apparent distance—when low on the horizon it looks both large and near, which contravenes the classical Emmett's Law, and demands some kind of size scaling which is not locked to apparent distance. The worry about lack of perception of depth in luminous plane figures having exaggerated perspective but which give illusory distortions was in fact expressed by myself, in the (unpublished) paper cited by Humphrey and Morgan. If illusions do occur in figures not seen in depth though the countermanding depth-cues are removed, it would have to be supposed that primary constancy can work like a 'super releaser' (as found in ethology), working beyond the normal range at which it is useful. This is quite possible, but if true it would make precise predictions difficult. On present evidence, however, it does not occur: Measuring the apparent depth in luminous Muller-Lyer figures of various fin angles, with the technique briefly described¹, I found that the apparent depth of the illusion figures correlates extremely closely with the measured illusions for each angle tested, over the full range of possible angles of the fins. The distortion and the apparent depth of the figures are both reduced for extreme angles, when normal perspective breaks down. To argue that the relation discovered between apparent depth and the illusions is fortuitous is to fly in the face of a correlation coefficient better than 0.9. There are other and quite different predictions which follow from the theory, and it is compatible with the curious finding that peoples who live in environments largely free of right angular corners and parallel lines, such as the Zulus who live in a 'circular culture' of round huts, do not suffer these illusions to anything like the normal extent^{2,3}.

The point raised about the Ponzo illusion is interesting. It could be that the vertical line is too far removed from the converging 'perspective' lines or, more interesting, it may indicate an important difference between size and shape constancy for which there is growing evidence.

The Orbison illusions are compatible with Fig. 4b (ref. 4). An important feature of primary scaling is that it is set by typical neighbouring depth features, not by the relative depth in the parts of the figure as a whole when this is complex and having conflicting depth features. It is thus entirely different from secondary scaling, which works simply according to apparent distance. Now the Muller-Lyer and the Ponzo figures are simple cases, as there are no other lines in the figures to produce complications; but to understand the Orbison figures it is necessary to isolate the neighbouring disturbing features and measure their apparent depth separately from the rest of the figure. The Orbison Fig. 3a (ref. 4) is a useful test case, for here perspective in the figure as a whole may be reversed by changing the spacing of the concentric circles, so that they are spaced either more or less closely from the centre. This reverses the apparent depth in the figure as a whole, but not the illusion when presented on a textured plane. This is again compatible with the interpretation for Fig. 4b (*op. cit.*). On the textured plane it is the typical depth information of the neighbouring lines which determines the primary scaling in all cases. These statements are testable by isolating features in any figure, measuring the depth of these isolated features, and comparing the measured depth of the isolated features with the illusion.

Much work remains to be done in relating depth to illusory distortions, but it is now fairly clear how the theory can be tested adequately.

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Occurrence of the Electroencephalographic Alpha Rhythm with Eyes Open

It is well established in electroencephalography that the alpha rhythm occurs much less frequently when the eyes are open in an illuminated environment than when they are closed. Moreover, if the visual environment is patterned, then alpha occurrence is even less frequent. Finally, 'paying attention' to the pattern reduces the occurrence of alpha still further¹. Although these general descriptions are valid, they can be misleading if one wrongly assumes that 'much less frequently' means a very low frequency of occurrence of the alpha rhythm. On the basis of such an assumption one might not attempt certain experiments concerning vision and the alpha rhythm, because the expected amount of alpha rhythm would be too little.

Recently, I have completed a study of the electroencephalographic (EEG) alpha rhythm recorded while nonsense syllables were being read. The apparatus was so arranged that whenever alpha occurred, a nonsense syllable was projected on to a screen for 0.2 sec. If alpha was not present the syllable was not presented. In this closed loop situation the EEG was divided into successive alternations of alpha and non-alpha, activation durations². The increased durations of activation reflected the increased alertness of the subject in response to the nonsense syllable flashed on the screen. A reasonable expectation would be that combining eyes open, increased attention, heightened expectancy, patterned stimuli and illuminated environment, would so decrease the frequency of occurrence of alpha that experimental trials would be excessively long and tedious.

Quite unexpectedly this was found not to be the case. Alpha rhythms, which disappeared when the patterned stimulus was automatically presented, re-appeared soon after the stimulus was automatically removed, permitting the next stimulus to occur. It was, in fact, the atypical subject who could not participate because of insufficient alpha with eyes open³.

In exploratory investigations now being undertaken here subjects are tested with eyes open in an illuminated room. The experimenters, apparatus, etc., are in view. Using a loop situation similar to that described here, a tone is presented when alpha occurs and is removed when alpha ceases, that is, when cortical activation occurs. We have found that for many subjects, the 'blocking' or inhibition of the alpha rhythm during feedback stimulation is not greatly increased with eyes open when compared with a similar condition with eyes closed. For some subjects, even when instructed to 'pay attention' to the environment, alpha occurs more often than had been expected.

These results are consistent with work described previously where subjects, watching a moving visual stimulus under various conditions of mental set, exhibited alpha about 20 per cent of the time⁴.

These observations have convinced me that investigations of electroencephalographic alpha rhythm and attention to patterned stimuli with eyes open would not be critically limited because of an infrequent occurrence of the alpha rhythm.

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