and recently Mather[3], in reviewing a symposium[4] on the subject, directs attention to the significance of those findings. Some further points of immediate interest follow. (i) A large part of the variability in at least two inbred lines of *Drosophila*, generally ascribed to residual heterozygosity or uncontrollable environmental variation, is governed by the time of embryo formation. In common with the lower organisms, *Lemna*[5], *Philodrina*[6] and *Aspergillus*[7], there is here an extra-chromosomal mechanism of inheritance. (ii) Greater emphasis must be placed on good sampling technique in taking flies for examination or mating. Taking flies from a set period is not advisable, since the time-effect not only varies with lines but also shows some interaction with generations. (iii) The use of an inbred control for removing some of the environmental variability from selection lines may increase their variability, since if the controls (c) and selection lines (s) are independent, or $V_c > 2W_{cs}$, then $V_{c-s} > V_s$. (iv) Stability of genotype, in the sense that it is normally applied, cannot be considered a complete interpretation of the relative variability of inbred lines and their crosses. It remains of considerable interest to assess how much may be apportioned to this.

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The Covering Reaction in a Tropical Sea Urchin

IT has long been known that certain littoral echinoids habitually cover the parts of their body that are exposed to light by fragments taken from their surroundings. Some have interpreted this as a concealing reaction, or, in part at least, as a response to strong light, or as a defence against desiccation and temperature extremes resulting from exposure at low tide; others remained non-committal. *Lytechinus variegatus* (Lamarck) shows the response in striking fashion[1] and, in Jamaica, in habitats where it is never exposed by tides. The response has been examined in these laboratories.

The individuals found in Jamaica differ noticeably in the depth of the green colour of the test and spines, pale and dark forms being present in about equal numbers in the populations I have examined. Both avoid strong light (especially the pale forms), either by seeking shade or by covering themselves with opaque fragments; if the shade or the material available for cover is scanty, both methods are employed. Naked forms transferred from shade to sunlight may begin to cover themselves in about two minutes and complete the process in about five minutes. In intense sunlight, the process is continued until the urchin is buried in the hole excavated by the removal of stones, shells, etc., used to form the cover.

The response has been ascribed to the activities of tube feet and pedicellariæ[2]; but I find no evidence of the latter taking part, each fragment being pulled down firmly against the tips of the spines by the tube feet attached to it. The number of tube feet involved depends on the weight of the object held, and if it is slightly displaced, additional tube feet are brought into play to hold it. These co-ordinated actions are still performed when the areas including the peristome or the periproct, and the lantern, together with all nerve elements associated with them, have been removed.

Light is a significant factor, since when it is directional, opaque objects are held against the source, and if the position of the latter is altered, the shading objects are moved accordingly. A shadow cast on the aboral or ambital regions produces a brief and rapid shortening of some tube feet, which then extend more slowly toward the shading object, adhere to it and hold it in the light path.

The covering is shed slowly and to varying degrees as the light intensity is reduced. In total darkness, a complete covering may be shed in 70 min.–3 hr.; but in some cases, one or two stones have been retained for as long as 19 hr. When light is re-admitted, the covering is picked up again with a speed which depends on the light intensity, the time the urchin has remained in darkness and its depth of colour (pale individuals covering themselves more quickly and more completely than dark ones).

A process of physiological adaptation may occur; urchins which have been compelled to remain uncovered in strong light cease to show the response, but may show it again after a sojourn in darkness.

The importance of light is shown by the effect of dyes such as eosin Y, bengal rose and neutral red, which, when dissolved in sea water or cœlomic fluid and injected into the perivisceral cœlom, photosensitize urchins so that they cover themselves in relatively dim light. The effect appears in 2–20 hr. and persists for four to seven days.

The work is being continued and will be published in full elsewhere.

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Nov. 16.

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Breeding Systems and Compatibility in *Glyceria*

A LIMITATION of gene exchange by incompatibility between segments of an outbreeding species-population is of primary importance in micro-evolution[1], and few cases have hitherto been reported in the Gramineae. Some results of a study of the species *Glyceria fluitans* and *Glyceria plicata* may therefore be of interest.

From both species, five widely separated local populations, each distinguished by minor morphological characters, were selected for intensive biosystematic investigation. Seed samples were collected by a suitable method[2], and the progeny grown in the experimental garden. All the plants had the somatic chromosome number $2n = 40$ usual in these species[3,4].