

P. flabellata, Tenison Woods, of our own coast, than to *P. laticostatus*, Quoy, of New Zealand. The latter differs from *P. M'Coyi* in being much more solid, and in having invariably 10 more ribs; the length also, generally exceeds the breadth and the convexity is greater than *P. M'Coyi* towards margin. With *P. flabellata*, Tenison Woods, it differs in being less solid and in having invariably 7 more ribs; *P. flabellata* having invariably 24. The teeth on the latter are generally 10 as in *P. M'Coyi*, and in this respect and in ligamental area show a closer correspondence with the latter than with *P. laticostatus*. *P. flabellata*, in Tasmania, moreover, is invariably exactly as broad as it is long. It would appear therefore that the characteristic shell of Table Cape is not identical with living species, and that it seems to be an intermediate form between *P. flabellata*, Tenison Woods, and *P. laticostatus*, Quoy, although showing a closer alliance with the former.

From the appearance of the fossil *P. laticostatus*, figured (Pl. xix., Decade ii.) by Professor M'Coy, and from the circumstance that all the Australian fossil forms examined by me are identical with the Table Cape form, it appears to me to be doubtful whether, on closer examination, the bird rock form referred to by Professor M'Coy will prove to be identical with the living *P. laticostatus*, Quoy, in all respects. This however can be easily set at rest.

NOTES OF SPECTROSCOPIC OBSERVATIONS OF COMET "PONS," 27TH JANUARY TO 2ND FEBRUARY, 1884.

By A. B. BIGGS.

[Read April 8, 1884.]

The spectroscope used was a small direct-vision compound prism by Browning, the telescope being a refractor of 3-inch aperture. After some difficulty in getting the object focussed upon the slit of the spectroscope there flashed out three bright bands. They appeared somewhat pyramidal in form, the base being on the south side of the telescopic image. The relative spaces between them I judged to be about as 2 to 3. I could not distinguish any difference, or even any trace, of colour; they appeared rather to resemble a phosphorescent glow. I had not the means, at the time, of determining their relative positions in the spectrum. On subsequent evenings, however, I took every precaution for determining this point.

On the evening of 29th January I succeeded in getting the spectrum of a gas flame (common coal gas) turned down to a minute point of blue flame, in juxtaposition with the spectrum of the comet, when, to my surprise and gratification, I found that the three comet lines coincided perfectly with the three conspicuous lines shown in the gas spectrum; the principal difference between the two spectra being, that the gas showed a faint continuous spectrum through all the colours, whilst that of the comet had perfectly dark spaces between the lines, and, so far as I could discern, *no* colour. I cannot say, however, that I might not have obtained a continuous spectrum from the comet had I been able to grasp more of its light. Such seemed to be suggested by the fact that the lines were broadened out towards the violet end, gradually fading away on that side, but were pretty sharp and decided on the side next to the red.

By a contrivance of my own, specially designed for double star measurement, I was enabled to project a dark-field "ghost" scale into the field of the spectroscope, and thereby got the relative positions of the lines from the sodium line D. This line I obtained by sprinkling a little salt in the gas flame. The mean of several observations gave the following results (the readings of my scale being reduced to that of Roscoe's frontispiece), for comparison:—The line D being at 50, the comet lines stood at 59.3, 72.2, and 99.5. Roscoe's carbon lines stand at 60, 76, and 100; also another group at 123 to 128. This latter, however, I did not detect. I think this agreement very close, and what little difference there is may well be accounted for by a difference of material of the prisms and the difficulty of measuring. I may mention that I took the precaution of scaling the principal solar lines during the preceding afternoon for the purpose of comparison. It was evidently chiefly, if not entirely, the *nucleus* that gave the lines, as, on the briefest stoppage of the driving clock, the lines instantly disappeared.

I have contented myself with describing, as carefully as possible, my observation, leaving to others more competent than myself the interpretation of the record. I would venture to remark, however, that my failure to detect continuity in the spectrum would, as I read it, indicate that the self luminosity of the comet must greatly overpower whatever sunlight it reflects.
