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“Bolander’s Pine?”

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DURING recent years increased attention has been focused on a number of trees believed to be *Pinus contorta*, growing singly and in groups in the grounds of Ashford Castle, Cong, Co. Galway.

Before the 1961 gales there were 16 of these trees noted, but the “big winds” of September 1961 decimated the Cong amenity grounds and left only 9 of the known *Pinus contorta* standing undamaged. Fortunately, a measurement of the individual trees had been carried out in March 1961, and this showed that at least 8 of the specimens were over 80 ft. in height, a further 4 being between 70 and 80 ft. The largest tree measured was 97 ft. high by 10 ft. 8 ins. B.H.G., in November 1961, this being one of the trees that survived the gales. One of the blown trees measured, however, 102 ft. by 9 ft. 3 ins. and contained 167.6 cu. ft. (Hoppus) of timber.

Apart from the fact that these are the largest known specimens of *Pinus contorta* in Ireland (and possibly in Britain also), they are of obvious taxonomic interest. Their appearance, which resembles neither the well-known coastal type nor the less-favoured inland, led us to delve further into their history and background. No local records were available but ring-counts on the stumps of blown trees suggested a planting date of somewhere in the early 1880's. An extract from a 1928 “Gardener’s Chronicle” added weight to this idea with this statement:—“On limestone soil at Cong, Co. Galway specimens planted in 1884 had reached a height of 70 ft. in 1923 with straight stems and well-furnished crowns. These were planted as *Pinus bolanderi*.” It will be shown later that *Pinus bolanderi* is in fact a regional variation of *Pinus contorta*. Elwes and Henry recognise the introduction of this tree with the following note which appears under the paragraph dealing with *Pinus contorta*:—“A tree of typical *Pinus contorta* planted in 1886 at Grayswood, Haslemere as *Pinus bolanderi* measured, in 1906, 28 ft. by 3 ft. 1 in.”

It will be seen from the above two extracts that a form of *Pinus contorta* has been recognised as a distinct taxon by some authorities and called *Pinus bolanderi* (Parl.), but Critchfield inclines to the view that it is a regional form meriting recognition as a subspecies: *Pinus contorta* ssp. *bolanderi* (Parl.). The other forms suggested by Critchfield are:—

Coastal Region :

Pinus contorta. Douglas ex Loudon. ssp. *contorta*.

Rocky Mountains :

Pinus contorta ssp. *latifolia* (Engelm : ex Watts).

Sierra Nevada :

Pinus contorta ssp. *murrayana* (Balf.).

The subspecies *bolanderi* appears to have a very limited range—Lat. 39 and 40 N., and Long. 123 and 124 W.—on the Mendocino white plains of California half-way between Cape Mendocino and San Francisco. This location is a Pacific coastal one about 20 miles long by a few miles wide, rising to only 200 ft. above sea level, and, though small in area, covers a wide series of site-types from heavily leached iron-pan soils to peat bogs further inland. Rainfall is generally high and the tree population extends on to the prairie-like coastal bluffs.

The Mendocino white plains *Pinus contorta* differs from the other three forms in one characteristic, namely, the absence of resin-canals in the leaf transection. This feature is all the more remarkable, when one considers that resin-canals are almost invariably present in the leaves of *Pinus* and are considered a characteristic of this Genus. They are occasionally absent in coastal *contorta*, particularly in those growing immediately adjacent to the Mendocino plains population. It is possible that the function of resin canals is that of protection against diseases and insects and thus this particular strain may be more prone to attacks of, say, the larvae of needle-miners.

Other differentiating features are not so striking, though it has been found that the Mendocino population have leaves of about 1.3 mm. width which is narrower than in any of the other areas sampled by Critchfield. The leaves were also found to be shorter than other forms, measuring from 3.1 to 4.6 cms. (mean) whereas in the coastal, intermediate and mountain types leaves range from 4.1 to 7.1 cms. in length. However, it is likely that the shortness of the Mendocino plains needles is largely a result of dwarfing due to exposure and it is possible that under good conditions they would be considerably longer.

