

The public debate on Jock Kinneir's road sign alphabet

Ole Lund

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Prelude

There has been some recent interest in Jock Kinneir and Margaret Calvert's influential traffic signs and accompanying letterforms for Britain's national roads from the late 1950s and early 1960s. Their signs and alphabets prompted a unique public debate on letterform legibility, which provoked the Road Research Laboratory to carry out large-scale legibility experiments. Many people participated in the debate, in national newspapers, design and popular science magazines, technical journals, and radio. It was about alphabets and signs that would soon become – and still are – very prominent in Britain's 'visual landscape' and elsewhere in the world. The debate still surfaces occasionally, often with the facts severely distorted. This article, supported by studies of archival sources, traces the public debate.

author's address

Gjøvik University College
PO box 191
N-2802 Gjøvik
Norway
ole.lund@hig.no

In August 1961 two researchers at the Road Research Laboratory in Britain published a paper on the 'Relative effectiveness of some letter types designed for use on road traffic signs' (Christie and Rutley 1961b). It appeared in the journal *Roads and Road Construction*. A shorter version was published in *Design* the same month (Christie and Rutley 1961c). These two papers were both based on a report 'not for publication' finished in January the same year (Christie and Rutley 1961a). These papers represented the culmination of a vigorous public debate on letterform legibility which had been going on since March 1959. The controversy and the Road Research Laboratory's subsequent experiments happened in connection with the introduction of direction signs for Britain's new motorways.¹

The design of these directional and other informational motorway signs represented the first phase of an overall development of a new coherent system of traffic signs in Britain between 1957 and 1963. The new system was a late British adaptation to, but not an adoption of, European practice and the UN Geneva protocol of 1949. The new British system contained a large number of innovative direction signs for use on motorways (including direction signs on 'all-purpose' roads pointing to connected motorways), direction signs for use on major 'all-purpose' roads, and direction signs for use on local 'all-purpose' roads. The new British system also included basic categories of largely pictorial traffic signs (both iconic and symbolic), such as mandatory signs, prohibitory signs and warning signs. Although modified and redrawn, the basic pictorial traffic signs were more directly adopted from the 1949 Geneva Protocol than were the direction signs.²

1. Motorways had been discussed in the Ministry of Transport since before the second world war (when they had been built in Germany, Italy and the USA). A working party was set up in 1953; it produced a general report (5 Feb. 1955). A short report on 'Signs for motorways' was produced in the Ministry (8 Nov. 1955). In 1957, after work had begun on the M1 (London – Birmingham) another report, 'Notes on motorway signs', came out. The Anderson committee on 'Motorway signs' was established in autumn 1957. The minister set up another committee, in order to advise on general road signs. (PRO: MT 126/1). Ideas of building motorways in Britain date back to the turn of the century; pressure increased from the mid 1930s (Charlesworth 1984; Smith 1998).

2. For background, see Moore and Christie 1960 (by two researchers at the Road Research Laboratory, comparing motorway direction signing in Britain, Germany and the USA); Schreiber 1961 (a history of roads); Spencer 1961 (an illustrated depiction of Britain's chaotic and insular traffic signs before this work started); Ministry of Transport 1962 (The 'Anderson report' on traffic signs for motorways); Ministry of Transport 1963 (The 'Worboys report' on traffic signs for 'all-purpose' roads); Froshaug 1963 (profusely and systematically illustrated article on the development of traffic signs and the Geneva 1949 protocol, leading up to the new British traffic sign system based on the recommendations of the Worboys committee); Ministry of Transport and Central Office of

Information 1965 (leaflet presenting 'The new traffic signs'); Moore n.d. (review of legibility research on road direction signs); Krampen 1983 (a special issue of *Semiotica*, on the origin and development of road sign systems in an international context), Charlesworth 1984 (the prehistory and history of British motorways); Charlesworth 1987 (history of the Transport and Road Research Laboratory); Department of Transport 1991 (brief history of traffic signs in Britain); Department of Transport 1994 (design manual for British directional signs); Department of Transport 1995 (comprehensive exposition of current British traffic signs); Smith 1998 (prehistory and history of British motorways); Baines 1999 (richly illustrated article on the British 'Kinneir/Calvert' road signs).

3. Sir Colin Anderson (1904–1980) had a distinguished career in transport and was president, National Council of the Design and Industries Association 1950–53, member of the Council of Industrial Design 1951–60, chairman of the Contemporary Art Society 1956–60, chairman of the Orient Line 1952–60, director of Midland Bank 1950–74 (Moriarty 2000, p. 57).

4. Froshaug 1963, p. 50; also Krampen 1983, p. 110.

5. Kinneir (1917–94) trained as an engraver; after wartime active service he designed exhibitions for Central Office of Information. He joined Design Research Unit in 1950. He started a design practice in 1956; one of his first jobs was the signing system for Gatwick Airport. He had just completed a baggage labelling system for Sir Colin Anderson's Orient Line, when he was engaged as a designer for the Anderson committee. (Hopkins 1964; Stephenson 1971; Kinneir 1983; Kinross 1994).

6. See Kinneir 1970, pp. 15–16.

7. Margaret Calvert (b. 1936). 'In the studio, Margaret Calvert's eye for detail was crucial in the drawing of the alphabets and the pictorial signs.' (Baines 1999, p. 32).

8. 'We have as a committee got into the habit of accepting the general weight & appearance of the German alphabet as being the sort of things we need! I think therefore something on these lines is what the committee believes it wants.' Letter from Colin Anderson to Jock Kinneir, 26 June 1958. (Margaret Calvert, London).

9. Kinneir 1971, p. 6; 1984, p. 344.

10. The skeletal structure of several characters in Kinneir's alphabet (a, c, e, g, k, y, s) resembles another sans serif, the Berthold Grotesk. However, the latter has a quite different overall look.

11. Akzidenz Grotesk 'halbfett' was issued in 1909 by Berthold in Berlin (ATypI 1975, p. 1), as a member of its existing Akzidenz Grotesk family. The display of 'halbfette' Akzidenz Grotesk in F. Bauer's comprehensive account of new typefaces issued in Germany 1908–1912 (Bauer 1912, p. 290), suggests that 1914 for 'halbfette' Akzidenz Grotesk in Seemann 1926 (p. 205) must be wrong. The Akzidenz Grotesk family was developed from sans serifs from the Bauer foundry in Stuttgart, which had been acquired by H. Berthold AG in 1897 (Bertheau 1995, pp. 2, 85, 92, 512–513, 558–559; Bauer 1928, pp. 25, 179).

12. Parallel to the continental popularity of Monotype's similar but somewhat more quirky Grotisque 215 and bold 216. (First issued 1926, and influenced by 19th century sans serifs from Stephenson Blake.)

13. The numerals for route numbers only (& letters A, B, and M) were designed differently from the main numerals for distances and later for numbering motorway exits: they are condensed and rather angular.

The motorway alphabet

The advisory committee on traffic signs for motorways (1957–1962), set up by the Ministry of Transport, and chaired by Sir Colin Anderson,³ consulted a large number of interested organisations and it also did something which was then ground-breaking:⁴ in June 1958 it appointed a professional designer. Jock Kinneir⁵ had by then already designed the signing system for Gatwick Airport.⁶ Together with his young assistant Margaret Calvert,⁷ and on the basis of the committee's broad recommendations, he designed the elegant and innovative motorway direction signs, as well as their accompanying letterforms.

Kinneir, who had rejected on 'aesthetic grounds' the committee's initial wish⁸ to employ the German DIN sans serif lettering of capitals and small letters,⁹ designed a new sans serif alphabet (see figure 1). It resembles and was probably based on the typeface Akzidenz Grotesk from the German type foundry Berthold (see figure 2). Both Richard Hollis (1994, p. 161) and James Mosley (1999, p. 9) claim that Kinneir's alphabet for road and motorway signs was based on Akzidenz Grotesk, or Standard as it was called in English speaking countries. A careful visual inspection of Akzidenz Grotesk 'halbfett' (Standard 'medium') and semi-bold (not regular) variants of similar sans serif typefaces with open semi-enclosed counters and diagonally cut terminals of letters like a, c, e and s, supports this claim. That is, a strong family resemblance is present between Kinneir's alphabet and Akzidenz Grotesk 'halbfett', while the individual shape of several letters are different.¹⁰ Thus, Kinneir's alphabet is far from a mere modification of Akzidenz Grotesk 'halbfett'. It is a unique alphabet with a combination of many specific features such as the discriminating Edward Johnston-like 'legibility' hook on the lower case letter l, the noticeable round dots of the lower case i and j, the diagonally cut terminal of the lower case letter a (unlike the inconsistent horizontally-cut terminal of the letter a of Akzidenz Grotesk 'halbfett'). In addition, each letter of the alphabet has a unique individual design, and the alphabet has also a unique letter spacing system.

