

LETTERS TO THE EDITOR.

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"Cheiropleuria bicuspis" (Bl.) Pr.

THROUGH the influence of the Rajah of Sarawak and the activity of the director of the museum there, to both of whom my grateful thanks are due, I have recently received an ample supply of specimens, dried and preserved in alcohol, of the uncommon Malayan fern, *Cheiropleuria bicuspis* (Bl.) Pr. As some considerable time must elapse before its details can be worked out, I think it will be well to state briefly certain points of interest in relation to it.

The creeping rhizome, which is covered with hairs, not scales, bears long petiolate leaves at intervals, which are variable in the form of the lamina. Some, especially those of the smaller plants, have an ovate acuminate outline, others may be two- or three-cusped, or in large plants the number of lobes may be four or five. In these cases there is an obvious bifurcation of the lamina, a point well shown in Sir W. Hooker's illustration of the species, quoted as Fig. 175 in Engler, u. Prantl., i., 4, p. 337. The relation of the leaf and its venation to that of *Dipteris* is very marked in the larger examples. There can be no doubt that the nearest affinity of *Cheiropleuria* is with the *Matoniæ*.

The fertile leaves appear to be always simple, and of narrow form. Their lower surface is covered by a dense mass of sporangia and hairs, in an *Acrostichoid* manner. The sporangia themselves have an oblique annulus, and the various ages of them are intermixed.

As against these rather advanced characters, the anatomy presents surprising features of simplicity. The rhizome appears in the Bornean specimens to be coplanately protostelic, with much parenchyma, not solenostelic, as stated by Christ ("Farnkraüter," p. 128). The leaf-trace comes off as a single mesoxyllic strand, which soon opens out and becomes semilunar, and then divides into two equal strands. These characters indicate, on one hand, a greater similarity to *Mertensia* in the mature stock than is shown by any *Matonioid* fern; on the other an advance on *Matonia* and *Dipteris*, both in the anatomical and the soral condition of the leaf. The effect of these facts upon the comparative position will be, on one hand, to strengthen the relation of the *Matonioid* series to the *Gleicheniaceæ*; on the other, to illustrate a further step in advance in foliar character than any of them show. The relation to *Platyrium* has been definitely indicated by Diels ("Naturl. Pflanzenfam.," i., 4, p. 336). It will remain for more detailed inquiry into the structure and development of both of these genera to show how far *Cheiropleuria* approaches *Platyrium*. Conclusions on this point must be deferred for the present, though certain facts appear provisionally to support such an alliance.

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July 18.

Cupriferous Sandstones at Exmouth.

OBSERVATIONS made last winter upon the lithological characters of the Red Marls, with intercalated sandstones, exposed in the cliff-section running eastwards from Exmouth towards Straight Point, disclosed some interesting facts which may serve to remove doubts as to these rocks having been formed under conditions contemporaneous with, and similar to, those

prevailing during the deposition of the German Rothliegende in Permian times.

The sandstones consist of very smooth and rounded grains of quartz, and what appears to be corneelian, together with copper and manganese, consolidated by a calcareous and dolomitic cement. The copper occurs as a green carbonate derived from the decomposition of minute particles of copper pyrites present in the rock. Vivid green patches and specks of this copper carbonate are very conspicuous on the surfaces of bedding-planes and other places where water has percolated freely. Mr. F. Southerden, of the University College, Exeter, kindly analysed some of the specimens, and an average sample yielded about 1 per cent., and a richer specimen more than 3 per cent., of the carbonate. None was found in any of the marl, nor in the red sandstones of Rodney and Orcombe Points.

The manganese is very widely distributed, both in the red and the buff sandstones, as minute black specks, frequently rudely dendritic in arrangement, and as films coating the grains of quartz. Occasionally large areas become quite black with it. Where copper is present manganese is always present also, but manganese is frequently present without the association of copper.

The grains of quartz composing the bulk of the sandstone are remarkable for their roundness and smooth surfaces. Much research in reference to sands leads me to believe that they were originally rounded by wind action, and subsequently polished by water holding finer matter in suspension. The natural disintegration of this type of sandstone produces a sand which, when sifted by wind and wave on the sea-beach, should be musical, but it was not until May last, after many visits, that I found several very musical patches on the beach between Rodney and Orcombe Points, and also under the "High Lands of Orcombe."

In places along the foot of the cliffs the lime in the cliff-springs cements the beach material into solid masses of sandstone and conglomerate, and dry sand, blown from the beach against wet places on the cliff-surfaces, eventually becomes consolidated into great cakes of sandstone for the same reason.

CECIL CARUS-WILSON.

A Fresh Feature of the Large Larch Saw-fly Outbreak in the Lake District.

IN the Lake District plantations, and elsewhere throughout the country, those interested in the welfare of the larch have viewed with no little apprehension, for some time past, the yearly ravages of the large larch saw-fly (*Nematus erichsonii*). As direct methods of control are out of the question over most of the affected areas, interest has been centred upon those natural agencies which in any way tend to limit the indefinite multiplication of this saw-fly, and it has been recognised that the atmospheric conditions, several of the common insectivorous birds, voles, certain insects, and parasitic fungus, are all capable of exercising a considerable if variable influence upon the numbers of the pest. To a combination of forces such as these must be attributed such respite as the trees have gained in certain of the infested areas, and in those cases where accurate observation of the facts was possible it was found that cessation of the saw-fly attack coincided with an overwhelming increase in the numbers of one of its insect enemies, an ichneumon, hitherto unknown to science, *Mesoleius tenthredinis*, Mor. This parasite, by eventually accounting for more than 70 per cent. of the larvæ within the cocoons, undoubtedly in these instances played a very large part in the reduction of the pest.

As *M. tenthredinis* was known to be present in