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I. Notes upon Californian Trees Part I

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13th January 1859.—Professor BALFOUR, V.P., in the Chair.

The following Candidates were balloted for and duly elected as Resident Fellows :—

F. LOCKWOOD LOGAN, Esq., 14 Saxe-Coburg Place.

HENRY B. RADFORD, Esq., 18 Moray Place.

JOHN M. HUNTER, Esq., 25 Albany Street.

The following donations were presented to the Society's Library from the University of Christiania :—

Om skovene i deres Forhold til Naturaloeconomien, of J. B. Barth.

Physikalske Meddelelser, ved Adam Arndtsen.

Quelques Observations de Morphologie Vegetale, par J. M. Norman.

Dr Balfour announced the following donations made to the Museum at the Botanic Garden :—

From Messrs P. Lawson and Son—Cone of *Araucaria imbricata*, from Peru.

From Dr Douglas MacLagan—War Clubs, from New Caledonia, and Marriage Dress, made of inner bark of a tree.

From the Earl of Shannon—Cone of *Picea Webbiana*, and fruit of *Cupressus Goveniana*, *C. lusitanica*, and *Laurus nobilis*, all ripened at Castle Martyr, near Cork.

From Andrew Murray, Esq.—Cones and leaves of *Abies bracteata*, and the resin yielded by the tree.

The following communications were read :—

I. *Notes upon Californian Trees*. Part I. By ANDREW MURRAY, F.R.S.E.

My brother, Mr William Murray of San Francisco, having, at various times, in sending home seeds of trees and plants from California, accompanied them with remarks either of his own or of others upon the plants themselves, and sometimes with figures of the more striking, I have thought it might be interesting, and possibly useful to the public, were I occasionally to throw some of these remarks together for publica-

tion, along with such of the figures as may be considered sufficiently interesting to deserve a place in the Transactions of the Society. They will necessarily be without order or arrangement, and are not intended for anything more than a record or memorandum of such points of interest regarding the plants as came before him or his friends.

Abies bracteata, Don. Plates I and II.

Having been for some time desirous to obtain seeds and cones of this singularly beautiful pine, I interested my brother in the subject; and although his other avocations prevented his undertaking the expedition himself, he caused two different expeditions to be made to procure it, one in 1856, and the other last season.

The first of these expeditions was conducted by his old fellow-traveller and co-explorer Mr Beardsley; the latter by Mr William Peebles, a gentleman who, in addition to his other qualifications for the task, appears to possess much talent as an artist, for it is to his pencil that we owe the graphic view of this tree as seen on its native mountains.

Before extracting one or two passages from their notes, I should perhaps first remind the Society of what was previously known regarding it.

The tree was first discovered by Dr Coulter, who spent ten years of his life in exploring the wilds of California and Mexico, at a time when they were still undisturbed by the hordes of gold-seekers who have since turned much of the country into vulgar ground. He discovered many new trees and plants, some of which (and among them *A. bracteata*) were described by Mr Don in the "Linnean Transactions," vol. xvii. (1835). Mr Don there says, "This curious and interesting species of fir was discovered by Dr Coulter on the sea side of the mountain range of Santa Lucia, about 1000 feet lower down than *Pinus Coulteri*. The trunk rises to the height of about 120 feet, is very slender, not exceeding two feet in circumference, and as straight as an arrow. The upper third of the tree is clothed with branches, giving it the appearance of an elongated pyramid. The branches are spreading, the lower ones are decumbent." I quote these remarks of Mr

Don, because there are some slight discrepancies (nothing material, but still discrepancies) between his account and those given by Hartweg and Beardsley, to be presently adverted to. He goes on,—“The bracts are long and recurved, and but little changed from the ordinary leaves, which give the cones a singular appearance. The seeds are remarkable for a peculiarity in their structure, in having the nucleus exposed at the inner angle of the seed through a considerable opening in the outer testa, as if the junction of the two sides had been prevented by the rapid enlargement of the nucleus.” I may remark, that the same peculiarity is to be found in the seeds of *Abies grandis*, *A. nobilis*, and the allied species. Mr Don adds, that it is only the middle branches which bear cones, a circumstance which reminds me of a similar remark made by my brother, on one of his former expeditions, regarding *Pinus tuberculata*, on which he plucked very ancient cones within reach of the ground, growing on the main stem of a great tree. The next botanist who saw this fine tree was Hartweg, who was sent out by the London Horticultural Society in search of plants and seeds in 1847. He describes his various expeditions in reports sent to the London Horticultural Society, which were published from time to time in the Journal of that Society. In vol. iii., p. 225 (1848), he gives the following account of his attempt to obtain seeds of *A. bracteata*. “On September the 20th I again left Monterey for the southern parts, which, on account of the disturbed state of last year, I could not visit before. As guide, I engaged the services of a man who had accompanied me on my last excursion to Santa Cruz, and who, from his profession of a hunter, was well acquainted with the intricate mountain-paths of the district I intended to visit. On the day of our starting we reached the Mission of La Solidar, an ill-constructed, half-ruined building, situate in the Salinas Valley, and encamped towards evening on the banks of the Salinas River within a short distance of the Mission. By sunrise the following morning we were again on horseback, and leaving the main road on the right, we entered a mountain defile leading to the Mission of San Antonio. . . . From San Antonio a range of mountains extends along the coast, attaining a great elevation, which, though apparently

