

That the cultivation of ipecacuanha should be taken up at Edinburgh is nothing more than might reasonably be demanded of a garden maintained at the national expense. It was indeed an arrangement which the residence at Edinburgh of Dr. Anderson, the then Superintendent of the Calcutta Botanic Garden, who was home on sick leave, rendered eminently desirable, and one upon which I was fully consulted by the Government, as appears in Dr. Anderson's report already quoted. Nor, in reference to the subject, should it in fairness be suppressed, that not only has the successful introduction of the ipecacuanha into India been due to the establishment at Kew, but that Kew has at the same time supplied living plants to Ceylon, the Mauritius, Jamaica, Trinidad, Barbadoes, Queensland, and various home and continental gardens.

Prof. Owen again appears to have been completely misinformed in respect to *Welwitschia*, which, he implies, had been sent to Kew in a state fit for cultivation. A very large and old specimen with the tap-root chopped off before its arrival, was placed for convenience in a pot of earth, and exhibited in the succulent house, where it would be likely to attract much attention, and would also be in contiguity to other plants from the same region. This was done without the slightest expectation of its showing any disposition to grow, and solely to gratify the public curiosity. On the appearance of symptoms of decay from the dampness incidental to a greenhouse, it was at once transferred to the museum, where it now remains. Prof. Owen, apparently quoting a statement in my memoir on *Welwitschia*, pointedly alludes to the fact that "cones with ripe seeds" had been received at Kew, but he omits to give the following words, "the albumen of which was perfectly rotten;" and when alluding to my acknowledgment of the receipt of "fine young plants," he does not add that these were Dr. Welwitsch's specimens gathered years before.

Prof. Owen refers to my answer to Q. 6,661 in the evidence given before the Royal Commission, as having by groundless insinuation "inflicted pain on fellow-servants of the State and collaborators in science, on men at least his (my) equals, and one of whom in a recondite botanical problem has shown himself his (my) superior." As Prof. Owen does not quote this question and answer, I shall do so. They are as follows:—Q. 6,661.—"Has there been insufficient space in the British Museum for the reception of specimens for the enlargement of its herbaria, or has any other obstacle interfered?"—A. "With regard to the British Museum I do not think any person can answer that except the officers of the establishment. I do not think that the nature and extent of its botanical collections or their condition is well known except to its officers."

I leave it to the reader to say whether any possible insinuation could be conveyed in such an answer, and, being unconscious of any, shall conclude with expressing my conviction that here again Prof. Owen has been misinformed.

J. D. HOOKER

Royal Gardens, Kew, Nov. 15

The Diathermacy of Flame

I HAVE to thank Lord Rosse for pointing out an omission in my communication on this subject. It was not, however, an "oversight," as Lord Rosse supposes, the source of error in question having been duly considered, and its amount calculated, when the experiments were made. It was neglected on account of its smallness. As its theoretical importance is unquestionable, and the amount of experimental error is likely to be much over-rated, I gladly supply the following figures, which show that this source of error was fairly negligible.

As heat, like all other radiant forces, necessarily diffuses with the square of the distance from its source, my method of maintaining a constant mean distance by lighting an equal number of jets equidistant from each side of the middle flame, was liable to an error equal to the difference between the square of the distance of the middle flame from the thermometer and the mean

of the squares of the distances of the other flames. The flames were $\frac{1}{2}$ of an inch apart, and the middle flame was 14 in. distant from the thermometer. Thus, in the first trial, when only three flames were lighted, the distance of the nearest was $13\frac{1}{2}$ in., of the middle 14 in., and of the farthest $14\frac{1}{2}$ in. Taking $\frac{1}{4}$ in. as our unit, the middle flame was 56 distant, the nearest 55, and the farthest 57. $56^2 = 3136$, $55^2 = 3025$, and $57^2 = 3249$. The mean of 3025 and 3249 is 3137, instead of 3136 as experimentally assumed; the error in this case is thus only $\frac{1}{3137}$

of the 4° increase which my thermometer registered, or $\frac{1}{784 \cdot 25}$ of a degree, a quantity far too small for consideration in using a common laboratory thermometer reading only to half degrees.

Proceeding onwards, the error of course continued increasing until it reached its maximum, when the 1st and 17th jet were lighted. The 1st was 48 quarter inches distant from the thermometer, the 17th was 62. $48^2 = 2304$, $62^2 = 3844$. The mean of these is 3074, instead of the experimentally assumed mean of $56^2 = 3136$. The difference is 62, i.e. $\frac{1}{50 \cdot 3}$ of 5° —

the last increment of heat. Thus the maximum error was less than $\frac{1}{10}$ of a degree, and the mean error lies between this and $\frac{1}{784 \cdot 25}$ of a degree.

As regards the last paragraph of Lord Rosse's letter, I would suggest that, with gas passing through a given orifice, the passage of equal quantities necessarily implies equal pressure; that in turning the micrometer screw of the supply tap so as to cause each additional pair of equal jets to consume an equal additional quantity of gas, I was merely admitting into the space between the tap and the jets a quantity of gas just sufficient to maintain an equal elastic tension or pressure in spite of the varying quantity issuing from the jets.

W. MATTIEU WILLIAMS

Skeletons of Wild Animals

MR. CLARK, of Cambridge, in NATURE of Oct. 31, remarks on the general absence of skeletons, especially those of the *Felidae*, in museums, and states that, so far as he knows, no European museum possesses more than skulls. It is with pleasure, therefore, that I draw his attention to the fact of the existence of a perfect skeleton of the lion in the Ipswich Museum. Besides this, there is a skeleton of the mole, one of the dog-faced monkey (*Cynocephalus anubis*), one of the dolphin, two very finely prepared skeletons of the boa constrictor, besides others of the ostrich, &c.

J. E. TAYLOR

Treble Rainbow

ABOUT the middle of August, whilst standing on platform of the station at Exmouth, I witnessed a phenomenon which I think is rare enough to be worthy of record. The sun was about an hour off the western horizon, and the river, which is to the west of the station, and is in that part about a mile and a-half broad, was perfectly calm; but there must have been a breeze blowing overhead, for a heavy shower of rain came rapidly up from the westward, and when it had passed to leeward displayed the two ordinary rainbows brightly; and not only these, for between them appeared the arcs of a third bow cutting the other two, the inner one on the horizon and the outer about ten degrees or thereabouts above it. This third rainbow appeared to have its centre as much above as that of the ordinary rainbow was below the horizon, and was due to the reflection of the sun from the calm surface of the river. The arcs of the third rainbow extended but a very small distance beyond the secondary bow, but were bright enough at the intersection to show a sort of check-work of colours, which presented a most curious appearance.

Oxford, Nov. 5

A. MALLOCK

Circular Spraybows

THERE have been several accounts lately in NATURE of circular rainbows, but none of your correspondents have mentioned "circular spraybows;" of course, in themselves they are of no great value, but under certain circumstances they can be seen so near that their brilliancy exceeds that of a rainbow.

The most perfect which I have seen was at the Falls of Foyers, off Loch-ness, at 8 A.M. on September 1, 1868. The previous