It is worth noting that Akzidenz Grotesk¹¹ and similar sans serif typefaces had been revived by type manufacturers in continental Europe during the 1950s and that Berthold had started to re-issue the Akzidenz family in 1955.¹² Akzidenz Grotesk had quickly reached canonical status within the idiom of the high modernist 'Swiss typography' of the late 1950s, and had also reached the English speaking world. Furthermore, Linotype issued the Berthold Akzidenz Grotesk series 57 (normal) and 58 'halbfett' for linecasting machines in 1959. This was before the more regularised and enclosed sans serif typefaces like Folio, Univers, Neue Haas Grotesk/Helvetica, Mercator and Recta – all with horizontally cut terminals – became the dominant idiom.

Like the DIN alphabet suggested by the Anderson committee, Kinneir's new design is characterised by obliquely cut terminals as well as relatively open semi-enclosed counters of letters like a, c, e and s (figure 1).¹³ However, the DIN alphabet suffers from rather narrow and rectangular letterforms, and the terminals of its capitals with semi-enclosed counters are cut at inconsistent angles.



Figure 1. Jock Kinneir's original motorway alphabet, from the Anderson report. The letters ABM and associated numerals are for route-numbers only. The original background colour is blue. (From: Ministry of Transport 1962, pp. 36–41: figures 1–4.)

Figure 2. Akzidenz Grotesk 'halbfett' in a Berthold specimen from c. 1960 (*Die «klassische» Grotesk*, Probe nr. 462).



Kinneir's new design got the committee's full support, as well as 'almost unanimous' support from the consultative organisations.¹⁴ When designing the sans serif alphabet, Kinneir and Calvert performed informal 'low-tech' experiments: with reflective material in an underground garage in order to determine a sensible weight; and in Hyde Park in London in order to determine sensible appearance-widths and a sensible x-height. In addition, informal experiments were performed in order to create an appropriate letter spacing system. Kinneir later commented on other aspects of the creation of the sans serif letterforms in question:

The basis of the letter design was the need for forms not to clog when viewed in headlights at a distance. For this reason counters ... had to be kept open and gaps prevented from closing. Also, as pointillist painting has shown, forms tend to merge when viewed from a distance, and this suggested a wider letter spacing than is usual in continuous text. (Kinneir 1984, p. 344)

The public controversy

It was exactly this letterform that – after appearing on the first experimental motorway signs put up in 1959 – generated the most heat and provoked a public controversy on letterform legibility. The controversy was present in the columns of publications as diverse as *New*

14. Ministry of Transport 1962, p. 4. Specimens of the alphabet appeared, without a name, in the Andersen committee's report (i.e. Ministry of Transport 1962, pp. 35–39).

15. The following chronological list is not exhaustive. Letter to the editor of *The Times*, 17 March 1959, p. 11, by Brooke Crutchley, printer to the University of Cambridge; attacking Kinneir's work. Letter to the editor of *The Times* 20 March 1959, p. 13, by Noel Carrington, an editor, designer and member of the advisory committee; supporting Kinneir. Letter to the editor of *The Times* 24 March 1959, p. 13, by J[ohn]. G. Dreyfus, and by G. S. Bagley, both attacking Kinneir's work. Editorial note under the heading 'Better traffic signs' in *New Scientist*: vol. 5, no. 124, 2 April 1959, p. 731. Main editorial article, 'Which signs for motorways?', in *Design* no. 129, Sept. 1959, pp. 28–32 (*Design* 1959). This article reported a discussion meeting organised by the journal (initiated by Brooke Crutchley, according to Crutchley 1980, p. 133), with contributors such as: a car manufacturer, a traffic sign manufacturer, the Ministry of Transport, the Road Research Laboratory, a landscape architect, Dr E. C. Poulton from the Medical Research Council's Applied Psychology Research Unit in Cambridge, David Kindersley, Jock Kinneir, Brooke Crutchley, as well as other designers and typographers. Letters to the editor of *Design*, no. 132, Dec. 1959, p. 71 (by Herbert Spencer, and by Aidron Duckworth). Letters to the editor of *Design*, no. 133, Jan. 1960, pp. 75, 77 (by Ernest Hoch, and by Norbert Dutton). An article by David Kindersley in *Traffic Engineering & Control*, Dec. 1960, pp. 463–5 (Kindersley 1960). A note in the 'Peterborough column' in the *Daily Telegraph*, 8 March 1961, and a follow up note a week or so later. Kindersley also appeared in *Cambridge Daily News*, 9 March 1961. Subsequently, in August 1961, the two papers by Christie and Rutley at the Road Research Laboratory, were published in respectively *Roads and Road Construction* (1961b) and *Design* (1961c). Comments were invited from the designers Herbert Spencer, Reynolds Stone and Colin Forbes; these were appended to the article in *Design*. Letters to the editor of *Design* followed up the debate in subsequent issues: In no. 154, October 1961, pp. 87, 89, by Hans Schmoller, and by David Kindersley. In no. 155, November 1961, p. 77, by Colin Forbes. In no. 156, December 1961, pp. 81, 83, by A.G. Long.

16. Letter from Jock Kinneir to Ministry of Transport, dated 17 March 1961. Letter from Ministry of Transport to Kinneir, dated 24 March 1961. (RTC.51/2/03. Margaret Calvert, London.)

17. Christie and Rutley 1961b, p. 239. See also (PRO: MT 126/1, Advisory Committee on Traffic Signs for Motorways: Interim Report, p. 3).

18. Kindersley had been in dialogue with the Ministry of Transport since 1949 when he had proposed for the Ministry that his new street name-plate alphabet (of seriffed

Scientist, Design, Roads and Road Construction, Traffic Engineering and Control, The Times, The Daily Telegraph, The Observer and Cambridge Daily News.¹⁵ In March 1961 BBC Television planned a debate between Kinneir and his opponent David Kindersley in the 'Tonight' programme. However, the Ministry of Transport advised Kinneir not to participate, while reassuring Kinneir that he had the committee's full support.¹⁶

In particular, the radical solution of employing small letters with initial capitals – never before used on standard British road signs¹⁷ – instead of using capitals only, was heatedly debated. Nevertheless, the use of sans serif instead of seriffed letters was also debated in this unique instance of a public discussion of letterform legibility.

The disgruntled opposition to Kinneir's solution was led by the 'traditionalist' letter cutter and lettering artist David Kindersley,¹⁸ a former apprentice and assistant of Eric Gill, and Brooke Crutchley, the printer to Cambridge University, both linked with the British mid-century typographic establishment (in which Stanley Morison was a central figure). I can only guess that this 'establishment', as well as being suspicious of continental modernism, must have been seriously offended by the fact that a major national letterform project had been initiated and partly implemented without it having been consulted.¹⁹ During the debate David Kindersley alleged that Kinneir lacked the basic competence and skill expected of a professional designer. He asserted that the reason why motorists could read Kinneir's direction signs 'is purely the result of their size and not due to any particular skill in their design', and further that size 'is only one of the many points a designer must bear in mind, and [it] is the easiest to determine'. He described Kinneir's alphabet as 'ill-chosen' and the road number figures as not conforming 'with the simplest rules of legibility'. He also described the layout of the direction signs as 'exceedingly inferior' (Kindersley 1960).

It was an illustrated article in *The Times* on 2 December 1958,²⁰ showing Kinneir's direction signs which were to be tested under actual traffic conditions at the soon-to-open Preston by-pass, that first provoked Kindersley (who had served the Ministry on several occasions in the past).²¹ The article in *The Times* led to an instant reaction. The very

capitals) should be adapted as the single standard in Britain. Although Ministry engineers supported the proposal, the Royal Fine Art Commission rejected his proposal (PRO: MT 95/28 1947–1952; MT 95/29 1952–1963; MT 1166; MT 126/1 1955–1968). The alphabet was approved by the Ministry of Transport in 1952 as one of several for street names (Ministry of Transport Circular no. 671, 28th May 1952), and Kindersley was engaged to advise on the spacing of all the recommended alphabets (the circular did not preclude the *ad hoc* use of other alphabets). Kindersley's alphabet was later to be widely used for street nameplates throughout Britain. James Mosley (1964, p. 48) has positively described it as 'using the Trajan idiom with vigour', while Alan Bartram (1978, fig. 59) has referred to it as a 'sluggish letterform' with 'malformed stumps of serifs'. However, at least two versions of this letter-

form seem to be in existence. The name-plate depicted in Mosley 1964 (and in Harrison 2000, p. 29) is a rather heavy-weight, vigorous, and beautiful interpretation of the Trajan idiom, while those shown in Dreyfus 1957 (p. 38) and in Baines 1999/2000 (p. 11), are rather anaemic and quaint looking.

