



Fig. 1. Root-tip metaphase in *Cerastium arcticum* Lange with 108 chromosomes. $\times 2,000$

Fig. 2. First metaphase in a pollen mother cell of *Cerastium arcticum* Lange showing many multivalents. $\times 2,000$

Chromosome counts for all the British species of *Cerastium* have now been made. Unpublished counts besides *C. arcticum* $2n = 108$ are *C. cerastoides* (L.) Britton $2n = 38$ and *C. pumilum* Curt. $2n = 90$ and $2n = 95$. The count for *C. cerastoides*, which was also collected on Ben Nevis, agrees with counts made by other workers for material collected in the Alps⁴ and in Greenland⁵. The *C. pumilum* material, $2n = 90$, which was collected in Surrey, agrees with the count made by Söllner⁶ for Swiss material. In the Surrey material, the higher number $2n = 95$ was more common than $2n = 90$.

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Bot. Not., 246 (1898).

² "Flora Danica", 17, Fasc. 50, 7 (1883).

³ Hylander, N., *Uppsala Univ. Arsskrift*, 7, 148 (1945).

⁴ Favarger, C., and Söllner, R., *Bull. Soc. Bot. Suisse*, 59, 87 (1949).

⁵ Böcher, T. W., and Larsen, K., *Medd. Gronl.*, 147, No. 6 (1950).

⁶ Söllner, R., *Experientia*, 8/3, 104 (1952).

A Method of obtaining Phloem Sap via the Mouth-parts of Aphids

ALTHOUGH aphids and coccids are known as 'sucking' insects, suggestions have been made from time to time¹ that forces within the plant, set up by or even independent of the insect, assisted in the feeding process. Yust and Fulton² observed fluid exuding from broken-off mouth-parts left embedded in lemons after detachment of the coccids which had been feeding there. The exudate formed pools on the lemon skins from which samples were taken for sugar analyses. When experiments on the feeding preferences of *Aphis fabae* Scopoli³ were extended to the comparison of turgid and wilting leaves on otherwise similar plants, the wilting leaves proved to be less acceptable to the aphids. The inference that aphids depend less on their own sucking power than on the turgor pressure in the plant tissue, to maintain the flow of plant sap through the exceedingly fine food

canal within their maxillary stylets, was checked by severing the mouth-parts of *A. fabae* individuals feeding on beans. Here, too, fluid was observed to exude from the stylet stumps left projecting from the plant surface.

The technique of obtaining sap from severed aphid stylets has been developed since (by T. E. M.) using the lachnid, *Tuberolachnus salignus* (Gmelin), a conveniently large species colonizing the branches of *Salix* spp. That part of the aphid's rostrum which remains outside the plant during feeding can be severed by a clean cut down on to the bark, without dislodging the stylet tips from their normal situation inside a phloem sieve-tube. The operation can be done on living insects on intact growing plants.

The exuding sap can be collected continuously by sleeving the projecting stylet stump in the end of a capillary tube. Exudate has been collected in this way at the rate of about 1 cu. mm. per hour uninterruptedly for periods of up to four days. Very similar rates of honey-dew excretion were recorded from adjacent intact aphids, suggesting that the force responsible for moving the sap out of the plant into the normally feeding insect is provided almost entirely by the pressure in the phloem sieve-tubes themselves. The chemical evidence confirms the view that the stylet exudate is the same as the sap ingested by aphids.

This method of obtaining phloem sap is now in routine use in a study of aphid nutrition, and might also be of use to plant physiologists. It is possible that stylet exudate differs somewhat from sieve-tube sap in an aphid-free plant. But the resemblance should be closer than that of extracts of whole phloem tissue, on which past studies of translocation, for example, have so largely been based.

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Shell Regeneration in some British Molluscs

A STUDY of shell regeneration in *Helix aspersa* (Müller)¹ showed that this snail was able to repair its shell with rapidity, chiefly by virtue of the speed with which amoebocytes could transport materials to the damaged area, either from the digestive gland or from other parts of the shell. It was of considerable interest, therefore, to investigate whether a similar process could operate in other Mollusca, and particu-