WILLIAM KNEALE *Walter Stoneman*

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William Calvert Kneale 1906–1990

WILLIAM CALVERT KNEALE was the youngest of the three children of William Kneale (1860–1933) and Hannah Calvert (1869–1941). On his father's side the family had lived in Liverpool since his great-grandfather settled there from the Isle of Man in 1820. His father, like his grandfather, was a superintendent in a large building firm. He was schooled at the Liverpool Institute, one of the city's prize possessions; when it was killed off by the LEA in 1985, the *Liverpool Star* recorded that 'rich, famous and eminent former pupils gathered in their hundreds from everywhere in the British Isles to honour and mourn the school which sent them from the back streets of this city to pinnacles of eminence throughout the country.' The young Bill Kneale specialised in classics, as bright boys did in those days, though he had a strong interest in mathematics too. He went up to Oxford in 1923 with a scholarship to Brasenose, and got first class honours in Mods and Greats. A senior scholarship enabled him to follow his tutor's suggestion and study abroad: at Paris, where he went to lectures of the psychologist Janet, and Freiburg, where he heard Husserl. A legacy of this was his subsequent interest in intentionality and in Husserl's teacher Brentano: he was to become a very active Trustee of the Franz Brentano Foundation set up in the 1960s by Brentano's son.

His first teaching post was as assistant to Laird at Aberdeen, followed by an Assistant Lectureship at what is now the University of Newcastle upon Tyne, largely involving teaching political philosophy. In 1932 he returned to Oxford, to a lectureship at Exeter College

which was converted into a permanent tutorial fellowship the following year. In 1936 he met Martha Hurst, who was then a Fellow of Lady Margaret Hall. She had just become Oxford's second-ever woman philosophy tutor, and he was lecturing on Time, a subject in which she was much interested and on which indeed they were eventually to write a joint article. They were married two years later, making her one of the first married women Fellows of an Oxford college. Both husband and wife had to obtain permission from their Governing Bodies to live out of college. On the outbreak of the war he was conscripted to work as a civil servant in the Ministry of Shipping. There he organised and looked after the personal welfare of foreign seamen who had joined the Merchant Navy for the duration. In 1944 he was released to return to Oxford and the family were reunited. Their first child, George, a statistician, was born during the war, while the second, born a year after the war, is herself, as Jane Heal, a well-known philosopher.

He served as Senior Tutor of his college from 1945 to 1950. 'Conscientious and unflappable', said one of his fellow-tutors, 'he disposed of the strains and complications thrown up by the outbreak of peace, with the minimum of fuss and flurry'. His other major administrative work was his chairmanship of the committee of enquiry set up by the university in 1964 to look at the structure of the undergraduate curriculum. At the time almost all courses were in single subjects, with combinations like Philosophy, Politics & Economics a rare exception. The Kneale Committee recommended greater freedom in combining elements from different Honour Schools, including a Cambridge-style system in which undergraduates could go on from a Part I in one subject to a Part II in another. This was too radical for the university to accept, but the advocacy of combined Honour Schools was more successful, and Oxford undergraduates can now take numerous interdisciplinary combinations.

He was elected a Fellow of the British Academy in 1950. He was then only forty-four, but to its credit the philosophy section of the Academy recruits new members a decade younger than their opposite numbers in other subjects. He was a prime mover in the Academy's Medieval Logic Texts project, and in retirement he was to serve as Vice-President of the Academy from 1971–2. Meanwhile Oxford University appointed him White's Professor of Moral Philosophy in 1960. Since he had only published one article on moral philosophy at the time, this might seem a surprising choice, though less so when one recalls that his predecessor was J. L. Austin, for despite the university's

attachment to the historic titles of its chairs it also wished to use them to recognise the best available talent. It should be added that punishment was a philosophical topic that had strongly interested him for twenty years, while his Marett Memorial Lecture on *The Responsibility of Criminals* was to be one of his best pieces. After only six years in the chair, however, he retired early. Despite what has just been said, he did feel a bit cramped by its title, and wanted to be freer to pursue his main interests in philosophical logic and philosophy of language. The chair carried with it too a heavy load of teaching and administration for the B.Phil. degree, and his health also played a part: he was having a great deal of back trouble from a slipped disc and was beginning to suffer from arthritis of the hip. On retirement he was promptly made an Honorary Fellow by Corpus Christi, the college to which his chair was linked and to which he had therefore migrated from Exeter. He had already been made an Emeritus Fellow of Exeter and an Honorary Fellow of Brasenose and had been given Honorary Degrees by the Universities of Aberdeen and Durham, and subsequently he received a third Honorary Degree, this time from St Andrews.