19. See also Brooke Crutchley in his autobiography *To be a printer* (1984, pp. 128–140).

20. Kinneir was interviewed on BBC Radio in the 'Today' programme on 5 December 1958. (Margaret Calvert, London)

21. The article was based on a Ministry press notice on 'Motorway traffic signs: experiments on Preston by-pass motorway', which were to be tested for a while under actual traffic conditions, and an attached 'press summary' of an interim report of the 'Advisory committee on traffic signs for motorways'; dated 1 December 1958. This

was less than two weeks before the Prime Minister Harold Macmillan opened this first motorway stretch in Britain. Practical demonstrations of various combinations of messages, letterforms and background colour had been carried out in daylight and darkness for members of the Anderson committee at Hendon Airfield on 18 August, while 'driving at speed' along the runways with committee member Lord Waleran (a former racing driver!) behind the steering wheel. (PRO: MT 126/1). Work on the 8-mile Preston by-pass had begun in 1956; it later became part of the M6 motorway (Charlesworth 1984, p. 1, 35ff).

22. PRO: MT 126/1.

23. PRO: MT 126/1.

24. Brooke Crutchley in *The Times*, March 17, 1959, p. 11.

25. Most notably David Kindersley, Brooke Crutchley, John Dreyfus and G. S. Bagley (see note 15).

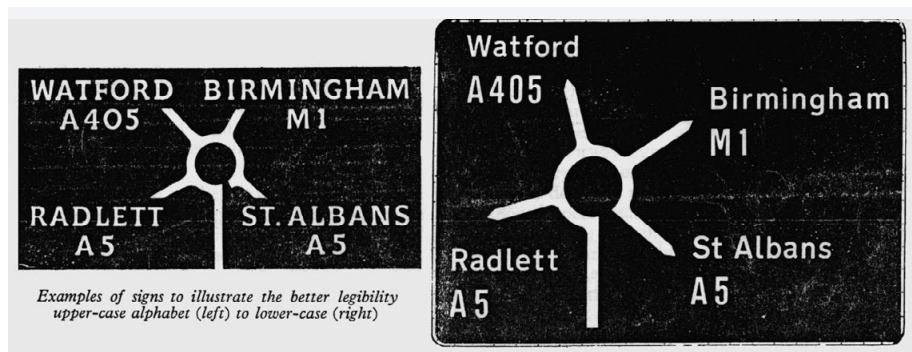
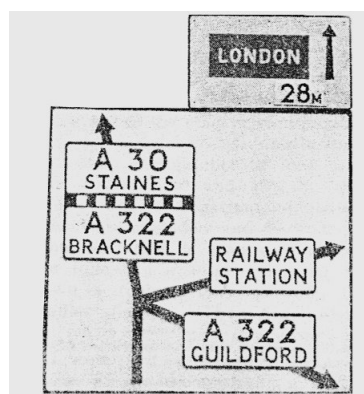
26. See especially Kindersley 1960.

same day Kindersley wrote to an old contact in the Ministry of Transport, a Mr Hadfield, asking for more information and a meeting. He stated that the letters on the direction signs 'don't appear to be very legible' and suggested that if lower case had to be used it should at least be a 'decent lower-case'. In a telephone conversation with Hadfield the following day, after extending his criticism by, among other things, pointing out 'the awful M', Kindersley announced that he would discuss the matter with Mr Brooke Crutchley, the Printer to Cambridge University, 'before deciding whether to make any public criticism'.²² In further correspondence between Kindersley and Hadfield at the Department during the winter, Kindersley disclosed his work on an alternative 'Mot-serif alphabet', and about the preparation of a letter to the editor of *The Times* by Brooke Crutchley.²³ The letter was published on 17 March 1959; it was this letter that started the public debate under discussion here. Crutchley asserted that Kinneir's solution ignored specialised 'knowledge accumulated over the years' and that there had been some 'misguided work behind the present proposal'.²⁴

The 'traditionalists'²⁵ argued that letterforms for destination names on sign panels are more legible in capitals than in small letters,²⁶ in spite of the fact that – as their argument goes – words in small letters are more legible for continuous text in books. (It was thus argued that words in small letters make both irregular word shapes and familiar word patterns for continuous text, and that this aids recognition.) The reason for preferring all-capitals for sign panels, according to the same argument, was that horizontal eye movements is not an issue on sign panels, and that place names are not familiar word patterns.

Figure 3. *left*: a pre-Kinneir, pre-motorway, directional road sign. (Christie and Rutley 1961b, p. 239: fig. 1). *right*: a Kinneir directional motorway sign. (From Ministry of Transport 1962, p. 59: fig. 38)

Figure 4 (*below*). An illustration from Kindersley 1960, showing a sign suggested by himself (*left*) and a Kinneir sign (*right*). Kindersley's caption reads: 'Examples of signs to illustrate the better legibility [of] upper-case alphabet (*left*) to lower-case (*right*)'. In his text, Kindersley comments on Kinneir's sign: 'Apart from the ill-chosen type, the height of the sign is still further exaggerated by large areas of wasted space, resulting from the off-centre and asymmetrical contemporary typographical fashion.' (Kindersley 1960, p. 464)



It was also argued that capitals are intrinsically clearer than small letters, especially when compared in the same nominal size. Therefore, the argument went, all-capital signs would allow for considerably smaller sign panels and therefore give large benefits with regard to the cost of production, as well as creating less impact on the landscape, and furthermore, smaller sign panels were easier to be caught in dipped headlights. The reasoning here was that as long as the dominant dimension of capitals (capital height) is bigger than the dominant dimension of small letters (x-height), big conspicuous all-capital lettering could be applied in a given area without the need to allocate space for ascenders and descenders.

It was further argued that serifs would strengthen terminals and thus define letters more clearly from a distance. In fact, David Kindersley proposed a theory of how serifs improve the legibility of letterforms in certain situations:

Try reading a page of sans-serif lower-case, and then a page of 'normal-face' and you will see at once that the normal one is more readable. The reason for the existence of the serif is clear, and is not just a meaningless tradition. In very small type, or in larger letters to be read at a great distance – in fact, wherever there is a question of distance in relation to size – there is always a loss of definition. The serif reinforces the individual character of the letter exactly where this loss is greatest. (Kindersley 1960, p. 465)²⁷

In the same article Kindersley continued his attacks on the motorway alphabet. On the numerals for use in route numbers only (and the associated letters A, B, and M) he commented categorically:

The road numbers, together with their letters, are even worse than the main alphabet, and do not conform with the simplest rules of legibility or differentiation. (Kindersley 1960, p. 465)

Against the arguments of the traditionalists, it was argued by the supporters of Jock Kinneir²⁸ that words with initial capitals and small letters provided more differentiated as well as more familiar word-shapes, as opposed to the rectangular and monotonous shapes of all-capital words. Words would therefore be easier to recognise from a distance. It was also claimed that the serifs and the modulated strokes of seriffed (roman) typefaces are not very well suited for reflective material.

The experiments

Comparative experimental research was recommended by several of the participants in the debate, especially at a discussion meeting organized by *Design* magazine.²⁹ The experiments subsequently undertaken by Christie and Rutley for the Road Research Laboratory³⁰ were, apparently, conducted as an answer to this demand. To put these experiments in perspective it should be taken into account that Kindersley's challenge was to a process that was already under way. It was not as if the job had been conceived as a public competition or competitive tender. The Anderson committee was fully in favour of Kinneir's proposal – based on parameters set by the committee itself. I think it is correct to say that the committee had no plans whatsoever

27. Reiterated in Kindersley 1974.

28. Most notably Noel Carrington, Herbert Spencer and Aidron Duckworth (see note 15). As a designer to a government committee, Kinneir did not (and could not) publicly reply to the attacks on his work.

