



Fig. 1. Approach grafting scion and rootstock seedlings

half the stem thickness. Each soil block has one side removed and the two cut surfaces are placed in contact so that the two stems are close together. The two exposed surfaces in the stems are firmly tied together with sterile material (Fig. 1).

Scion and rootstock seedlings so treated are potted, and three weeks after grafting the rootstock seedling is topped 1 cm. above the graft union. The scion seedling is cut 1 cm. below the graft union four weeks after grafting and its roots are removed from the pot. Tying materials and the stub above and below the union should also be removed four weeks after grafting.

Although the method described proved successful under normal daylight conditions, the union of the two plants and the subsequent growth of the graft were faster under an artificial light supply of 18 h a day.

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Long-Distance Migration of Salmon

IN 1956 a salmon tagged in Scotland was recaptured in Eqalug Fjord, south of Sukkertoppen, on the west coast of Greenland¹. Information about the recapture of a second British salmon has recently been received from the Ministeriet for Grønland. The more recent recapture was made on October 19, 1961, near Kangamiut (65° 50' N., 53° 21' W.), a small settlement north of Sukkertoppen and just outside the Arctic Circle. The fish was a male, 73 cm. overall and weighed 2.4 kgm. when gutted. It was tagged as a smolt approximately 20 cm. in length in the estuary of the River Usk, Monmouthshire, on April 27, 1960. The distance between tagging and recapture positions is about 2,000 miles.

This recapture is of especial interest because the smolt was one of a number which entered the cooling-water system of the Uskmouth Generating Station, near Newport, Monmouthshire, and were netted out

of the fine screen chambers, tagged and released lower down the estuary in the course of the rescue operations organized by the Central Electricity Generating Board.

In 1960 a salmon tagged as a smolt in the estuary of the Miramichi River, New Brunswick, Canada, was recaptured on the south-west coast of Greenland², and more recently the recapture of another Canadian salmon in that area has been reported (Nielsen, J., private communication).

Large numbers of salmon, both smolts and adults, have been tagged during recent years, and it is possible that these very-long-distance migrations may be more common than was earlier supposed. Whether fish that have travelled so far would normally return to their native rivers to spawn is, of course, still unknown. However, these recent reports show that salmon from both sides of the Atlantic can appear together in the coastal waters of south-west Greenland at some stage during their marine life.

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¹ Menzies, W. J. M., and Shearer, W. M., *Nature*, **179**, 790 (1957).

² Nielsen, J., *Meddelelser om Grønland*, **159**, No. 8 (Copenhagen, 1961).

ENTOMOLOGY

Influence of Illumination on Moulting and Regeneration in the Cockroach *Blattella germanica* (L.)

IN *Blattella germanica*, at temperatures between 18° and 30° C., regeneration of a metathoracic leg, if begun before the critical period, adjusts the moulting cycle so as to provide the exact amount of extra time needed for completion of the regeneration process before ecdysis¹⁻⁴. (If the level of regeneration is such as to require no muscular reorganization, this effect is absent⁵⁻⁷.) In animals regenerating a whole leg, but not in controls, the corpora allata and 'head lobes' (ventral glands) show marked volume oscillations suggesting a circadian rhythm^{8,11}. Photoperiod effects are important in re-setting timing of developmental processes in the diapause of many insects⁸, and the onset of the dark phase in particular influences circadian activity rhythms, neurosecretion, and abnormal morphogenesis leading to tumour formation in the cockroach *Periplaneta*⁹. Far-red illumination has an adverse effect on growth in *B. germanica*¹⁰.

Time-regulation of the temperature-dependent moulting and regeneration processes may involve some temperature-independent factors such as illumination. Preliminary to a study of possible photoperiod effects, an investigation of the influence of single changes in illumination on moulting and regeneration has been made.

Mass-cultures of *B. germanica* were reared for at least two generations in a 'light box' continuously