

Experiment with a Vacuum Tube

A TUBE like a radiometer tube contained a concave metal disk within the bulb; this disk could be connected with the pole of an induction-coil, and about a quarter of an inch above it was a small wire which could be connected with the other pole. The bulb was exhausted to such a point that a 5-inch spark could not pass from the wire to the metal disk. The wire and disk were connected for several minutes with an induction-coil giving $4\frac{1}{2}$ to 5-inch sparks; although no spark passed between them, the glass on the side of the bulb, which was just in the focus of the metal concave disk, was melted, and the pressure of the external air forced the melted glass inward, and a minute hole was formed, of course destroying the vacuum. The diameter of the hole was about that of the finest sewing-needle; it was in the centre of a depression in the side of the bulb about a tenth of an inch in diameter.

H. ALFRED CUNNINGTON

Devizes, February 28

[Having succeeded in melting platinum by the heat of molecular impact (*Proc. Roy. Soc.*, No. 191, p. 110, and *NATURE*, vol. xix. p. 137), it is not surprising that the heat is sufficient to melt glass when the focus falls on it. In a paper communicated to the Royal Society in November last, now being printed in the *Philosophical Transactions*, I mentioned that by drawing the focus on to the side of the glass tube by means of a magnet, the glass became heated to redness. In December I wrote to Prof. Stokes that I had melted up a piece of Gorman glass in the focus of the rays, and at the same time I sent a piece of the melted glass to my friend Mr. Sorby, of Sheffield, for microscopic examination, as the fusion *in vacuo* had produced an unusual appearance on the surface of the glass.—WILLIAM CROOKES.]

Tides in the Bay of Fundy

HAVING resided for some years in the neighbourhood of this bay, I am able to give a little information respecting its tides. The bay splits into two at its inner end. One of these branches leads through a narrow channel into the broad basin of Minas. The other, called Chegnecto Bay, is not interrupted by any such contraction, and is therefore more favourable for the formation of very high tides. This bay itself divides at its upper end into two, and one of these, called Chepody Bay, contracts very gradually for some thirty miles inland, forming the estuary of the Petitcodiac River. This is the place where the highest tides occur, and as far as I have been able to learn, their maximum height is 70 feet. A powerful "bore" is formed by the incoming waters. The captain of the steamer *Emperor*, which plied between St. John, N.B., and Windsor, N.S., informed me that the highest tide in any part of Minas Basin was about 55 feet. This would probably be at the head of Cobequid Bay, near Truro. Noel Bay, which is mentioned in Dr. Haughton's letter (*NATURE*, vol. xix. p. 432), is in Minas Basin, rather more than half way from its narrow mouth to the head of Cobequid Bay. If the range here at ordinary spring tides is 50.5 feet, any one looking at the map and knowing the effect of funnel-shaped estuaries, would be prepared to learn that there is a range of from 60 to 70 feet in Chepody Bay and the estuary of the Petitcodiac, at strong springs.

J. D. EVERETT

Malone Road, Belfast, March 14

End-on Gas-Vacuum Tubes in Spectroscopy

WHILE nothing will give me greater pleasure and confidence in my own worked-out views than to learn, as you intimate in the editorial note (*NATURE*, vol. xix. p. 400), that so able a working scientist as Dr. Van Monckhoven had preceded me in pointing out the value of *end-on* gas-vacuum tubes, and had sent specimens similar to mine to several observers in England, allow me to inquire where I can find any published account in this country of his tubes, the parties to whom they were sent, and the work accomplished with them? And why, also, if the said tubes were found by those gentlemen as intensely superior for spectroscopic results as mine are proving themselves—they have not yet been described in any of the latest London books I have been able to look into on spectroscopy, natural philosophy, electricity, and instrument-makers' price lists, though the old, pale, imperfectly-lighted, transverse-vision tubes are referred to in all?

Your obliging answer to these questions will evidently be of interest to Dr. Van Monckhoven, as well as myself, while it will also have a far wider and more important bearing for many persons

in Scotland. For they, conscientiously striving by all recognised public methods of study to keep up with progress in the south, and not having heard of *end-on* gas-vacuum tubes for the spectroscope before my recent paper on them, would very much like to have thereby and therein a practical demonstration of what a thing, and a good thing too, being, as you say of this, "already well known in England," really consists in; and to what extent, therefore, every member of the community here ought to have similarly known it on the 10th inst., and myself nearer to the same date in 1878, when M. Salleron made the first examples for me, on my then supposed new idea. PIAZZI SMYTH
Edinburgh, February 28

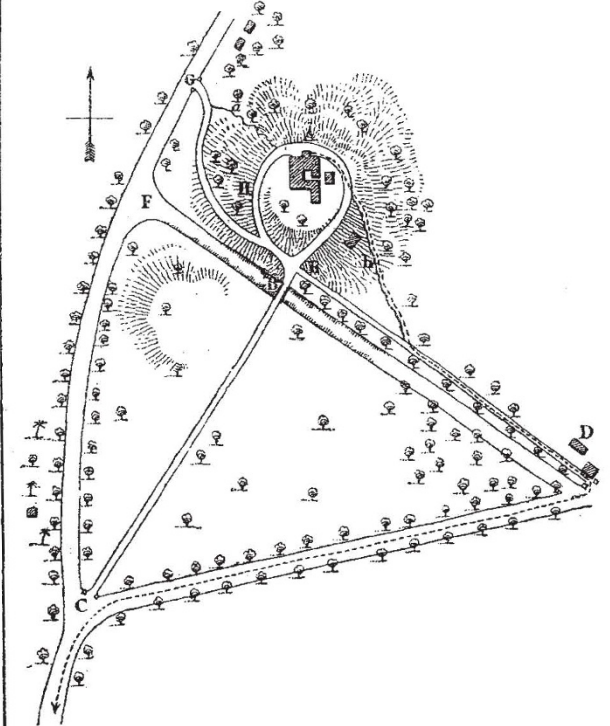
[Dr. Van Monckhoven writes that his new tubes were described to the Belgian Academy of Sciences in 1877, in a note, a copy of which he sends us. He states that he sent some of these tubes to Mr. Dallmeyer, who gave them to various English men of science. They give, he states, about 100 times more light than the ordinary spectrum tubes.—ED.]

Intellect in Brutes

DR. RAE has so fairly disposed of Mr. Henslow's "examples of so-called "practical" and "abstract reasoning" that further comment is unnecessary. As, however, the subject of intellect in brutes is on the *tapis*, I will give an instance of sagacity in a dog that finally set at rest any doubts I ever entertained that the difference between human and animal intelligence is one of degree only.

If you have space for it, the accompanying plan will be of great value in describing the circumstances.

Mr. J. W. Cherry, of the Madras Forest Service, was owner of the dog in question, a bull terrier, called "Bully." We



lived in the bungalow (A), the compound of which was bounded south and west by public roads (D C) and (G F C) both leading to the cantonment of Mangalore in the direction C. There were three gates into the compound at (C) (D) and (G), the main approach to the Bungalow leading over a bridge (B), that spanned a branch public road (F D). The compound was filled with trees and shrubs, and bordered by dense lantana hedges, so that with the exception of a portion of the western road at F, neither of the cantonment roads were visible from the bridge, nor could the foot-paths (a) and (b) be seen thence.

Now Bully had a lady friend (canine) living in the canton-