

respectively at the 5, 10 and 20 cm. depths, while corresponding values at 5 p.m. were 16.8, 14.8 and 14.1° C., respectively. In the bare soil the highest temperatures observed at 9 a.m. were 14.2, 14.0 and 15.0° C. at the above depths, while corresponding values at 5 p.m. were 22.6, 19.0 and 15.5° C., respectively. It should be mentioned that the highest temperatures noted at each soil depth do not necessarily coincide, but may occur at different dates.

The highest air temperatures observed at these two hours of observations were 15.8 and 19.2° C., respectively.

Ground frost as recorded 5 cm. above ground occurred only twice over the bare soil, but 8 times above the grass during the period of observations. The lowest grass-minimum temperatures recorded were in June -1.1° C., in July -0.2° C., in August -1.3° C. and in September -2.2° C.

This limited material does not allow for much discussion, but it gives some valuable indications for future work on the processes of soil formation in Iceland. It also provides additional paths for studies of ecological differences in the country's natural vegetation, but fuller information is needed before definite conclusions can be reached. Therefore further work is in progress.

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<sup>1</sup> *Vedráttan (Bull. Meteorol. Bur. Iceland)*, 1-22; 25 (1924-45; 1948).

## PSYCHOLOGY

### Perceptual Defence and Filter Theory

It has been suggested by Broadbent<sup>1</sup> that his general theory of selective processes in the human nervous system could give an account of the phenomenon of perceptual defence. His theory assumes that information entering the central nervous system can be thought of as arriving along certain 'channels' and that a 'filter' can select one (or occasionally more) channels and suppress the input along others. He has said: "It is economical for a series of stimuli to be analysed first for simple physical properties conveying little information . . . (if) classes of words may behave in the same way as sensory channels do . . . the filter might detect that a word belongs to the general class of sexual words without distinguishing which of those words it is and pass the word to the later perceptual mechanisms for more detailed analysis if the filter is set to pass sexual words. . . . The main factual point at which evidence seems to be needed is the question whether a class of words can act in the same way as a sensory channel".

On this last point one may comment that a class of words, where class is defined by meaning only, has no physical characteristics common to all its members. Hence if the filter works on physical characteristics, as stated above, it would not be able to select such a class without selecting the individual members in it, which Broadbent was trying to avoid.

To accept his suggestion leads to the following prediction. The threshold for detecting what class a word belongs to should be lower than that for identifying individual members of that class. The present communication presents an experiment to test this.

Two lists of monosyllabic words were prepared on magnetic tape, seven words in each list. These were

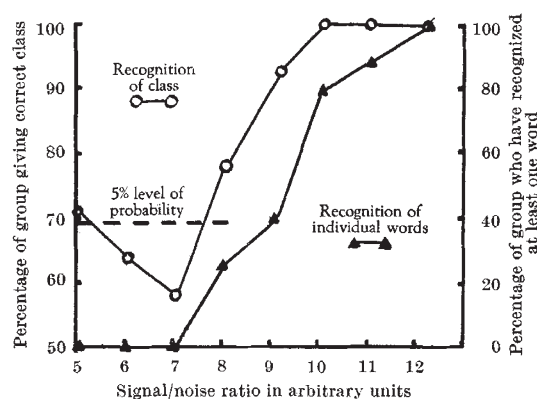


Fig. 1

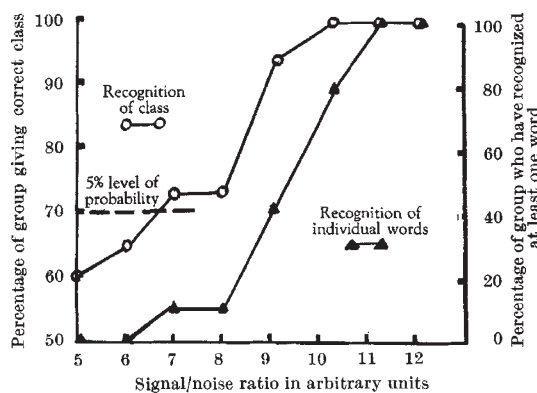


Fig. 2

played to subjects at different signal-to-noise ratios. Two groups of undergraduates were used as subjects. Group A ( $n=14$ ) were presented with a list of colour names, and asked to make a forced choice at each signal-to-noise level as to whether the class of words was colours or animals. They were also given the second list and asked to identify the individual words on it, without being told anything about the context. The list was actually the names of clothes. This design biases the experiment in favour of the prediction, due to the effect of context on threshold<sup>2</sup>. Group B used the lists the other way round (clothes for class, and colours for individual, recognition). The results are shown in Figs. 1 and 2.

For both lists the point at which the class recognition curve rises above the 5 per cent level of confidence (by the binomial test<sup>3</sup>) is also the point at which the first words are recognized correctly. Since contextual help was given for the class-recognition thresholds but not for the individual word-recognition thresholds, the curve for the latter is, if anything, displaced farther than it should be to the right. This finding agreed with the subjects' introspections.

Thus the prediction from Broadbent's theory is not fulfilled, and we must conclude that classes of words cannot function like a sensory channel, at least in this type of situation.

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<sup>1</sup> Broadbent, D., *Perception and Communication* (Pergamon Press, London, 1958).

<sup>2</sup> Bruce, D., *Language and Speech*, 1, 79 (1958).

<sup>3</sup> Seigel, S., *Nonparametric Statistics* (McGraw-Hill, New York, 1956).