

find much useful matter in this volume. The authors are thoroughly competent to deal with the legal aspect of the case, whilst their judicious comments show that they appreciate at least many of the technical difficulties necessarily presented by the subject. The contents deal with the various sections of the Electric Lighting Act, adding copious notes and comments, and references to legal precedents and decisions. Quotations are given from the evidence collected by the Select Committee on Electric Lighting, and from the Rules and Regulations recommended by the Society of Telegraph Engineers and Electricians concerning the prevention of fire-risks. One or two minor slips in the science are to be regretted, as for example where the authors state that a current of unit strength will decompose 0.9378 grammes of water per second. It is a pity, moreover, that they have departed from customary usage in speaking of the "strength" of a current as its "intensity." That term has been and is still so much abused, that so long as it is liable to mislead its use should be avoided. One of the authors describes himself as "Fellow of the Physical Society of London." We were not aware that the Physical Society of London recognised any such grade amongst its members.

LETTERS TO THE EDITOR

[The Editor does not hold himself responsible for opinions expressed by his correspondents. Neither can he undertake to return, or to correspond with the writers of, rejected manuscripts. No notice is taken of anonymous communications.]

[The Editor urgently requests correspondents to keep their letters as short as possible. The pressure on his space is so great that it is impossible otherwise to insure the appearance even of communications containing interesting and novel facts.]

Ben Nevis Observatory

IN NATURE, vol. xxvii. p. 399, there is among its notes of scientific intelligence, a paragraph mentioning that at a public meeting in Glasgow last week, called at the suggestion of Sir William Thomson and Mr. John Burns of Castle Wemyss, it was agreed to collect money for a permanent observatory on Ben Nevis.

As NATURE has always kindly encouraged this project of the Scotch Meteorological Society, perhaps you will permit me, as Chairman of the Society's Council, to add a little to this brief notice.

A requisition was presented to the Lord Provost of Glasgow, which was signed, not only by the eminent physicist and the extensive ship-owner mentioned in your notice, but also by Dr. Grant of the Glasgow Observatory, suggesting that a meeting of the merchants and ship-owners should be called to aid the Society in raising the necessary funds.

The Lord Provost in compliance called a meeting for the 14th inst., which was well attended, and at which very able speeches were made, not only by the three requisitionists, but by the Lord Provost and by other influential citizens. The result of the meeting was a resolution expressing approval of the Society's proposal, and appointing a Committee to obtain subscriptions in aid of it.

It is expected that the amount of the funds required will be obtained from a community so wealthy and so public-spirited as that of Glasgow. But if we are mistaken in this, the Society's Council intend to appeal to other communities also for help, being resolved to resort to every legitimate means of attaining an object allowed on all hands to be of national importance.

The Council began with Glasgow, not only because it is the richest community in Scotland, but because the Scotch Meteorological Society originated there. The late Sir John G. Forbes of Pitsligo, and I, being both of us interested in meteorology, applied to the British Association for the Advancement of Science, when it met in Glasgow in September, 1855, under the presidency of the Duke of Argyll, to see whether it would approve of the formation of a Meteorological Society for Scotland. The result of our application was the following resolution by the General Council:—

"Resolved, that the British Association express their satisfaction at the proposed establishment of a Scotch Meteorological

Society, and their willingness to afford the Society any assistance which can be yielded by the establishment of the Association at Kew.

"That a letter to this effect be addressed to the Meteorological Society by the General Secretary."

On the basis of this testimonial by so influential a body, Sir John Forbes and I proceeded at once with the organisation of a Society, the Duke of Argyll being our first President, and assisting us greatly by his patronage.

When the Society resolved on attempting the formidable undertaking of establishing an observatory on Ben Nevis, at a cost of at least 5000*l.*, the first movement for funds was made among its own members and friends, the result of which was a promise of 1400*l.* provided the full sum of 5000*l.* was raised. In order to be enabled to fulfil this condition, the Society's Council not unnaturally went first to the town where it originated, and which more than any other town would be supposed to take an interest in the Society and its operations.

There was this further reason: that the Observatory being intended to be on the west coast, its proximity to Glasgow would add to that interest, and the more so as, on account of the vast shipping and commerce of the Firth of Clyde, no district of Scotland could be so deeply concerned in obtaining additional data for storm warnings.

The British Association, by way of encouraging the formation of the Meteorological Society, expressed in the resolution before quoted a willingness to afford to it assistance from its establishment at Kew.

This promise, unfortunately, the Association was unable to fulfil. But this disappointment to our Society has now been so far compensated by a handsome donation of 100*l.* towards the Ben Nevis fund from Dr. Siemens, the present President of the Association.

