THE

PHILOSOPHICAL MAGAZINE,

OR

ANNALS

OF

CHEMISTRY, MATHEMATICS, ASTRONOMY, NATURAL HISTORY, AND GENERAL SCIENCE.

BY

RICHARD TAYLOR,

Fellow of the Society of Antiquaries, and of the Linnæan, Geological, Royal Astronomical, Royal Asiatic, and Royal Geographical Societies; Hon. Memb. of the Nat. Hist. Society of Moscow;

AND

RICHARD PHILLIPS,

Fellow of the Royal Societies of London and Edinburgh, of the Geological Society of London, &c. &c.

"Nec aranearum sane textus ideo melior quia ex se fila gignunt, nec noster vilior quia ex alienis libamus ut apes." Just. Lips. *Monit. Polit.* lib. i. cap. 1.

VOL. X.

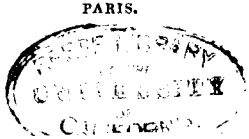
NEW AND UNITED SERIES OF THE PHILOSOPHICAL MAGAZINE AND ANNALS OF PHILOSOPHY.

JULY—DECEMBER, 1831.

LONDON:

PRINTED BY RICHARD TAYLOR, RED LION COURT, FLEET STREET, *Printer to the University of London.*

SOLD BY LONGMAN, REES, ORME, BROWN, AND GREEN; CADELL; BALDWIN AND CRADOCK; SHERWOOD, GILBERT, AND PIPER; SIMPKIN AND MARSHALL; AND S. HIGHLEY, LONDON:— BY ADAM BLACK, EDINBURGH; SMITH AND SON, GLASGOW; HODGES AND M'ARTHUR, DUBLIN; AND G. G. BENNIS, PARIS.



white at their extremities. Each quill-feather of the wings has a broad margin of white on its inner web, and the secondaries and tertials are tipped with white. Upper tail-coverts and feathers of the tail deep cinereous; the latter, with the exception of the two middle ones, which are plain, having a border of white on their inner webs. A white collar passes over the back part of the neck, immediately behind which is a narrow parallel band of a chestnut colour. On each side of the breast a black spot is conspicuous. All the inferior parts are white except the thighs, which are of a bright rust colour, and the under coverts of the wings, which exhibit a slight tint of the same hue. Legs and feet yellow. Claws dark horn colour inclining to black. Colour of the eyes not known. Total length 9 inches; wings, from the carpus to the tip of the second quill-feather, $5\frac{9}{10}$; upper mandible, from the point to the gape, in a straight line, $\frac{7}{10}$; under mandible, $\frac{6}{10}$; tarsi, 1.

The specimen from which the foregoing description was taken occupies a place in the Manchester Museum.

That *G. Holmii* bears a striking resemblance to the *G. Swainsonii* of Mr. Vigors cannot be denied; the white collar and chestnut-coloured band on the neck of the former, and the pure white plumage of its abdomen, constituting the most obvious points of difference between the two species.

To Edward Holme, M.D., the learned and accomplished President of the Natural History Society of Manchester, (who has uniformly promoted my zoological investigations by every assistance which his extensive knowledge and valuable library could supply,) this bird is respectfully dedicated.

XXXIV. *On* Monticellite, *a new Species of Mineral; on the Characters of* Zoizite; *and on* Cupreous Sulphate of Lead. *By* H. J. Brooke, *Esq. F.R.S. L.S. & G.S.**

Monticellite.

I OBTAINED a year or two since from Mr. G. B. Sowerby, a specimen said to have come from Vesuvius, containing some imbedded crystals of a substance which I believe has not been before noticed, and of which I am not aware of having seen any other specimen. The matrix is crystalline carbonate of lime; and besides the mineral I am about to describe, it contains particles of black mica, and some minute crystals of pyroxene. On the supposition of its being an undescribed mineral, and from Vesuvius, I have named it after Mr. Monti-

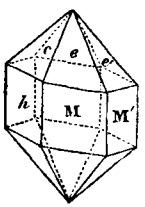
* Communicated by the Author.

celli, who has published a work in illustration of the minerals found in the neighbourhood of that mountain. The general aspect of the crystals is that of quartz, and might by a cursory observer be mistaken for it. The colour generally is yellowish, but there are some crystals nearly colourless and nearly transparent; and on placing a portion of the specimen in dilute muriatic acid to dissolve the carbonate of lime, I found that the surfaces of the yellowish crystals became dull, and were covered with a yellowish powder, leaving the crystals less coloured than they were at first.

The primary form is a *right rhombic prism* of about 132° 54′, a terminal edge being to a lateral edge as 1 to 1·046 very nearly.

I have not observed any cleavage planes on the fractured surfaces, and the crystals are too small to allow of much other examination in this respect. The hardness is between that of apatite and felspar. There is no crystal sufficiently free from the matrix to allow of the specific gravity being ascertained; nor are the surfaces of the crystals sufficiently perfect to afford very accurate measurements. The following therefore may admit of some slight correction:

Planes	*e*,	*c*,	*h*.
Symbols	$\frac{1}{3}$ B,	$\frac{1}{2}$ E,	1 G.
M,M′ =	132° 54′		
M,*e* =	145 00		
e,*e*′ =	141 48		
h,*c* =	138 46		
M,*h* =	113 33		



Zoizite.

