Sex in *Melandrium*

THE development of stamens in pistillate plants of *Melandrium* under the influence of *Ustilago violacea* (Pers.) Fuckel is well known. Recently, this action has been simulated by treatment of plants with the animal hormone testosterone, while the reverse change has been caused by œstrone[1,2]. None of the authors responsible for accounts of the reversal, whether natural or artificial, has remarked upon the fact that, when such a change from the pistillate to the staminate condition occurs, some characters of pistillate plants are replaced by those typical of staminate plants while others are not. Thus, the copious branching and diminution in size of the leaves which is produced in the region of the inflorescence, and the grouping of the flowers into more or less sessile clusters, all of which are characteristics of staminate plants, appear after infection. On the other hand, the calyx retains the inflated shape characteristic of pistillate plants and, although infection of originally pistillate and staminate plants reduces the length of the calyx-teeth, they retain the characteristic difference in shape, and those of the pistillate plants remain the longer. These characters are seen best in *M. album*, where the differences between pistillate and staminate plants are more extreme.

It appears that the differences in branching are secondary sexual characters while the differences in calyx-characters are completely sex-linked. One of the purposes of this note is to indicate the possibilities which such hormone studies hold out in discriminating between two otherwise inseparable types of character.

Infection by *Ustilago violacea* or, according to Löve and Löve[1,2], the application of the *single* chemical substance testosterone, can perform the *dual* function of promoting the formation of stamens and suppressing the formation of pistils. On the other hand, Westergaard[3,4] has postulated that these two functions are performed, normally, by two separate sets of genes on the Y-chromosome, and has produced considerable cytological and genetical evidence in support of this idea, including the removal of the 'female-suppressors', in which case the plants lacking them produce both stamens and pistils.

One modern tendency (see review by Löve and Löve[2]) is towards the assumption that the normal formation of staminate flowers is due to the genically controlled production of a substance resembling testosterone. This does not preclude the possibility of the simultaneous production of 'œstrone' in quantities insufficient to affect the morphology. It is not easy to reconcile this view with the *two specific* actions which Westergaard postulates for the sets of genes. This difficulty is important because Westergaard has made far-reaching deductions concerning the evolution of diœcism from his results.

It should be pointed out, however, that in interpreting the genetical data the idea of 'female-suppressors' in *Melandrium* has been introduced only because the effect of the *removal* of the genes concerned is to cause pistil development. Alternatively, it might be argued that a concentration of 'testosterone' just sufficient to promote the formation of stamens but insufficient to suppress pistil-formation might be produced under the influence of one set of genes, while an additional production of 'testosterone' caused by the other set of genes would induce the abortion of the pistil. Thus, the two sets of genes could have the same action and neither be specifically a 'female-suppressor' nor a 'male-promoter'. This view is supported by the fact that purely pistillate plants, when infected by *Ustilago violacea*, produce well-formed stamens, while the abortion of the pistil varies in extent and is never complete. A similar impression is gained from the diagrams by Löve and Löve[2] showing the effect of treating pistillate plants with testosterone.

In *Melandrium* the structure of the X-chromosome is not so well known as that of the Y, so that 'male-suppressors' or 'female-promoters' upon it are not known as yet.

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[2] Löve, A., and Löve, D., *Arkiv. f. Bot.*, **32**, A, 1 (1945).
[3] Westergaard, M., *Hereditas*, **32**, 60 (1946).
[4] Westergaard, M., *Hereditas*, **32**, 419 (1946).

Sweating in Sheep

DURING investigations on the humidity of the fleece atmosphere carried out in the summer of 1946, certain sheep were found to have a consistently higher relative humidity (70–90 per cent) close to the skin than at points farther out in the thickness of the fleece (25–50 per cent); humidity measurements being made with cobalt chloride papers, prepared as described by Solomon[1]. Strips of cobalt chloride paper were placed vertically in the fleece so that one end of each strip rested on the skin and the other lay about 1 in. away from the skin. Humidity differences were measured between the two ends of single papers so placed. In one healthy, undipped sheep, the high humidity found at the base of the fleece was confirmed by placing close to the skin *Lucilia sericata* (Mg.) eggs incubated to within half an hour of hatching; other eggs from the same batch were placed in the same part of the fleece, but one inch away from the skin. The eggs near the skin hatched immediately, indicating a humidity of at least 80 per cent, as shown by the work of Davies and Hobson[2]. The larvæ survived in this position and established a strike without any addition of moisture. Eggs placed one inch from the skin did not hatch, indicating a lower humidity at that point. The limiting factor for strike on this and other sheep used appeared to be the non-attraction of blowflies to oviposit on them. The existence of a population of gravid blowflies in the vicinity was shown by attracting flies to oviposit on some of the sheep, using the technique of Hobson[3].

It is concluded from the above evidence that certain sheep sweat to an extent sufficient to maintain humidities at the base of the fleece suitable for the development and survival of blowfly eggs and young larvæ. Under similar weather conditions, other sheep were found to have fleeces too dry throughout for strikes to develop successfully.

It was not clear from the above observations how far such sweating varied and depended on the activity of the sheep. Freney[4] attempted to find if sweating occurred in sheep after running; he found that the weight of moisture in wool samples from the base of the fleece did not increase after sheep had been run in hot weather. The following experiments were made, therefore, using cobalt chloride papers as described above, to discover how far moisture