

PROPAGATION OF CHESTNUTS AND CAMELLIA BY NURSE SEED GRAFTS

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Introduction

A few years back while working with chestnut propagation at Auburn University, cuttings made from young seedling plants rooted readily while cuttings from old trees were very difficult to root.

This led to the belief that there were substances in the germinating seed that caused the young or juvenile wood to root readily.

Seed cotyledons enclosed in the old seed coat were removed from several young seedlings, and a simple hardwood scion from bearing trees, trimmed to a point at the base, was inserted into each of the removed cotyledons. These grafts with the cotyledons attached were placed in a medium of sand to see if the scion would absorb enough of the substances from the cotyledons to induce rooting. Checks were used without cotyledons attached.

Within a few weeks some of the scions began to grow vigorously while others put out weak growth and died in a short time. When the grafts were examined, it was found that those making good growth had formed a union with the cotyledon petioles and had formed a good root system. None of the checks rooted.

This process of grafting has now been evolved where a very high percentage of the scion will unite with the cotyledon petioles and produce good root systems.

Procedure

The young chestnut seedling is connected to the cotyledons by prominent petioles. In performing the graft, the cotyledon petioles are cut near the cotyledons, and a knife point is inserted between the cut petioles into the cotyledons making an opening for the scion. The scion, trimmed at the base similar to a cleft graft, is then inserted into the opening. Care is taken to bring the exposed cambium of the scion in contact with the cut surfaces of the petioles.

After the grafts are made, they are lined out with the cotyledons about one and one-half inches below the surface of the medium and handled as cuttings.

For best results with chestnuts, the scions are collected during the dormant season and the grafts are made in early spring. At present, the procedure has not been developed for semi-hardwood scions. Under mist the cotyledons rot and prevent a union; when a jar is turned over the scions, the leaves darken and drop off.

