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**Frank Ramsey: A Sheer Excess of Powers**, by Cheryl Misak. Oxford: Oxford University Press, 2020. Pp. xxvii + 500.

It would be difficult to praise this wonderful book too highly. It is an exemplary biography, not only detailing the life and work of one of the most remarkable minds of the twentieth century, but also doing so with great panache, historical scholarship and philosophical understanding. Clearly the result of meticulous archival work, it does full justice to Ramsey's extraordinary abilities, and to his rich, if short, life. On the way it also illuminates the Cambridge of Ramsey's time, with its galaxy of economists, mathematicians and philosophers. But Ramsey's world extended beyond Cambridge. Certainly, it was occupied by Wittgenstein, Keynes, Russell, Moore, Hardy, and Littlewood, but Misak tells us as well of the Bloomsbury group, the Vienna Circle, psychoanalysts, and countless others. Since he made seminal contributions to mathematics, logic, philosophy, economics and decision theory it would be impossible for any normal human being to do justice to it all, but Misak deals with the problem by having specialist collaborators from different disciplines talk about individual contributions, in specialist boxes inserted within the main text.

Ramsey was born in February 1903, and died in January 1930, just before his twenty-seventh birthday. His father was a mathematics don, and his mother, Oxford-educated, a social reformer. They were part of the intellectual aristocracy that dominated the Cambridge of that era. Frank was an academic prodigy, progressing through scholarships and prizes to Winchester school, mathematics at Trinity College, Cambridge, and as soon as he graduated a Fellowship at King's. By 1922, while still an undergraduate and a teenager, he had completed the daunting task of translating Wittgenstein's *Tractatus* into English, which C. K. Ogden had invited him to undertake as one of the only people in England competent enough in both

philosophy and German to do so. He had also launched a refutation of Keynes's *Treatise on Probability* that was enough to perform the extraordinary feat of shaking Keynes's confidence in his own philosophical ability. To his great credit Keynes's admiration was such that he went on to baby-snatch Ramsey from Trinity to King's in 1924, shortly after he graduated, and they remained firm friends and colleagues.

The refutation of Keynes (published in *The Cambridge Review* in January 1922) showed an element in Ramsey's approach to philosophy that Misak is rightly anxious to emphasize. Keynes's theory of probability required logical relations between propositions whereby one would 'probabilify' another. Ramsey, although himself a mathematician and logician, would have none of this. Instead he turned to the actual human use of probabilities and chances, putting credences or degrees of belief where Keynes had asked for logical relations. This heralds the extent to which pragmatism, with its emphasis on the human use of concepts and their utility to us, permeated Ramsey's approach to philosophy. Misak shows that he was introduced by Ogden to the volume of writings of C. S. Peirce, *Chance, Love and Logic*, which Ogden had published in 1923. Ramsey finished reading it just as he was about to graduate from the Mathematics Tripos the following year. (The archival evidence is sketchy, but he was probably ranked top.) Peirce made a great impression on Ramsey, and themes from Peirce are woven into his papers from then until his death. Peirce's idea that a belief is manifested in habits of behaviour formed the germ of Ramsey's great writings on credence and probability, enabling him to weave the logic of probability into the human world in which it got its utility. It is also visible in Ramsey's brief work on the concept of knowledge, which avoids 'justification' in favour of causation and reliability. Apparently, Ramsey's notes on Peirce included a quotation: 'Let us not pretend to doubt in philosophy what we do not doubt in our hearts' (Misak, p. 144), which then moulded his attitude to induction, logic, and eventually scientific theorising. It also marked the beginning of his departure from the austere world of Russell's philosophy of mathematics, and Wittgenstein's *Tractatus*.

