

## Letters to the Editor.

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### The 'Lapides palmati' mentioned in the "Historia Naturalis" of the Elder Pliny.

PLINY, in Book 36, par. 134, in the course of a description of various minerals, says, "Palmati (sc. lapides) circa Mundam in Hispania, ubi Caesar dictator Pompeium vicit, reperuntur, idque quotiens fregeris". (Stones marked with the pattern of a

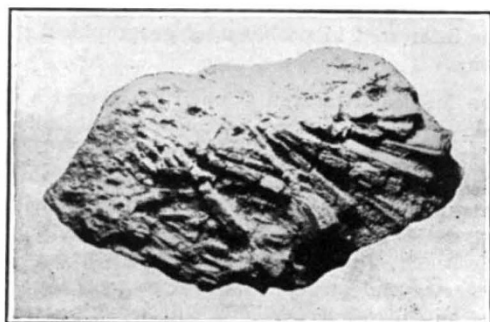


FIG. 1.—Andalusite in mica schist.

palm, which appears however often you break the stone, are discovered near Munda in Spain, where Cæsar, during his dictatorship, defeated Pompey.)

So far as I am aware, no attempt has been made to identify these stones, beyond the almost certainly incorrect suggestion that they were fossils of palm leaves. Munda, near which Cæsar defeated Labienus and Cneius Pompeius in 45 B.C., was situated in the province of Spain called Andalusia, and the aluminium silicate, andalusite, which derives its name from that locality, answers Pliny's description well and in two different ways.

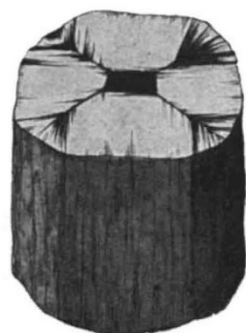


FIG. 2.—Chialstolite pattern. From Miers' "Mineralogy" (by kind permission of Macmillan and Co.).

In the first place, occurring in argillaceous schist, mica schist, and other rocks, it often forms radiating groups of prisms which bear a remarkable resemblance to branches with thin spiky leaves. Fig. 1 shows a specimen in mica schist from the Geological Museum of Trinity College, Dublin. Although, however, the words "idque quotiens fregeris" might describe the finding of a palm-like pattern of crystals when the parent rock is broken, it seems more probable that they refer to a still stranger property of the mineral. A variety of andalusite known as chialstolite ( $\chi\alpha\sigma\tau\acute{o}\lambda\iota\tau\eta\varsigma$ , arranged diagonally) or macle (*macula*, a spot) consists of "stout crystals having the axis and angles of a different colour from the rest, owing to a regular arrangement of carbonaceous impurities through the interior, and hence exhibiting a coloured cross, or a tessellated appearance in a transverse section". The pattern is discovered wherever the crystal is split

("quotiens fregeris"), and Fig. 2, taken from Miers' "Mineralogy", p. 50 (second ed.), shows that the pattern may sometimes bear a great resemblance to palm branches. The chialstolite variety occurs, among other places, at Morbihan in Brittany, and Andalusian specimens, found in Pliny's day, may well have shown the phenomenon. Dana ("System Min.", 1904, p. 497), from whom the words in quotation marks are taken, reproduces pictures of other chialstolite patterns.

My thanks are due to Dr. Louis B. Smyth, and to my wife, for suggestions and assistance in arriving at this identification.

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### Eclipse Plumage in the Mallard.

THE reasons for the changes of pattern, colour, and type in the plumage of fowls have been the subject of investigation by many workers and the parts played by testis, ovary, and thyroid shown. Work has also been carried out on ducks, the reactions of testis and ovary receiving most attention. Goodale,<sup>1</sup> Seligmann and Shattock,<sup>2</sup> Kuhn,<sup>3</sup> and others found little correlation between the eclipse plumage of the mallard and testis size and function or ovarian influence.

The experiments on ducks which I describe briefly below were undertaken because it was thought that a wider study of the relation between the endocrines and plumage modification would be profitable.

The mallard (*Anas boschas*) was chosen as being the most responsive material, the drake having two regular changes of plumage type during the year—eclipse plumage from May to September and mating or normal plumage from October to April.

The aim of these experiments was to produce the eclipse plumage in these drakes during their mating plumage season, October to April. Before each experiment, areas of feathers were plucked on breast and belly, and, in the pituitary work, on the flanks.

A start was made with thyroid, on the lines of the experiments of Greenwood and Blyth,<sup>4</sup> and others in which the colour of the neck hackles of the Brown Leghorn cock was changed from gold to black by the feeding of thyroid. No parallel change occurred in the mallards though a similar preparation was used and the amounts fed approximated to the higher dosages given to the fowl. The thyroid feeding appeared to cause only an alteration in the pattern rhythm of the growing belly feathers—their colour was unaltered and the breast feathers showed no change. It was noticed also that large single doses of thyroid that caused precipitate moulting in cocks had no similar effect on the drakes.

Pituitary was next tried. Desiccated anterior lobe suspended in saline was injected subcutaneously into drakes, with the result that the growing feathers in all plucked areas showed modifications in pattern and colour. Except in the breast feathers of two drakes, these modifications approximated to the normal eclipse plumage exhibited later by each drake.

At the same time other drakes were given subcutaneous injections of dried posterior lobe suspended in saline. Here, though there was modification in pattern and colour, the modified pattern and colour differed from the normal eclipse feathers shown later by each drake, from those produced by the anterior lobe injections, and from the modified pattern of the belly feathers produced by the thyroid feeding referred to above. There appeared to be a change of the pattern rhythm and intensity of pigment deposition.