

ART. XVI.—*Helichrysum dimorphum* Cockayne—a Hybrid?

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Helichrysum dimorphum was discovered by Cockayne near the confluence of the Poulter and Waimakariri Rivers and described by him in 1915. Another plant was found by the same authority at Puffer's Creek, which runs into the Broken River not far from its junction with the Waimakariri. The two localities are about ten miles apart. The species has not been found again.

I visited the Puffer's Creek locality in February, 1919, and took specimens. The object of this paper is to suggest that *Helichrysum dimorphum* is a hybrid between *H. filicaule* and *H. depressum*, just as *H. Purdiei* seems to be certainly a cross between *H. glomeratum* and *H. bellidioides*.

Helichrysum dimorphum is a strong climber. The plant has a lusty, thriving appearance, and the branches grow in very great profusion and are most thickly massed together. Climbing upon a plant of *Coprosma propinqua* it shows leafless branches in the open, and leafy branches wherever it is at all shaded. The flowers, which are not fully open in my specimens, are borne upon the leafless branches. *H. depressum* occurs close to it in the bed of the creek, and *H. filicaule* is, as usual in such localities, abundant all round it. The plant grows about 8 ft. or 10 ft. above the bed of the creek.

Helichrysum filicaule shows a distinctly scandent or semi-scandent habit whenever it grows among tall plants, such as *Discaria* or *Leptospermum*. I have collected specimens over 2 ft. in length at Akaroa and elsewhere, one of these being found in the immediate neighbourhood of the Puffer's Creek plant when I was unsuccessfully searching for it in 1917. *H. depressum*, on the other hand, has been observed growing in actual contact with plants of *Discaria* without showing any tendency to climb.

My suggestion is that *H. dimorphum* is a cross between the two, deriving its scandent habit from *H. filicaule*, and its strength and solidity of form, which enable it to become a true climber, from *H. depressum*. As regards the inflorescence, *H. dimorphum* appears to be more closely related to *H. depressum* than to *H. filicaule*. The flowers in my specimens are just sufficiently advanced to make this quite clear. The resemblance to the flower and involucre of *H. depressum* is very close indeed. The flower is sessile at the tips of the branches, as in *H. depressum*, not terminal on a long filiform peduncle, as in *H. filicaule*; and the involucre bracts in their number and arrangement are exactly like those of *H. depressum*, the involucre being rather cylindrical than hemispherical.

In support of the theory I should adduce the following considerations:—

(1.) In both its localities both *H. filicaule* and *H. depressum* are present at no great distance. In the Poulter locality the plant grows on the top of a high terrace (perhaps 60 ft. to 80 ft.) above the river, in whose bed *H. depressum* is abundant, while *H. filicaule* is present everywhere about it.

(2.) The leafy parts strongly resemble *H. filicaulis*, and the leafless parts *H. depressum*.

(3.) The plant is of extreme rarity, and this would be accounted for, in part, if *H. dimorphum* were a hybrid between the two plants named.

POSTSCRIPT.

Since the above was written I have observed the plant in great quantities on the Lower Poulter, on the Esk River near its confluence with the Waimakariri, and along the Waimakariri itself between the confluence of the Poulter and that of the Esk with that river. The Esk mouth is not much more than five miles from the Puffer's Creek locality.

ART. XVII.—*On the Occurrence of Striated Boulders in a Palaeozoic Breccia near Taieri Mouth, Otago, New Zealand.*

By PROFESSOR JAMES PARK, F.G.S.

[Read before the Otago Institute, 9th December, 1919; received by Editor, 31st December, 1919; issued separately, 10th, June 1920.]

IN a small cove close to Rocky Point, which is the first headland on the south side of Taieri Mouth, and about a mile and a half from the Taieri jetty, there is a conspicuous bed of coarse red and green breccia. It is underlain by bluish-grey micaceous phyllites, and overlain by altered flaggy greywacke. The strike of the breccia and associated rocks is about N.N.E.—S.S.W., and the dip S.S.E. at angles ranging from 5° to 30°. Generally the inclination of the lowermost beds is flatter than that of the uppermost beds. At Taieri Mouth the dip of the grey micaceous slaty rocks ranges from 5° to 15°, and that of the greywacke south of Rocky Point from 15° to 30°.

The breccia is well exposed in the sea-cliffs near Rocky Point, and can be traced northward along the line of strike one-third of the distance to Taieri Island as a line of submerged reef that is in places awash at low water. It is not present on Taieri Island.

To the southward of Rocky Point the breccia ought to crop out on the ridge between that place and Akatore Inlet, but I failed to find it there. It is a rock not easily overlooked, and I am inclined to believe that it peters out before it reaches the crest of the ridge. It is probably a lens-shaped mass with a maximum thickness of some 120 ft.

At Rocky Point the breccia resembles a consolidated rock-rubble, being mainly composed of a confused pile of angular and subangular fragments and blocks of red and green siliceous slaty shale. It also contains numerous masses of an excessively hard jasperoid and aphanitic breccia that appear to have been torn from some pre-existing breccia. The constituent fragments range in size from small grains to masses many feet in diameter.