The couple retired to Yorkshire where both had roots: she came from Skipton and one of his forefathers had been headmaster of a village school in the dales. They settled in Wharfedale, first at Burnsall, and then nearby in Grassington. A very hospitable couple, Martha and Bill lived a simple and industrious life. Until his health made rough walking painful they were very active out of doors and many summer's days at Burnsall included a swim in the devilishly cold river Wharfe. The University of Leeds made both of them Honorary Lecturers in the Department of Philosophy, where they were regular attenders at the Philosophical Society and the postgraduate seminar meetings. As well as writing a dozen articles in this period of retirement, he worked away at a book, *The Instrument of Thought*, a study of how languages came to have the structure we find in the languages of civilisation; but he never quite got it to his own satisfaction. Inveterately curious-minded, facts of every kind had always interested him (the house was full of reference books), but he took a special interest in natural and local history, topography and geography, and an outing with him would easily turn into an entertaining tutorial on all the various things encountered. He was a great attender at meetings of the WEA, the local Field Society, etc.; and it was at a local concert in Grassington that he died of a sudden heart attack in June 1990.

He was brought up as a Methodist, but was much taken with the

works of Chesterton as an undergraduate and was attracted by the idea of becoming a Catholic. He could never accept the doctrine of atonement, however, and he remained — rather regretfully — a sympathetic agnostic all his adult life. In politics he was a strong supporter of the Liberal party and of the Liberal-SDP alliance. He was sober in every sense of the word, scholarly, concerned to get it right, with a fairly old-fashioned conscience and entirely devoid of any kind of affectation. He had no foibles or oddities, but in private as in public was a kind, generous, calm, straightforward man.

He saw his primary vocation as that of a teacher. Characteristically, he said that he had devoted to *The Development of Logic* 'all the time I could spare from teaching and other more urgent activities'. He was a good lecturer, his exposition being exceptionally lucid and unfussy, and a good tutor, friendly and conscientious and giving a general impression of sanity and common sense. He believed in philosophy as a training for public life, where, as he said, 'the first step must be an effort to get rid of confused thinking. So long as we are muddled and uncertain about our aims it is always possible that we may fall into injustice or inefficiency — or, what is more likely, both at once.' His pupils agreed:

> You took me for my final set of tutorials and I have over and over again told people that those tutorials were worth my entire Oxford experience. In my career in the US Navy I spent a goodly amount of time doing analytic work as to what kind of a Navy we should have. The logical thinking processes that you taught me were of inestimable value. In my subsequent career as Chief of American Intelligence, I was continually forced to deal with subject matter over which I had little command. The best I could do was to probe with logic in an attempt to find what the determining issues truly were. Many times I have been asked by young men and women what they should study in order to achieve some particular goal. Inevitably I tell them the story of why having studied philosophy under you was of great value to me in a non-philosophical career as a military officer. I suggested that what they need was to find any way to develop their powers of reasoning no matter what the subject matter.

He was one of the group of young philosophy dons who had begun to shake up the subject at the university in the thirties. Gilbert Ryle was his closest Oxford friend, and he himself was way ahead of the times in his knowledge and enthusiasm for modern logic. In the immediately post-war years his lectures were among the highlights of Oxford philosophy, but they were far from being contributions to the main

line of its development at that time. Discussion at Oxford was coming to be dominated by the treatment of philosophical problems, in one way or another, as problems about the structure and semantics of language. Ryle, Austin and others seemed to be among the leaders of a revolutionary movement that promised an exciting reconceptualisation of traditional questions. But Kneale preserved a careful distance from the substance of these popular analytical programmes, while sharing with them their ideals of rigour in argument and clarity in exposition. As a result his lectures won quite a number of the younger generation to the view that at least some genuinely respectable problems were too deep to be resolved by fashionable techniques of linguistic analysis.

He was an excellent judge both of people and ideas. He could emphasise the importance of something without overdoing it; he could cut things down to size without the least tendency to belittle. Just once, reviewing an abysmal translation of some medieval logical tracts, he was provoked to conclude

> Sometimes, indeed, X seems to agree with the schoolboy who said, 'Does it have to make sense? It's Latin'. A plain reprint of the Latin text would have been useful, but misrepresentation of this kind is a disservice to medieval studies.

