

which generally transmit their character by seed.<sup>156</sup> The occurrence, in trees belonging to widely different orders, of weeping and fastigate varieties, and of trees bearing deeply cut, variegated, and purple leaves, shows that these deviations of structure must result from some very general physiological laws.

Differences in general appearance and foliage, not more strongly marked than those above indicated, have led good observers to rank as distinct species certain forms which are now known to be mere varieties. Thus, a plane-tree long cultivated in England was considered by almost every one as a North American species: but is now ascertained by old records, as I am informed by Dr. Hooker, to be a variety. So, again, the *Thuja pendula* or *filiformis* was ranked by such good observers as Lambert, Wallich, and others, as a true species; but it is now known that the original plants, five in number, suddenly appeared in a bed of seedlings, raised at Mr. Loddige's nursery, from *T. orientalis*; and Dr. Hooker has adduced excellent evidence that at Turin seeds of *T. pendula* have reproduced the parent form, *T. orientalis*.<sup>157</sup>

Every one must have noticed how certain individual trees regularly put forth and shed their leaves earlier or later than others of the same species. There is a famous horse-chestnut in the Tuileries which is named from leafing so much earlier than the others. There is also an oak near Edinburgh which retains its leaves to a very late period. These differences have been attributed by some authors to the nature of the soil in which the trees grow; but Archbishop Whately grafted an early thorn on a late one, and *vice versâ*, and both grafts kept to their proper periods, which differed by about a fortnight, as if they still grew on their own stocks.<sup>158</sup> There is a Cornish variety of the elm which is almost an evergreen, and is so tender that the shoots are often killed by the frost; and the varieties of the Turkish oak (*Q. cerris*) may be arranged as deciduous, sub-evergreen, and evergreen.<sup>159</sup>

*Scotch Fir (Pinus sylvestris)*.—I allude to this tree as it bears on the question of the greater variability of our hedgerow trees compared with those under strictly natural conditions. A well-informed writer<sup>160</sup> states that the Scotch fir presents few varieties in its native Scotch forests; but that it "varies much in figure and foliage, and in the size, shape, and colour of its cones, when several generations have been produced away from its native locality." There is little doubt that the highland and lowland varieties differ in the value of their timber, and that they can be propagated truly

<sup>156</sup> Godron, 'De l'Espèce,' tom. ii. p. 89. In Loudon's 'Gardener's Mag.,' vol. xii., 1836, p. 371, a variegated bushy ash is described and figured, as having simple leaves; it originated in Ireland.

<sup>157</sup> 'Gardener's Chron.,' 1863, p. 575.

<sup>158</sup> Quoted from Royal Irish Academy in 'Gardener's Chron.,' 1841, p. 767.

<sup>159</sup> Loudon's 'Arboretum et Fruticetum;' for Elm, see vol. iii. p. 1376; for Oak, p. 1846.

<sup>160</sup> 'Gardener's Chronicle,' 1849, p. 822.