barren, as seen from the Mission, I was assured, on the western flank towards the sea, is covered by large pines." Mr Hartweg, after reaching the mountain range, goes on to say—"descending the western flank of the great mountain range, I found at last the long-wished for *Abies bracteata* occupying exclusively ravines. This remarkable fir attains the height of 50 feet" (the reader will remember that Dr Coulter stated it at 120 feet, and he will presently find that Beardsley states it at 130 feet), "with a stem from 12 to 15 feet in diameter,"—(this must be a mistake for 12 to 15 inches, Dr Coulter say that the largest were only 2 feet in circumference, instead of 15 in diameter, which would give 45 in circumference)—"one-third of which is clear of branches, and the remainder forms an elongated tapering pyramid, of which the upper part for 3 feet is productive of cones." These must have been bad specimens, for Mr Beardsley's account describes them as branched to the ground, and Mr Peebles' drawing, although it represents one or two devoid of branches at the base, represents others feathered nearly to the ground. "Having cut down some trees, I found to my regret that the cones were but half-grown, and had been frost-bitten. In more sheltered situations towards the sea-shore, the same happened to be the case; and I was thus precluded from introducing this remarkable fir into Europe."

The next attempt to obtain seed of it was that made by Mr Beardsley in 1856—(Jeffrey was not so far south)—and I cannot do better than quote that part of his notes which relates to this tree. He made his attempt in the middle and latter part of October:—"After finishing my collections in this vicinity (Monterey), I set out for the Santa Lucia mountains below the mission of San Antonio; our equipage from Monterey consisted of a waggon drawn by two horses, three loose animals, to ride and pack into the mountains, one Dutchman, one greaser, one rifle, two revolvers, two bowieknives, camping utensils, &c., and provisions for twelve days" (a preparation which indicates that, however much the rest of California is crowded, this part is still in its primitive wildness). "We reached the Mission the third day; here we left our waggon, and proceeded on horseback into the mountains, in search of *Abies bracteata*, which we

found on the second day, on the western slope of the range, about 30 miles from the Mission, and about 10 miles from the sea-coast, by the worst trail that I ever travelled in this or any other country. After passing the *divide*, and descending to the west, I fell in with the tree, occupying the mountain sides as well as the ravines, and not 'exclusively the ravines,' as described by Hartweg. I was greatly disappointed in finding the cones too ripe to be able to obtain a supply of seed. I tried cutting the top off, but a few strokes of the hatchet shattered the cones in pieces, and scattered the seeds to the winds. The only plan was to climb to a most dangerous height and pick off the few cones which could be reached. They went to pieces in my hand the moment they were touched. The cones only occupy a few feet of the top, hence the difficulty and danger of obtaining them. I have never seen any description that does justice to this most beautiful of all the firs; it rises to the height of 130 feet, straight as a line, the trunk tapering regularly from the ground to the top; clothed with branches, which are slim and graceful, down to the ground; the outlines of the branches taper almost as regularly as the trunk, giving the appearance of an 'elongated pyramid,' as Hartweg describes it; but I would rather call it a tall spire with a pyramidal base of two-thirds of the lower part of the tree; the pencil of the artist could not give it a more regular shape than it appears in nature. I saw no tree deprived of its lower branches, except in thickets where it was impossible for them to grow; there was none, with the above exceptions, that I could not step from the ground on to its branches. Not the least remarkable thing is, that these branches bear fine foliage down to the ground, and the branchlets often touch the ground. I have found it occupying exclusively the calcareous districts abounding with ledges of white, veined, and gray marble. We encamped for the night on the point of a ridge, the only place to be found level, and large enough to make down our beds; in the evening, it commenced raining, and increased into a regular driving storm. We passed the most horrible night that ever fell to my lot to experience; we were totally unprovided, as there was no appearance of a storm when we lay down a short time

after dark. We had provided wood only to cook with, and we were obliged to get it with great labour, and at the risk of breaking our necks, to keep from freezing. With great difficulty we kept our fire up until morning. The mountains here are as steep as the laws of gravity will admit, and in a state of disintegration; rocks from the ledges above were detached by the rains, and came tumbling down past us, making a fearful crashing among the trees, increasing in speed until they landed among the rocks at the bottom of the ravine below us, with a noise which sent its reverberations up among the hills like peals of thunder. The impenetrable darkness of the night, the howl of the tempest, the crashing of falling rocks, together with the severity of the cold rain, almost snow, made the night truly awful. We saw a large grizzly bear just before dark, and plenty of fresh tracks everywhere, which added nothing to the enjoyments of the night. Day-light came at last, and with it a clear sky, which I hailed with more gratitude, I think, than I ever did in my life,—thankful that I was alive.