Seed-cone orientation on the branch with consequent symmetry or asymmetry of the base of the cone is also used as a likely feature for separating *Pinus contorta* forms, but it is by no means conclusive. It suffices to say that the Mendocino type falls into a group with heavily reflexed cones, which are, thereby, oblique at the base. Two further seed-cone characteristics are noted. Firstly, the apophyses on the cone-scale of the Mendocino form are more quadrangular in face-view and pyramidal in outline than the coastal form which has an almost conical or rounded scale. In this feature the Mendocino and mountain groups are more alike than the Mendocino and coastal groups. Secondly, the serotinous habit has been more widely used as a taxonomic character in differentiating forms of *Pinus contorta*. A cone is considered serotinous if it remains closed on the tree for a period of 10-12

months after it matures, and this is very characteristic of the Mendocino white plains population. It has also been found that the Cong specimen cones are harder to open under room-temperature conditions than other home-collected contorta cones.

How well then do our Cong specimens fit into this picture? Firstly a note about the site might be appropriate. The trees in question are growing as park-land specimens scattered throughout the amenity grounds surrounding the Castle. The soil would appear to be a rich brown-earth overlying limestone which outcrops in several places in the immediate vicinity, in the form of the typical deeply-fissured limestone-crag. Shelter is adequate from the estate woodlands, groves and shelter-belts. The main Galway-Mayo mountain ranges lie to the South and West and afford considerable protection from the direct force of the Atlantic gales. The one exception to this is the shore of Lough Corrib, which bounds the South of part of the Gardens, and along which exposure is fairly severe. There are no actual meteorological records for Cong, which lies at around 40 ft. above sea-level, but the following records refer to a recording station at Claremorris, 18 miles to the N.E., at 225 ft. a.s.l. The yearly mean temperature over the years 1943-50, was 50° F. which is almost the same as that for Dublin, Tralee, Foynes, Mountmellick and other centres, but late spring frosts appear frequently in the Claremorris records. Screen temperatures down to 27° F. in April 1950 and 29° F. in May 1945 might be expected to preclude any but the hardiest exotic trees. During the 1943-50 period the extreme minimum screen temperature of 4° F. was recorded in January 1943, being the second lowest recording for Ireland during those years. Yearly annual rainfall, fairly evenly distributed throughout the year, is about 50 inches.

A description of the character and appearance of the trees themselves is difficult as they range between many-stemmed rough-branched types to tall trees with excellent stem-form and dimensions already mentioned. However, one could say that they mostly look like elderly *Pinus radiata* stems with *Pinus sylvestris* foliar-habit! It is this lighter-coloured foliage which first singled them out from the *Pinus radiata* with which they are intermingled. One notable feature of the better specimens is their uniform habit of branching. In other words, the branch spread is not remarkably wide at the base, tapering away rapidly in the typical cone-shape of coniferous trees, but the lower branches are not much wider than those further up the tree, the taper only occurring at the very top. This lends the trees a graceful columnar appearance.

The leaves average 6.7 cm. in length, which is disturbing, as it makes them longer than the average for any of the subspecies in their native habitat, whereas the Mendocino Plain population are reputed to have the shortest leaves! However, as already stated, the true "bolanderi" site is a barren exposed gravelly bluff, and the trees only windblown shrubs. It is possible, therefore, that when transferred to

such a relatively favourable site as Cong, marked morphological changes may take place. The width of the leaves, 1.4 mm., is consistent with Critchfield's findings, and perhaps most important of all, no resin canals were observed in any leaf transections.

The seed-cones are remarkably long for *Pinus contorta*, 5.9 cm. \times 2.2 cm. wide. In spite of being heavily reflexed they are not bulbously asymmetric, but they have a curious long, almost cylindrical appearance, curving towards the twig. The seeds so far extracted from cones of the Cong trees were noted to have unusually long narrow wings and also a particularly sharp hook-like projection on the seed itself.

Of the timber little can be said, unfortunately, as we have not yet had the opportunity of putting it through a full test schedule. However, some of the trees were sawn up in the Forestry Division's Cong saw-mill where it received favourable comment. The pith-flecking so prominent in *Pinus contorta* was very evident in this material which sawed well and planed cleanly with little or no lifting of the grain. Seasoning, along with *Pinus radiata*, proved no worry and the finished boards have an unusually attractive appearance. The intermediate relationship between spring and summer wood allows this timber an attractive "grain" without affecting the planing and working properties.

Seeds collected from these remarkable trees have been sown and it remains to be seen how their progeny behave in a variety of site-trials.

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