But such severity seems to have been a unique exception. Otherwise, as in his frequent contributions to the discussions at Joint Sessions, however critical he might be he was always positive and nearly always managed to extract something worthwhile from what was being said. Together with his breadth of learning, his judiciousness made him among other things a superb examiner. When there was disagreement between the examiners of a Ph.D. thesis, 'Ask Kneale to decide' would be the obvious solution.

He had begun writing his book *Probability and Induction* in 1939, but his work on it was interrupted by his wartime activities and not completed until 1946. The book was published by Oxford University Press in 1949. The thrust of his contribution to the subject was to argue for an uncompromisingly realist account both of probability and natural laws. Indeed he saw the two as intimately connected, since the statement of a natural law whereby all *A*s are *F* could always be identified with the assignment of value 1 to the corresponding probability $p(F,A)$. So he quite naturally rejected the subjectivist identification of

probability with degree of belief. Complete confidence that all actual *A*s are *F*, he argued, does not necessarily carry with it any confidence at all that if some other particular had been an *A*, it would also have been *F*. It is equally wrong to identify the probability of an *A*'s being *F* with the relative frequency of *F* things among *A*s, for this runs into irresoluble difficulties where the reference class is infinite or the probability at issue is the property of an individual outcome rather than a class of outcomes. The thesis that probabilities are not relative frequencies fits in closely with the rejection of a Humean account of natural laws. If probabilities are not just frequencies of conjunction, natural laws are not just uniformities of conjunction. Kneale argued instead that if there are any natural laws of the kind scientists have often tried to formulate, they must be principles of necessitation. That is to say, they must impose limits on possibilities of co-occurrence. And their necessity is not of some special kind but is all of a piece with the necessity of logical laws, even though any knowledge acquired of them differs from knowledge of logical laws in virtue of its being empirical. Correspondingly, we need a concept of the field of possibility — the space of compossible worlds — that is left open by being an *A*, and if this is called the 'range' of *A* we can equate the probability of a thing's being *F* given that it is *A* with the ratio of the range of the combination of *F* and *A* to the range of *A* on its own. Intuitively, this ratio may be described as measuring a certain kind of difference that being an *A* makes to being *F*. But while Carnap's analysis of probabiity in terms of range-ratios treated that difference as just a matter of how actual occurrences and non-occurrences are spread, Kneale went on to treat such spread as a display of principled necessitation.

On his view, then, the assertion of a natural law is just a limiting case of the assertion of a value for a probability relative to its evidence. But it is quite another matter to assess, as scientists routinely do, how far the available experimental or observational data lends acceptability to the assertion of a natural law or probability. That kind of higher-order judgement cannot on his view apply any quantitative measure, and *a fortiori* it does not apply any probability function. Instead, he thought, we consider one hypothesis to be more acceptable than another if it is less extravagant or less negligent or both. It is less extravagant if any gratuitous addition that it makes to the relevant field of possibility is smaller than any gratuitous addition made by the other hypothesis. And it is less negligent if it does better in exploiting any opportunities for increased simplicity or precision that are afforded by the evidence.

Kneale thought it important, however, to distinguish between what he called 'primary' and 'secondary' induction. Primary induction involves generalisation about perceivable objects and properties, while secondary induction involves non-perceivable ones, such as subatomic particles or electromagnetic radiation. Both are subject to the ideal of minimising extravagance and negligence, but secondary induction aims also at the explanation of generalisations already accepted by primary induction and the prediction of new generalisations that would be acceptable to primary induction. Induction is therefore a policy of enquiry, not a mode of argument. Primary induction is the policy of searching for acceptable statements about — total or partial — conjunctions of characteristics and assuming the impossibility of conjunctions not discovered by continued search. What is rational here is always to make the strongest assumptions consistent with the known facts. Secondary induction is then the policy of searching for a single all-inclusive system of explanation. So the classical problem of induction — about how to justify arguments from limited evidence to open-ended conclusions — can be side-stepped. Since there are no alternative policies by which our enquiries can lead us beyond the given, it is rational for us to pursue the policies of primary and secondary induction.

