

named *C. alpicola*, Wahl., grew in an equally elevated situation. This dispelled the thought that had been in my mind that *C. helvola* was only a sterile form of *C. canescens* caused by growing at so great an altitude. I hope the specimen which Mr. B. S. Ogle is cultivating for me may, when mature, throw some additional light upon the subject.

In conclusion I may say that in 1896 I made an unsuccessful search for *C. helvola* on Loch-na-gar, but I had so little time at my disposal that I was unable to examine the southern slope, where in the eighties I remember seeing mountain forms of *C. canescens*. Pfarrer Kükenthal has recently seen our *C. helvola* and considers it to be *canescens*  $\times$  *lagopina*.

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On *Limnocarpus*, a new Genus of Fossil Plants from the Tertiary Deposits of Hampshire. By CLEMENT REID, F.L.S., F.G.S.\*

[Read 17th March, 1898.]

WHILE engaged on the Geological Survey of Hampshire during the last ten years, I have found abundance of a fruit closely allied to *Potamogeton* and to *Ruppia*, though differing materially from those genera. As no generic description appears to have been published, and this seems to be one of the rare cases in which a Tertiary plant can be shown to belong to a generic type now extinct, I have delayed publishing the new genus until further material could be obtained and some doubtful points could be cleared up.

No description can yet be given of any part of the plant except the fruit, though the type species seems to have had linear leaves like those of *Ruppia* or of many species of *Potamogeton*. Leaves of this character occur in certain seams of loam in the Lower Headon Beds containing no fruits except those of *Limnocarpus*.

LIMNOCARPUS, genus novum e Naiadacearum.

Fructus succulentus? Carpella 2, pedicellata, sese marginibus ventralibus adherentia: endocarpium durum, a tergo carinatum, admodum foveatum, rugosum: rostrum productum. Semen circa loculi processum curvatum, testa coriacea.

Species unica, herbæ aquaticæ.

Accedit *Potamogetono* sed ab eo carpellis 2 nec 4 discrepat.

\* By permission of the Director-General of the Geological Survey.

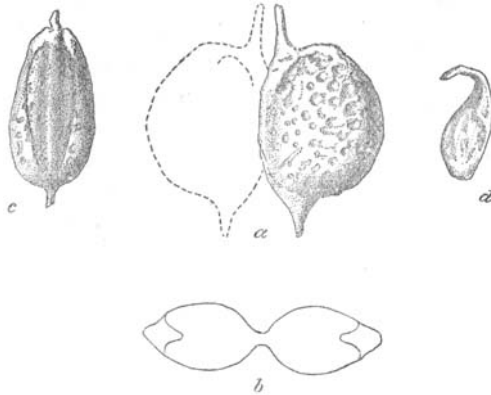
Aquatic herbs; fruit succulent? Carpels two; endocarp hard, dorsally keeled, deeply pitted and wrinkled, adhering by the ventral margin, stalked; beak elongated; seed curved round a process from the cell, testa coriaceous.

*LIMNOCARPUS HEADONENSIS*, *nobis*.

SYN. *Carpolithes headonensis*, J. S. Gardner in Rep. Brit. Assoc. 1887, pp. 420, 421, pl. 3. fig. 30.

Endocarp 2 mm. long by 1.5 mm. broad, inflated, laterally compressed, deeply pitted; a large oval oblique pit on the side corresponds with the internal process round which the seed is curved; pedicels converging, about  $\frac{1}{3}$  the length of the endocarp; beak slender, parallel, about  $\frac{1}{2}$  the length of the endocarp.

The fruit resembles that of *Potamogeton*, but is distinguished by the carpels being adherent, 2 instead of 4, and by the pitted



*Limnocarpus headonensis*.

- a*. Endocarp, side view, the second carpel shown by dotted line. *b*. Transverse section through fruit. *c*. Endocarp of another specimen, dorsal view. *d*. Seed somewhat shrivelled, from another specimen. All magnified 10 diameters.

endocarp with long slender stalk and beak. These characters probably indicate that the two carpels were buried in a succulent exocarp; for pitted endocarps usually belong to fleshy fruits, and the convergence of the stalks would scarcely bring the carpels together edge to edge, unless they were already in some way connected. Most of the endocarps are found detached, but I have now seen six specimens in which the ripe endocarps adhere by their narrow ventral edge.\* The inflation of the

\* The attachment is often so slight that several fruits have divided in the attempt to remove the adhering sand.

endocarp, and the absence of any trace of lateral pressure or facetting in any of the specimens examined, show that the carpels cannot have exceeded two. In germination the keel becomes detached, and is therefore missing in many specimens.

The genus occurs in brackish-water deposits throughout the Oligocene strata of the Hampshire Basin. The type-specimens are from the Lower Headon beds of Hordle cliff, the same species ranging upwards into the Hamstead series. Badly preserved endocarps, perhaps belonging to another species of the genus, or to *Potamogeton*, occur in the Mead End beds, at the top of the Barton Sands.

In 1862 Heer described\* as *Cyperites Forbesii* some fruits from the Hamstead beds. His figures are not satisfactory; and the types cannot be recognized in the Burdett-Coutts collection, now in the Museum of Practical Geology, which he used, though several slabs of clay full of seeds, apparently named by Heer *Cyperites Forbesii*, are there†. Heer's reference of the fruits to Cyperaceæ, suggestion that they may be the unknown fruits of *Cyperus reticulatus*, and description, which in nearly every particular is unlike that of the genus *Limnocarpus*, may make it seem absurd to suggest that he has been mistaken. His remark, however, that they occur in "great numbers together in the upper three feet of the third division [of the Hamstead Series] of Edward Forbes" is curious, for all the recognizable specimens on the slabs in the Museum of Practical Geology belong to *Limnocarpus*, too badly preserved for specific determination, though perhaps representing only a smaller variety of *L. headonensis*. There is nothing in the collection that I can refer to Cyperaceæ, though some of the crushed and distorted specimens seem to resemble Heer's figures. Mr. E. T. Newton and I think that in all probability a mistake has been made, and that through describing badly preserved specimens Heer missed the essential characters. If such be the case, Heer's species must be deleted, being so described and figured as to be quite unrecognizable. Perhaps, however, the real *Cyperites Forbesii* may have found its way into some other collection, for several plants figured on the same plate cannot at present be traced.

\* Quart. Journ. Geol. Soc. vol. xviii. p. 373, pl. xviii. figs. 20 & 21.

† Similar fruits have been figured by J. S. Gardner also as *Cyperites Forbesii*, *op. cit.* fig. 16.