The Scotch Meteorological Society is one out of many proofs of the usefulness of the British Association in encouraging researches in particular branches of science, and the recent recognition of the Society's work in this Ben Nevis enterprise by so eminent a man as the present President of the Association is very gratifying to the Council.

DAVID MILNE HOME

Milne Graden, Coldstream, February 26

Indian Archegosaurus

THE skull and part of the vertebral column of a large labyrinthodont, allied to *Archegosaurus*, was obtained in 1864 from the Bijori-group of the trias-jura of India, and presented to the Asiatic Society of Bengal. It was soon after sent to England for determination. All traces of this unique and important specimen, which should now belong to the Government of India, are now lost, and I write in the hope that some of your readers may be able to afford us a clue to its present position. The specimen can hardly have been mislaid, as it is some two feet in length.

RICHARD LYDEKKER

The Lodge, Harpenden, Herts, February 21

The "Vampire Bat"

KINDLY permit me to ask for a further explanation from Mr. Geo. J. Romanes about the vampire bat, in regard to which he says in his criticism of "Zoological Sketches" (Oswald): "Mr. Bates says (I presume it is a clerical error giving Mr. Belt as the authority) the vampire, however, is the most harmless of all bats." Yet he, Mr. Bates, would lead us to believe that a species of the same genus, *Phyllostoma*, is a blood-sucker, and had even attacked himself (see p. 91 of the fifth edition of his "Naturalist on the Anazon").

Is there a species of *Phyllostoma* that lives on fruits, the vampire, and another species of the same genus that Mr. Bates calls "the little grey blood-sucking *Phyllostoma*," that may possibly attack human beings?

The late Chas. Waterton seems to have had no doubt that the vampire attacks persons asleep, and gives an instance.

The common name vampire may not be in South America confined to the species *Phyllostoma spectrum*. Mr. Romanes' remarks would lead one to believe that he considered there was no species of bat that attacked human beings.

THOS. WORKMAN

4, Bedford Street, Belfast, February 15

DR. ROMANES, in criticising a book ("Zoological Sketches"), in NATURE, vol. xxvii. p. 333, says: "The writer speaks of

vampire bats as those which suck the blood of sleeping persons, whereas the truth is, as Belt has remarked, "the vampire is the most harmless of bats."

In Charles Darwin's "Voyage of the *Beagle*," we find an account of a vampire bat (*Desmodus d'orbigny*) sucking the withers of horses during repose. We also have Charles Waterton's most circumstantial account of the sucking of the blood of human sleepers. Waterton says there are two species, only one of which attacks man. The Rev. J. G. Wood tells us in his notes to "Waterton's Wanderings" that the bat is *Vampirus spectrum*, on what authority he does not say, but quotes C. Kingsley in confirmation of the blood-sucking habit. Again, Prof. Mivart has an article in the *Popular Science Review* for July, 1876, on bats, in which he not only quotes Darwin's account, but speaks of the modification of the teeth and stomach of *Desmodus* as specially suited to this habit. What I wish to ask in all humility, as a mere onlooker, is, How are we to reconcile the above statement with all this authority?

94, Jacob Street, Liverpool, February 12 A. W. AUDEN

I INADVERTENTLY wrote the name of Belt while quoting from the work of Bates. The answer to the question which your correspondents ask is sufficiently simple, and has, in fact, been furnished by one of them, viz., that while the vampire bat itself does not suck blood, the name is popularly extended to other kinds of bats which do. These other kinds—and at any rate some of them—belong indeed to the same sub-family as the vampire (viz., genera *Phyllostoma* and *Desmodus*); but that the large and repulsive-looking vampire is innocent of the habit in question may briefly be made evident by citing again, and a little more fully, the authority of Mr. Bates, who writes: "The vampire was here by far the most abundant of the family of leaf-nosed bats. . . . No wonder that imaginative people have inferred diabolical instincts on the part of so ugly an animal. The vampire, however, is the most harmless of bats, and its inoffensive character is well known to residents on the banks of the Amazons" ("Naturalist on the Amazon," p. 337).¹ Again, Mr. G. E. Dobson writes: "This species (*Vampirus spectrum*), believed by the older naturalists to be thoroughly sanguivorous in its habits, and named accordingly by Geoffroy, has been shown by the observations of modern travellers to be mainly frugivorous, and is considered by the inhabitants of the countries in which it is found perfectly harmless" ("Catalogue of the Chiroptera, &c." p. 471).

In conclusion, I cannot quite understand why my remarks should have led any one to believe, as one of your correspondents says, that I consider there is no species of bat which attacks human beings. I stated that the author whom I was reviewing was wrong in speaking "of vampire bats as those which suck the blood of sleeping persons," a statement which appears to me plainly enough to imply that there are certain other bats which do suck the blood of sleeping persons.

