The stretch response of the upper eyelid may form part of the intrinsic pattern of function of anti-gravity muscles during consciousness. It may be considered advantageous during the wakeful state to limit the amount of control referred to the conscious level, by the provision of local controls (stretch reflexes). We may regard the eyelid stretch reflex to be in this category, and to provide some degree of control of position at a low level, while only relatively important decisions are referred to higher brain levels for conscious consideration.

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Perception of Topographical Information (with Reference to Road Signs)

AN experimental study has compared six layouts of advance road direction signs. This communication is concerned with three of these, at present displayed in Great Britain, the Continent and the United States. On the first two designs, a road intersection is represented by a diagram on the display, road numbers and place-names are enclosed in rectangular boxes on the British layout, without boxes on the Continental design. On the American display the destinations are listed and short arrows at the side indicate direction. The distance legibility is greatest for the American type, then the Continental, and the British signs are least legible when signs are compared on backboards of equal area¹. The order appeared to be determined by the size of lettering. The present experiments tested the effect of the difference in the displays on accuracy and speed of interpretation.

Signs describing a route with junctions of different complexity were drawn in each of the layouts. Subjects sat 9 ft. from a screen and off-set 1.4 ft. to the right. A projection tachistoscope displayed the signs, with black on white contrast, 1/10th to scale for intervals ranging from 0.5 to 2 sec. This gave some similitude to the visual angle at which drivers view signs. Subjects responded to the signs either by drawing the direction necessary to attain a previously designated destination, or by moving a control stick. Throughout the experiment they performed a compensatory tracking task as a substitute for driving, with the tracking display set normal to the subject. Performance was measured by: (a) response-time between the presentation of the sign and the subject's response with the control stick; (b) errors of drawn directional movement; (c) indirect effects of the sign layouts on an error score on the tracking task. In separate experiments, signs in three layouts, selected from all those tested, were compared. The sign layouts were presented in a counter-balanced order and a subject followed the route three times.

In a subsidiary experiment, signs were briefly exposed to subjects who were required to draw a diagram of the junction represented immediately afterwards, and indicate the direction necessary to reach a destination. The diagrams were scored for accuracy.

Table 1. SCORES ON RESPONSE MEASURES TO DIRECTION SIGNS IN THREE LAYOUTS

Response measures	British	Layout Continental	American	No. of signs per layout	No. of subjects per cell
Mean log response time	2.2132	2.1291	2.1365	6	18
Errors of directional movement	43	26	17	9	27
Errors of reproduction	36	39	70	12	12

The tracking task scores showed no difference between layouts. Table 1 shows the results of the other measures; significance was tested by analysis of variance.

There were more errors of directional movement and a longer response time to the British layout. Caution is required in interpreting the latter result as response time was partially determined by interaction effects between the British layout and the others with which it was compared. Errors of reproduction were greatest on the American layout, although on all layout errors were more numerous on complex signs. On the American layout four-fifths of the attempts at reproducing the complex signs were unsuccessful.

These results showed that it was possible to scan and select a direction from a Continental or American sign with almost equal facility, but on the latter layout the numerous errors of reproduction on the complex signs demonstrated that the topographical displays convey an erroneous message about the layout of the crossroads the observer will meet. However, before simple junctions, the American list layout may be optimal as it permits larger lettering. It was concluded that before simple junctions there are advantages in displaying the Continental or American layouts; before complex junctions, the Continental design with a diagram of the approaching junction is desirable.

Part of the problem of designing topographical displays is to emphasize significant details to aid visual resolution, but cognitive processes of interpretation are also important. The individual, in route finding, has to locate his own geographical position and to have the intention of proceeding to another known position. In doing so, he has the aid of symbolic representations in the form of topographical displays. The individual has to match the symbolic representation with the geographical layout, either directly or from memory of the representation, which requires the selective use of environmental cues. Bartlett² has described the ideational content of direction finding from road signs, placing emphasis on the general anticipatory function of the symbols. The present results suggest that not only may the symbols be changed to aid discrimination, but the form of the layout may reduce conceptual work. Emphasis on discriminability and the presentation of optimum configuration or 'Gestalten' can present different design problems which are not always easy to reconcile.

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