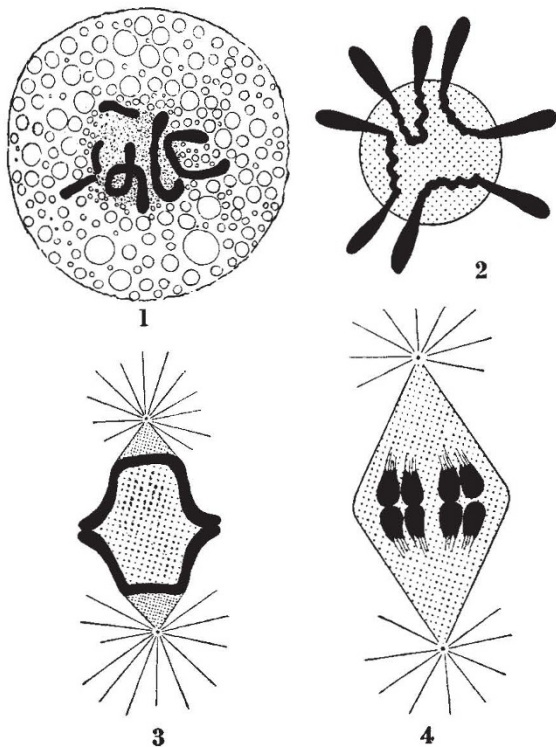


Chromosome Cycle of *Ascaris megalcephala*

PAINTER¹ and Schrader² have recently suggested that the long chromosomes of the germ-line cells in *Ascaris megalcephala* are peculiar in having a large number of spindle attachments instead of only one as hitherto assumed. Some time ago, I carried out an experiment to test this hypothesis. Uteri of adult females (var. *bivalens*) were irradiated with a Coolidge tube (65 kv., 5 ma., 30 cm. distance, unscreened radiation for 5 minutes). They were then kept for 5½ days at 38° C. and fixed in Carnoy. In several cases the long chromosomes of the first cleavage division were fragmented as a result of the irradiation. Fig. 1 shows a cell in which one of the four chromosomes has been broken in two places, leaving three fragments which are all attached to the spindle.



DIAGRAMS OF CHROMOSOME CYCLE OF *Ascaris megalcephala*.
 1. Metaphase plate of first cleavage division in material irradiated with X-rays.
 2. Metaphase plate of first cleavage division. The stippled part represents the spindle-area.
 3. Anaphase of first cleavage division.
 4. Spermatogonial anaphase.

It seems that the spindle attachments are confined to about the middle third of the length of the chromosomes. As a result, this region usually forms a characteristic zig-zag inside the spindle region at metaphase (Fig. 2). At anaphase the chromosomes do not form V's, but have the shape shown in Fig. 3.

The existence of multiple spindle attachments does not explain why the chromosomes in the ancestral cells of the somatic tissues fragment at the second to the fifth cleavage divisions, but it does explain why, when this fragmentation takes place, each piece has its own spindle attachment. Probably the club-shaped end portions of the chromosomes (genetically inert so far as the soma is concerned?) are left without spindle attachments at the time of fragmentation; their degeneration in the cytoplasm is possibly a result of this.

There can be no doubt that the multiple spindle attachments are functional throughout the germ-line cycle (and not merely at the cleavage divisions). They are very obvious during spermatogenesis or oogenesis; probably the spindle attachments are so close together that all those in one chromatid are mechanically compelled to go to the same pole at anaphase.

It is interesting that in spite of the multiple spindle attachments, the chromosomes of *Ascaris megalcephala* do not fragment during spermatogenesis or oogenesis; probably the spindle attachments are so close together that all those in one chromatid are mechanically compelled to go to the same pole at anaphase.

The existence of multiple spindle attachments in *Ascaris* naturally suggests that the spindle attachments of some other organisms may also be compound, although so close together that they behave as a unit at division. If this were so, it might explain some cases of the evolution of chromosome numbers which are otherwise very difficult to understand.

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¹ T. S. Painter, "Chromosome Fusion and Speciation in *Drosophila*", *Genetics*, 20, 327 (1935).

² F. Schrader, "Notes on the Behaviour of Long Chromosomes", *Cytologia*, 6, 422 (1935).

Control of the Enzymic Action of Lipase

A SUBSTANCE has been isolated from the castor oil seed, which controls the reversible action of lipase. The reduced form of this substance, which seems to be the predominating one in seeds, acts as an activator of the hydrolysis of fat by the *Ricinus* lipase and as an inhibitor of the synthesis of fat from glycerol and oleic acid. The oxidised form, which is easily obtainable from the reduced form by autoxidation in air, acts as an activator for the synthesis and as an inhibitor for the hydrolysis. The intermediary form is indifferent for both synthetic and hydrolytic processes.

The substance is a colourless rhombic plate crystal. The melting point 130° C.; $[\alpha]_D^{25} = -77^\circ$. It is soluble in alcohol, methanol, glycerol, ether, acetone, benzene, chloroform, but not in petroleum ether. The solution in alcohol shows blue-violet fluorescence and two selective absorption bands with maxima at 314 m μ and 285 m μ .

The sterol reaction of Liebermann-Burchardt, the Cuboni reaction for cestrogenic hormone, and the vanilin-phosphoric acid reaction for bile acid are positive, but the Salkowski reaction for sterol and Gregory reaction for bile acid are negative.

Details will be published later in the *Japanese Journal of Biochemistry*.

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Sulphur-containing Pigments of Plant Origin

WITH the view of throwing light on the nature of the transient blue pigment, cyanohemidin, formed on exposing to the air an anaerobically prepared extract of *Mercurialis perennis*¹, we have recently undertaken the investigation of the more stable blue compound formed on drying the actively growing shoots of this plant collected during the early spring. We have found that this compound changes spontaneously on keeping, or more rapidly on heating its aqueous solutions,