

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—or 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