wind of 80 miles an hour at an elevation of 100,000 feet (less than the height deduced by Verbeek for that reached by some of the ejecta) might theoretically co-exist with a trade wind of ordinary velocity at the earth's surface.

It is not so much with reference to the velocity as to the direction of the upper currents near the equator that Mr. Abercromby's itinerary observations are valuable, since they correspond both normally and exceptionally with what might be expected from the laws of *aéro-dynamics*. Theory is naturally perhaps, though still somewhat singularly, silent as to what is supposed to be the motion of the air in the upper regions of the belt bounded by 15° on either side of the equator. Ferrel's equations are not very satisfactory for this space, owing to the smallness of the term $2v\omega \sin \theta$ representing the deflecting force of terrestrial rotation (*ablenkungskraft*), and close to the equator fail altogether at the surface. That the wind there, however, still maintains its westward component under the normal conditions which accompany the north and south trades is plain both from Mr. Abercromby's and other observations. Higher up, owing to the absence of friction, the air tends to move in the "inertia curve" corresponding to its motion at the surface, whose

radius of curvature is $\frac{v}{2\omega \sin \theta}$; and since near the equator $\sin \theta$ is very small this curve is very nearly a straight line parallel to the equator. Whatever therefore happens to the surface wind through local influences such as latitudinal shift of thermal equator or doldrums, or the establishment of a local heat maximum on a land surface causing a deflection of the normal trade wind into a local monsoon, ought not to interfere sensibly with the general tendency of the upper air to stream from east to west for a considerable space on either side of the equator. I may just remark, *en passant*, that the belt bounded by 15° N. and S. latitude embraces an area of more than one-quarter of the entire surface of the globe.

The apparent anomalies as well as rules exhibited by Mr. Abercromby are thus seen to be in complete accordance with the above principle. It is only when we get some distance away from the equator that the gradient towards the poles in the upper atmosphere becomes large enough to change the westward into an eastward motion. As the air slides down this slope the radius of the "inertia curve" becomes smaller, and it veers through S.E. and S. to S.W., the normal direction of the upper current at the boundaries of the trade zones.

That the barometer gradient at a height of 13,000 feet over the equator is very small either from or towards the poles may be gathered from the following extract from a table given by Dr. Sprung in his "Lehrbuch der Meteorologie" (Hamburg, 1885):—

		Height 13,123 feet. Mean pressure in inches.	
Lat. 20° N.	.	.	18.504
10°	.	.	18.532
0	.	.	18.543
10° S.	.	.	18.547
20°	.	.	18.547

Above this height the gradient towards the poles would increase, but theoretically there might be no change in the direction of the wind near the equator.

June 3.

E. DOUGLAS ARCHIBALD.

Mammaliferous Gravel at Elloughton, in the Humber Valley.

I was informed a short time ago that a large bone had been found in a gravel-pit near Brough, on the Humber, and went at once to examine the place. I found the "bone" to be a mammoth's tusk of large size, and learnt that other teeth and bones had not infrequently been exhumed in the pit. As this seems to be a new locality for mammalian remains, I think a short description of the deposit may be found useful.

The excavation was commenced about twelve months ago on the top of a small isolated hill known as Mill Hill, which rises out of the Humber Flat to a height of about 90 feet, close to the village of Elloughton, and since that time there has been a constant and steady removal of the material, so that a good section is now exposed. The hill forms an outlier of the Wold Range, from which it is separated by low ground nearly a mile in width, the north shore of the Humber lying about one mile

to the south of it. It is composed of Oolitic rocks overlain by gravel. The section at present shown is as follows:—

A. Top-soil, &c....	... 2½ feet.	{ A British burial found in this layer, on the west side of the pit.
Contains pebbles of flint, sandstone, red chalk, Oolitic limestone, and other local rocks, along with a few well-worn erratic pebbles of felsite, quartzite, &c.; also rolled lumps of clay and streaks of carbonaceous matter like decayed vegetation.
The mammoth's tusk and other bones were found in this bed.
Of doubtful age, but probably belonging to the Estuarine Oolites.
B. Rough stony gravel, }
with sand... }	... } about
... } 9 feet.	
C. Yellow sand, with }
stony layers ... }	... } about
... } 5 feet.	
D. Hard gray clay, forming
floor of pit ...		