29. The article 'Which signs for motorways?' reported the discussion meeting (*Design* 1959, pp. 28–32). See note 15 for the participants. Both sides claimed support from existing experimental legibility research (mainly on the question of capitals versus small letters, but also on the question of serif versus sans serif). See also a letter to the editor from Noel Carrington in *The Times*, 20 March 1959, p. 13; a letter to the editor from John Dreyfus in *The Times*, 24 March 1959, p. 13; as well as Kindersley 1960, p. 464. Also see references to existing research – for example to Forbes *et al.* (1950 [sic]) – in Christie and Rutley (1961a, 1961b, 1961c), in Moore and Christie (1960, 1963), and in the Anderson report (Ministry of Transport 1962, p. 4). Other references to existing research can be found in Reynolds Stone's invited comment (p. 61) appended to Christie and Rutley's paper in *Design* (Stone 1961); and in a letter to the editor from David Kindersley, in *Design*, no. 154, 1961, pp. 87, 89.

30. 'To assist the [Anderson] committee a substantial research programme was carried out in the Road User Section on the effects of factors such as lettering, size of sign, colour and lighting on the visibility and legibility of signs' (Charlesworth 1987, p. 120).

to abandon Kinneir's solution, regardless of the outcome of the Road Research Laboratory's experiment. The Kindersley 'challenge' was regarded with irritation in the Anderson committee as well as in the Ministry of Transport. As was pointed out in a letter to Jock Kinneir from the ministry:

You are already in a strong position vis-a-vis your detractors; it is you who were commissioned by the Department to do the job, it is your signs that have been erected on the motorways, and you can be sure of the solid support of the Committee for what you have done.³¹

In fact, Kinneir and the committee members tacitly regarded Kindersley as an indefatigable and annoying detractor who carried out a campaign based on 'tendentious claims and half-truths' against both the committee's and Kinneir's work.³²

Kindersley had stated optimistically that: 'No decision should be finally and publicly announced on the M1 signs until the facts are established by the Road Research Laboratory' (Kindersley 1960, p. 465). Dr E. C. Poulton³³ from the Applied Psychology Unit of the Medical Research Council, who participated in the discussion meeting organised by *Design*, 'was in no doubt that the facts could be established – providing the criteria could be agreed in the first place' (*Design* 1959, no. 129, p. 30).

Four different types of letterform were employed in the experiments:

- sans serif letters of capitals only, based on designs by Edward Johnston, commissioned by the Road Research Laboratory from the chief critic of Kinneir's solution, letter cutter David Kindersley;
- seriffed letters of capitals only, commissioned by the Road Research Laboratory from David Kindersley;
- Jock Kinneir's sans serif small letters (with initial capitals); by then already employed on the Preston by-pass in Lancashire;
- the same letters by Kinneir as above, but in a smaller size and applied with more interlinear space and more generous margins.

The aim of the experiment was to find out which of these types of letterform could be read at the greatest distance in order 'to keep the angle between the driver's line of sight and the road ahead as small as possible' (Christie and Rutley 1961c, p. 59). However, the experiment also aimed at investigating the question of capitals versus small letters, and in addition, investigating 'the value of serifs ... because it has been suggested ... that serified lettering is more legible than sans-serif lettering' (1961b, p. 240). Christie and Rutley alleged that the question of sans serif versus seriffed letterforms was only examined with respect to the two capital letter styles employed (since no small letters with serifs were included in this multi-variable experiment).

Altogether 6336 reading distances were recorded.³⁴ The experiments were conducted in an airfield at Benson in South Oxfordshire. In order to speed up the experiments the signs were attached to a car moving towards stationary observers instead of the opposite natural way (see figure 6). Christie and Rutley sensibly pointed out that this reversing should not affect the relative order between the letterforms.³⁵ The size of the letters on the test signs were around five times smaller

31. Letter from the Ministry of Transport to Jock Kinneir, 24 March, 1961, Ref. RTC.51/2/03. (This is the letter where the ministry advised Kinneir not to participate in a television debate with Kindersley.) (Margaret Calvert, London.)

32. Letter from Jock Kinneir to the Ministry of Transport, 17 March 1961; letter from the committee chairman Colin Anderson to Fred Salfield of the *Daily Telegraph*, 8 March 1961, complaining about the misinformed pro-Kindersley coverage in the newspaper's 'Peterborough' column the very same day, where it was reported that the Anderson committee was about to report to the Minister of Transport in Kindersley's favour; letter from Colin Anderson to Jock Kinneir, 6 April 1961. (Margaret Calvert, London.)

33. Poulton published several research papers on legibility in the late 1950s and the early 1960s, in journals like *American Journal of Psychology*, *Ergonomics* and *Journal of Applied Psychology*.

34. Christie and Rutley 1961a, p. 6.

35. Although Cohen (1981), according to Hughes and Cole (1986), demonstrated that eye movement behaviour is different in a laboratory situation from when actually driving on the road, Hughes and Cole claim that the pattern of eye movements is not a critical factor in the conspicuity of objects (Hughes & Cole 1986, pp. 1108–09).

than for Kinneir's real signs already in use on the Preston by-pass. However, absolute size and absolute distances were not in question here, and had been dealt with experimentally earlier (see *Design*, no. 129, 1959). Sizes were probably anyway expected to vary for different applications and situations.

The mean reading distances – where the longer the better – were, in descending order:

- 247 ft for David Kindersley's seriffed capitals;
- 240 ft for Jock Kinneir's sans serif small letters with initial capitals;
- 239 ft for the Edward Johnston-based sans serif capitals;
- 212 ft for Jock Kinneir's letterforms in a smaller size and with generous margins.

Figure 5. One of the 24 basic signs that were used in the experiment (here shown in four alphabets). The total number of signs was 96, based on four alphabets and 24 basic signs (6 single-name destination signs, 6 two-name destination signs, 6 three-name destination signs, and 6 message signs like 'Stop' and 'No entry'). From the top: Kindersley's 'Edward Johnston' alphabet; Kindersley's own seriffed alphabet; Kinneir's sans serif alphabet; and Kinneir's sans serif alphabet in smaller size and with generous margins. (Christie and Rutley 1961b, p. 240: figure 3c)



Figure 6. 'The experiment was greatly speeded up by mounting the signs on a vehicle and driving them towards a group of 10–15 stationary observers seated on a tiered platform.' Note the 'margins' of the board on which the signs are mounted. The subjects in the experiments were Royal Air Force volunteers, at Benson airfield, Oxfordshire. (Christie and Rutley 1961a, figure 4. The photograph was published in Christie and Rutley 1961b, p. 242, as figure 4; and later published in Mijksenaar 1971, p. 30.).



Discussion

While discussing their results, Christie and Rutley asserted that the difference in favour of Kindersley's seriffed capitals over the two sans serif letter styles was statistically significant – 'about 3 per cent ... i.e. the difference is unlikely to be due to chance' (1961c, p. 60). However they added that spacing, layout, and width to height ratio of the letters, might have been confounding factors. Nevertheless, they seem to have overlooked that – according to figures given in the text – the height of Kindersley's seriffed capital letters was at least 25 per cent larger than the dominant dimension of the largest version of Kinneir's sans serif letters, their x-height. Thus, since reading distance is to a large extent a function of letter size, results more favourable to Kinneir's letterforms could have been produced by increasing that size.

However, the Road Research Laboratory (as opposed to the Anderson committee), seemed persuaded by Kindersley and his supporters' heavily promoted view that the competing letterforms should be compared while positioned tightly into areas of equal size hardly without surrounding space, and by referring to the production cost per square unit of a sign. Under this unrealistic condition, capitals will inevitably create a more prominent visual image than small letters. This is because small letters will have to accommodate extra interlinear spacing for ascenders and descenders. Their visual size, expressed by x-height, will under this condition have to be smaller. Not only does this 'tightly crammed on an equal area' argument rely on an unrealistic condition (both printed matter and sign panels usually rely on relatively large areas of space around the text), it also disregards a basic heuristic rule among designers: that interlinear spacing needs to be larger for text in capitals than for text in small letters. Furthermore, it also disregards the fact that capitals are wider than small letters and so need considerably more space width-wise, something which might become a critical factor on sign panels with long destination names. Some long destination names even needed to be abbreviated or contracted on some sign-panels, and restricted space in some circumstances demanded economy in sign width.³⁶ Nevertheless, the Anderson report concluded this debate in the following way:

We feel ... that in designing a traffic sign regard must be paid to the space around the lettering as well as to the lettering itself, and that a sign that completely filled the space available would be so un-attractive as to be quite unacceptable. (Ministry of Transport 1962, p. 4)

Kinneir pointed out that 'The criterion requiring an economic use of sign surface was to be largely overridden by the need to achieve clarity of layout on the more complex signs' (Kinneir 1971, p. 10). A similar point of view had also been present in the internal discussions of the committee, where it was asserted that instead of filling the space available, a relatively large area of uninterrupted blue background against the landscape background was desirable in order to reduce background noise and improve the 'target value' of the sign.³⁷ Note that the experimental signs employed by the Road Research Laboratory, probably for similar reasons ('target value'), were mounted on a large khaki-painted panel, providing a wide margin, on top of the car that moved towards the stationary observers (see figure 6).

