

sidered report of Prof. Dufour, of Lausanne, the Swiss member of the jury.

"L'Angleterre vit, dans le domaine des instruments scientifiques, dans un isolement assez grand par rapport aux autres pays. Elle a ses habitudes et ses traditions, des instruments bien faits, mais ces constructeurs, ne paraissant guère se soucier de ce qui se fait hors de chez eux, ont peu d'influence sur l'étranger."

C. V. BOYS.

#### Notes on Minerals from the Lengenbach Binnenthal.

IN a recent visit to Binn I obtained some interesting minerals—viz. (1) a new mineral (2) Dufrenoyite, (3) Hyalophane.

(1) A new member of the sulpharsenites of lead, crystallising in the oblique system

$$B = 82^\circ 42' \frac{3}{4}. \quad a:b:c = 1:36817:1:947163.$$

Very similar to dufrénoyite in appearance, but distinguished by the rounding of the dome and pyramid planes and well-marked oblique symmetry.

I found an imperfect crystal three years ago, but it was not till last August that I obtained sufficient material to fully determine this new mineral.

(2) I also found some very finely developed crystals of dufrénoyite having fifteen new faces, also a twinned crystal, twin plane (0.1.14), thus resembling rathite, whose twin plane is (0.15.1).

(3) Hyalophane, the baryta felspar which is isomorphous with orthoclase, is now shown by some of my specimens to twin according to the Baveno and Manebach laws of twinning in orthoclase.

A full account of the above will appear in the next number of the *Mineralogical Journal*. R. H. SOLLY, Cambridge.

#### Gog and Magog.

YOUR interesting paragraph in NATURE of September 26 on the local Flemish giants carried annually in procession omitted the parallel most suggestive to English readers: Gog and Magog, cousins German of Gayant and Phinar, used also to figure annually in the Lord Mayor's Show, as is noted in Chambers's Encyclopædia. According to tradition "the Guildhall giants are images of the last two survivors of a race of giants who inhabited Albion, descendants of wicked demons and the thirty-three infamous daughters of the Emperor Diocletian, who, after murdering all their husbands, sailed to Albion. These giants Brute and his Trojans finally overcame, leading the last two survivors prisoners to London, where they were kept as porters at the palace-gate. This is Caxton's account; another represents one of the giants as Gogmagog, and the other as a British giant who killed him, named Corineus. These giants have stood in London since the days of Henry V., and have witnessed all its history since. The old giants were burned in the great fire, and the new ones, which are 14 feet high, were constructed in 1708. The ancient effigies, which were made of wicker-work and pasteboard, were carried through the streets in the Lord Mayor's Shows, and copies of the present giants were in the show of 1837. Formerly other towns in England and abroad had their giants, as the Antigonius of Antwerp, 40 feet in height, and Gayant, the giant of Douay, 22 feet in height." D. P.

Edinburgh, October 3.

#### Fireball of September 14.

A VERY memorable meteor fell into the Atlantic on September 14, 1492, and is recorded in the diary of Columbus. It would be interesting to know whether his notes are sufficiently precise to enable one to say whether the radiant of that meteor is the same as that of more recent ones. C. E. STROMEYER.

Lancefield, West Didsbury.

#### A New Name for an Ungulate.

IN a paper published in the *Geological Magazine* for September 1901 I described a large ungulate from the Eocene of the Fayûm, Egypt, under the name *Bradytherium grave*. I now find that the name *Bradytherium* had been employed a few months previously by G. Grandidier for a large extinct edentate from Madagascar (*Bull. Mus. d'Hist. Nat.*, Paris, 1901, p. 54), and I therefore wish to propose the name *Barytherium* for my genus.

CHAS. W. ANDREWS.

British Museum (Natural History), October 7.

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#### ON THE MAGNETIC ROTATION OF LIGHT AND THE SECOND LAW OF THERMODYNAMICS.

IN a paper published sixteen years ago I drew attention to a peculiarity of the magnetic rotation of the plane of polarisation arising from the circumstance that the rotation is in the same absolute direction whichever way the light may be travelling. "A consequence remarkable from the theoretical point of view is the possibility of an arrangement by which the otherwise general optical law of reciprocity shall be violated. Consider, for example, a column of diamagnetic medium exposed to such a force that the rotation is  $45^\circ$ , and situated between two Nicols whose principal planes are inclined to one another at  $45^\circ$ . Under these circumstances light passing one way is completely stopped by the second Nicol, but light passing the other way is completely transmitted. A source of light at one point A would thus be visible at a second point B, when a source at B would be invisible at A; a state of things at first sight<sup>1</sup> inconsistent with the second law of thermodynamics." (*Phil. Trans.* 176, p. 343, 1885; *Scientific Papers*, vol. ii. p. 360). It is here implied that the inconsistency is apparent only, but I did not discuss it further.

In his excellent report ("Les Lois théoriques du Rayonnement, Rapports présentés au Congrès International de Physique," Paris, 1900, vol. ii. p. 29), W. Wien, considering the same experimental combination of Nicols and magnetised dielectric, arrives at a contrary conclusion. It may be well to quote his statement of the case. "La rotation magnétique du plan de polarisation constitue un cas exceptionnel digne de remarque, et l'on pourrait ici imaginer un dispositif qui mettrait en échec principe de Carnot s'il n'existait pas une compensation inconnue."

"Faisons, en effet, les suppositions suivantes; Deux corps de température égale sont entourés d'une enveloppe adiabatique. Les rayons qu'ils s'envoient réciproquement traversent deux prismes de nicol. Entre ces prismes se trouve une substance non absorbante sur laquelle agissent des forces magnétiques qui font tourner le plan de polarisation d'un angle déterminé. La radiation émanant du corps 1 pénètre dans le nicol 1. Nous supposons que le rayon subissant la réflexion totale n'est pas absorbé, mais renvoyé dans sa propre direction par des miroirs convenablement disposés. Admettons que le plan de polarisation soit tourné de  $45^\circ$  par les forces magnétiques. La section principale du deuxième nicol étant orientée dans la direction parallèle au plan de polarisation du rayon émergent, toute la lumière transmise par la substance absorbante (*sic.*) traversera le nicol. Par conséquent, la moitié des rayons émis par le corps 1 frappera le corps 2.

"Les rayons émis par le corps 2 se divisent en deux parties égales, dans le nicol 2. Une moitié est, comme précédemment, renvoyée par réflexion. L'autre moitié, après que son plan de polarisation a subi une rotation de  $45^\circ$  dans le même sens que le rayons émis par le corps 1, vient frapper le premier nicol. La section principale de ce nicol étant perpendiculaire au plan de polarisation, aucune radiation ne le traverse, et nous pouvons renvoyer toute la lumière au corps 2.

"Le corps 2 reçoit ainsi trois fois plus d'énergie que le corps 1. [That is, 2 receives the whole of its own radiation and the half of that of 1, while 1 receives only the half of its own radiation.] L'un de ces corps s'échauffera par conséquent de plus en plus aux dépens de l'autre."

Wien then suggests certain ways of escape from this conclusion, but it appears to me that the difficulty itself depends upon an oversight. It is *not* possible to send back to 2 the whole of its radiation in the manner

<sup>1</sup> The italics are in the original. That magnetic rotation may interfere with the law of reciprocity had already been suggested by Helmholtz.