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for sun and air to the roots, and I have never had any disease.

As to the Arve, *Pinus Cembra*, I have pruned some, and find they do not bear it so well as *P. austriaca*. They are growing very luxuriantly, but for some years past have been sadly injured by the boring beetle. The *P. ponderosa*, of which I have one large tree, is a miserable-topped unsightly tree, and is especially preferred by the borer.

The *P. pyrenaica* has almost entirely failed with me. Being a Spaniard, it lacks sun in Tweeddale. The true *P. uncinata* grows a pretty diminutive tree. The tree named by nurserymen in their lists as *P. uncinata* is nothing but the *P. Mugho*.

IV.—On the Ferns of Brisbane. By ROBERT GRIEVE.

The number of ferns which I have been able to gather within twenty miles of the town of Brisbane, exclusive of Lycopods and Equisetaceæ, is in all fifty-five species. Every river is skirted by a great fluvial forest to a breadth varying from a few yards to a few miles. Dense, moist, gloomy, the nocturnal mosquito here hums its war-song at noonday. The large fig trees of various kinds, the red cedar (*Cedrela Toona*), the gigantic nettle (*Urtica gigas*), and the Seaforthia palm are abundant. At our feet are various growths allied to Maranta and Caladium. Above our heads are festoons of creepers, while at every step our progress is impeded by some wait-a-bit thorn, or the vines and lianas that bind the whole together. Such are the localities which produce some of our finest ferns. First of all is the tree fern, *Alsophila*, which rises to the height of 30 or 40 feet. I only know one species, although close to the skirts of the wood is its congener, *Dicksonia dubia*. Of the genus *Pteris* we have four species. *Pteris tremula*, with its polished ebony shafts, and the larger and more graceful, *Pteris vesperilionis*, 10 feet high. The two other species are the ubiquitous *P. aquilina*, and the more rare *P. longifolia*. As we force our way through the forest, we tread on two interesting little ferns, *Pellaea paradoxa* and

felicitis. On rotting tree-stumps grow side by side, *Niphobolus-confusus* and *rupestris*. We next come upon a plant, the only one of its genus with us, *Allantodia australis*. Proceeding over the rich loose leaf-mould, we observe a most graceful fern, calculated to be an ornament to every conservatory, *Nephrolepis exaltata*. *N. oblitterata* may also be seen adhering to rocks outside the forest, and insinuating its polished roots among loose stones, and close beside it is that curious plant, *Drynaria diversifolia*. Those apparently withered oak leaves are the first produced pinnatifid unfertile fronds, always dessicated, of that tall feathery *Polypodium*. To obtain a plant you must take the rock to which it adheres.

But let us return to the forest. Here and there, in a moist hollow of a dead tree, may be seen *Nephrodium molle*, like an immense Prince of Wales's feather; still more common, and of darker green, are several varieties of *Nephrodium decompositum*. Two other swamp-growing species, viz., *Nephrodium unitum* and *propinquum*, do not seek the shade. Allied to this genus is *Lastrea coriacea*. In the depths of the scrub, often in solid masses of many yards extent, we find the dark green *Asplenium attenuatum*, conspicuous for its proliferous reproduction. There are several varieties of this fern, some perhaps altogether distinct. A fern I discovered bears some resemblance to *Asplenium*, but is, perhaps, more closely related to *Doodia*. A much finer and larger species of *Asplenium* than the last, is *A. falcatum*, one of our choicest ferns. High over head, it grows in the hollows of trees, from which it throws out bunches of long dark green crescents, and is generally obtained with difficulty. So also is that beautiful epiphyte sometimes called an *Asplenium*, *Neottopteris australasica*, a grand fern, much like what is called the Bird-nest fern by gardeners. It attains a size at which each leaf may measure 8 feet. *Davallia pyxidata*, the Hare's-foot fern, a beautiful species, is common in British conservatories. All these epiphytes grow in similar situations, mostly in branch hollows of the largest trees, sometimes at 20 feet, sometimes at 200 feet. The most beautiful of all is without doubt, *Platyserium alcorni, grande*. I have frequently seen it covering 100 square feet, or about 12 feet by 8.

