of fuchsin and had been experimentally investigated with great power by Kundt.[1]

Sellmeier himself somewhat marred[2] the physical value of his mathematical work by suggesting a distinction between refractive and absorptive molecules ("refractive und absorptive theilchen"), and by seeming to confine the application of his formula to cases in which the longest of the molecular periods is small in comparison with the period of the light. But the splendid value of his formula for physical science has been quite wonderfully proved by Rubens (who, however, inadvertently quotes[3] it as if due to Ketteler). Fourteen years ago Langley[4] had measured the refractivity of rock-salt for light and radiant heat of wave-lengths (in air or ether) from ·43 of a mikron to 5·3 mikrons (the mikron being 10^{-6} of a metre, or 10^{-4} of a centimetre), and without measuring refractivities further, had measured wave-lengths as great as 15 mikrons in radiant heat. Within the last six years measurements of refractivity by Rubens, Paschen, and others, agreeing in a practically perfect way with Langley's through his range, have given us very accurate knowledge of the refractivity of rock-salt and of sylvin (chloride of potassium) through the enormous range of from ·4 of a mikron to 23 mikrons.

Rubens began by using empirical and partly theoretical formulas which had been suggested by various theoretical and experimental writers, and obtained fairly accurate representations of the refractivities of flint-glass, quartz, fluorspar, sylvin, and rock-salt through ranges of wave-lengths from ·4 to nearly 12 mikrons.[5] Two years later, further experiments extending the measure of refractivities of sylvin and rock-salt to radiant heat of wave-lengths up to 23 mikrons, showed deviations from the best of the previous empirical formulas increasing largely with increasing wave-lengths. Rubens then fell back[6] on the simple unmodified Sellmeier formula, and found by it a practically perfect expression of the refractivities of those substances from ·434 to 22·3 mikrons.

And now for the splendid and really wonderful confirmation of the dynamical theory. One year later a paper by Rubens and Aschkinass[7] describes experiments proving that radiant heat after five successive reflections from approximately parallel surfaces of rock-salt and again of sylvin, is of mean wave-length 51·2 and 61·1 mikrons respectively. The formula which Rubens had given in February 1897, as deduced solely from refractivities measured for wave-lengths of less than 23 mikrons, made μ^2 negative for radiant heat of wave-lengths from 37 to 55 mikrons in the case of reflection from rock-salt, and of wave-lengths from 45 to 67 mikrons in the case of reflection from sylvin! (μ^2 negative means that waves incident on the substance cannot enter it, but are totally reflected).

A FOURTH SPECIMEN OF "NOTORNIS MANTELLI," OWEN.

NATURALISTS in New Zealand have this week been thrown into a great state of excitement by the capture of the fourth entire specimen of this very rare flightless Rail.

On August 8 I received a telegram informing me of the acquisition, and asking advice as to its preservation. Fortunately, a skilled taxidermist is attached to the Otago Museum, and I was able to arrange that the bird should be sent to that institution: it arrived two days later, and its remains are now in my care.

The last specimen of *Notornis* was captured twenty years ago; and it was almost universally considered by Maories, as well as by whites, to be extinct; hence the interest that attaches to the present specimen.

It may not be uninteresting to naturalists at home to be reminded of some facts in the history of *Notornis* as recorded in Buller's "Birds of New Zealand." The name was originally bestowed by Owen on some fossil bones discovered in the North Island, New Zealand.

Some years later (1849), Mr. W. Mantell was able to secure a freshly killed specimen, taken in the south-west of the Middle Island (the southern of the two main islands of New Zealand). This bird, the skin of which is in the British Museum, was declared by competent ornithologists at home to be identical with the fossil form. The second specimen was killed by Maories in 1851, and its remains are also in the National Collection. The third specimen was obtained nearly thirty years later, in 1879, and was purchased for the Dresden Museum. (From an examination of the bones Dr. A. B. Meyer declared it to be distinct from the fossil form, and named it *N. hochstetteri*.) These three specimens were killed at three spots about 100 miles apart, in very rugged country. Later, an incomplete skeleton was discovered, which is at present in the Otago Museum.

The bird recently killed is thus the fourth specimen seen in the flesh, and its future fate is at present uncertain. It was killed by a dog in the bush adjoining Lake Te Anau, in the same district as the other three specimens.

I have examined and made sketches of its viscera, which, like all parts of the bird, are carefully preserved for the owner. The specimen is a young female, in excellent health and splendid plumage.

During the present month I have been fortunate enough to obtain, on deposit, an egg of the Moa—the third or fourth, I believe, in anything like a complete condition. Although the egg is much broken, one side remains practically complete; the pieces of the other side had fallen inwards, and are embedded in the sand within the shell. The egg was discovered in a sandy deposit, and when it reached me was partially enveloped in sand. This has been removed, as far as safety would permit, from the more complete side of the egg, and the whole was thoroughly soaked in weak gelatine to bind sand and shell together. The specimen closely agrees in size and shape with the cast, which is familiar in all museums, and alongside of which it is now on exhibition. As in the case of the eggs previously discovered, it was one of a pair; the other was unfortunately broken, on handling, by those concerned in its excavation.

W. BLAXLAND BENHAM.

Dunedin, August 14.

A LIVING REPRESENTATIVE OF THE OLD GROUND-SLOTHS.

ALL naturalists will unite in congratulating Señor Florentino Ameghino on the remarkable discovery it has been his good fortune to make. It appears that several years ago he was informed by Ramon Lista—a traveller in Patagonia—of an encounter with a strange nocturnal beast, which, after being fired at and apparently hit, succeeded in escaping unharmed. It was described as like an Indian pangolin in size and form, but with the skin covered with greyish red hairs instead of scales; and from the rapidity with which it disappeared among the bushes, seemed to have been an animal of comparatively active habits. Till quite recently, nothing more had ever been heard of the strange creature seen by Lista in Santa Cruz; most of those to whom the story

[1] Kundt, *Pogg. Ann.*, vols. 142, 143, 144, 145, 1871–72.
[2] *Pogg. Ann.*, vol. 147, 1872, p. 525.
[3] *Wied. Ann.*, vol. 53, 1894, p. 267. In the formula quoted by Rubens from Ketteler, substitute for $\mu\infty$ the value of μ found by putting $\tau = \infty$ in Sellmeier's formula, and Ketteler's formula becomes identical with Sellmeier's. Remark that Ketteler's "M" is Sellmeier's "$m\kappa^2$" according to my notation in the text.
[4] Langley, *Phil. Mag.*, 1886, 2nd half-year.
[5] Rubens, *Wied. Ann.*, vols. 53, 54, 1894–95.
[6] Rubens, *Wied. Ann.*, vol. 60, 1896–97, p. 454.
[7] Rubens and Aschkinass, *Wied. Ann.*, vol. 64, 1898.