is to identify a belief with a set of actions, like abstaining from eating caterpillars, instead of with one of their causes. But any theory

that makes beliefs entail causal functions from desires to actions can remedy this. For then the 'set of actions' of a full belief *b* will be all those that *b* would combine with some desire to cause; and *p* will be the condition in which every such action would succeed, i.e. achieve the object of the desire involved, say to eat without dying. But this is obviously the condition that *b* be true, i.e. *b*'s truth condition.

Ramsey can therefore let this 'success semantics' (Whyte 1990) give the truth condition of any belief definable by 'the actions to which … it would lead'. Indeed he must do so, since a belief's truth condition cannot be given just by how it makes us act, for that will be the same whether it is true or false. What does depend on a belief's truth is whether the actions it causes succeed: hence success semantics. But this, while vindicating Ramsey's claim that analysing belief solves the problem of truth, rules out the redundancy theory: for success semantics, since its contribution to the analysis of beliefs is to say what makes them true, is itself a substantive theory of truth.

4 Laws and causation

Ramsey produced two theories of laws of nature (see LAWS, NATURAL). Both are Humean in distinguishing law statements from accidentally true generalisations not by what they say but by how we use them. In 'Universals of law and of fact' (1928) Ramsey says they are 'consequences of those [general] propositions which we should take as axioms if we knew everything and organised it as simply as possible in a deductive system' (p. 150). Although Ramsey soon abandoned this 'systematic theory' (Armstrong 1983), it remains the best Humean account of laws.

Ramsey's second theory, in 'General propositions and causality' (1929), is that law statements like 'all men are mortal' are 'variable hypotheticals', which 'are not judgments but rules for judging "If I meet a ϕ I shall regard it as a ψ"' (p. 149). Thus 'a causal generalization is not … one which is simple, but one we trust' (p. 150), while to believe there are unknown laws is to believe there are 'such singular facts … as would lead us, did we know them, to assert a variable hypothetical [which must] be

also asserted to hold within … the scope of our possible experience' (p. 152).

This theory explains why we invoke causation and laws in assessing action, since 'we cannot blame a man except by considering what would have happened if he had acted differently; and this … depends essentially on variable hypotheticals' (p. 154). But its account of why 'the deduction of effect from cause is conceived to be so radically different from that of cause from effect' (p. 157) will not do. For here Ramsey relies on our view that causes precede their effects, a view he identifies with the fact 'that any present volition of ours is (*for us*) irrelevant to any past event … *to us* now what we do affects only the probability of the future' (p. 158, my italics). But this implies that the only reason we can't affect the past is that we think we can't, which is absurd. Only the fact, not the view, that effects never precede their causes can explain why gluttons should believe 'I will starve if I don't eat' but not 'I will have starved if I don't eat': *pace* Ramsey, some variable hypotheticals need to be made true by facts (see CAUSATION, COUNTERFACTUALS).

5 Theories

Scientific theories apply new predicates to unobservable entities, like photons, to explain observable, e.g. optical, phenomena. How do these predicates acquire empirical meaning? Ramsey's drastic answer in 'Theories' (1929) is that there are no such predicates: we use 'is a photon', 'has frequency *n*', etc. not as predicates but as existentially bound variables. That is, a theory tacitly starts with quantifiers, 'properties exist – call them "being a photon", etc. – such that …', followed by the explicit theory, in two parts. Its *axioms* link its predicate variables to each other, while its *dictionary* (see CAMPBELL, N. R.) links them to observable predicates like 'is red' (p. 112). Thus if 'α', 'β' and 'γ' are our theoretical predicates, 'the best way to write our theory seems to be … ($\exists\alpha,\beta,\gamma$):dictionary.axioms' (p. 131). This, which is now called the 'Ramsey sentence' of the theory, eliminates its problematic predicates while keeping its structure and observable consequences.

Although this account has been widely accepted – and explicitly applied to

functionalist theories of the mind (Lewis 1972) – its explanations of other striking facts about theories are rarely noticed. It entails for example that parts of theories, since they contain variables, are not 'strictly propositions by themselves' and their meaning 'can only be given when we know to what stock of "propositions" … [they are] to be added' (p. 131). Since this makes theoretical statements in rival theories incomparable, 'the adherents of two such theories could quite well dispute, although neither affirmed anything the other denied' (p. 133). This both explains the phenomenon of 'incommensurability' (see KUHN) and limits its consequences, e.g. for deductive accounts of theoretical explanation (see HEMPEL): for as Ramsey remarks, it does not affect reasoning within the scope of a single theory's quantifiers.

