

be good grounds for believing that they were idols; but had I been left without help to interpret for myself I should not have guessed them to be net-sinkers, but rather children's playthings—the ancient representatives of modern dolls. To show how little pains are sometimes taken in the preparation of net-sinkers, I may mention that a few months ago, while walking along the banks of the River Bann, I saw a fisherman cutting the tough sward into pieces about two inches by three or four, which, in answer to my inquiry, he informed me were intended for net-sinkers. I asked him why he did not use stone or lead, and he replied that turf sinkers were much superior, as in using them the nets never became entangled in the bottom of the river. I wonder if this custom is a recent invention or a survival from earlier times.

I was struck by the close resemblance which several other objects in the Schliemann collection bore to Irish antiquities. I have noted several tool-stones with the usual hollowed marks on the sides, especially those bearing the double numbers 26 and 1578, 26 and 1478, 26 and 1522, 45 and 1499, and also a stone celt or hatchet with marks on the sides like those on the tool-stones, and hammered at the edge, numbered 13 and 1505, all of which I could match from my own collection. Several whorls are marked in my notes as being similar to others found in Ireland, and an object bearing the numbers 6 and 1636 as being almost identical with double stone beads in my collection. I have also a large series of rubbing or polishing stones similar to others in Dr. Schliemann's collection. Hammer-stones numbered 6 and 7268, 26 and 1529, 26 and 1566, 13 and 1570 are perfect duplicates of some of those found by myself, with flint and bone implements, &c., at Portstewart and Ballintoy. The ornamentation on a few of the stone and glass whorls and beads in my collection have a sort of resemblance to that on some of the terra-cotta whorls exhibited by Dr. Schliemann.

Cullybackey, Belfast, February 10

W. J. KNOWLES

#### Selenium

THE use of selenium for the automatic registry of star transits, proposed by me in a letter which you were good enough to publish in NATURE, vol. xxiii. p. 218, leads to the idea of applying it in a somewhat similar way for photometric purposes, in order to improve the existing scale of star magnitudes, and to watch any variations therein.

Bombay, February 5

W. M. C.

#### A CHAPTER IN THE HISTORY OF THE CONIFERÆ

THE Sequoias form the third genus of the Taxodiæ in the "Genera Plantarum." The only existing species are the Wellingtonia and the Red-wood of California, both of which are confined to the south-west coast regions of the United States. Their nearest living allies are Taxodium and Glyptostrobus; but these were as completely differentiated in the Eocene as at present, and they all appear, like the Ginkgo, to be survivals from more ancient floras; Sequoia especially had formerly a far wider range than it has at the present day.

The Sequoias are monœcious, and have obtusely ovate ligneous solitary and terminal cones one to two inches in length, which are persistent and gaping after shedding the seed. The scales are spirally disposed, sixteen to twenty in number, wedge-shaped, with an orbicular or transversely oblong nail-like head, depressed, wrinkled, and mucronate in the centre, sharing thus to some extent the ornamentation which seems a characteristic of the Taxodiæ. The foliage is distichous and yew-like in *Sequoia sempervirens*, and spiral and imbricated in *S. gigantea*, but both occasionally foliate in the opposite way. The former, or red-wood, occupies the Coast Range, a sandy rock rising to 2000 feet, of supposed Cretaceous age, and forms dense forests twenty to thirty miles in width, from a little south of Santa Cruz to the southern borders of Oregon, following the coast line for some 350 to 500 miles, its distribution depending, according to Prof. Bolander, upon the sandstone and oceanic fogs. The *S. gigantea* extends at intervals along the western slope of

the Sierra Nevada for nearly 200 miles, and at elevations of 5000 to 8000 feet. "Towards the north the trees occur as very small, isolated, remote groves of a few hundreds each, most of them old and interspersed amongst gigantic pines, spruces, and firs, which appear as if encroaching upon them; such are the groves visited by tourists (Calaveras, Mariposa, &c.). To the south, on the contrary, the Big-trees form a colossal forest forty miles long and three to ten broad, whose continuity is broken only by the deep sheer-walled cañons that intersect the mountains; here they displace all other trees, and are described as rearing to the sky their massive crowns; whilst seen from a distance the forest presents the appearance of green waves of vegetation, gracefully following the complicated topography of the ridges and river-basins which it clothes."<sup>1</sup> The leaves are scale-formed, rounded dorsally, concave on the inner face and closely inlaid, regularly imbricated on the branchlets, longer and looser on the branches. In young trees they are much larger and freer, with long and awl-shaped leaves at an acute angle to the stem. No trees under cultivation in this country seem yet to have completely assumed the small imbricated foliage characteristic of the giant trees of California.

Although the types of foliage in the two existing species appear to be perfectly distinct, they are not really entirely so; for *S. sempervirens* preserves the spiral scale-like leaves for a short distance at the base of each branchlet, and *S. gigantea* sometimes assumes the distichous arrangement. Besides, the foliage of the former is not in two rows as it is in Taxodium, being spirally arranged round the stem; but the leaflets, where they are flat and comparatively expanded, have a strong tendency to crowd into two marginal rows, so that every surface becomes exposed to light and moisture. The leaflets take a half twist near their base, and then diverge upward or downwards towards the sides of the branchlet, an additional row frequently lying centrally along the branch.

The earliest-known Sequoias are Cretaceous, and were described by Carruthers, one as *S. Woodwardii* from Blackdown, and others as *S. Gardneri* and *S. ovalis* from the Folkestone Gault. The foliage from the latter has falcate leaves like Araucaria, and it is only inferred that it and the cones belonged to the same trees. It is not impossible that the cones may have been brought down from some high ground, and the foliage been shed by trees nearer the sea-level. Although Sequoia itself cannot be traced farther back than the Cretaceous, Schimper speculates on its probable derivation from some much older Araucarian form, and believes its position to be between the Cupressinæ and the Abietinæ.

Saporta regards the Chalk period as the age of Sequoias, and our principal knowledge of them is derived from Heer's "Flora fossilis arctica," where a large number are figured. Saporta speaks of Pattorfik as a Sequoia wood carpeted with ferns, and Ekkorfat as a forest composed of cycads, sequoias, and firs. *S. Reichenbachii* is the chief form, and occurs in the Cretaceous of Kome, Spitzbergen, and doubtfully at Atane. The foliage resembles the larger foliage of *S. gigantea*, being spiral, awl-shaped, set at an acute angle to the stem, and with the points overlapping. It differs in being less regularly spiral, and often combines an approach to the more distichous *S. sempervirens* type, being called in such cases, *S. Smittiana*. In several of the figured specimens from the Komeschichten the branchlets of the two forms are almost united, and a very slight degree more care in collecting would, it seems, have placed the reality of the union beyond the possibility of doubt. One instance is reproduced from plate xx., and a fragment from the same plate determined as *S. Reichenbachii*, to show that even apart from the frequent association of the two species on the same slabs, their distinctness cannot be maintained if the

<sup>1</sup> Lecture before Royal Institution, April 12, 1878, by Sir J. Hooker.