Our findings confirm those of Katsumi[6] in that we observed that kinetin inhibits longitudinal growth and uptake of water in sections floated on sucrose alone and, furthermore, suppresses indolyl-3-acetic acid-promoted increases in length and green weight. The inhibitory effect on the former was found to be more marked than on the latter. Exogenous indolyl-3-acetic acid and kinetin, supplied individually, brought about almost identical changes in protein synthesis and further increase was noticed in sections which received both indolyl-3-acetic acid and kinetin. An optimum protein content was reached after about 12 h of growth in each case. Protein changes in indolyl-3-acetic acid-treated sections closely paralleled changes in longitudinal growth and green weight. It will be seen, however, that although the increase in length induced by indolyl-3-acetic acid was almost quantitatively reversed by kinetin and, moreover, the growth of control sections kept on sucrose was inhibited, the increase in protein content was far greater.

We conclude from these results that there may be no direct relationship between the observed enhancement of protein synthesis and the growth effects of auxin. Kinetin seems to act as an uncoupler of auxin-induced protein synthesis and water uptake. This suggests that auxin-dependent water uptake may be related to some metabolic activity other than to the synthesis of protein, but still associated with growth. The correlation usually made between protein synthesis and water uptake is most surprising. In theory, one molecule of water is released for each peptide bond formed during the synthesis of the protein molecule. Furthermore, coiling of the peptide chain would lock up various hydration sites[8] with the result that the osmotic concentration of the cell sap would decline. Indeed, there are examples on record which indicate that water uptake may occur in tissues showing a net decline in protein synthesis[9].

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Chromosome Number of a Sub-Antarctic *Rubus*

Rubus geoides from the southern hemisphere is a creeping form of bramble with simple, glossy leaves and hermaphrodite flowers. It occurs in Patagonia and in the Falkland Islands, where it is harvested locally for the red raspberry-like fruits. This species can be considered to be the southern equivalent of the northern hemisphere circumpolar species of creeping diploid *Rubus arcticus*. *R. geoides* was considered of possible interest for raspberry and blackberry breeding in Scotland because of its hardiness, lack of thorns, and its ability to produce fruits under windy and extreme climatic conditions. Plants raised from seeds received from Patagonia have grown well both indoors and outdoors in the east of Scotland, although its leaves are subject to mildew when kept in a poorly ventilated glasshouse and its flowering has been sparse.

The somatic chromosome number, previously unknown, has now been determined from root-tips of two plants[1]. Both these were tetraploid ($2n = 28$) and within the complement the contracted chromosomes vary slightly in size (Fig. 1). The complement includes only a single satellited chromosome, whereas in tetraploid species of the true blackberries (*Eubati*) from Scotland there may

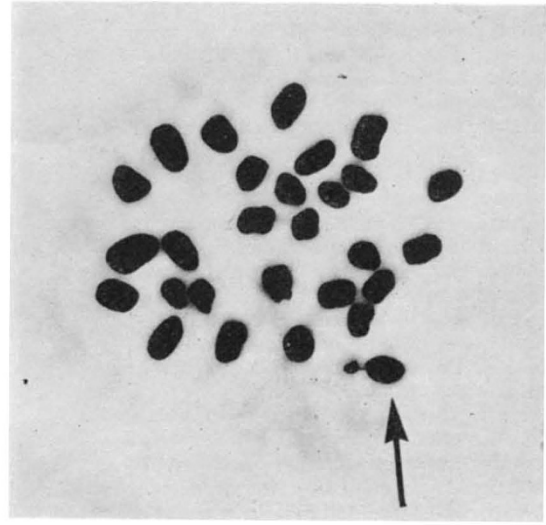

Fig. 1. Somatic chromosomes of *Rubus geoides* ($2n = 28$). (× 6,552). Note the occurrence of only one satellited chromosome (arrowed) in the tetraploid complement

be as many as five satellites present or two as in the diploid raspberry (*R. idaeus*)[3]. We have postulated[2] that in *Rubus* an increase in satellite number may have an adaptive function in relation to climate, especially in association with cooler growing conditions; but this does not appear to be so for *R. geoides*. Furthermore, the occurrence of only one satellited chromosome in a tetraploid species suggests amphiplasty, which has already been found by Heslop-Harrison[3] in *Rubus* and confirmed by Tun[4] for ribes species hybrids; thus *R. geoides* may be a true breeding species hybrid. In support of this, more flavonoid components are found to be present than in the two primary northern European diploid species of *Rubus*.

That *R. geoides* is a tetraploid has advantages for the breeder for it will probably readily hybridize through its diploid gametes. Furthermore, owing to wide geographical isolation from *R. idaeus* it is possible that such hybrids between these two species will show strong heterosis.

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Phosphatidyl Carnitine: a Possible Intermediate in the Biosynthesis of Phosphatidyl β-Methylcholine in *Phormia regina* (Meigen)

CARNITINE can replace the dietary choline, otherwise essential, when *Phormia regina* larvae are reared on a chemically defined diet[1,2]. When this substitution is made, β-methylcholine almost completely replaces choline in the lecithin of the larva[3,4]. Similar results have been obtained with the house fly, *Musca domestica* Linnaeus[5]. γ-Butyrobetaine can also substitute for choline in the diet[2], giving rise to phosphatidyl β-methylcholine[6]. Recent investigations by Hodgson and Dauterman[7] have demonstrated that trimethyl-(3-hydroxypropyl) ammonium acetate (TMAA) inhibits the growth of *P. regina* larvae when the