Because Ramsey sentences say that certain universals (properties or relations) exist, nominalists, who deny this, must reject them (see NOMINALISM). Realists about universals, however, can use Ramsey sentences to determine what empirical universals exist, as follows. Since not only *un*observable properties exist, we treat *all* predicates in law statements as variables. The Ramsey sentence of all such statements then quantifies over all universals that occur in laws, which are all the empirical universals there are (Mellor 1991).

6 Universals

What lets Ramsey ignore nominalism in 'Theories' is his denial in 'Universals' (1925) that our distinction between particulars and universals shows any intrinsic difference between them. First, it cannot be based on the subject–predicate distinction, e.g. between 'Socrates' and 'is wise' in 'Socrates is wise': for the subject of the equivalent 'wisdom is a characteristic of Socrates' is wisdom, which is not a particular (p. 14). Also, in molecular propositions like 'Socrates is wise or Plato is foolish', the subject-predicate distinction generates complex universals, like being wise unless Plato is foolish. But Ramsey argues that if these existed, then (e.g.) that a universal *R* relates *a* to *b*, that *a* has the complex property *Rb* and that *b* has *aR* would 'be three different propositions because they have different sets of constituents, and

yet they are … but one, namely that *a* has *R* to *b*. So the theory of complex universals is responsible for an incomprehensible trinity, as senseless as that of theology' (p. 14). Similarly with Socrates's apparent property of being wise-unless-Plato-is-foolish and Plato's of being foolish-unless-Socrates-is-wise. If, as Ramsey assumes, the proposition that Socrates is wise or Plato is foolish can have only one set of constituents, there can be no such complex properties.

Predicates can therefore distinguish universals from particulars only in atomic propositions, and even then the distinction will not imply an intrinsic difference unless that difference would explain our impression that (e.g.) 'Socrates is a real independent entity, wisdom … a quality of something else' (p. 19). But no such difference will do this. For our impression comes from associating 'wise' only with propositions of the atomic form '*x* is wise' while associating 'Socrates' with *all* propositions containing it, including the molecular 'Socrates is neither wise nor just'. Yet we could as easily associate 'wise' with this and all other propositions containing it, and restrict 'Socrates' to the atomic form 'Socrates is *q*', where *q* is a universal: a form which, without complex universals, can no more include 'Socrates is neither wise nor just' than '*x* is wise' can include 'neither Socrates nor Plato is wise' (pp. 20–1). So no intrinsic difference between universals and particulars can be inferred from – since none will explain – our associating atomic forms with predicates but not subjects.

Why then do we do that, thus making universals seem less 'real and independent' than particulars? Ramsey's explanation is this. A predicate symbol 'ϕ' can stand alone only if it names a real universal, not if it abbreviates (e.g.) ' has *R* to *a* or *S* to *b*'. This we must abbreviate to 'ϕx', to distinguish it from the two-place '… has *R* to *a* or … has *S* to *b*', written '$\phi(x,y)$'. But since it is irrelevant to an extensional logic whether or not 'ϕ' names a universal, we always write 'ϕ' as 'ϕx', '$\phi(x,y)$', etc., thus associating all predicates with atomic forms (pp. 26–8).

We cannot therefore infer from this practice that particulars differ intrinsically from universals. A logician can take 'any type of objects whatever as the subject of

his reasoning, and call them individuals, meaning by that simply that he has chosen this type to reason about' (p. 30). We naturally choose easily discriminable objects, such as those with locations in space and time, to quantify over first; but what makes them particulars is simply *that* we choose them, not why. But then the fact that objects of certain types fail to count as particulars, just because we choose to exclude them from the range of our *first*-order quantifiers, is no reason to deny, as nominalists do, that they exist. The existence of universals, i.e. of whatever we leave for our second-order quantifiers to range over, is no more problematic than that of particulars.