GEORGE J. ROMANES

Hovering (? Poising) of Birds

LET me entreat the Duke of Argyll not to confuse the issue between us. I made bold to ask his Grace to draw a diagram showing by what balance of forces he thought a bird could be sustained in mid-air, motionless on motionless wings, in a perfectly horizontal wind; and he refers me to a beautiful drawing of a kestrel hovering, with fluttering wings, in still air. (See note at foot of page 161 of the "Reign of Law," 5th edition, 1868: "Mr. Wolf's illustration of a kestrel hovering shows accurately the position of the bird when the action is performed in still air.")

This is quite beside the mark. The problem to be solved is not, How does a bird remain at rest in mid-air on fluttering wings? That question is admirably answered in the "Reign of Law" (p. 160). But the problem before us—the same that was discussed in NATURE in 1873-74—is simply this, How does a bird remain at rest in mid-air on perfectly motionless wings?

Does the Duke deny that this ever takes place? Has he forgotten the letters of Prof. Guthrie and Major Herschel (NATURE, vol. viii, pp. 86 and 324) in which the phenomenon was so graphically described? The Duke himself says (NATURE, vol. x, p. 262), "that under certain conditions of strength of air-current a kestrel can maintain the hovering position with no visible muscular motion whatever;" and compares

the action to that of a rope-dancer "standing still in some tiptoe attitude." At that time he appears to have recognised the peculiar features of motionless hovering; but now he denies that he has ever "seen a kestrel's wings motionless when hovering," except for a moment or two, and even then he "could detect the quivering of the quills."

I am really at a loss to know whether the Duke maintains his former position; or whether by shifting his ground he admits that it is untenable; or, lastly, whether he has not partly misapprehended the problem under discussion.

In instancing the "hovering of a boy's kite" the Duke curiously parodies the mistake which he made in his last letter, which required for its correction the tilting of gravity through a certain angle. So here, when he says, "the element of weight is here represented by the string, held at the surface of the ground," he forgets the all-important angle between the direction of gravity and the direction of the string at its point of attachment to the kite.

HUBERT AIRY

February 26

HAVING all my life given some attention to the flight of birds, I may mention that I have frequently noticed both hawks and gulls stationary in the air, without flapping, for five or six seconds over the Cornish cliffs when the wind has been blowing off the sea, but never under the circumstances mentioned by Dr. Rae. I totally fail to see why Mr. Airy should be, as the Duke of Argyll states (NATURE, vol. xxvii, p. 387), "mistaken in his description of the facts," it having been plain throughout that Mr. Airy employs the term "hovering" as equivalent to "hanging in motionless poise." Mr. Wolf's kestrel in the "Reign of Law," p. 160, is shown as moving its wings through an angle of about 30°.

Although I believe there is nothing in the etymology of the word "hover" which implies movement, yet its similarity to such words as "quiver," "shiver," &c., may have caused the idea of movement to be associated with it; but whether this be a "disease of language" or not, Mr. Airy seems to have most accurately described what is surely not an uncommon fact of observation.

W. CLEMENT LEY

The Auroral "Meteoric Phenomena" of November 17, 1882

IF Dr. Groneman has established the fact that the spindle-shaped beam from every point of observation appeared moving in a straight line, that is an important point gained; but I fail to gather from his letter on p. 388 that there is clear evidence of this. He cites S. H. Saxby as one observer in favour of this, but his description appears to me very ambiguous. When he says, "Its trajectory was much flatter than that of the stars," what stars does he mean? If he means the stars at the same declination as that of the beam, viz. about 10° S., then a great circle undoubtedly would be flatter, but still more would a small circle having its centre at the magnetic pole. On the other hand, H. D. Taylor writing from near York describes the path of the beam as from south-east to south-west, thus making it a small circle curved in the wrong direction for an auroral arch.

It must be remembered that it is very difficult to judge whether a trajectory is a straight line when it covers a great extent in azimuth.

T. W. BACKHOUSE

Sunderland, February 26

IT is much to be desired that the increasing interest concerning this great phenomenon should supply the only way of obviating the paucity and incompleteness of observations, by having a meeting of observers and advanced nature-students either at London or Bristol. The Utrecht observation says: "When this arch had obtained the length of 90° (which lasted only a few seconds), a separation was made in the middle of its length," &c. I think this accounts for many of the discrepancies.

M. Groneman writes: "The Dutch observations confirm the English, only the phenomenon seems to have been of greater apparent size and therefore nearer." I used to think this for the same reason he gives, but I now think it probable that it was further from the earth when it first approached.

From Bordeaux I learn the sky was cloudy, but the aurora was well seen from Rome, Spezia, and Florence, and I have hopes of observations from the north of Italy.

The logical position is that we must lay aside all preconceived