36. The Anderson committee was fully aware of this in its discussions (PRO: MT 126/1: 'Minutes of the twenty-second meeting' [of the Anderson committee] 25 April 1960). See also the discussion in the Anderson report (Ministry of Transport 1962, p. 9). Also of relevance here is a discussion in the Worboys report on situations 'when site conditions restrict the width of signs' (Ministry of Transport 1963, p. 10). See also PRO: MT 116/6: Appendix A to Committee Paper no. 4 (a talk on traffic signs by R. L. Moore).

37. Committee 'Notes', 29 February 1960; and committee 'Minutes' of the 22nd meeting, 25 April 1960; as well as a letter from Jock Kinneir to the Ministry of Transport, 17 March 1961. (Margaret Calvert, London.)

38. For a brief but useful discussion on the technical concept of 'statistical significance' see Pedhazur and Schmelkin 1991, pp. 202–3.

39. At an earlier instance Spencer had referred disapprovingly to Kindersley's alphabet as 'quaintly rustic letter forms' (Letter to the editor of *Design*, no. 132, December 1959, p. 71).

40. Letter from Jock Kinneir to the Ministry of Transport, 17 March 1961. (Margaret Calvert, London.)

41. Cyril Burt's and (fictitious?) co-author's once acclaimed article 'A psychological study of typography' was published in 1955 in the journal which Burt edited, *The British Journal of Statistical Psychology*. Burt's almost identical monograph, bearing the same title, with a foreword by Stanley Morison, was published by Cambridge University Press in 1959. The positive reception of these two publications until the early 1980s, among both researchers and designers, has been thoroughly dealt with by Rooum (1981) and Hartley and Rooum (1983). They have convincingly shown that Burt's dubious if not fraudulent practices also extended into his work on legibility and typography (see e.g. Hearnshaw 1979). Note that Robert B. Joynson's attempt to rehabilitate Burt (Joynson 1989) ignores Rooum and Hartley's devastating articles, and that Rooum and Hartley's articles are not mentioned in Mackintosh's collection (1995).



Figure 7. Davis Kindersley's capitals-only serifed alphabet. (*Design* 1959, p. 30)

Christie and Rutley seemed to be fully aware that the technical concept of 'statistical significance' does not express meaningful significance or substantial meaningfulness.³⁸ They concluded that 'the most remarkable feature of the results for the three ... scripts is that the reading distances are so nearly equal ... the difference is so small that caution is necessary in interpreting its meaning' (Christie and Rutley 1961b, p. 243), and 'the results do clearly indicate ... that none of the three scripts tested has any appreciable advantage over the others with regard to legibility' (Christie and Rutley 1961c, p. 60). It is thus reasonable to claim that no significant difference in legibility was found. In their conclusion Christie and Rutley also noted that the small difference between the two capital letter styles (one serifed and one sans serif) was not necessarily based on the serifs or lack thereof, but might depend on other variables.

Christie and Rutley finally concluded: 'Since there is little difference in legibility between the different types of lettering, it seems reasonable to make the choice on aesthetic grounds' (1961c, p. 60). They went even further and suggested that 'there are grounds for believing that aesthetic questions may be at the root of the controversy' (1961b, p. 243). In the final Anderson report, it is admitted that 'taste plays so important a part, as we believe it should' (Ministry of Transport 1962, p. 5). Herbert Spencer in his comment in *Design*, stressed that aesthetic consideration – 'taste, tradition, relevance and fashion' – were of utmost importance. He clearly expressed his disapproval of Kindersley's 'partially' serifed letters, which he described as 'clumsy' and as ignoring 'both taste and tradition' (Spencer 1961).³⁹ Also Reynolds Stone seemed unhappy about Kindersley's 'unusually serifed capitals' and he complimented Kinneir's sans serif letters. Nevertheless, he suggested that if 'good' small serifed letters had been included in the tests, they might have outdone the others (Stone 1961).

Kinneir referred, although not in public, to Kindersley's proposed alphabet as having 'mis-serifs': 'As far as appearance goes I cannot imagine even the most obdurate philistine wanting to cover England with 'mis-serifs!'⁴⁰ And in a much later account, Kinneir referred to the committee's view of Kindersley's alphabet as 'grotesquely ugly' (Kinneir 1983, p. 20).

Unsurprisingly, Cyril Burt's name was called upon in the debate:

Fashionable or not, the use of sans meant ignoring experts like the psychologist Sir Cyril Burt, who 'has recently recalled and reaffirmed scientific findings that "for word recognition a sans serif type face was the worst of all"'. (Stone 1961, here quoting P. M. Handover's recently published 'Letters without serifs', which again quotes Burt.)⁴¹

David Kindersley defended his design. In a letter to the editor of *Design* in a later issue, he applauded the tests undertaken by the Road Research Laboratory. He however urged that 'the conclusions drawn from it are bad – really bad' (letter to the editor, *Design*, no. 154, 1961, pp. 87, 89). He pointed out that the tests were not performed at 'real distances'. He claimed, referring to a study by the prolific American researchers Paterson and Tinker (1946) on the legibility of newspaper

headlines, that both capital legibility and seriffed letter legibility decrease at a lesser rate (assumably with an increase in distance) than for both small letters and for sans serif letters. Furthermore, he claimed that his letters for motorway signs 'can be read from at least 175 ft further away than the existing lower case signs [i.e. Kinneir's] with equal areas' (p. 89). I can only guess that this figure is based on calculations where several quantities are included – for example the differences of the results between his and Kinneir's alphabets, the difference between the test distance and a larger distance, and 'the decrease at a lesser rate' thesis referred to above.

Kinneir's supporter Herbert Spencer brought up a fundamental reservation about the value of experimental research, and cautioned:

Such tests of lettering as these are therefore useful in disposing of pseudo-scientific arguments, but in cases where the results strongly favour a particular design they must, to be of any practical use to designers, be elaborated upon so that we can clearly understand why one design functions more effectively than another.
(Spencer 1961).

It is interesting to observe in retrospect that the public debate on these new direction signs focused on only one – and a rather low-level – aspect of the new direction signs, their letter design. One of the letters to the editor of *Design* in the aftermath of the presentation of Christie and Rutley's research came from A. G. Long (assumably not a designer, perhaps a road engineer). He applied what today might be called a usability perspective and accused the research of suffering 'from an unnecessarily restricted consideration of some aspects and an unduly indiscriminate study of others'. He pointed out that the question of colour seemed to have been ignored, and the same applied to performance in bad weather, or in the dark while illuminated by different kinds of artificial lighting along the road and from the car. 'All these are surely more urgent problems of road design than a finicking survey of the effect of serifs on capital letters on large boards displayed in good conditions on the best roads.' (letter to the editor, *Design*, no. 156, 1961, pp. 81, 83). Note however that the discussions in the committee and the advice from the consultative organisations predominantly focused on more high level questions, like: the content of, and logical relationships between, the many categories of direction signs, as well as colour and illumination, and mounting and siting.

From the Anderson committee to the Worboys committee Jock Kinneir was subsequently engaged as designer to the Ministry of Transport's Worboys committee (1961–1963) on traffic signs for 'all-purpose' roads. The Worboys committee was served by a Working Party, with officers from the Ministry of Transport and the Road Research Laboratory. Kinneir was not a member of either the committee or the working party, but he attended practically all their meetings, at which he frequently demonstrated new design proposals.⁴²

Kindersley's challenge was however not laid to rest. The 'merits of upper and lower case lettering' was constantly recurring at meetings in the Worboys committee, and considerable resources were employed to deal with the question. The admission was that 'it was essential that

42. PRO: MT 116/1–17.

[the committee] recommendations should be on a firm basis'⁴³ and that Kindersley should 'be given a full and fair hearing'.⁴⁴

At the second committee meeting Christie from the Road Research Laboratory introduced the subject by describing the comparative research from 1961 on Kindersley's and Kinneir's letterforms. He concluded that there were 'remarkably little differences'.⁴⁵ In a later meeting the committee summed up Christie's presentation: 'that from the point of view of functional effectiveness there was little to choose between upper and lower case lettering; on grounds of taste and appearance they were firmly in favour of lower case'.⁴⁶ According to a tabulated review of comments from the 26 organisations consulted by the Worboys committee, none requested upper case letterforms, and only two explicitly requested lower case.⁴⁷

Two 'Committee documents' were dedicated to the question of 'upper case' versus 'lower case': 'A comparison of two designs for a stack-type advanced direction sign'⁴⁸ (figure 8), and 'The claims of Mr. Kindersley on behalf of upper case lettering on road signs'.⁴⁹ In the latter it was revealed that

David Kindersley during April continued the campaign already conducted with Sir Colin Anderson's Committee on Motorway Signs to urge the superiority of upper-case for road signs. His argument is that upper-case letters, because they do not waste space with ascenders and descenders, can be larger and therefore more legible in a given space than lower case letters. This was specially true of serified upper-case. Therefore, if upper-case lettering were used, road signs could be considerably smaller and less expensive.