After graduation Ramsey pursued his academic interests and his personal life with equal enthusiasm. Suffering, like other young men of his time, from agonizing insecurities about sex he went to Vienna, where he met Wittgenstein, Schlick and Carnap, and undertook a course of daily psychoanalysis from Theodor Reik. By means of this, or perhaps instead by means of what he reported as some rather jolly encounters with a 'charming and good-natured' *fille de joie*, he was more or less cured. At any rate, very soon after his return he began a relationship with Lettice Baker, a freethinking and adventurous young woman, with whom he eventually had a somewhat testing open marriage in the manner of the Bloomsbury group.

At the same time as he was appointed at King's, he wrote his first large-scale academic essay 'The Foundations of Mathematics', extending and

repairing Russell's logicist programme and notably dividing Russell's paradox in set theory from other paradoxes using semantic terminology, thereby avoiding Russell's own ramified theory of types. Over the next five years he also gave an early defence of the deflationist theory of truth, insisting, however, that this was just one pillar of what he wanted to build, which was a comprehensive theory of judgment and belief. He was still engaged on that task in the final year of his life. Meanwhile, however in the paper 'Truth and Probability' he expanded his criticism of Keynes into a full-scale foundation of Bayesian decision theory, revealing for the first time how a firm empirical basis for the simultaneous measurement of a person's degrees of belief and rankings of preference could be had, and revealing as well that on pain of being open to a Dutch book, credence had to conform to the mathematics of probability. After the work of Leonard Savage in 1954 this became tarred with the brush of 'subjectivism', and Ramsey's view of probability is still sometimes called the subjective theory of probability. But as Misak stresses, he himself forewarned against the imputation. Certainly, degrees of belief are personal, and one person's may well be different from another's. But they are part of:

the system with which the speaker meets the future; they are not therefore subjective in the sense that if you and I enunciate different ones we are each saying something about ourselves which pass by one another like 'I went to Grantchester' 'I didn't'.

If we endorse different systems for meeting the future we disagree, and if one of us is basing their choice of system on false or unreasonable beliefs we can expect them to do worse. Ramsey always insisted on the objective basis for cognitive habits, even when holding that those habits are not so much matters of belief but, as here, dispositions to incur costs for benefits, or in the case of conditionals and open generalizations habits of inference, or in the case of causal interpretations of the world habits of intervention.

It is also important to realize that apart from the injunction to look for the evidence and base one's credences on what one finds, there are no direct prescriptions in Ramsey's work, as there are in subsequent theories of rational choice. As his second editor Hugh Mellor put it, 'Ramsey's theory of belief in "Truth and Probability" is a very—and very early—paradigm of a functionalist account of an aspect of mind' (Mellor 1990, p. xviii). As with much of his other work, not only in philosophy but also in mathematics and economics, it took several decades for the rest of the community to catch up.

Ramsey was always interested in social and economic problems, and during the first years of his Fellowship he had multiple conversations with the economists Keynes, Sraffa, Pigou, Harrod and others, who used him as something of a mathematical sounding board. These forays into economics resulted in two papers that were published in the *Economic Journal*. The first ('A Contribution to the Theory of Taxation') introduced what economists

now known as Ramsey's Taxation Rule, and the second, on the question of how much a society should save for the future ('A Mathematical Theory of Saving'), introduced a principle also today known as Ramsey's rule. This is not the place to describe the economics, although this is admirably done by Misak herself and by Partha Dasgupta and others in the relevant boxed contributions. It took a while for each to be appreciated, but in 2015 when the *Economics Journal* celebrated its one hundred and twenty fifth anniversary, it included both of these papers amongst the best thirteen it had ever published, and they are now at the foundations of their respective branches of economics. As Keynes said in his obituary of Ramsey:

When he did descend from his accustomed stony heights [the foundations of thought and psychology] he still lived without effort in a rarer atmosphere than most economists care to breathe, and handled the technical apparatus of our science with the easy grace of one accustomed to something far more difficult.