This mineral has been confounded with *Epidote* by Haüy, probably from the occurrence of crystals of that substance in the *Zoizite* of Hoff; and in this mistake he has been followed by most other writers on the subject.

The late W. Phillips says, "it cleaves parallel to the planes of a right rhombic prism of about 60° and 120°."

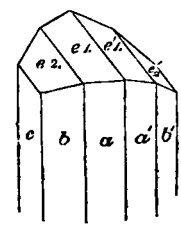
Mr. Haidinger, in his Treatise on Mineralogy, says that Epidote and Zoizite are easily distinguished by their *colours*. And in reference to the angle which I had given as that of Zoizite, differing from the angle of Epidote, he says; "this would render it necessary to consider Zoizite as a particular species." Hence it is clear that Mr. Haidinger could not have examined this mineral; for if he had, he must immediately have perceived its difference from Epidote.

I have lately obtained a small crystal of Zoizite with terminal planes,

planes, from which it is evident that the primary form is an oblique rhombic prism, and from the angles given below it approaches very nearly, if it be not the same as that of euclase. It has also a bright cleavage through the oblique diagonal, similar to that of euclase, and no very distinct cleavage in any other direction.

The annexed figure exhibits the form of the crystal I have alluded to, the terminal planes of which are, however, too imperfect to afford accurate measurements.

$e1,a = 123° 30'$ (about)*
$a,c = 107\ 20$ ... $P,c9 = 107° 20'$
$b,c = 121\ 45$ ... $P,c2 = 121\ 30$
$a,a' = 145\ 20$
$b,b' = 116\ 30$



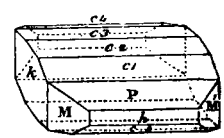
The perfect identity of the forms of Zoizite and Euclase depends obviously on the relative *dimensions* of the primary forms, as well as upon the angles of the prisms; and as those dimensions can be deduced only from accurate measurements of the terminal planes, it is to be hoped that those who possess better crystals will supply the deficient angles, and complete the description of the form.

Cupreous Sulphate of Lead.

A specimen I have lately obtained of this substance has enabled me to give the annexed figure and measurements of the crystals. The primary form is an *oblique rhombic prism*, a terminal edge of which is to a lateral edge as 19 to 8 very nearly, the plane angles of the terminal plane at the extremities of the oblique diagonal being $59° 12'$.

Planes	$c1$,	$c2$,	$c3$,	$c4$,	$c5$,	h.
Symbols....	$\frac{8}{5}$ Ă,	$\frac{3}{2}$ Ă,	$\frac{2}{1}$ Ă,	1 Ă,	$\frac{1}{2}$ Ă,	1 H.

$P,M = 96°25'$
$P,h = 102\ 45$
$P,c1 = 176\ 35$
$P,c2 = 161\ 30$
$P,c3 = 156\ 10$
$P,c4 = 151\ 40$
$P,c5 = 129\ 40$
$M,M' = 61$



* Corresponding planes of euclase, as measured by W. P. (See his figure.)

Hemitrope crystals occasionally present themselves, the plane of revolution being parallel to the plane *h*, which truncates the edge of the prism. The angle at which the two planes P then intersect each other, is 154° 30′.

XXXV. *On a new Register-Pyrometer, for Measuring the Expansions of Solids, and determining the higher Degrees of Temperature upon the common Thermometric Scale. By* J. Frederic Daniell, *Esq. F.R.S.*

[Continued from p. 199.]

I SHALL now proceed to show the degree of confidence which may be placed in this new pyrometer, by comparing the result of its indications with those of the best experiments upon the expansion of metals. Those of MM. Dulong and Petit* are well adapted to this purpose. These able philosophers, in their celebrated prize Memoir on the Measure of Temperatures, and on the Laws of the Communication of Heat, have given, from experiment, the expansion of rods of platinum and iron at different intervals between the freezing point of water and the boiling of mercury. Their mode of experimenting was unexceptionable; but it is to be regretted that they have not corrected their final results for an error of calculation which has been pointed out by Mr. Crichton† which is by no means unimportant to the reasoning which they have founded upon them. The error, however, affecting the amount of expansion in volume, is reduced to one-third in the linear expansion, which is the subject of the present investigation, and may therefore be disregarded.

The following Table of the expansion of iron and platinum is extracted from their work.

Table II.

Temperature deduced from the Dilatation of Air.	Mean absolute Dilatation of Iron for 180 degrees.	Mean absolute Dilatation of Platinum for 180 degrees.
From 32° to 212°	$\frac{1}{28200}$	$\frac{1}{37700}$
From 392° to 572°	$\frac{1}{22700}$	$\frac{1}{36300}$

Whence we deduce the linear expansion of platinum for 180° Fahrenheit, from 32° to 212° ·00088420: and for 180°,

* *Ann. de Chimie et Physique*, vii. 113.

† Annals of Philosophy, New Series, vol. vii. p. 241.

from