been arbitrarily adjusted downward by 13 mgal to coincide with American data (*7*). Similar, pronounced gravity minima have been found for Canadian meteorite craters (*8*). The magnitude of anomaly was found to be related to the size of the crater and to the volume of pulverized rock which the crater contained. Data for the Wilkes Land feature fall on a smooth curve extrapolated from values for the Canadian craters.

Seismic measurements suggest the existence of a depression in the rock surface at this position (*7*). The actual change in elevation of sub-ice topography may account for about 50 mgal of the total anomaly (*7*). Still, this leaves about 100 mgal to be explained by other factors. Even with a density contrast as high as 0.5 g/cm^3, a minimum of 4 km of glacial drift would be necessary at this position to account for the anomaly (*7*). This is an unreasonably large thickness for such material. If, however, it is assumed that the anomaly is caused by fragmental rock similar to that found in Canadian craters, a more normal density contrast is obtained (0.13 g/cm^3). About 16 km of such material is required to produce the anomaly; this agrees well with the predicted crater depth (*1*).

The ice surface above the site of gravity minimum and rock surface depression "shows considerable relief," which is in "sharp contrast" with the adjacent ice plateau (*7*). The close spatial association among these ice surface irregularities, the rock surface depressions, and the gravity minima, suggests that they may be related. Perhaps the relief of the ice surface at this locality was caused by movement of the ice sheet when it filled a crater gouged by meteorite impact. If so, the fact that it remains noticeable suggests that the postulated impact event may have occurred as recently as 5000 years ago, which is estimated as the age of australites (*9*).

The feature described previously appears to be consistent with the presence of an impact crater in Antarctica as predicted (*1*), but the proof is not conclusive. The practicability of conducting a detailed geophysical program to define this feature in greater detail is being investigated.

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19 July 1962

Letter Recognition within Words Flashed Left and Right of Fixation

Abstract. Neural activity related to eye movements has been proposed as a reason for superior recognition of words to the right of fixation. Predictions from such propositions were verified in our experiment. The distribution of recognition errors among letter positions on the left is relatively symmetrical, while the distribution on the right increases from fixation.

Mishkin and Forgays (*1*) concluded that superior recognition of English words exposed tachistoscopically to the right, rather than to the left, of an observer's fixation point occurs because the reading sequence of English proceeds toward the right, thus selectively training the right visual hemifield. Hebb (*2*) proposes that temporal-spatial neural networks, whose activation corresponds to the conscious recognition of the words, are built up as a result of reading. Activity in the frontal oculomotor areas of the cerebral cortex, present when the observer is reading from left to right and necessarily preceding the overt eye movements, forms an integral part of the neural network. Thus, such an incipient eye movement toward the right when a familiar word appears on the right of fixation facilitates the activation of the network. Since observers are not accustomed to reading English from right to left, a perceptual process having a left directional motor component is not strongly established.

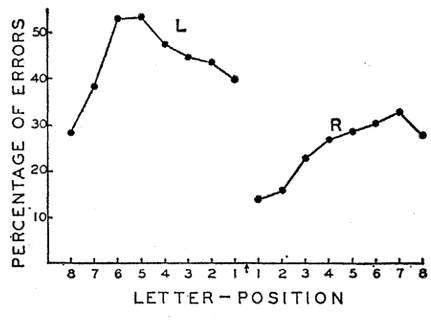

Fig. 1. Percentage of errors left (*L*) and right (*R*) of fixation (indicated by small arrow) at each letter position.

Heron (*3*) hypothesized the existence of a post-exposure, sequential reading of persisting physiological traces, with the sequence analogous to the succession of ocular fixations across the visual field when a stimulus is continuously present. Thus, for words at the left, the observer first focuses his perceptual process toward the left on the beginning of the word, and then reads toward the right. The primary tendency toward the beginning of the word conflicts with the tendency to read toward the right, and perceptual accuracy suffers. When the word is presented to the right of fixation, however, no such conflict occurs. Direct evidence for the relevance of these eye movements comes from the discovery of greater perceptual accuracy for the stimuli on the side of fixation toward which the first eye movement is directed after the tachistoscopic exposure (*4*).

Anderson and Crosland (*5*) long ago suggested that perceptual "attention" might be sequentially distributed in tachistoscopic exposure from left to right, with maximal clarity near the leftmost letter position because of a primacy effect. Harcum (*6*) has also inferred such an effect, on the assumption that the elements which show fewer errors have been favored by primacy, that is, the sequential process began in the visual areas onto which these elements were projected.

Directional characteristics of the stimulus elements themselves affect the distribution of errors, and, hence, the inferred direction of the perceptual process (*7*). Therefore, on the basis of Heron's argument, described previously, Finkel and Harcum (*8*) predicted not only superior recognition of normally printed words in the right visual field but also superior recognition in the left visual field for words printed in left-right mirror image. Also predicted was a greater "primacy effect" for the elements nearer fixation in the left visual field with mirrored words, and in the right hemifield with normally oriented words. For the mirrored words, both

predicted results occurred. For the normal words too few errors occurred for any conclusions about the shapes of the error functions—although fewer overall errors did appear on the right. However, Anderson and Crosland (*9*) have previously obtained for nonsense words more nearly symmetrical error functions on the left of fixation than on the right.

