Successful Crossing in the Genus *Lathyrus* through Stylar Amputation

Interspecific hybridization in the genus *Lathyrus* has been attempted by several workers with little success. Barker[1] obtained viable, partially fertile hybrids from the cross *L. hirsutus* × *L. odoratus*. Taylor[2] claimed to have produced seeds by crossing *L. odoratus* with *L. pratensis* reciprocally. It has not been possible to repeat this cross. Senn[3] reported failure in 458 attempts at intercrossing seventeen species of *Lathyrus* and *Pisum sativum*. Marsden-Jones[4] successfully crossed *L. rotundifolius* with *L. tuberosus*. In this Department viable seeds have been produced from the following crosses : *L. cicera* × *L. sativus* (Saw Lwin*), *L. clymenum* × *L. ochrus* (Saw Lwin*), *L. clymenum* × *L. articulatus*—reciprocally (Davies), *L. articulatus* × *L. ochrus* (Davies), *L. hirsutus* × *L. odoratus* (McWhirter*), *L. odoratus* × *L. hirsutus* (Davies), *L. sylvestris* × *L. latifolius* (Ellis*).

The cross *L. hirsutus* × *L. odoratus* of Barker has been successfully repeated in this Department without difficulty. Some reciprocal crosses were attempted between 1951 and 1955 but were unsuccessful.

The reasons for failure in interspecific hybridization attempts have been discussed by Blakeslee[5], and methods employed to overcome barriers to crossability have been reviewed by Maheshwari[6]. Lack of success in the cross *L. odoratus* × *L. hirsutus* could be due to the greater style-length of *L. odoratus* (10 mm.) as compared with *L. hirsutus* (4 mm.). Style-length differences contributed to the failure of interspecific crossing attempts in the genus *Datura*[5].

A modification of the technique of Buchholz *et al.*[7] involving complete amputation of the female parent style was used in crossing *L. odoratus* with *L. hirsutus*, and several hybrids were produced. The best results were obtained by pollination on the cut stump after all the style was removed, though after removal of 4 mm., 6 mm. and 8 mm. portions, fertilization did sometimes take place. Grafting *L. hirsutus* styles on to the ovaries of *L. odoratus* was successfully effected, but showed no advantage over direct pollination on the cut stump.

For routine crossing and to avoid emasculation damage, a modification of Doak's soda-straw method[8] for crossing *Gossypium* was found to be useful. Pieces of the culms of various species of grass were fitted down over the styles of unopened flowers, excluding the anthers and with one end protruding from the keel. When the flower had opened pollen was pushed down the culm with a tightly fitting glass rod on to the stigmatic surface. This method may have wide application in work with other genera.

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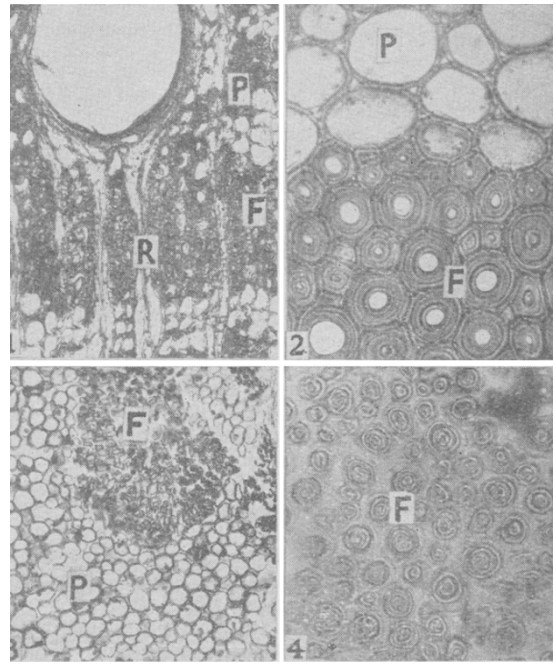
Difference in the Behaviour of Tissues in Ancient Plant Remains and during Chemical Treatment

Although considerable work has been done on the cell wall structures of ancient and buried woods[1] and their degradation[2] from chemical, physical and botanical aspects[3], little attention has so far been paid to the differential behaviour of the main tissues of such woods. While studying the minute anatomy of fossil woods and buried woods, we noted the peculiar behaviour of the two important tissues of the dicotyledonous woods. During long submersion of wood in water or soil, parenchyma cells and rays are usually found to retain their original structure better than the fibres (Fig. 1). This was reported by two of us (K. A. C. and S. S. G.), but no definite reason for such behaviour could be put forward except the nature of pits on the walls of fibres, vertical parenchyma cells and wood rays[4]. The main obstacle to chemical investigation has so far been the difficulty of obtaining pure samples of parenchyma and fibres from fresh woods. Recently, while working on bamboo, it has been possible to separate mechanically its parenchymatous and prosenchymatous tissues. This led us to think that it might be worth while analysing chemically these pure tissues and at the same time examining them microscopically at different stages of delignification, with the view of getting a clearer picture of the nature of the cell wall.

Chips of bamboo (*Dendrocalamus strictus* Nees) were delignified in a pressure autoclave by the conventional sulphate method for various periods. In this method, delignification was carried out with a solution containing sodium hydroxide and sodium sulphide in the ratio of 2 : 1 for various periods up



All are transverse sections. (1) Buried wood (*Dalbergia latifolia* Roxb.) of thousand years (× 120). (2–4) *Dendrocalamus strictus* Nees. (2) Untreated fibres and parenchyma (× 300). (3) After 5 hr. treatment (× 45). (4) Fibres of (3) highly magnified (× 300); cf. (2) and (4) and note difference in the structure of fibre wall. *F*, fibres; *P*, parenchyma; *R*, rays