An experiment and a comparison test between signs with Kindersley's letterforms and signs with Kinneir's letterforms were performed by the Road Research Laboratory for the Worboys committee.⁵⁰ The experiment and the comparison test are both described in 'The claims of Mr. Kindersley ...'.⁵¹

The experiment involved 13 subjects who were passengers in a car. Interestingly, while implicitly discussing internal validity problems in this multi-variate experiment (posed by confounding factors such as variations in background colour etc.), the Road Research Laboratory nevertheless concluded that

the mean legibility distance for the place-names on Mr Kindersley's [upper case] sign was 3.4 per cent greater than that for the RRL sign [with Kinneir's lower case]. The difference, however, was not statistically significant, i.e. it could have been due to chance.⁵²

On this background, the Committee asserted that

the results of this analysis was broadly in agreement with previous experiments of the RRL in 1961 ... However, it was considered that a fuller comparison was necessary before the claims of Mr. Kindersley could be dismissed.⁵³

A kind of preference study ('comparison tests') was therefore also conducted by the Road Research Laboratory, involving groups of 'observers not on the RRL staff to place the signs in order of merit'. The two Kindersley signs included in these 'comparison tests' (with two different background colours) came out respectively seventh and

43. PRO: MT 116/5. Committee minutes 5, 31 May 1962.

44. PRO: MT 116/1. Working Party minutes 14, 7 June 1962.

45. PRO: MT 116/5. Committee minutes 2, 22 February 1962.

46. PRO: MT 116/5. Committee minutes 4, 26 April 1962.

47. PRO: MT 116/6. Committee paper no. 4, 'Direction signs', 9 April 1962.

48. PRO: MT 116/8. Committee document no. 11, May 1962.

49. PRO: MT 116/8. Committee document no. 14, 10 September 1962.

50. PRO: MT 116/8. Committee document no. 11, May 1962.

51. PRO: MT 116/8. Committee document no. 14, 10 September 1962.

52. PRO: MT 116/8. Committee document no. 11, May 1962.

53. PRO: MT 116/8. Committee document no. 14, 10 September 1962.

54. PRO: MT 116/8. Committee document no. 14, 10 September 1962.

55. PRO: MT 116/8. Committee document no. 14, 10 September 1962.

56. PRO: MT 126/1. 'Note of a meeting', 8 August 1963 (this note prescribes several changes of features used on early motorway signs and shown in the Anderson Report). MT 126/1. 'Loose minute' of a meeting on 'Motorway signs', 8 December 1964.

eleventh 'in efficiency' out of 13 signs. Two signs designed by Kinneir and two signs designed by the RRL (all four in lower case letters) came out first.⁵⁴

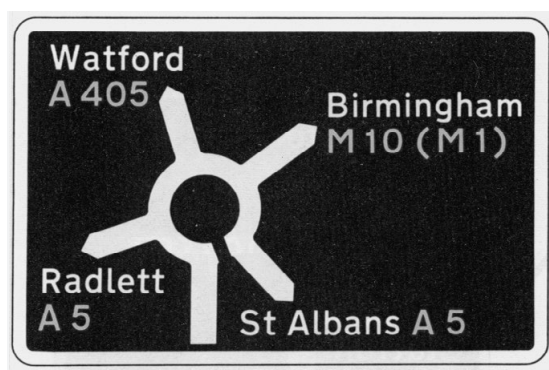
After receiving the RRL's results for this experiment and for the comparison test, the Worboys committee closed the matter and finally concluded that 'the members of the committee agreed that a full and fair hearing had been given to Mr. Kindersley's claims'.⁵⁵

From the motorway alphabet to 'Transport medium' and 'Transport heavy'

For the Worboys committee and thus for Britain's 'all-purpose roads' Kinneir developed two slightly modified variants of his motorway alphabet (with, for example, a shortened hook on the lower case j). The two alphabets were named Transport Medium and Transport Heavy. The 'medium' was for white letters on a blue or green (dark) background (see figure 11), and the 'heavy' was for black letters on a white or yellow (light) background (see Ministry of Transport 1963, pp. 97–102) (see figure 12). However, an alternative style for route-numbering was not included for 'all-purpose roads', as for the motorways (see note 13). The elegantly sloping lines of the arrows that symbolised the roads ahead on the motorway advance direction signs became straightened out on the Worboys signs for all-purpose roads (compare figure 3 with figure 9). Furthermore, for Worboys the model of direction sign layout inherited from the Anderson committee was also 'redesigned', leading to much smaller sign areas.

Soon after the publication of the Worboys Report in April 1963 (before the subsequent regulations went through Parliament and came into operation in January 1965), meetings were held in the Ministry in order 'to discuss the impact of the Worboys Report on motorway signs'.⁵⁶ It was decided to harmonise as far as possible the design and layout of the two types of British direction signs – on the lines laid down for all-purpose road signs.

Figure 8. *left*: Map-type advance direction sign for a roundabout junction on an 'all-purpose' primary route. The background colour is green. (From: Ministry of Transport 1963, pp. 34–35, 122). *right*: Stack-type advance direction sign. The background colour is green. (From: Ministry of Transport 1963, p. 24)





9a



9b



Figure 9. (a) Top and middle: route confirmatory sign and direction sign. The background colour is green. Bottom: direction sign to motorway for use on all-purpose road. The background colour is blue. (From Ministry of Transport 1963, pp. 120, 127). (b) Advance direction sign before a junction. The background colour is green. (From Ministry of Transport 1963, p. 120).

Figure 10. A flag-type direction sign for local use. (Photograph provided by Margaret Calvert)



Figure 11. Transport Medium, for use on signs with dark backgrounds. (From Ministry of Transport 1963, pp. 97–99)



Figure 12. Transport Heavy, for use on signs with white backgrounds. (From Ministry of Transport 1963, pp. 100–101)

57. Ministry of Transport, 1962; 1963; and subsequent regulations and reviews, referred to in Department of Transport 1991, p. 12ff.

58. 'We went for the utmost simplicity, cutting out everything which didn't actually say anything (like serifs on letters, and boxes round lettering) and went on cutting and cutting until we were left with the residue, the important residue, and then gave that the greatest value possible.' (Kinneir 1983, p. 19)

59. 'Instead a system of layout was devised in which related items are related spatially and unrelated items are derelated spatially' (Kinneir 1989, p. 4).

60. Letter from Ministry of Transport to Kinneir, signed R. L. Huddy, 12 June 1958. RTC 53/4/024 Pt 4. (Margaret Calvert, London.) See also Froshaug 1963, illustration on p. 46.

61. A layout of the approaching junction and destinations ahead, marked with arrows and with the associated destination names distributed accordingly.

62. Moore and Christie 1960, p. 815.

In retrospect

It was decided to use Kinneir's sans serif alphabets of small letters and initial capitals, as well as his complete sign system, for both motorways and all-purpose roads.⁵⁷ Some of the many prominent absences in his motorway directional signs were: no serifs, no boxes around destination name and road number, no barbs on the heads of the arrows that symbolise the road ahead, and, not least, no forced symmetrical or grid-based positioning of destination names.⁵⁸ This represented an 'exceedingly inferior layout' and resulted in 'large areas of wasted space' according to Kindersley (1960, p. 464). Although the 'no boxes' feature adhered to an emerging modernist norm in graphic design (meaningful groupings were to be signalled, minimalistically, by spatial relationships alone),⁵⁹ it was also based on the wish of the Anderson committee, and was in accordance with the 1949 Geneva protocol.⁶⁰ Furthermore, eliminating the boxes around each destination name and road number, while keeping the map-like⁶¹ organisation of the destination signs, allowed for considerably larger lettering on the same sign area.⁶²

Figure 13. Prototype signs, probably made at the Road Research Laboratory.