He thus developed a systematic philosophy of induction and probability that offered an attractive alternative to accounts based ultimately on Hume's identification of natural laws with de facto conjunctions of events. And his analyses were buttressed by powerful arguments. He showed, for instance, how attempts to justify induction by an inversion of Bernoulli's theorem are bound to break down. He showed how the calculus of chance can be considered applicable even to a deterministic world. And he had a particularly ingenious argument to show how high is the price that has to be paid for treating natural laws as generalised truth-functional conditionals. When, for example, the law that all ravens are black is equated with the statement that nothing is both a raven and not black, we have to suppose that whenever a certain kind of event (such as the existence of a non-black raven) has no actual instance, there must be a law of nature that bans it. Contrapositively, if there is no law of nature preventing a raven from being non-black, a non-black raven must exist at some time and place. In other words, no failure to occur can be accidental: every natural possibility must be realised. But this is very difficult to accept, as he pointed out. It is at least conceivable that there never has been and never will be a chain reaction of

plutonium within a strong steel shell containing heavy hydrogen. But we need not suppose a law of nature excluding such events: their absence may be perfectly well explained by the variety of factors that in practice prevent or deter human beings from creating the requisite conditions for them to occur.

The Development of Logic will stand as Kneale's monument, though it is of course a joint work. In the preface he explains how the idea of writing a history of logic first occurred to him in 1947, and how a decade later he had produced a draft of the book. But by then the first six chapters, which took the story from its Greek beginnings down to the mid-nineteenth century and which 'I had put together quickly in an impressionistic style', needed to be completely rewritten to match the larger scale of the six later ones that carried the story on from Frege to the present day. He revised three of them himself with the help of two terms' special leave, but 'even so I might have lost heart if my wife had not at the same time agreed to take charge of the Greek part'. The book was published by Oxford University Press in 1962. It has been reprinted eleven times and translated into six languages. It has indeed no rivals. Apart from anything else, Prantl's *Geschichte der Logik im Abendlande* pre-dates the advent of modern logic, while C. I. Lewis's *Survey of Symbolic Logic* leans so far the other way that although Leibniz is allowed in as a seventeenth-century Boole, Aristotle is an unperson. Only Bochenski's *History of Formal Logic* matches Kneale's in scope, and it is arranged as a chain of translated texts, linked by notes but with no attempt at a sustained narrative.

Kneale's philosophical work had always been soaked in the history of the subject. In one paper he half-apologises for having 'given a lot of space to quotation and exposition of old views'. This, he says, is 'partly because I personally find it interesting to approach some philosophical problems through consideration of the views of others, but also because I think that in this case some understanding of the history of thought is essential for an appreciation of the problem'. The cautious note struck here — 'some problems', 'this case' — seems to me to be a distinct understatement. I think he preferred to approach almost all problems via a consideration of the views of others, and believed that some understanding of their history is essential to a proper appreciation of almost all problems. In *The Development of Logic* this preference and this belief are set free to play across the whole field of logic. Through-

out the book, that is to say, his interest is primarily in the logic rather than in history for history's sake. For example, Whately's *Elements* played a great inspirational part in the nineteenth-century revival of logic, but it makes no intrinsic contribution to the subject and it gets no mention; on the other hand Frege's *Begriffsschrift*, which might have been written in hieroglyphics for all the impact it made, is given sixteen pages. After asking himself whether someone's work is interesting, Kneale asks himself 'is it true?', and where his author is in error or confused or has missed a trick, he feels free to take as long as he thinks necessary to clear the matter up.

A work of history of this critical kind gets its distinctive character from two sources: its author's conception of the subject in question, and his own qualities of mind. Logic for Kneale meant formal logic, the study of valid principles of inference applicable to all kinds of topic. The formal nature of the principles gives the subject a mathematical side from the outset. Having never lost his boyhood interest in mathematics, he was happy to do justice to this, but his standpoint was fundamentally that of a philosopher. Hence, for example, the way the second half of the book manages so remarkably to integrate the development of logic over the last hundred years with the development of the philosophy of mathematics over the same period. Hence too the way *De Interpretatione* and Aristotle's ideas on modality each receive as much attention as the syllogism; and so on. But perhaps because they are so sensible, his own actual philosophical positions are generally unobtrusive. The one exception is his doctrine of truth as a property of propositions rather than sentences, which is used both against Aristotle's treatment of tomorrow's naval battle and against Tarski's theory of truth.