In the rough gravel, B, there are some boulders of local rocks so large as to suggest the idea that floating ice has been the agent of their transportation, especially as it seems as though the blocks must either have been raised from a lower level, or floated over the depression intervening between this hill and the Oolitic exposures in the flanks of the adjacent Wolds.

The junction of B with C is very well marked, and there are signs of erosion, and unconformity between them; but as the whole of the beds are current-bedded and irregular, this line of separation may be of no importance. On the other hand, since fossils seem only to be found in the sand, C, this may be the remains of an older deposit which has been denuded during the deposition of the overlying unfossiliferous gravel, B, and this latter bed may be a continuation of similar rough unfossiliferous gravels seen on the lower ground to the westward.

If the clay exposed on the bottom of the pit really forms part of the Oolites, I see no means of determining the age of these gravels; but my impression is that at any rate they are not older than the oldest boulder-clay of Holderness, and are probably not later than the newest. At Hesse, six miles to the eastward, bones have been found in a chalky rubble underlying boulder-clay, which Prof. Phillips regarded as pre-Glacial. At Bielbecks, seven miles to the northward, similar remains were obtained in 1829 from a fresh-water deposit which I think was regarded as post-Glacial. It may be that these deposits will eventually prove all to be of one age.

The size and condition of the tusk were such that I do not think it can have been carried hither by water-currents alone. It has more probably either been dropped from the floating or living carcase of the animal or from a mass of floe-ice. Its length, as it lay exposed on the floor of the pit at the time of my visit, was 90 inches, but the workmen said they had broken up about two feet of the "thick end" before they were aware; and as the apex was also blunted and badly preserved, I think its length when first deposited cannot have fallen short of 10 feet. Its diameter was 6 inches at a distance of 10 inches from the apex; $7\frac{1}{2}$ inches at 20 inches; 8 inches at 30; $8\frac{1}{2}$ at 40, beyond which it did not seem perceptibly to thicken. It lay in a water-logged gravel, and was in a very friable state; and though I was enabled, through the kindness of Mr. H. Lyon, the owner of the pit, to strengthen the specimen with cement, it crumbled into small splinters when an attempt was made to remove it, and was irretrievably ruined. Its curvature was not great, and would lie within a breadth of about 20 inches.

The only other remains I have yet obtained from the pit are some portions of the teeth of the mammoth and a few irre recognizable fragments of bone.

In the top-soil on the west side of the pit a British burial has been cut through, wherein lay the bones of a human skeleton, together with a fragmentary vase with the characteristic ornamentation.

G. W. LAMPLUGH.

Bridlington Quay, June 6.

Fall of Peculiar Hailstones in Kingston, Jamaica.

SHORTLY after midday on the 2nd inst. a thunderstorm visited this city; the rain began with the wind from the east, as is usual with our May seasons, but it speedily changed to the

west, accompanied with much lightning and thunder. Immediately hailstones became mingled with the rain, attention being drawn to their advent by the sharpness with which they struck on the shingled roofs. The west door of the laboratory being open to the air, the hail came in freely, nearly covering the floor for more than 12 feet. The hailstones were of clear ice, inclosing a few bubbles of air, varying from mere points to bubbles of the size of a split pea. The shape of the stones

was singular. Suppose a shallow and very thick saucer to have a shallow cup, without a handle, inserted in it, and you will have a good idea of the form of the hailstones when unbroken. Many had more or less lost the "saucer" by violence, while some were entirely without it, presenting the appearance of a double convex lens with faces of different curvature.

By actual measurement the hailstones were found to vary from one-quarter to three-quarters of an inch in diameter, and from one-eighth to one-quarter of an inch in thickness at the thickest part. I observed that in very many of the larger stones the air-bubbles could move about, showing the interior to be still liquid; as melting proceeded the bottom of the "saucer" would suddenly give way and become concave. The storm lasted about 15 or 20 minutes, hail falling for the greater part of the time. The hail which fell on grass remained unmelted for ten or fifteen minutes after the rain ceased. The fall of hail was very local, none falling at my house a mile away. I am informed that hail last fell in Kingston in 1839.

JAMES JOHN BOWREY.

Government Laboratory, May 12.