“I had intended to have spent a portion of the day in collecting what few seeds I could; but the storm had beaten them off, so that all attempts in this vicinity were useless. After breakfast, we packed up and took the back track. After passing the first ridge, I descended into a deep gulch where there were a few trees, and found the seeds all gone. I descended again on the north side, and found one small tree that had a few shattered cones left, and obtained about a handful. I attempted to cut off the top, but the first few strokes of the hatchet knocked them all off, and I was obliged to give it up for the season. We reached Monterey after an absence of nine days. We had killed on the trip, four deer, three antelopes, one hare, one wild cat, and seen two grizzly bears.”

This account by Mr Beardsley gives an important hint to cultivators in this country. The tree being confined to a calcareous soil, would indicate that it would be well adapted to our chalk districts, which, for another reason, may be more suitable to it than our Scottish hills, namely, from their better climate. From its locality south of San Francisco, and Dr Coulter's remark that it grows 1000 feet lower on the mountains than *P. Coulteri*, it is probably less hardy than

the general run of Californian pines. Still Hartweg's finding the cones frost-bitten, and Beardsley nearly getting frost-bitten himself, would seem to indicate that it grows in a climate not free from a considerable degree of cold.

Next year (1857) Mr Lobb, the collector, paid a visit to the spot, but was scarcely more successful than Mr Beardsley. He found that the seeds were, like those of *P. nobilis*, subject to the attacks of an insect in their green state, from which, of course, no precaution in the way of gathering, drying, or packing, can protect them.

Last year Mr Peebles' expedition has produced little more than Mr Lobb's. Notwithstanding that he was a month earlier than Beardsley, he was still too late.

He returned on the 17th of September. He found that the cones were so ripe that the trees could not be cut (which was the usual method adopted in procuring cones from the pines in former expeditions) without scattering the cones to the winds, so that all he got were obtained by climbing the trees and carefully picking the cones. This difficulty in reaching the spot at the right time is explained by a remark of Hartweg's in regard to other plants. "Being now aware of the rapidity of Californian vegetation, I lost no time in collecting such seeds as were worth taking, and returned to my headquarters by the beginning of May. Most kinds had during the fortnight after I first saw them in flower ripened their seeds." For the benefit of any future expedition, I may mention that a man of the name of Miers accompanied both Lobb and Peebles as guide, and he knows the station perfectly. It is exceedingly unlikely, however, that any fresh expedition will be tried until the country is more opened up. The expense, danger, chance of bad seed, and small returns, will deter any one from trying it as a mercantile speculation, and there is little in the district to induce an explorer to try such difficult ground which has been already examined.

Mr Peebles mentions that the padres of the Mission use the resin of the tree for incense. My brother sent me a little of it, which I have tried, and find the odour pleasantly terebinthine.

He also sent me a beautiful photograph of the cone taken by Mr G. Johnston, one of the principal photographic artists in

San Francisco, which suggests a convenient and rapid mode of procuring information as to species from scientific headquarters, without the expense and delay of sending bulky specimens, which may possibly be of no value.

The cone does not appear to have been properly figured in any very accessible work. I think, therefore, it will be an acceptable offering to the Society to give the annexed figure, which I owe to the accurate pencil of Dr Greville.

Torreya Myristica, Hooker (Californian Nutmeg). Plate III.

This interesting genus was first correctly described and put upon its present basis by Dr Walker Arnott in the "Annals of Natural History" (1st series), vol. I., 1838. There are two Californian species: one, the *T. taxifolia*, or stinking cedar, is common both to the east and west sides of North America; the other, the *T. Myristica* or Californian nutmeg, is confined to the western sides of the Rocky Mountains. It receives its vernacular appellation, not from its spicy qualities, nor from possessing any of the intrinsic properties of the nutmeg, but from its cone bearing a very close external resemblance to that fruit, more especially in the ruminated appearance of its seed. Although known to my brother several years before, it was only first sent home by Lobb in 1857, and described by Hooker in the "Botanical Magazine," No. 4780. The fruit and leaves are there figured, but not the tree itself; and as the form and aspect of the tree is of interest on account of its relationship to the yew and pine families, I have thought it desirable to give the annexed figure of it, taken by Mr Peebles. It grows to a height of 30 or 40 feet, and it will be seen that it bears considerable resemblance in habit to an old larch.

II. Professor BALFOUR read the following communications:—

1. *List of Plants found at Tayport, Fife*, in September 1858. By Professor LAWSON, Kingston, C.W.—The following species were observed on the ballast heaps at the harbour of Tayport:—*Lepidium ruderale*, *Papaver Argemone*, *P. Rheas*, *P. dubium*, *Fumaria calycina*, *Linum usitatissimum*, *Camelina sativa*, *Spergula arvensis*, var. *major*, *Cannabis*

W. Peebles del.

W. & A. K. Johnston, Edin.

Abies bracteata Don.

R. K. Greville, del.

W. & A. K. Johnston, Edm.

Cone of *Abies bracteata* Don

W. Peckles del.

W. A. K. Johnston. Sculp.

Torreya myristica. Hooker.