Kneale's personality permeates the book. As well as his phenomenal erudition, he brought to it his marvellous sense of proportion, of relative size and worth in the intellectual realm. (When he announces that 'Abelard's mind was the keenest, though not in all respects the most admirable, that had been devoted to the subject for more than a thousand years', one sits up and takes notice.) He never forgets that, as the book puts it early on, 'matters which are now perfectly plain were very difficult when they were first thought of'; and I do not think there is a person or period for which a reader will fail to come away with a heightened appreciation. He had a gift for systematic elucidation that was, as a reviewer put it apropos the chapter on medieval logic, 'remarkable for bringing order and sense into an extraordinary

complex mass of material, much of which might seem on its surface to resist both'. His scholarship is deployed with the lightest of touches—no lengthy footnotes or elaborate technicalities. The literary style is unpretentious but never flat: on the contrary, it has an easy graceful flow and liveliness, not so much humorous as amused. *The Development of Logic* is a classic in the field of the history of thought; it is also a book to read and re-read.

As well as these two books he wrote some forty shorter original pieces. A bibliography compiled by Amedeo Conte is included with his translation of *The Development of Logic (Storia della Logica,* Turin 1972). Items to add are 'Boole and the Revival of Logic' in *Mind* 1948, 'Perception' in *Perception: a Philosophical Symposium,* ed. F. Sibley 1971, 'A Fragment of Logic' in *Zeitschrift für Papyrologie und Epigraphik* 1973, and 'The Demarcation of Science' in the 1974 Schillp volume on Popper. His habit seems to have been to wait for an invitation before writing with a view to publication, for the great majority are papers given to the Aristotelian Society or the Joint Session, or public lectures such as the British Academy's Annual Philosophical Lecture, or contributions commissioned for books such as Ryle's *The Revolution in Philosophy.* The range of subjects covered is wide. Individual articles deal with time, substance, and mind and body. There are several on perception, including sense data, verification, and primary and secondary qualities. There is a series on the philosophy of science, mostly concerned with defending or elaborating the themes of *Probability and Induction.* There is another series on the history of logic. And perhaps a third of the total output deals with philosophical logic, the principal topics being necessity, propositions, indirect speech, and the paradoxes.

Several of these articles have become connoisseurs' items. I shall end with one of them, 'The Province of Logic', but meanwhile here is Jonathan Bennett in a private letter on 'The Notion of a Substance':

> Kneale's 'The Notion of a Substance' is one of my favourite philosophical papers. It starts with a beautiful sketch of the contrast between the notion of substance in Aristotle's *Categories* (the notion of a thing or subject of predication) and what the notion had turned into in the early modern period (the notion of something simple and/or sempiternal), with some shrewd conjectures about how and why the change occurred. From there Kneale moves on to Hume and thence to Russell's atomism. The paper is chock-full

> of good questions, solid challenges, original proposals and suggestive wonderings, all presented in the plain unfussy way that Kneale did everything. He discusses the credentials of the belief that a simple substance can neither come into nor go out of existence (unproven, but hard to shake off); the idea that events are substances (which threatens to imply that some of them have no duration); the view that higher-level things are always sets of lower-level things (refuted by the waves of the sea, which move as no set of water particles does); the concept of an atomic proposition (suspect, says Kneale: we know what it is for a sentence to contain others, but what is it for a proposition to contain others?); and on and on. It is a fine paper and still worth pondering. Bill Kneale told me that he did most of the thinking for it while on duty watching for fires early in the second world war. This is a pleasant thought. There he is on a London rooftop maintaining his lookout, no doubt with scrupulous care, while wondering whether it is really all right to believe in material substances.

and here is Myles Burnyeat on 'Time and Eternity in Theology':

> 'Time and Eternity in Theology' begins with a fragment of Parmenides: 'It neither was at any time nor will be, since it is now all at once, a single whole'. The fragment expresses an idea of eternity as present existence without temporal succession, which Kneale traces through Plato, Augustine, Boethius, and on to Aquinas. His question is why theologians should have found this a good way to think of the existence of God, given that 'on the face of it, talk about life without a distinction of earlier and later is self-contradictory'. His conclusion is indeed that 'if anyone thinks he can nevertheless make good use of the old phraseology, he must explain it afresh', but for students of ancient philosophy like myself Kneale's paper came as a revelation. Here was a sympathetic, patient exploration of a paradoxical-seeming but immensely influential ancient concept — an exploration which took the idea of eternity seriously, distinguished it clearly from the more familiar idea of timeless truth in mathematics, and tried to see if it could be made intelligible. As such, the paper remains a model of how to engage in a philosophical discussion of a historical theme. (It is appropriate that the next important contribution to the subject was an equally excellent paper by Martha Kneale: 'Eternity and Sempiternity', in *PAS* 1968–9. The debate continues.)

