In the Oslo Fjord the tentacular crowns of *Pomatoceros triqueter* are brown, blue or orange. A quantitative investigation in 1948 based on samples collected once a month during the whole year gave a total of 2,848 individuals, of which 2,628 had brown, 218 blue and 2 orange tentacular crowns.

The colour of the tentacles depends on variation in the concentration of three pigments, blue, red and yellow, and of minute white granules, all individuals possessing all four kinds. In the blue tentacular crowns the blue pigment dominates, with little or none of the yellow; in the brown there is less blue, but more yellow and red pigment; and in the orange the yellow and red pigment dominate, while only traces of the blue are present. Whereas the yellow pigment dissolves at once in alcohol, the blue and red pigment as well as the white granules have remained unchanged even after three years preservation in absolute alcohol.

Crosses within the brown type always give individuals with brown tentacles. We have made twenty-five crosses of brown × brown, giving 8,658 animals, each of which has a brown tentacular crown.

Eleven crosses have been made within the blue type. Each cross gave individuals with blue and brown tentacular crowns in the ratio 3 : 1. The total number of F_1-individuals in blue × blue crosses was 3,837, of which 2,911 had blue and 962 had brown tentacular crowns. From one of these eleven broods two crosses of F_1-individuals with blue tentacular crown were carried out. One cross gave 60, the other 73 F_2-individuals, all with blue tentacles.

Ten crosses have been carried out between individuals with blue and individuals with brown tentacular crowns. Each cross blue × brown gave individuals with blue and brown tentacular crowns, in the ratio 1 : 1, the total numbers being 739 with brown and 755 with blue tentacular crowns.

Further investigations are in progress.

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Somatic Chromosomes of Conjugales

THE following properties of the chromosomes of *Spirogyra* have been demonstrated to the Genetical Society in recent years and an account of them will shortly be published.

(1) *The centromeres.* The British species of *Spirogyra* include those the chromosomes of which have diffuse centromeres or alternatively are polycentric, as well as those with subterminal and median localized centromeres. The parallel separation of the chromatids of *Spirogyra crassa* to the poles of the spindle was first observed by Geitler[1] in 1930.

(2) *The nucleolar-organising chromosomes.* The Conjugales so far as investigated (*Spirogyra, Zygnema, Mougeotia, Sirogonium, Closterium, Cosmarium* spp.) have nucleolar-organising chromosomes the nucleolar organising regions of which are visible inside the nucleolus at resting stage.

The British species of *Spirogyra* include those : (*a*) in which part or the whole of the chromosome concerned is a specialized nucleolar-organising region ; (*b*) those in which the nucleolar-organising chromosomes number at least 2, also 3, 4, per nucleus. In some it appears possible that all the chromosomes are nucleolar-organising.

(3) *The 'nucleolar substance' of metaphase.* In *Spirogyra*, at metaphase, anaphase and early telophase, the chromosomes are surrounded by a densely staining substance, in many species forming a thick blanket over the whole metaphase plate, in others (*crassa, triformis*) constituting merely a fluid matrix such as that described for *Luzula*[2], the first plant organism specifically stated to possess diffuse centromeres. In *Spirogyra*, this substance becomes more or less deposited on the chromosomes during anaphase[3] and removed during telophase. In some species, globules of the substance proceed to the poles independently of the chromosomes.

This substance was called 'nucleolar-substance' by Geitler, and the name may prove to be a truly descriptive one. However, my own observations have shown, so far, that the nucleolus of the resting stage has always become completely broken down at metaphase ; the stages of its breakdown, a lengthy process, are readily observable. The organisation of new nucleoli in telophase can also be followed from the earliest stages. It is therefore clear that the 'nucleolar substance' present at metaphase is not part of the nucleolus proper.

There is no evidence, as yet, of the chemical nature of the 'nucleolar substance', though this is being sought. The staining reactions so far as observed do not differ from those of the nucleolus.

A cyto-taxonomic survey of the species of *Spirogyra* and other Conjugales has been begun in this Department. It is apparent that the species are well differentiated by the numbers and characters of their chromosomes.

It may well be that we have in *Spirogyra*, as in other lowly organisms, access to evidence which may eventually make it possible to distinguish chromosomes of different kinds. That some will be called 'primitive' and others 'advanced' is inevitable. It may be pointed out that the idea is an old one, discussed by Geitler[3].

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[1] Geitler, L., *Arch. Protist.*, **71**, 79 (1930).
[2] Malheiros, de Castro and Camara, A., *Agron. Lusit.*, **9**, 51 (1947).
[3] Geitler, L., *Arch. Protist.*, **85**, 10 (1935).

Basal Sterility in Wheat

THE wheat spike is an example of the occurrence of parallel development of morphologically similar structures, namely, the spikelets and florets. The spike consists of an axis upon which are arranged two opposite rows of spikelets. Each spikelet consists of an axis upon which are arranged two rows of florets. The apical and basal spikelets are often sterile, and in each spikelet the third floret (counting from the base) is often sterile and the fourth floret usually sterile. Apart from these differences, the spikelets and florets are indistinguishable at maturity. This similarity emphasizes the interest of the action of the 'sterile base' genotypes[1] which condition a sterility of the basal floret of each spikelet. Three types are known : St_1, in which the basal (first) florets are sterile ; St_2, in which the basal and second florets are sterile ; and St_3, in which the basal, second and third florets are sterile. Only the St_1 type has

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