Singular Nesting-place of Linnets

It may be interesting to some of your readers to know of the recurrence of a strange freak on the part of a pair of linnets. Last year they selected, as the scene of their nest-building and other parental operations, the interior of a Maltese water-bottle, hung against a brick wall, at the back of the house of Capt. G. Wood, and in a sort of half yard, half garden. The bottle is of porous ware, 10 inches high, 7 inches wide at its broadest part, which is mid-way between the bottom of the neck and the base, and having an upright constricted neck 4 inches long and only 1½ inches in diameter on the inside. In this singular receptacle the birds contentedly built, laid their eggs, and successfully reared their brood.

This year, strange to say, the same pair, or one identically like them, have returned to the old haunt, deftly repaired and slightly added to the old nest, laid their eggs, and now have a vigorous progeny of five or six unfledged youngsters.

How the birds came, in the first instance, to select such a shelter, seeing that they could only pass in or out with folded wings, and by a sort of dart, and that to enter the neck from within in this way must have been a task of considerable skill and no little difficulty, is a mystery; but that they should have retained such a happy memory of their first sojourn as to lead them to return to their old quarters, is more interesting still.

H. VIAN-WILLIAMS.

3 Waterloo Place, North Shields, June 2.

A Brilliant Meteor.

YESTERDAY I saw a very brilliant meteor with train, resembling a firework in shape, colour, and other features. It was coming from Ursa Major, and vanished midway between α Lyrae and δ Cygni. Motion very slow; 21h. 19m. mean Turin time.

Turin, June 11.

F. PORRO.

ELECTRICITY AT OXFORD.

IT is with very great regret that we learn that the study of natural science in the University of Oxford received last week a blow which is all the more to be

deplored in that it was, in part at all events, delivered by those from whom such an onslaught was least to have been expected. Professed hostility or indifference to the great scientific movement of the day, injudicious economy,—these are obstacles which promoters of that movement must be prepared to face, and will in the long run overcome. It is not, however, to be expected that progress will be made if each forward step is checked by those who have themselves enlisted on the side of science.

The cardinal point which the University had to decide was whether it should or should not provide itself with a laboratory for the development of the teaching of electricity. The Clarendon Laboratory was, we believe, the first building in this country which was planned and erected for the study of experimental physics alone. It was designed about twenty years ago by Prof. Clifton, and, if we except the provision made for electricity, nothing better or more complete is to be found within the four seas.

Rooms were, it is true, originally set apart as electrical laboratories. The rapid growth of the science would have sufficed to render them inadequate now, but we gather from a statement circulated by Prof. Clifton that other causes have combined to strengthen the case for an extension of the building.

Optics has been a favourite subject among students of physics at Oxford, and optical apparatus now occupies the space intended for electrical instruments. Thus it has come to pass that "the important branches of electricity and magnetism are," in the words of the Professor, "necessarily excluded from the practical course."

In consequence of this unsatisfactory condition of affairs, Prof. Clifton has for some years lectured almost exclusively on electricity, and has been compelled to discuss methods of manipulation and details as to instruments which are usually mastered in a laboratory. The Lee's Reader in Physics, Mr. R. Baynes, has also established a practical course on electrical measurements, in Christ Church. Although the work he has thus done is excellent, we believe that it is not contended that Christ Church is in a position to make a permanent provision for instruction in electricity on a scale adequate to the requirements of the University.

For some time past, therefore, the University has been urged to add a wing for electrical work to the Clarendon Laboratory.

The necessity of providing for other University requirements has caused a long delay, but at length the turn of physics seemed to have come. Plans prepared by Prof. Clifton were submitted to the Hebdomadal Council. Mr. Henry Wilde, F.R.S., generously promised a gas-engine, dynamos, and an electric lamp. The Delegates of the Museum (who superintend the laboratories of the University), the Curators of the Chest (who have charge of its financial affairs), approved the scheme. It was adopted by the Council, and nothing remained but for the graduates in Convocation assembled to give their assent.

At the last moment, however, unexpected opposition arose. Balliol and Trinity Colleges have for some years combined their provision for the teaching of natural science, and the President of Trinity, acting for these Colleges, issued a pamphlet hostile to the grant for the proposed new laboratory. This step was taken on two grounds, both of which appear to us mistaken.

In the statement above referred to, Prof. Clifton had mentioned as an advantage incidental to the erection of the new laboratory that he would be able to abandon the lecture course of electrical demonstrations, as the instruction given in them would be better provided for in laboratory work. He proposed to substitute a general course on physics, addressed not only to the comparatively few students who aim at high honours in that subject, but to the larger body who enter for the first or preliminary stage of the honour examination. To this