'Apart from the great innovators, the Freges and Russells, philosophers are remembered more for spectacular errors than for upholding unfashionable truths. Still, in the company of those who are remembered for the latter, he will have a place of honour.' This tribute to Kneale was handsome and just, but perhaps some part of all of us would secretly rather be a Cavalier — wrong but romantic — than a Roundhead. So it is nice to be able to conclude with a piece of work which both establishes

him as a true innovator and contains a spectacularly fruitful error. 'The Province of Logic' appeared in H. D. Lewis's *Contemporary British Philosophy, Third Series,* and its more technical middle half is reproduced in Chapter IX of *The Development of Logic.* A man of his character would not dream of canonising a piece of his own work in this way unless he thought its importance absolutely demanded it, and the importance he attached to it comes out in the section 'The Place of Logic among the Sciences' with which, significantly, *The Development of Logic* ends. This then is the story.

If one accepts that logical principles are validated by the meanings of 'and' and 'or' and the like, it is hard not to concede a similar character to truths validated by the meanings of any other words, whence the talk of 'the logic of colour-words' or 'the logic of "God"' which so irritated Kneale. Is there, he asks, any way of marking off the logical constants, thereby defining the scope of logic proper and incidentally deciding whether Frege did indeed manage to reduce arithmetic to logic. His answer is that logical constants are those words whose full sense can be given by laying down rules of inference for the propositions expressed with their help. Conjunction is the paradigm: the rules 'from *A&B* infer *A*', 'from *A&B* infer *B*' and 'from *A, B* infer *A&B*' give the whole sense of '&'. Contrariwise, although there are comparable rules like 'from *x is red* infer *x is not blue*' and 'from *x is scarlet* infer *x is red*', they obviously come nowhere near to giving the full sense of 'red'. Trouble arises, however, when we try to apply the idea to 'or'. The best we can get are Gentzen's natural-deduction rules, which appeal to subordinate deductions from suppositions and therefore depend on the rules for other words, creating an objectionable complication. The source of the trouble, says Kneale, is the fact that an inference cannot have more than one conclusion although it may have more than one premise. If we allow rules with several conclusions as well as several premises we can formulate satisfactory rules for the troublesome cases, and this is what Kneale does. But at the same time he sees the need for a generalised notion of proof (the essential complement to Carnap's innovation, which was a purely semantical notion of logical consequences with many conclusions). Think of a conventional proof as set out like a tree with the conclusion at the foot, premises and axioms at the top, and each node or fork in a branch corresponding to the application of a rule of inference. Then Kneale's proofs, or 'developments' as he called them, are similar except that they can fork downwards as well as

upwards, corresponding to the application of a rule with more than one conclusion. He illustrated the idea by using his rules to construct developments for each of the axioms and rules of propositional calculus in *Principia Mathematica*. Since it is known that every tautology is provable in the *Principia* system, it would be natural to suppose that a development for any tautology could be obtained by joining together the developments corresponding to the various steps in its *Principia* proof. Unfortunately this is not so. He had overlooked a subtle possibility which has no parallel in conventional logic. If the same proposition occurs several times over as conclusion of one development and also several times over as premise of another, joining together one copy of each development will deal with just one pair of these dangling 'heads', and each time another copy is added to deal with one of the remainder it brings new heads with it, like a hydra.

The moral is that 'developments' are too simple to serve as the required generalisation of proof. One needs to consider much more complex patterns in which branches that have forked may rejoin, creating closed circuits, and it takes quite sophisticated mathematical investigation to distinguish the admissible patterns from the fallacious ones. Working out these ideas could fill half a book, and has done just that (see *Multiple-conclusion Logic* by D. J. Shoesmith and T. J. Smiley, CUP 1978), where whole chapters and sections are devoted to 'Kneale proofs', 'Cross-referenced Kneale proofs', 'Recurring Kneale proofs', 'Infinite Kneale proofs'). His error, then, turned out to be a *felix culpa*; the generalisation of logic demanded by his definition of the subject turns out to have a life of its own, and is far from being a routine extension of conventional logic. And Kneale takes equal place with Carnap as founding father of this new province of logic.

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