

as to release the vacuum gently, and infiltration takes place.

Generally eight to ten leaves of *Atropa belladonna*, L., each 6.5 in. long and 3-3.5 in. at the widest, were simultaneously infiltrated. They were first rolled in a springy, spiral, piece of celluloid-like material 1-1.5 in. wide, and secured if necessary with a loose rubber band. The leaves so compacted were held in chamber *a* with their petioles at the bottom, by means of a suitable spring-clip.

The method gives complete infiltration with minimal reduction of pressure, and if a good rate of evacuation is obtainable the leaves need not be kept under reduced pressure, even with the relatively large chambers used, for more than a minute.

The quantity of infiltrating liquid required depends, of course, on the volume necessary to cover the leaves. For the number of leaves and dimensions given, nearly a litre was required, of which less than 15 ml. was retained by the leaves: this extravagance of the method is sometimes a drawback.

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Inheritance of Minor Colour Vision Variations

A CONSIDERABLE amount of attention has been given to the inheritance of major colour vision defects, namely, red-green blindness and anomalous colour vision¹⁻⁶, and the view most favoured at present is that there are two groups of totally sex-linked alleles with three members in each group (together with dominant normal genes) which determine major red and green defects. Walls has recently put forward the view that there might be a third locus, also with three alleles, and totally sex-linked, which determine blue vision defects⁶.

Total sex-linkage of minor blue and yellow vision defects is not supported by the fact that these variations are as frequent in women as in men⁴. A study of forty pedigrees which reveal the inheritance of blue and yellow minor colour vision defects, collected in the course of testing 649 men and 546 women, strongly suggests that some of their more extreme forms are due to the action of partially sex-linked multiple allelomorphs. Partial sex-linkage is difficult to distinguish decisively from autosomal inheritance, but seems likely.

The minor defects of blue vision are defined as: (1) blue deviation, (2) blue weakness, and (3) blue-yellow weakness with darkened violet. The distinction between 'deviation' and 'weakness' has been explained fully elsewhere⁴. It is suggested that the appropriate genes might be called: *B* (normal and most dominant), *b*₁, *b*₂ and *b*₃ (most recessive). The segregation of these genes is clearly apparent in the pedigrees, two of which suggest the dominance order and four suggest crossing-over between genes in the blue series.

The minor defects of yellow vision are defined as: (1) yellow deviation, (2) yellow weakness and (3) extreme yellow-blue weakness. The appropriate genes might be called: *Y* (normal and most dominant), *y*₁, *y*₂ and *y*₃ (most recessive). Again, segregation

can be seen clearly in the pedigrees, three of which suggest the dominance order and four indicate crossing-over between genes of the yellow series.

These facts seem to favour a four-receptor theory of colour vision.

In addition, five pedigrees show totally sex-linked forms of minor red and green deviation. These are very mild forms of red and green anomaly, two pedigrees for red, two for green and one for both together. Darkening of the red is shown in one pedigree. In order to explain these, it is necessary to assume a degree of heterozygous manifestation not much less than the defects of the hemizygotes themselves, though not always the same. This may be because the appropriate genes are the most dominant, next to the normal genes in the familiar protanope and deuteranope series, and have the greatest penetrance.

In many of the pedigrees, major red and green and minor blue and yellow variations occur together and may be traced out as segregating independently. Totally sex-linked major blue defects were not found in the population tested, but may occur.

Details of this investigation will be published fully elsewhere.

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¹Waller, G. H. M., *Z. Ind. Abst., Vererb.*, **45** (4), 279 (1927).

²Franceschetti, A., *Schweiz. Med. Wochens.*, **58**, 1273 (1928).

³Franceschetti, A., *Bull. Acad. Suisse Sci. Med.*, **5**, 227 (1949).

⁴Pickford, R. W., "Individual Differences in Colour Vision" (1951).

⁵Gray, R. C., *Arch. Ophth.*, **29**, 446 (1943).

⁶Walls, G. L., and Mathews, R. W., *Univ. Calif. Pub. Psych.*, **7** (1), 1 (1952).

Predacious Mosquito Larvæ

APART from the obligatory cannibalism of the genus *Toxorhynchites* and the sub-genera *Mucidus* and *Lutzia*, cannibalism in other mosquito genera has been little studied. Graham¹ stated that the addition of 3 per cent common salt to the breeding water brought about cannibalism in *A. gambiæ*. This was not confirmed by subsequent work. It has, however, been observed in Mauritius that facultative cannibalism exists within the salt-water strain of *A. gambiæ*. Such a tendency has not been observed in the fresh-water strains of *A. gambiæ*.

Third- and fourth-stage larvæ can be seen to seize other larvæ, of all stages, by the abdomen and to commence to feed. This would appear to stimulate neighbouring larvæ, as within a few seconds numerous larvæ are feeding upon the hapless victim, whose vigorous struggles are usually in vain. The head capsule is all that remains, but larvæ can be seen attempting to extract the contents of the head capsule with their mouth brushes. Pupæ are immune from attack.

This tendency to cannibalism, in the presence of abundant larval food, brings about a considerable mortality in a laboratory culture. The breeding dishes are littered with head capsules each morning, the larval numbers being correspondingly reduced.

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¹Graham, W. M., *Bull. Ent. Res.*, **1**, 51 (1910).