Although strong selection by some animals against acyanogenic plants has been observed in the laboratory and in natural populations, there is no satisfactory evidence to show how the frequency of the acyanogenic gene is maintained in mixed colonies of *L. corniculatus*. There are three points that are worth mentioning. (1) The apparent selection against cyanogenic plants exerted by young *Hygromia hispida* could partly counteract the selection by the other animals. (2) In populations containing only cyanogenic plants the frequency of score 5 and 6 plants is usually low. (3) Some field observations show that acyanogenic plants produce more seeds, grow and clone more quickly especially when the density of the animals which eat them is low. Dawson¹ noted that acyanogenic plants may be partly self-fertile. In August 1960 one of the areas on Silbury Hill (Wiltshire), which has been sampled in four successive years, contained 11 cyanogenic and 42 acyanogenic plants. In September 1960, 14 plants in this colony had pods and all these plants were acyanogenic. The frequency of cyanogenic plants with pods in another colony was, however, the same as the over-all frequency in previous samples of that population.

Daday² has correlated the gene frequencies in populations of *Trifolium repens* with January isotherm, such that a decrease of 1° F. in January mean temperature corresponds to a reduction of 4.23 per cent in the frequency of the glucoside gene. Daday proposed that a 'geographical factor' associated with temperature acted on wild populations of *T. repens*. It is possible that the January temperature is controlling the distribution of the animals selectively eating acyanogenic plants and that this is reflected in the gene frequencies in populations of *Lotus corniculatus* and *Trifolium repens*.

Genetic polymorphisms are controlled by selective forces. The predation of the acyanogenic forms of *Lotus corniculatus* by various animals appears to be part of the mechanism by which the polymorphism of the cyanogenic glucoside is maintained.

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PSYCHOLOGY

The Act of Visual Attention

THE act of visual attention consists of: a mental set directing a fixation of gaze, conjugate ocular movements, and accommodation of the lens and pupil. The mental set, particularly, is related to the general nervous and neuromuscular activity and to the autonomic function, as shown by the electrical resistance of the skin.

The act is performed in a wakeful state with open palpebral fissures.

We have determined the relationship between visual attention and the size and reactivity of the palpebral fissures. Measurements were made simultaneously of the position of the upper eyelid, the electrical resistance of the palmar skin and muscle

Fig. 1. Simultaneous records of eyelid movement, d.c. resistance of palm, biceps brachialis electromyogram, and periods showing spot of light

electrical activity. The movement of an upper eyelid was recorded by means of a low-torque potentiometric transducer attached by a light lever. Palmar skin resistance was measured by a method developed by one of us (D. K.) (to be described elsewhere). Muscle activity was recorded from surface electrodes over a biceps brachialis. The subject was sitting and was instructed first to gaze straight ahead, and then, at a signal, to concentrate his attention on a small spot of light (1 cm. diameter), which appeared intermittently at a distance of 2.4 metres, without moving his head. The observations were made on six subjects.

Under these conditions, visual attention was accompanied in approximately 70 per cent of all tests by an increase in size of the palpebral fissure as shown by the elevation of the upper lid in our records. During this, the skin resistance may change, usually decreasing. The electromyogram altered little. This was the most consistent pattern observed. A typical record is shown (Fig. 1). In this instance, lid elevations of 1–2 mm. were measured. Such movements could not alter the light entering the pupil, since at no time was the pupil covered by the upper lid, and eyeball movement was not apparent.

Poulton and Gregory¹ observed that visual tracking is accompanied by a reduction in the rate of blinking. Our observations confirm this, and indicate that the act of visual attention, and its associated state of wakefulness, are accompanied by a widening of the palpebral fissures, and that these composite reactions are under automatic unconscious control by brain mechanisms.

Further details of these and related observations are being published.

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