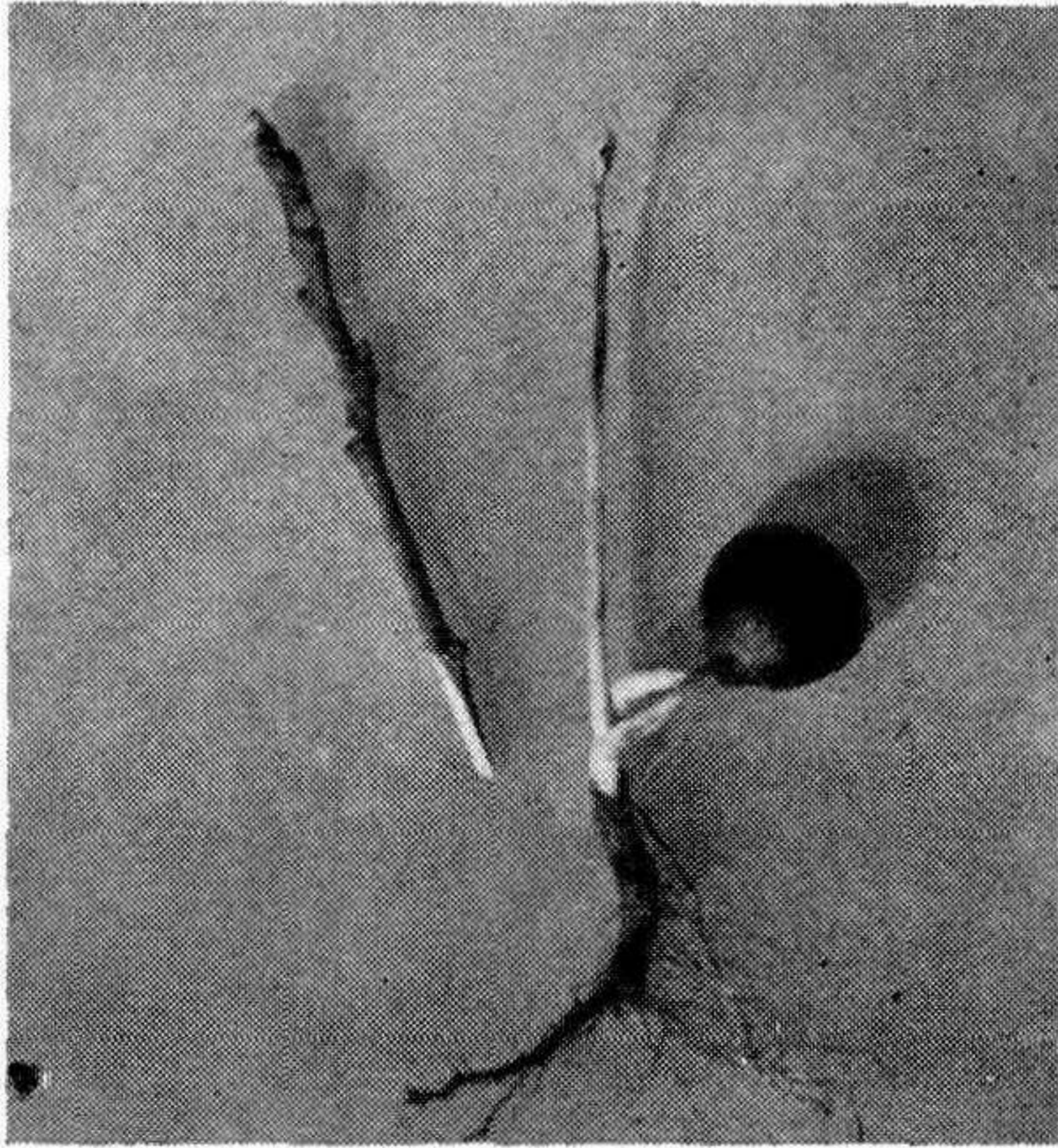


Figure 1. A chestnut seedling and scion.

