B. HUMPHREY: I would expect to see a lilac at the end of the first year of rooting 8 inches high. They respond to high nitrogen which makes them more susceptible to blight (*Pseudomonas syringae*).

This is the last session and I have been left to wind up the proceedings, and it is indeed a great privilege to be allowed to do so. I have most sincerely enjoyed the meeting and hope you have all done so as well. It has all been thoroughly worth while and I look forward to seeing you when the Society visits our Nurseries in July or, failing this, let us make a date for the next Annual Conference at Merrist Wood in September, 1971.

THE CONFERENCE VISITS

(1) James Coles and Sons, Thurnby, Leics, England

23rd July, 1970

D. C. HARRIS

Conference Secretary

On both sides of the A47 road, 3 miles west of Leicester, the urban landscape suddenly relaxes into 65 acres of well-cultivated trees, shrubs and roses. This is the nursery of James Coles and Sons, renowned growers of top quality nursery stock and, on this particular afternoon, host to members of the I.P.P.S. A smiling William R. Coles with his son Geoffrey invited the visiting party to see as much as possible of the nursery and to ask questions freely during the brief 2-hour tour. With this hospitable welcome in mind, the visitors divided into small groups and, ably guided by members of the nursery staff, embarked on a detailed and rewarding study of the production areas.

Ornamental trees are an important crop within the nursery industry and budded trees of the more popular and valued cultivars are recognized as a speciality of the Coles nursery. Nursery Manager, Steve Haines, explained that the budding season for trees normally extends from late May until mid-August. *Acer platanoides* are budded first, followed in chronological order by *Acer pseudo-platanus*, *Crataegus*, *Prunus*, *Tilia* and finally *Malus*. In spite of the extra time required to produce a saleable tree especially with certain *Prunus* cultivars, such as *p.* 'Kiku Shidare' ('Shidare Zakura'), most understocks are budded just above soil level and are not top worked. Experience has shown that a better shaped head can be grown when the main stem is of the cultivar material. Understocks are headed back during the February after budding. Thereafter trees are staked, tied and grown on for 3 or 4 years before sale. Those few cultivars, for which propagation by budding is not always reliable, are normally whip grafted from the middle to the end of September. The graft union is tied with plastic tape and protected from wind by a clear

polyethylene bag until a callus has formed. If any "misses" occur from either budding or autumn grafting the understocks can be worked again in early spring.

Excellent young trees which had been budded a year earlier could be seen. Growth of *Tilia X euchlora* and *Tilia platyphyllos* 'Rubra' budded onto *Tilia platyphyllos* was exceptionally vigorous. *Malus* X *purpurea* 'Aldenhamensis', barely one year from budding onto seedling crab, had produced 6 ft. tall unfeathered shoots and were still growing strongly. Maiden whips 8 ft. tall are expected before the end of the year. *Malus* 'Lizet' which produces feathered growth during the maiden year had attained 4 to 5 ft. and looked as if stems at a minimum height of 5 ft. 6 in. would be formed before growth stops in October.

Hollies enjoy a regular demand on the Coles nursery and a standard method of production was outlined by Ron Dewick. Tip cuttings collected in September are wounded, treated with S.B.2 rooting powder (0.3% IBA) and struck under polyethylene film in unheated cold frames. The following spring the rooted cuttings are bedded out in the open and grown on for 2 years. The resultant liners are replanted and grown on for a further 2 years before sale. Fastest growth is obtained from plants grown on acid land. Approximately 20 different cultivars of *Ilex aquifolium* and *Ilex* X *altaclarensis* are raised. *Ilex aquifolium* 'J.C. van Tol' ('Polycarpa') is considered to be the best commercial cultivar, combining fast growth with profuse and regular berrying. *Ilex aquifolium* 'Pyramidalis' although slightly slower in growth makes a fine plant and can also be relied on for regular and heavy crops of berries. *Ilex aquifolium* 'Pyramidalis Aurea' is the most favored variegated holly. On the Thurnby land 9 to 12 in. of growth produced in two distinct spring and autumn flushes is obtained from this variegated plant each year.

Discussing a block of French hybrid lilacs, I.P.P.S. members learned that *Syringa tomentella* is being used on a trial basis as an understock. Initial observations indicate that *Syringa tomentella* establishes more quickly after planting and produces fewer suckers than the more usual understock, *Syringa vulgaris*. French hybrid lilacs are either field-budded during early August or bench grafted during the winter. Propagation by cuttings has also been tried but in spite of satisfactory rooting being obtained, the rate of subsequent growth has been disappointingly slow. Plants 27 months old at a height of 1½ to 2 ft. were observed. By comparison, budded plants of the same age were 2½ to 3½ ft. tall.