Our study tests the hypotheses of Heron (*3*) by determining the distributions of errors within normally oriented, meaningful words presented tachistoscopically to the right or left of fixation. Predictions are the same as those of Finkel and Harcum (*8*) for words printed in the normal manner.

Forty different eight-letter English words were printed in black ink on white cards. Twenty words appeared one at a time on either side of fixation in different exposures. After the 0.05-second exposure, the observers, not knowing the exposure side beforehand because of the haphazard presentation sequence, attempted to report the word verbally, and then to write down as many letters as they could. Failures to reproduce letters correctly within one letter position were scored as errors. Although no instructions were given to this effect, all 20 observers reproduced the words from left to right.

Figure 1 shows fewer overall errors to the right of fixation ($P < .002$). A generally increasing function of errors rightward from fixation, and about equality for opposite halves of the words on the left, was obtained. Thus, the difference between right and left halves of words was greater for the words to the right of fixation ($P = .01$). Therefore, a greater inferred conflict between incipient eye movements, and also a poorer perception of words, occur to the left of fixation. This confirms both hypotheses (*10*).

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Pachytene and Diakinesis Behavior of the Isochromosomes 6 of Maize

Abstract. Complementary isochromosomes which shared homologies only for the centromere region and one or two adjacent chromomeres were rarely found associated at pachytene. It is therefore questioned whether the centromere plays an important specific role in the initiation of synapsis. It is also questioned whether centromere repulsion is a cause of diplotene separation and terminalization since the isochromosome univalent foldbacks assumed shapes typical of bivalents with chiasmata at diplotene and diakinesis.

An unusual type of sectorial aberration was found in microsporocytes from several tassel branches of an otherwise apparently normal corn plant grown from seed which had been irradiated at 12,000 r. The abnormality can be interpreted as a translocation in which breaks occurred in both chromosomes 6 (the nucleolus organizer chromosome) at or near the centromere: in one chromosome on the short arm side of the centromere and in the other on the long arm side. From cytological evidence (Fig. 1, *A* and *B*) it appears that at least one and possibly both breaks were separated from the centromere by one chromomere. Reunion is thought to have occurred in one of the three ways diagramed in Fig. 2 which are cytologically indistinguishable. If the original breaks and reunions occurred at the chromatid level, the two exchange chromatids must have been distributed at anaphase to the same pole to establish a sector in which all of the chromosome material was present but in the new arrangement for chromosome 6. Note that each of the rearranged chromosomes is an isochromosome except for one or two chromomeres for which the synaptic partners are found in the other chromosome. Homologies between the two chromosomes are therefore limited to their centromeres and one or two chromomeres. The other chromosomes of the complement appeared normal and formed nine completely synapsed bivalents.

At pachytene the two isochromosomes 6 usually each synapsed internally to form two separate foldbacks which gave the appearance of 11 bivalent chromosome pairs per cell. In 4/158 of these cells the isochromosome of the short arm (carrying the nucleolus organizer) was open as in Fig. 1*C*. Rarely (in 6/164 or about 4 percent of pachytene cells) the two chromosome 6 fragments were paired in the centric region. Since centromeric associations occurred in this material on the average

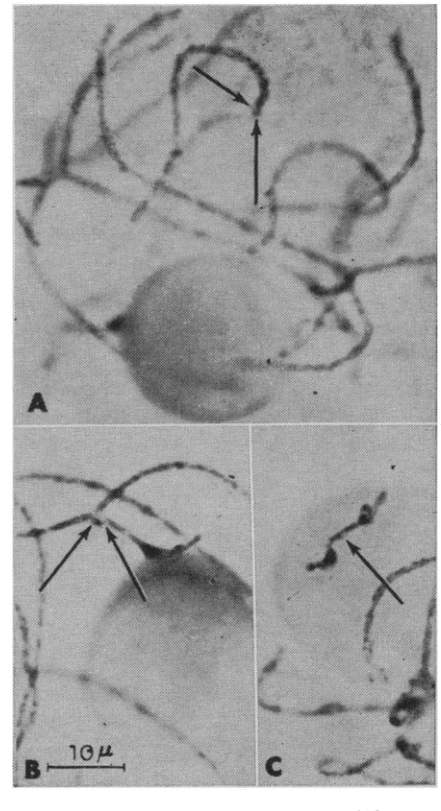

Fig. 1 (right). *A*, Chromosome 6 long arm isochromosome in a univalent foldback configuration (above nucleolus, shaped like a reversed question mark). Arrows point to centromere and to an adjacent chromomere. The chromosome 6 short arm isochromosome can be seen extending to the left from the nucleolus, out of focus except for the darkly staining nucleolus organizer region. *B*, Chromosome 6 short arm isochromosome in a univalent foldback configuration (attached to the nucleolus and extending above and to its left). Arrows point to its centromere and to an adjacent chromomere. Its centromere is associated with that of another chromosome. *C*, Chromosome 6 short arm isochromosome in an open univalent configuration. The arrow points to its centromere. The two large darkly staining regions are the two nucleolus organizers.