Left: A complex intersection as shown in the 1957 regulations. Right: The same intersection without boxes enclosing the destination names – which allows for considerable larger letters. (From Moore and Christie 1960, p. 815)

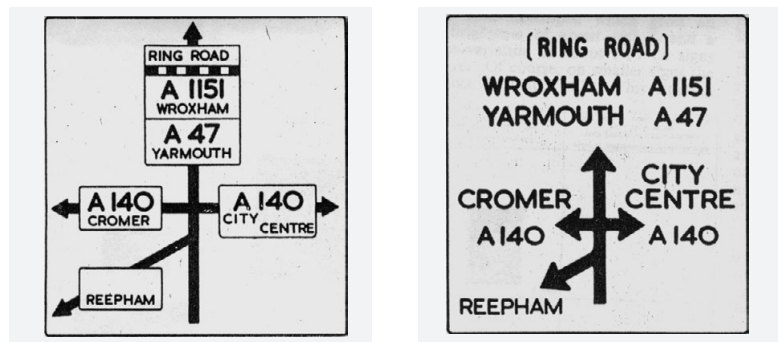


Figure 14. Jock Kinneir overseeing signs under manufacture. (From *Sign World* 1967, p. 676)



Kinneir's rather neutral sans serif letterforms were, compared with Kindersley's somewhat unusual seriffed capitals, undoubtedly more in line with contemporary aesthetic preferences among designers and taste trend-setters. To suggest that the final decision of the Anderson committee was taken already before the Road Research Laboratory performed the tests at Benson airfield in 1960 is perhaps to overstate the issue, but nevertheless, a feeling that the experiments were some kind of play to the gallery – only necessitated by the public debate and performed in order to shrug it off – is hard to avoid. Nevertheless, Kinneir's solution of lower case sans serif letterforms corresponded more with the practice in neighbouring European countries,⁶³ as well as with direction signs on the American interstate highways⁶⁴ – an important imperative.

Kinneir and many other designers at that time strongly believed that sans serif letterforms – in the combination of small letters and initial capitals – were intrinsically more legible for signing systems than seriffed capitals, due to the more distinctive word shapes they created. They also believed that sans serif letterforms were easier to handle, less 'aesthetically sensitive', and generally more 'forgiving' when actually produced; that is, in various modified forms for various applications, especially with the tools available at the time. Furthermore, if small letters were preferred, then sans serif letters were undoubtedly more aesthetically suited than seriffed letters to relatively short ascenders and descenders (i.e. to large x-heights); hence they demanded less inter-linear space and thus were more practical (Mason 1994).

With the recommendations of the Worboys committee for all-purpose roads, words set in all-capital style were largely reserved for certain mandatory and prohibitory traffic signs. This distinction provided the means for a functional differentiation of certain important signs such as 'STOP' and 'GIVE WAY'.⁶⁵

Noel Carrington, a member of the Anderson committee, argued that since seriffed types are characterised by a high contrast between thick and thin strokes, they 'would almost certainly prove unsuitable when the letters have to consist of reflectionized material to catch the headlights'.⁶⁶ In reply, it has to be admitted that Kindersley's sturdy seriffed capitals were unusually low in contrast – probably in order to solve exactly the problem suggested by Carrington. However, this characteristic of Kindersley's design, together with its highly idiosyncratic and unusual serifs, rather than its serifs *per se*, might very well have created exactly the uneasiness that people like Herbert Spencer felt towards it.

Interestingly, the leading figure of the British mid-century typographic establishment, Stanley Morison, who seems not to have participated in the public debate, undermined at least part of the argument of his fellow traditionalists, while addressing a continental public. In a 1962 postscript to a German-language edition of his *First principles of typography*, published in Switzerland in 1966,⁶⁷ Morison stressed the practical and pragmatic aspects of using sans serif letter-forms for applications like traffic signs.

Sanserif type is ... quicker, easier and therefore cheaper to make. It is in fact the cheapest of all to make. Its forms can be mastered by the

63. That is, in Germany, Belgium and Holland, but not in France. In fact, 'continental practice was evenly divided in the use of upper or lower-case lettering on direction signs' (PRO: MT 116/5. Committee minutes no. 4, 26 April, 1962).

64. *Design*, no. 129, September 1959, p. 31; *Design*, no. 132, 1959, p. 71; Moore and Christie 1960, p. 816; Ministry of Transport 1962, p. 4.

65. See for example Ministry of Transport 1963, pp. 10, 103; Moore and Christie 1963, p. 116.

66. Letter to the editor from Noel Carrington, in *The Times*, 20 March 1959, p. 13.

67. See Huib van Krimpen's introduction in a recent edition of *First principles of typography* (Morison 1996, p. xiii).

lowest category of draftsmen. Naturally, municipal architects and others to whom lettering is no more and no less than a necessary evil, gave the medium a cordial welcome, and with reason. That is to say with reason of a natural kind: of self-interest, which is the best – because a material and rational – basis for the choice of sanserif. It is not surprising that sanserif is superseding the serified style in all transport and street designations. Its economy of cost cannot but make sanserif the universal public medium of communication. (reprinted in Morison 1996, p. 39)

The aftermath

Together with his associate Margaret Calvert,⁶⁸ Kinneir came to dominate the design of public wayfinding and signing systems, and their associated sans serif letterforms, in Britain in the next few decades – for motorways and all-purpose roads, airports, the railways, the public hospitals, and the armed forces. Their influence was also felt abroad – for road signs, railway signs and airport signs.⁶⁹ Kinneir's motorway signing system has 'been called Britain's true corporate identity' (Rainford 1996, p. 13) as well as 'a house style for Britain' (Baines 1999, p. 27).⁷⁰

However, the dispute did not end in the 1960s. Since then it has come to the surface on many occasions. Several contemporary writers are vigorous supporters of David Kindersley's position of the early 1960s. For example Montague Shaw, in his book on David Kindersley, offered this summary:

It is one of the misfortunes of the creative person that his sensible work is, from time to time, set aside in favour of a vastly inferior article, by ignorant judges who are swayed by fashion and an uneducated taste. ... [David Kindersley's letters] were better in every single case. But the sanserif was used. (Shaw 1989, p. 19)

This account was accentuated in a more politicised manner by the designer James Souttar in a talk given at the Monotype Conference in Cambridge, 1992. Citing Shaw, he described Kinneir's road sign work as belonging to nothing less than 'a vision of shabby utopianism.' (Souttar 1992, p. 5). Other factually unreliable accounts have been published; for example:

A series of tests carried out by the Road Research Laboratory showed that in terms of recognition and legibility at speed, Kindersley's capitalized serif letters *were greatly superior* to the modernist sans serif, upper-and-lower-case letters. But despite this conclusive result the sans serif was chosen. (Eason and Rookledge 1991, p. 98; my italics)

However, Robin Kinross, who appears prominently among the 'pro-Kinneir historians', celebrates Kinneir's work as a great achievement:⁷¹

These signs were the first, in any country, in which 'visual' and 'functional' considerations were fused. They marked a new turn in British typography. And in the subtleties of their letterforms and of their rules of configuration, the signs showed a sophistication beyond the grasp of the title page- and inscription-bound traditionalism. (Kinross 1992, p. 167)

68. Margaret Calvert became a partner in Kinneir, Calvert Associates in 1964. She was head of graphic design at the Royal College of Art (1987–1990).

69. For example (either on motorways, airports or railways) in Australia, in Hong Kong, in the Middle East, in Greece, on the Continent, and in Scandinavia. For instance both the Danish and the Norwegian road sign alphabets are adaptations of the Kinneir Transport alphabet. Both alphabets retain the noticeable round dot on the lower case letters i and j. However, the Danish alphabet, introduced in 1978, is a more direct adaptation – albeit excessively letterspaced compared with the Kinneir original (see Bernsen *et al.* 1996, pp. 30ff). The Norwegian 'Trafikkalfabetet', drawn in the mid 1960s (date given by Erik Hagen at Vegdirektoratet, Oslo) is a far rougher adaptation where e.g. the discriminating 'legibility hook' on the lower case letter l has been removed (see Statens Vegvesen 1987, pp. 381ff).

70. Jock Kinneir gave many lectures at conferences around the world, was interviewed on television and radio on several occasions, and wrote several substantial accounts on his signing systems (e.g. Kinneir 1968; 1970; 1971; 1983; 1984). He published one book, *Words and buildings: the art and practice of public lettering* (1980), and was head of graphic design at the Royal College of Art 1964–1969.