Looking over the many fine blocks of plants, it was obvious that throughout the nursery an intensive system of planting is followed. Rooted cuttings of *Deutzia*, *Philadelphus*, *Weigela*, *Potentilla* and similar shrubs are planted at a spacing of 1 ft. x 4 to 6 in. One year transplants are spaced at 1½ to 2 ft. x 1 ft. The practice adopted for

weed control under this intensive planting system was described. Simazine is applied in early spring at a rate of 1½ to 2 lb. active ingredient per acre. By midsummer when the herbicide has lost much of its activity, a canopy of foliage from the closely spaced plants effectively inhibits further weed growth. Persistent weeds are removed by hand. Trees are treated in a slightly different way. Rootstocks or young whips are planted, one ft. apart, with 3 ft. between the rows. This still represents intensive planting but both mechanical cultivators and herbicides can be used between the rows for weed control throughout the year.

During the afternoon, half an hour was spent in the Glasshouse Propagation Department with Leslie Wykes and Tom Allen. Comparisons were made between grafted and cutting-raised plants of large flowering hybrid *Clematis*. An interesting discussion of the two propagation techniques ensued. Cuttings taken from plants grown under glass are inserted in a peat / sand rooting compost during May or June. Four to six weeks later when rooting has occurred, the young cuttings are potted into 2½ in. pots and grown on under glass for a further 6 months. At this time the plants are cut back to near soil level, repotted into 3½ in. long pots and staked. By the end of the following summer, flowering plants are 3 to 4 ft. high and ready for sale. Grafted plants, although requiring more attention than cuttings, produce saleable stock within 6 months. Small scions of selected cultivars are grafted on to the understock *Clematis vitalba* during February. Two or three root grafts can be made from one rootstock crown. Completed grafts are potted into 2½ in. pots and maintained under conditions of warmth and high humidity for about 4 weeks until a union has been formed. Thereafter, the rapidly growing plants are potted into 3½ in. long pots and are ready for sale as flowering 3 to 4 ft. high plants by August or September.

At the end of the tour it was agreed that the first nursery visited during an I.P.P.S. Conference had set a very high standard. Much of value and interest had been learned and the I.P.P.S. is grateful to Mr. W.R. Coles, his son, and the nursery staff who gave of their time and experience so generously.

THE CONFERENCE VISITS

(2) Harry Wheatcroft and Sons, Edwalton, Notts, England

24th July, 1970

In a warm address of welcome David Wheatcroft announced that earlier the same day Harry Wheatcroft and Sons had acquired additional premises in the locality and henceforth rose production from the combined nurseries would be increased to 1½ million bushes,

20,000 standards and 75,000 miniatures. This stimulating stop press news set the tone for a thoroughly interesting and lively afternoon.

The visiting party was divided into 3 groups and guided through the various departments of the home nursery. In the glasshouse propagation block, Dave Staton explained the production of miniature roses.

Short one-bud scions are whip grafted onto 4 to 6 mm bare-rooted *Rosa canina* understocks during January and early February. Scions in full leaf are obtained from pot-grown stock plants potted in the autumn and gently forced into growth from mid-December onwards. Particularly good scion wood is produced from plants grafted onto *Rosa multiflora*; although preferred for stock plants, this rootstock is not used for saleable plants because it induces excessive vigor in the scion. The graft union is made on the collar of the understock with approximately ¼ in. of the scion cut showing above the top of the cut-back understock. Thin twine is used for tying. Two grafters with one assistant can graft and put away 2,500 to 3,000 plants in an 8-hour day. Grafted plants are placed vertically in a double glazed propagating case with the understock roots loosely packed in moist peat. During the ensuing 3 weeks while callusing takes place plants are sprayed with Captan on alternate days in order to prevent Botrytis infection on the soft new growth. Scions which lose their leaves at this stage callous less freely. After a union has formed plants are plunged in peat under cold glass with plants touching in the rows and 1½ in. between adjacent rows. Shading is required during periods of bright sunlight.

As soon as a suitable tilth can be prepared on outside land, usually during April, plants are set out at a spacing of 12 in. x 4 in. x 4 ft. wide beds. Protection from wind is provided by 6 ft. high lathscreens permitting 50% wind filtration. At the end of the year plants are approximately 11 in. high and ready for sale.

Concerning the availability of scion material it was explained that early in 1970 an experiment had been undertaken to determine the effect of supplementary mercury lighting on stock plants. Eight plants each of 9 cultivars were placed under mercury lamps during early January. A similar number of plants of the same 9 cultivars were grown without supplementary lighting. Records showed that the illumination treatment almost doubled scion production.

In answer to a question on alternative methods of propagation, Dave Staton replied that budded plants tended to produce tall shoots during the maiden year and at the time of sale were too big. Cuttings of certain cultivars of miniature roses were easy to root, but the plants did not seem to overwinter satisfactorily in the open.