A final example of Ramsey's descent from the stony heights occurred when in the last two years of his life he tackled the formidable *Entscheidungsproblem* of finding whether there can be a mechanical procedure for discovering whether an arbitrary formula is a theorem in systems such as the predicate calculus. The solution had to wait until the mid-thirties when Turing and Church independently discovered the negative answer. Ramsey delivered partial results in a paper published posthumously ('On a Problem in Formal Logic') but *en route* came up with a mathematical result that, once more, had to wait for recognition until well after his death. Taken up by Paul Erdos and others it became the progenitor of an entire branch of combinatorial mathematics: Ramsey Theory.

After Wittgenstein's debacle as a schoolteacher in Austria, Keynes succeeded in inveighing him back to Cambridge in January 1929 ('Well, God has arrived. I met him on the 5.15 train'). Although Ramsey was universally regarded as the most benign and genial of friends, the suspicious and paranoid Wittgenstein had broken off with him back in 1925, and it took a while before they met in Cambridge. Wittgenstein was intent on getting a PhD, which he would need in order to hold down an academic job, by submitting the *Tractatus* as his dissertation, and much of Ramsey's final year was spent dealing with the many tragi-comic misunderstandings and accusations that Wittgenstein strewed over his own path to achieving this. The degree required a summary of the dissertation, which Wittgenstein flatly refused to provide. Ramsey stepped into the breach, writing it himself. Meanwhile however they talked incessantly. Misak makes it clear that Ramsey was chipping at the edifice of the *Tractatus* on several fronts, writing in a late note:

We cannot really picture the world as disconnected selves; the selves we know are in the world. What we can't do we can't do and it is no good trying. Philosophy comes from not understanding the logic of our language; but the logic of our

language is not what Wittgenstein thought. The pictures we make to ourselves are not pictures of facts.

He was also intent on getting Wittgenstein to make a place for the many things referred to in our language, such as causation, open conditionals, ethics, and chances which lay outside the austere world of atomic propositions and truth-functions of them. But to do so meant, again, bringing the use of language firmly into the centre of the picture. Wittgenstein struggled against this, before learning, over the decade after Ramsey's death, that it was useless to try to stem this particular tide. As he wrote in 1945 in the Preface to the *Philosophical Investigations*:

I was helped to realize these mistakes [in the *Tractatus*] —to a degree which I myself am hardly able to estimate—by the criticism which my ideas encountered from Frank Ramsey, with whom I discussed them in innumerable conversations during the last two years of his life.

Ramsey's death followed some weeks of gradual decline. It has proved difficult to diagnose what went wrong, but Misak presents a very plausible answer. Ramsey loved outdoor pursuits, including swimming. The symptoms he showed were consistent with Weil's disease, which could be caught from the urine of animals. Given the timings, it would have been possible that Ramsey contracted it in October 1928. In an inspired piece of detective work, Misak discovered that the first part of that month was indeed unseasonably warm, so it is not unlikely that a fatal swim in the river Cam precipitated the tragedy.

I wish to finish by raising a problem, partly philosophical but partly biographical.

Misak's biography makes clear that Ramsey was a good friend of the topologist, codebreaker, and computer pioneer, Max Newman, who although older than Ramsey had been a contemporary as a mathematics undergraduate, and became not only a colleague but a friend. As she also makes clear, every philosopher in Cambridge avidly read Russell's work, and of course Russell's views on mathematics were the topic of Ramsey's PhD. Now, in 1928 Newman had published his remarkable paper on Russell's 1927 book *The Analysis of Matter* (Newman 1928). Russell (in parallel with Carnap in the *Aufbau* (1928) and Schlick in his *General Theory of Knowledge* (1925)) was seeking to use logic as a tool for relaxing strict phenomenalism such as that in his earlier work (especially his 1914 *Our Knowledge of the External World*). He hoped instead to defend what became known as structural realism, in which, we can ascend from a kaleidoscope of raw sense data to reference to theoretical (here, physical) entities, although subject to the strict caveat that we can only ever understand their relations, or structural properties. In one way the programme was a natural extension of Russell's distinction, first expressed in 'On Denoting', between knowledge by acquaintance and knowledge by description: 'The distinction between acquaintance with

things and knowledge about them is the distinction between the things we have presentations of, and the things we only reach by means of denoting phrases' (Russell 1905, p. 479). Although in 1905 readers were allowed to apply denoting phrases in a vocabulary rich enough to provide the descriptions that identify this second, theoretical, class of things, by 1927 this had changed. Now, the vocabulary of external things, functions of them, their relations, and their properties, were all to be substituted by variables and existential quantifiers, giving what later became known as the Ramsey sentence of the theory that there is a common-sense physical world containing particular things with particular properties. Apart from logical vocabulary, the only denotations left referred to items of immediate acquaintance—sense data.