List of works

* Ramsey, F. P. (1990) *Philosophical Papers*, ed. D. H. Mellor, Cambridge: Cambridge University Press. (Contains all Ramsey's major philosophical papers. By permission of Cambridge University Press, this entry draws on the editor's Introduction to this book. Page references for the quotations from Ramsey's work refer to this edition; the dates given are those of first publication or, if published posthumously, of composition.)

Ramsey, F. P. (1990) 'Weight or the value of knowledge', ed. N.-E. Sahlin, *British Journal for the Philosophy of Science* **41**, 1–3. (Previously unpublished note calculating the value of collecting evidence for the truth or falsity of a proposition.)

Ramsey, F. P. (1990) *Notes on Philosophy, Probability and Mathematics*, ed. M. C. Gavalotti, Naples: Bibliopolis. (Previously unpublished notes.)

Ramsey, F. P. (1991) *On Truth*, ed. N. Rescher and U. Majer (1991), Dordrecht: Kluwer. (Previously unpublished notes for an uncompleted book on truth and related matters.)

References and further reading

* Armstrong, D. M. (1983) *What is a Law of Nature?*, Cambridge: Cambridge University Press, ch. 5.4. (Referred to in §4. Argues that Ramsey's first theory of laws of nature is the best Humean account of them and then attacks it.)

* Chihara, C. S. (1980) ‘Ramsey’s theory of types: suggestions for a return to Fregean sources’, *Prospects for Pragmatism: Essays in Memory of F. P. Ramsey*, ed. D. H. Mellor, Cambridge: Cambridge University Press, 21–47. (Referred to in §1. Defends a Fregean reading of Ramsey’s theory of types.)

* de Finetti, B. (1937) ‘Foresight: its logical laws, its subjective sources’, ch. VI, transl. H. E. Kyburg, *Studies in Subjective Probability*, ed. H. E. Kyburg Jr and H. E. Smokler (1964), New York: Wiley, 93–158. (Referred to in §2. Argues on operationalist grounds – see OPERATIONALISM – against objective interpretations of probability even in physics.)

* Jeffrey, R. C. (1983) *The Logic of Decision*, 2nd edn, Chicago: University of Chicago Press, ch. 3. (Referred to in §2. Interprets Ramsey’s ‘Truth and probability’ as a prescriptive subjective decision theory.)

* Keynes, J. M. (1921) *A Treatise on Probability*, London: Macmillan. (Referred to in §2. Gives the interpretation of probability as a measure of a logical relation of partial entailment attacked by Ramsey and later revived by Carnap.)

* Lewis, D. (1972) ‘Psychophysical and theoretical identifications’, *Readings in Philosophy of Psychology Volume I,* ed. N. Block (1980), London: Methuen, 207–22. (Referred to in §5. Uses Ramsey sentences to define mental states by their causes and effects.)

Mellor, D. H., ed. (1980) *Prospects for Pragmatism: Essays in Memory of F. P. Ramsey*, Cambridge: Cambridge University Press. (Contains eleven original essays on different aspects of Ramsey’s philosophy.)

* Mellor, D. H. (1991) ‘Properties and predicates’, *Matters of Metaphysics*, Cambridge: Cambridge University Press, 170–82. (Referred to in §5. Uses the Ramsey sentence of all laws to determine what empirical universals exist.)

Sahlin, N.-E. (1990) *The Philosophy of F. P. Ramsey*, Cambridge: Cambridge University Press. (A comprehensive introduction to Ramsey’s philosophy and also to his mathematics and economics, not dealt with in this entry.)

* Sahlin, N.-E. (1991) ‘Obtained by a reliable process and always leading to

success', *Theoria* **57**, 132–49. (Referred to in §2. Develops and defends Ramsey's reliabilist theory of knowledge.)

* Whitehead, A. N. and Russell, B. (1927) *Principia Mathematica*, 2nd edn, Cambridge: Cambridge University Press. (Referred to in §1. The basis of Ramsey's attempt to reduce mathematics to logic.)

* Whyte, J. T. (1990) 'Success semantics', *Analysis* **50**, 3, 149–57. (Referred to in §3. Gives the truth conditions of beliefs as the conditions in which the actions they combine with desires to cause achieve the objects of those desires.)

* Wittgenstein, L. (1922) *Tractatus Logico-Philosophicus*, London: Routledge, §4.46. (Referred to in §1. The theory of tautology used by Ramsey to strengthen *Principia*'s definition of mathematical propositions.)