

show varying degrees of specialization, for which the mycorrhizic habit and the habitat give a reasonable explanation. Moreover, the anatomical fact that the leaf-trace in *O. pendulum* and *O. simplex* is composed of several strands at the base in place of one (l. c., p. 21) supports the opinion that they are not primitive types of the genus. Lastly, the fact that the vestigial lamina is clearly seen in some of Prof. Rosenstock's specimens would be less easily harmonized with the view of *O. simplex* as a primitive form than it would with the theory of reduction above expressed.

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GLASGOW, February, 1908.

PRELIMINARY NOTE ON NUCLEAR DIVISION IN *MNIUM HORNUM*.

—Nuclear division in the Mosses has up to the present time received but little attention. Beer¹ found four chromosomes in the dividing spore-mother-cells of *Funaria hygrometrica*, but stated later² that the number in this plant and in several other species, including *Mnium hornum*, was far greater. He also refers to the compound nucleoli in the spermatogenic cells of *Atrichum undulatum*.

The premeiotic divisions have been studied in the developing archesporium of *Mnium hornum*. The resting nucleus is made up of a fine homogeneous network and a single large centrally placed nucleolus. The latter contains almost the whole of the chromatin and by its persistence dominates the early stages of the division. At its first appearance the spireme consists of broad band-like masses of chromatin which are found especially at the periphery of the nucleus; by the further contraction of the chromatin a thin, thread-like spireme is formed. At this stage the nucleolus stains much less deeply, loses its sharp outline, and, a little later, breaks up and disappears. Twelve chromosomes are formed by the breaking up of the spireme, and these become arranged on the equator of the spindle showing the slender, hook-like form characteristic of the somatic divisions. The diaster originates in the usual manner by the splitting of the chromosomes, and during the anaphase and telophase the latter pass through changes resembling those described in the prophase.

A short period of rest elapses after the final division of the archesporial cells. The resting nucleus of the spore mother-cells shows the characteristic nucleolus and a somewhat coarser reticulum than that of the premeiotic cells. The closely coiled spireme arises by an increase of the chromatin in the nuclear reticulum. Contraction of the thread then takes place and results in a definite synapsis. On emerging, the thread thickens at the expense of the nucleolus which gradually disappears. The spireme divides up into six chromosomes which show the O- and the irregular X-forms characteristic of the reduction division. After separation the chromosomes pass outwards to form the daughter-nuclei. These do not enter into a completely resting condition, but quickly undergo the homotype division. This resembles the premeiotic divisions in its chief features. A full description of the divisions with figures will shortly be published.

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¹ New Phytologist, vol. ii, 1903, p. 166.

² On the Development of the Spores of *Riccia glauca*. Annals of Botany, vol. xx, 1906, p. 278, footnote.



Wilson, Malcolm. 1908. "Preliminary note on nuclear division in *Mnium hornum*." *Annals of botany* 22, 328–328.

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