It seems obvious that in this process content is lost. When the body is found in the study Watson would not have admired Holmes for giving as his theory about it that some things or some persons bear some relation to this body. But Russell (and Schlick and Carnap) thought that in some circumstances what remains is the nugget of goodness – a description of the structure the theory gives to the physical world, which is in turn all that we know about it. Newman showed that this is not true, for the purely logical claims with which we are left do not in any contentful sense identify a structure. They just give us an uninterpreted formula of first- or second-order logic, and all that is necessary to give it an interpretation is a domain of sufficient cardinality. Any scientific content beyond what was given in observation has been destroyed. Holmes's theory is not a real theory at all:

Any collection of things can be organized so as to have the structure *W*, provided there are the right number of them. Hence the doctrine that only structure is known involves the doctrine that nothing can be known that is not logically deducible from the mere fact of existence, except ('theoretically') the number of constituting objects. (p. 144)

Russell replied to Newman with a letter in April 1928 (published in the second volume of his autobiography, p. 176) admitting to having read Newman's paper with 'some dismay': 'it is of course obvious, as you point out, that the only effective assertion about the physical world involved in saying that it is susceptible to such-and-such a structure is an assertion about its cardinal number'. Russell then suggested that he might consider adding to the pure observational basis (referring only to the kaleidoscope of internal impressions) some bridge notions such as 'co-punctuality' or spatio-temporal proximity, but he never pursued it, although he did repeat a similar structural approach in later work (Russell, 1948, p. 245).

Philosophers of science have good reason to wrestle with the problem Newman left. For it is a very powerful thought that the terms of a theory *must* be given whatever meaning they have by their roles in the inferences, either intra-theoretic, or from theory to observation, that the theory permits.

Where else do they get them? And those inferential roles are captured by the Ramsey sentence of the theory plus the analytic Carnap sentence connecting the quantifications to the theory's vocabulary.

Now we come to Ramsey's 1929 paper 'Theories', in which what became known as the Ramsey sentence for a theory was introduced. Ramsey was not directly talking about sense data and the physical world, but in more abstract terms about any 'primary system' of data, and theories in a secondary system erected to explain them. But it seems likely that Newman's point would apply in just the same way. All the Ramsey sentence does is provide a quantificational structure that (provided the data set is consistent) is bound to be satisfied in any world of equal or greater cardinality than that in which the data exist. Ramsey was at least as good a mathematician as each of Newman and Russell; he certainly knew Russell's work, and given that it had been presented in 1927 to the Moral Sciences Club, it is highly likely that he knew of the Newman paper. So why was he silent about the point that was obvious to both of them? It is after all worth remembering that model theory was quite well advanced by 1928 – Lowenheim's original theorem was published in 1915, and Skolem's additions in 1920 and 1923. If in 'Theories' he took himself to have come to a point at which Newman's problem isn't even a threat worth taking into account, I think it is a pity that he left his answer as veiled as he seems to have done (Ainsworth 2009).

I think that subsequent reflection has thrown up three classes of solution to Newman's problem, corresponding to the options Shakespeare puts in front of Malvolio: 'Some are born great, some achieve greatness, and some have greatness thrust upon them'. Born great implies that some theoretical notions have a privilege as of right: Carnap's idea of certain relations being 'founded', this being supposed to be a logical property, is a prime example. Russell did not say why he was attached to co-punctuality, but he might have felt something similar about it, and if we take a leaf out of Kant's book, some notion of causation applied across both the empirical and the theoretical worlds would be another candidate. Quite similarly Lewis thought that some properties and relations are by their nature—by metaphysical right as it were—the most eligible referents of our predicates. 'Natural' for Lewis is part of the old vocabulary, and we should possess the idea in advance of looking at any new theory (Lewis 1970).