71. See Kinross 1984; 1989; 1992, p. 167; 1994b.

72. Not only did the 1949 UN Geneva protocol inform its work, but four members of the Anderson committee had made a personal inspection of motorway signs in Belgium, Holland and Germany (PRO: MT 126/1, Press notice, 1 Dec. 1958). They had also taken colour slides while touring continental roads (Kinneir 1971, p. 3).

Kinross is not only enthusiastic about the end result of the design process but also attaches great importance to the process itself: as an exemplary model for designing that aims to fulfil public needs. He sees it as an index of modernisation and public service democracy in Britain's post-war pre-privatisation era: a large-scale unglamorous planning process open to rational justification, in contradistinction to 'the recent cult of the designer, who reveals expensive master-creations to a boardroom, as a *fait accompli*' (Kinross 1989, p. 52). Kinross refers to the fact that the design process in question involved a broadly composed committee, an outward look towards continental Europe,⁷² assessment of relevant research, consultation with a large number of interest groups, a public debate, an expert designer, and technical advisers who conducted experimental research. Furthermore, the two committees and working parties in question were indeed not passive bodies. The minutes from the Anderson committee's 27 meetings and the Worboy committee's 19 meetings (and from numerous working party meetings) bear evidence of lively and constructive debates.

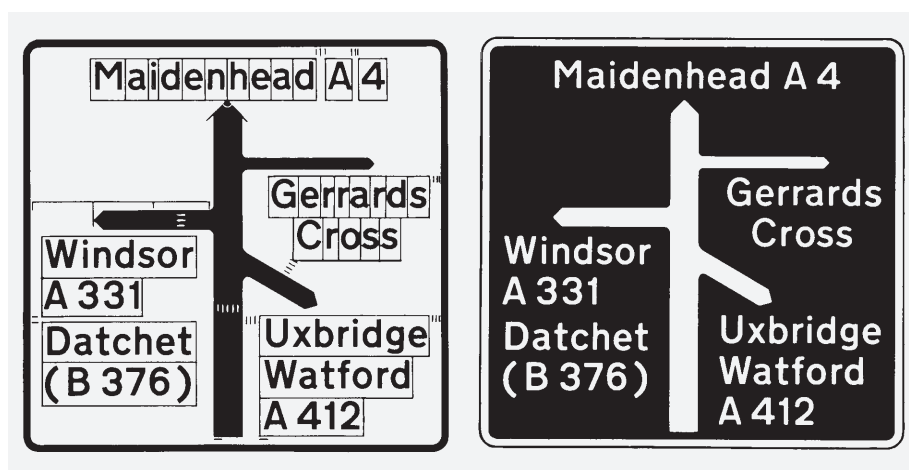
The dispute goes on. Factually unreliable accounts seem to be perpetuated, for example in a recent article on David Kindersley and his work by Robert Long, in the American typographic journal *Serif*:

The all-caps alphabet that he designed used heavy, bracketed square serifs to promote legibility and intelligibility when seen from a rapidly moving vehicle. While it appears that practical tests *clearly demonstrated its superiority* to the Helvetica [sic] that was much in fashion at the time, Helvetica set in upper and lower case won (Long 1995, p. 35; my italics)

The same distortion applies to an illustrated web-page devoted to David Kindersley:

Motserif – David Kindersley's capital alphabet for motorway signs. It *proved to be much more legible* than lower-case but less fashionable, and was not adopted (Typefaces by David Kindersley 1995; my italics).

Figure 15. Original sign layout and spacing template and the corresponding sign (advance direction sign for complex junction). 'Signs are laid out according to a system of preferred minimum dimensions expressed in stroke widths' (Kinneir 1968, p. [7]). 'The relative importance of each road is shown by differing the width of the route symbol' (Ministry of Transport 1963, p. 121).



A system design perspective

Designing in the twentieth century developed from small-scale crafting and planning of individual artefacts for mass production, to a situation in which whole systems are designed rather than individual artefacts. Kinneir's signing system is an interesting and early example of such 'system design', and with a graphic designer playing the central role. First, the sheer number of signs: a whole range of different kinds of traffic signs related to each other, with separate solutions for motorways, major roads and local roads. Second: all the practical consideration of layout, letterforms, size of letters, colour, background colour, reflection, illumination, mounting and siting, and not least, the content of the many different signs of each category. And third: the design of a system with prototypes and specifications which included a letter spacing system based on a limited number of tiles so the signs could 'design themselves', that is, so local sign manufacturers could easily space the letters consistently (or with 'tolerable uniformity'⁷³) just by following the instructions in the manual (see figure 15). In fact, early on Kinneir explicitly regarded himself as a 'systemiser' and he was depicted thus in an article on 'the man you can't escape' in *The Sunday Times* in 1964:

Kinneir sees himself primarily as a design 'systemiser', and it is perhaps his ability at taking organisational and financial considerations into account that so endears him to the official mind. (Hopkins 1964)

Epilogue

In 1994 the journalist Helen Fielding wrote a spirited account of British 'road sign madness' in the *Independent on Sunday*. She attacked the unsatisfactory situation on British local roads and streets, where signs are too often either lacking, or obscured, or in the wrong place, or cluttered together in such a way that 'motorists of Britain just don't know which way to turn'. She perceptively stated – and probably unwittingly echoed a modern usability engineering credo – that 'The trouble is, systems are usually set up by people who know the way anyway. They ought to be checked by people who are strangers to the area'.

More recently Phil Baines published a richly illustrated article on 'Kinneir, Calvert and the British road sign system' in the graphic design magazine *Eye*.⁷⁴ His article focuses on Kinneir's road sign system, but – like Fielding's – it also depicts a messy and unfortunate state of road direction signing in Britain today. Baines criticises clutter, lack of maintenance, poor application, the presence of pre-Worboys signs on many 'all-purpose' roads,⁷⁵ and the occasional use of non-standard letters. However, his criticism also extends to inconsistencies in a group of rather clumsy direction signs developed in the mid 1980s and formally prescribed in 1994.⁷⁶ These signs deviate markedly from Kinneir's principles.⁷⁷ They are map-type and stack-type direction signs where the pre-Worboys feature of boxes enclosing destination names has been re-introduced in the form of coloured panels behind the names. There is reason to believe that this solution – introduced with good intention but probably carried out without professional design advice – reflects a fundamental lack of understanding of the principles which underpin Kinneir's elegant and simple system.

73. PRO: MT 116/2, Working Party paper no. 42. See also MT 116/5: Committee Minutes 16, 18 Aug. 1963, which reveals that Kinneir wanted to develop a more foolproof system which would deal with imperfect spacing between certain letter combinations: 'It was *agreed* that the inherent imperfections demonstrated must be accepted on economic grounds.'

74. Baines, Phil. 1999. 'A design (to sign roads by): Kinneir, Calvert and the British road sign system'. *Eye*, no. 34, vol. 9, pp. 26–36. The article includes a section on 'Road signs in London' with photographs by Roman Inhoff and commentary by Nick Bell and Phil Baines, pp. 33–35.

75. The latest replacement date for pre-Worboys directional signs on all-purpose roads is now 1 January 2005 (Department of Transport 1994, p. 2). However, back in 1967 the Department proposed 31 December 1973 as the date 'for the completion of the traffic signs change-over programme' (*Sign World* 1967, p. 683).

76. These signs are described in Ball and Caddle 1989; Department of Transport 1991, pp. 16–17; Department of Transport 1994.

77. A similar criticism can be found in Kinross 1989.

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An earlier version of this article appeared in my Reading doctoral thesis of 1999: 'Knowledge construction in typography: the case of legibility research and the legibility of sans serif typefaces'.

78. The Transport Research Laboratory, in Berkshire, claims that it has no materials or documents from the legibility research that was carried out by the then Road Research Laboratory in the early 1960s; it further claims that there are 'no historical archives at all' at the laboratory (communication 8 February 2000 with Brian Cooper via Pat Baguley at the TRL). Neither the Departmental Record Office (of the Dept of the Environment, Transport and the Regions) in Hastings, nor the Motorway Archive at The Institution of Highways and Transportation, in London, have been consulted.

Archival sources

Minutes, notes, circulars, committee drafts, committee documents and correspondence cited, are either from files in the archives of the Public Record Office at Kew, or from the private collection of Margaret Calvert, London. Details are given in the notes. The following files at the Public Record Office (PRO) have been examined for this article: MT 116/1–17 (Traffic Signs Committee, 1961–1963); MT 126/1 (Motorway signs, 1955–1968); MT 95/28–29 (Street name-plates, 1947–1963).⁷⁸

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