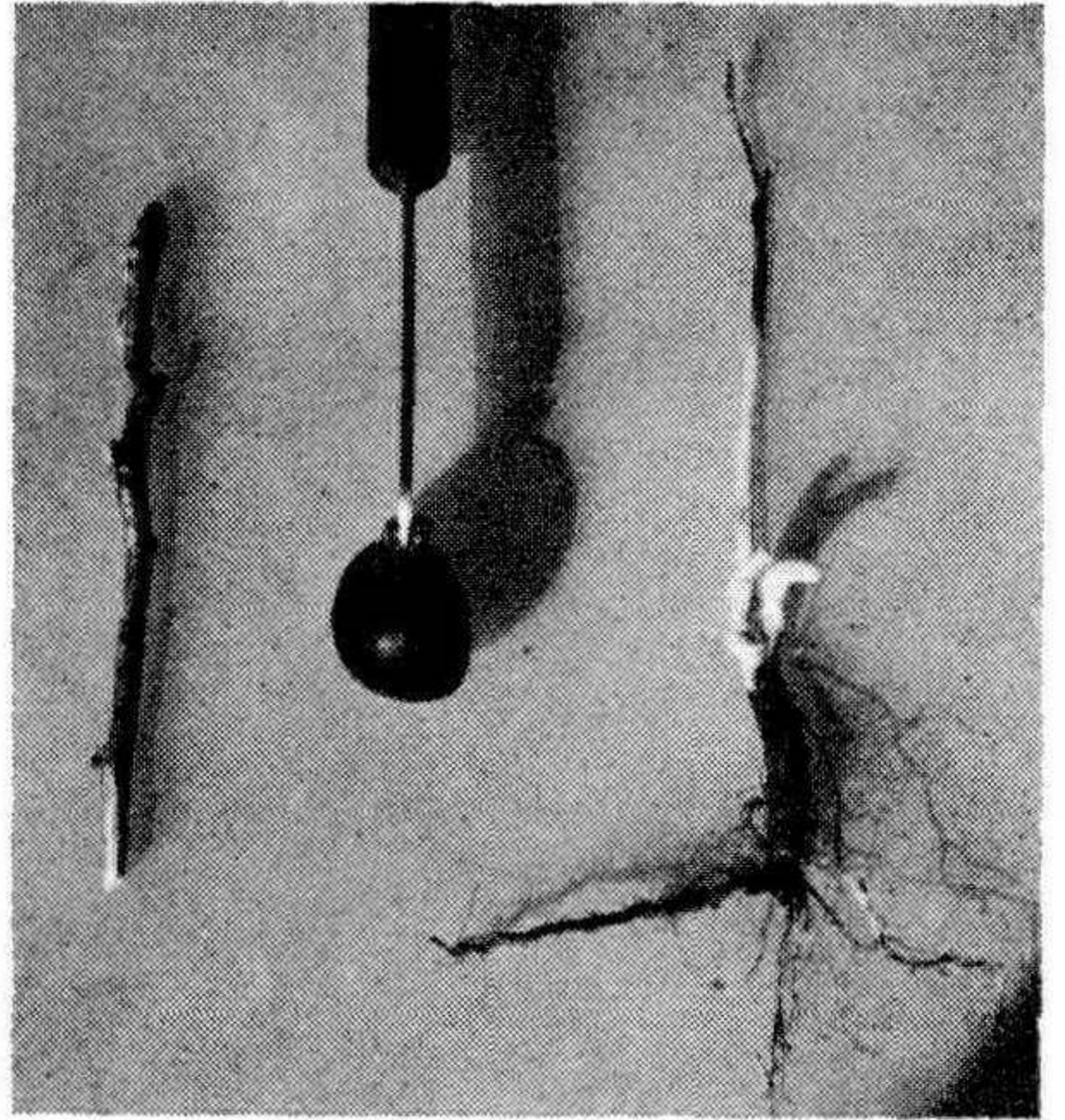


Figure 2. The seedling cut off from the cotyledons. The knife is used to spread the cotyledons and the scion will be inserted.