The third idea is that terms have greatness thrust upon them if the electorate has more or less arbitrarily bestowed the honour: Goodman's conventionalist view of the way that some predicates become entrenched and others ostracized would illustrate this (given Carnap's own conventionalism about logic, his theory may not in the end be so different). This is, in effect, the theory Newman himself foresaw and attacked:

In the present case we should have to compare the importance of relations of which nothing is known save their incidence (the same for all of them) in a certain aggregate. For this comparison there is no possible criterion, so that 'importance'

would have to be reckoned among the prime unanalyzable qualities of the constituents of the world, which is, I think, absurd. (p. 147)

If we think that it is we ourselves who arbitrarily select members of the elite, we cannot at the same time accord them distinctive scientific authority.

This leaves achieving greatness, which would imply exactly that some pieces of vocabulary have worked hard to become members of the elite, presumably like all top executives by having roles in successful organizations—scientific theories with histories of success to their name—and that therefore form, and deserve to form, part of the habits with which we meet the future. If we return to Lewis's conception of 'natural' properties it is hard to see how its application could be known independently of the very scientific theory into which it is supposed to be injecting content. Nobody would have thought that superposition or entanglement or non-local interaction is a natural state before quantum theory canonized them. It seems much more likely that it works the other way around, so that it is the ongoing development of scientific theory that entitles us to select some properties and relations as having credentials making them more acceptable than others (Psillos 2009). Lewis is also happy about this, although thinking that science is detecting, rather than creating, the really elite nature of whatever answers to the terms in which it works (but this does leave it open whether there is really any new work for a theory of universals to do, or whether we just have to wait for science to do it for us (Lewis 1983)).

Where does Ramsey stand in this classification? If an answer is to be found in the interstices of 'Theories' it is quite hidden. It is a dense and difficult paper, well exhibiting what Misak singled out as the daunting speed and directness of Ramsey's writing, the result of the 'excess of powers' of her title. But I think on independent grounds we can place Ramsey firmly in the second camp. Greatness must be achieved. Ramsey had explicitly distinguished real relations from mere relations in extension, and I think it would actually be quite foreign to his thinking for him to have been drawn into the sparsely mathematical landscape of Newman's problem. For Peirce and any pragmatist we start *in medias res*. This means that even at their birth our 'theoretical' terms are never merely the uninterpreted signs of a formal language, brought into the world without any parentage, or orphaned and waiting to be adopted from somewhere outside their home if they are to have a semantic place in the world. Russell was bent on a foundational project quite foreign to Peirce. But then so are other theorists exploring the idea that parts of our vocabulary, in science or anywhere else, come into the world naked of any liaisons and histories and analogies, bringing to mind at least suggestions of ideas. When theorists first start talking of forces, causes, fields, they already have something in mind, waiting to be refined and made observable and measurable as the science develops (Hesse 1963). In my view, this makes it unclear how great a fan Ramsey himself

would have been of Ramsey sentences and their subsequent place in the philosophy of science.

In short, Ramsey can happily use terms that have come to deserve a place in our thought by their utility in historically successful and growing bodies of scientific theory (the importance of this capacity for growth was stressed in Earman 1978). The extent to which this leaves us having largely structural knowledge of theoretical entities, knowing them by their roles and their dispositions but not knowing whatever intrinsic natures they may have, and the extent to which this should trouble us, engendering what has been called Ramseyan Humility, are of course left as open questions (Psillos 2009 p. 148; Lewis 2009). This gives us another, very apt, phrase, to put to the memory of a great mind and a great man, who, ninety years after his death, now has a biography worthy of him.

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