Another species of *Platycerium* not so familiar to British botanists, *P. alcicorne*, *longifolium*, is a much smaller plant and has a perfectly distinct fructification. In *P. grande*, the fructification crosses the whole of the broad disc-like fronds, whereas *P. longifolium* only bears spores upon the tips of its comparatively attenuated leaves. *Polypodium tenellum*, a creeping fern, makes its way like ivy or convolvulus up the trunks of trees, and adheres to its support by numerous fibres. It is the last of the forest ferns that I shall name, and I would observe that the nomenclature is given with diffidence. Passing from the shade of the forest, we cross the broad meadows. Here and there a gigantic gumtree or ironbark (both *Eucalypti*), intercepts the vertical rays of the sun. We see around us the ubiquitous *Pteris aquilina*, and mixed with it is the similar, but fairer fern, *Polypodium rugulosom*. *Dicksonia dubia* grows in compact and tall masses hard by; and *Doodia aspera* on the stony ground. *Doodia media* and *caudata* seek a moister habitat. By the shade of rocks grow two pretty little ferns, light in form but dark in colour, resembling one another, but yet distinct, *Cheilanthes Sieberi* and *Nothochlaena distans*. Out of the sun, over the broken banks of that streamlet, not far off, is the lightest, airiest, and most herbaceous of all ferns, *Lindsæa microphylla*, not in single stalks, but in great bunches of transparent vegetation. The shape of its leaf resembles *Sphenopteris affinis* of the Coal Measures. Growing near are *Lindsæa Fraseri*, *L. linearis*, *L. trifida*, and *L. heterophylla*. They form a group matchless for grace and delicacy. Two very unique ferns love the inhospitable sand, *Schizæa dichotoma*, and *S. bifida*. Their resemblance to the grasses causes them frequently to be passed over.

By the shelving banks of this stream, or among its undergrowth, may be found our three *Adianta*: *Adiantum formosum*, *A. hispidulum*, *A. assimile*, so called from its close proximity to the Maiden-hair of Europe. The Maiden-hair is partly shaded from the light by another fern, *Blechnum cartilagineum*, and nearly in the stream is the other species, *B. striatum*.

Conspicuous among swamp ferns, for its size and beauty, is *Todea barbata*. It has a large central crown of ver-

nation formed by fifty fronds, each 8 or 10 feet high. Not inferior in size, if somewhat in grace, is the large *Chrysodium aureum*, which only grows on the banks of tidal streams. *Lygodium microphyllum* is a creeper, and may be seen trailing through the reeds and water plants for many yards, leaving everywhere a gay festoon as it moves along. It somewhat resembles *Tropaeolum canariense*, but is more light and delicate. Lastly, we have three *Gleichenias*, with their simple rudimentary spores at the back of each frond, ready to drop off at a touch, *Gleichenia dicarpa*, *G. microphylla*, *G. flabellata*. They are wiry and incompressible, but eminently graceful and light.

11th February 1875.—Professor ALEXANDER DICKSON in the Chair.

The following Communications were read:—

I. *On the Fertilisation of the Cereals.* By ALEXANDER STEPHEN WILSON.

To the position taken in my last paper* on the fertilisation of the so-called European cereals, that these grasses were self-fertilised; that the act of fertilisation in those cases in which the flower opens is probably performed in the opening, and is necessarily confined to the twenty or thirty minutes during which the flower remains open, certain objections were taken. It was objected that I appeared to make the mistake that fertilisation took place when the pollen was shed, which, as was illustrated by the case of many plants, it was said, was not necessary.

The meaning of the word "fertilisation" is partly a matter of convention. It may mean that act of the anthers by which they project or discharge the pollen, which, falling directly on the pistil, shall produce the embryo; or it may mean the falling of the pollen on the ovule after being carried a distance by the wind; or it may apply to the

* See *ante*, pp. 84-95.