While in the glasshouse unit I.P.P.S. members were shown a '3-site'' mobile glasshouse used for the double purpose of exhibition bloom production and temporary winter storage of lifted plants. Bush roses of selected cultivars are planted on 2 of the 3 sites. One of the

planted sites is protected by the glasshouse from March until September and the second planted site is rested. Show quality bloom is produced from the protected site from May onwards. Each winter the glasshouse is moved over the third site and used as a temporary store. The earth floor together with polyethylene sheeting attached to the superstructure helps to maintain a high humidity.

At the time of the visit field budding of bush roses was in progress and I.P.P.S. members were able to watch the operation while nursery manager, F.A.B. Newenham, explained the technique.

Soil is removed from the collars of earthed up *Rosa laxa* understocks by an Egedal Blower machine. Four small shares which form part of the basic 2 row unit remove soil from 2 sides of the understocks. High velocity air ducted from turbines to points immediately behind the shares blows the remaining soil from the base of the plants leaving the collars exposed. Trained teams of budders and "tyers" complete the operation. To ensure that work is not delayed due to an irregular supply of buds, budwood is collected 2 or 3 days in advance of use and held in cold stores until required. It was emphasized that although budwood is deleafed before storage, thorns should not be removed until immediately before budding or buds will deteriorate. Flexible rubber patches are used for tying in. In one day 1,000 to 2,000 buds are normally inserted by each budder, but a rate of 3,000 per day is occasionally achieved by a few experienced knifesmen. A "take" of 90 to 95% is expected.

Commenting on a point of management, F.A.B. Newenham explained that to ensure a high percentage "take", budding is not undertaken on a piece work basis. Weekly wage rates paid throughout the full working year are however adjusted according to personal output during the vital propagating period.

The selection of cultivars, number of buds required, and order of budding is planned well in advance. The season normally starts during the second week of June, with almost all available staff involved. As the season progresses the number of budders is gradually reduced until approximately mid-August when field budding is usually completed. By maximizing output early in the season full advantage is taken of fine weather and long days. Almost 80 different cultivars are grown, but it is hoped to reduce this number if future years. Some of the more popular cultivars are 'Super Star', 'Fragrant Cloud', 'Prima Ballerina' and 'Diorama', but a high demand for the recently introduced 'Oriana', 'Whisky Mac' and 'Alecs Red' is anticipated.

Mechanization is an important aspect of large scale rose production. This was clearly demonstrated by an array of 26 different machines and items of production equipment assembled from various parts of the nursery for our inspection. Ernest Parsons, who is responsible for the maintenance of all production equipment and also controls a machinery sales and service unit which operates from the

nursery, explained in seasonal order the mechanization involved in a 2-year rose production cycle. Implements ranging from heavy sub-soilers to bundling and tying machines were discussed. There was much to be seen during the 40 minutes allocated to this part of our visit, but of particular interest were standard horticultural and agricultural implements which had been modified to accommodate the specific needs of the nursery. The plant carrying capacity of a Super Prefer planting machine had been almost doubled by fitting 2 side mounted panniers in place of a single front mounted pannier. For the same machine a reinforced nylon 'All Weather Cabin' had been constructed to protect operators from wind and rain. It was mentioned that the cabin could be easily detached from the planter and used as a canopy for detailed field work if required. Much interest was shown in a set of spring tine harrows which were suspended from an elevated tool frame by rigid arms to permit harrowing through a standing crop of bush roses. Other one-off machines included a Horstine Farmery Band Fertilizer Applicator on which the landwheel drive had been modified to facilitate operation under particular conditions which prevail at the Wheatcroft nurseries.

A rapid tour of a jacketed cold store and a quick examination of stored budwood completed a most successful and thoroughly absorbing afternoon. Grateful thanks were extended to all those concerned at the host nursery.

NOTES ON THE PROPAGATION OF VIBURNUMS

P. D. A. McMILLAN BROWSE, *et al*

(Ed. note. The ensuing report is the result of a request from the Executive Committee of the G.B. and I. Region, IPPS, to their members for information, particularly from personal experiences, in the technique of propagating viburnums Ten persons contributed — R. D. Anderson, G. P. Chandler, D. M. Donovan, R. J. Hares, S. J. Haines, B. R. Halliwell, P A. Hutchinson, J. G. D. Lamb, P. D. A. McMillan Browse and K. Mickelburgh Mr. P. D. A McMillan Browse collated the information into a report, which was circulated to G B. and I. meetings in September, 1970. The exercise is a continuative one and we should like to have additional relevant information).

VEGETATIVE PROPAGATION

Viburnum x bodnantense and its vars. 'Charles Lamont', 'Dawn' and 'Deben', *V. fragrans* and var. 'Candidissimum', *V. grandiflorum, V. foetens.*

This group of deciduous, winter flowering Viburnums lends itself to several techniques of propagation; small quantities can be reliably produced by 'French' layering but for large scale production a system