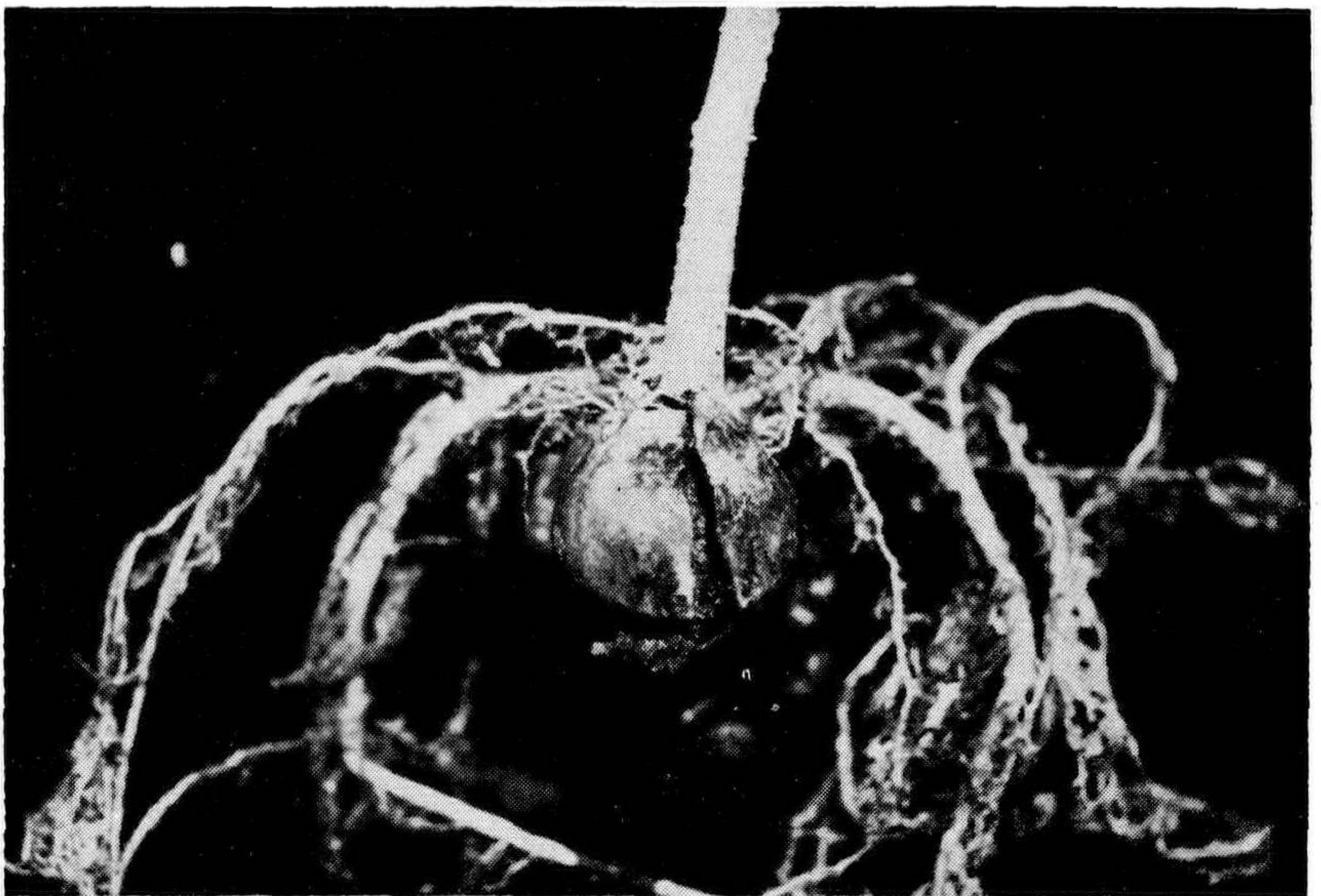


Figure 3. A rooted chestnut "nurse-seed" graft.

Mist Propagation of Chestnut Cuttings

Chestnut cuttings taken on June 15 and treated with Rainbow Hormone #2 powder have rooted very satisfactorily when placed under intermittent mist, using 16 seconds in a 2-minute cycle. The date for taking cuttings was determined by taking cuttings at 10-day intervals beginning April 28 and ending July 28. The following table gives the results in 1962.

While chestnuts have rooted readily under mist, forcing the buds into growth has been a problem. By June 15 the buds are in a resting stage and will not grow under normal conditions until the rest period is broken.

Table 1 Effect of Date on Rooting of Chestnut Cuttings under Mist During 1962 Growing Season

Date cuttings taken	Number of cuttings out of 12 that rooted
April 28	0
May 8	2
May 18	3
May 28	5
June 8	10
June 18	10
June 28	2
July 8	0
July 18	0
July 28	0

The rest period breaks normally after the cuttings have been carried through the winter. This has been true of those surviving from cold storage at 35° F., as well as those carried in flats under normal greenhouse temperatures. Cold is not necessary to break this rest period.

Many cuttings die during the long carry-over period. Those that have survived have made good growth.

Nurse Seed Grafting Camellias

Nurse seed grafting of camellias was just as successful as nurse seed grafting of chestnut. Both dormant and active scions were used in grafting camellias. Active scions of camellias were covered with a jar to prevent transpiration during high temperatures of summer.

There are two advantages in using the nurse seed graft for camellias: (1) The scion will root much faster and growth the first years is greatly increased, and many camellia varieties are difficult to root. Seed grafting gives excellent results with such varieties. The camellia seed is smaller in size than that of the chestnut seed, but the procedure is the same as for chestnuts. Both *Camellia Sasanqua* and *Camellia Japonica* seed have been used in this work.

This is a progress report and answers are not available on all points. However, this work opens up an interesting field in plant propagation.

MODERATOR MCDANIEL: Thank you, Prof. Moore, for a very stimulating paper. Our final paper this morning is by Dr. Fred Lanphear, Department of Horticulture, Purdue University.