

THE additions to the Zoological Society's Gardens during the past week include two Magellanic Foxes (*Canis magellanicus*) from South America, presented by Baron Adolp Ott; a European Pond Tortoise (*Emys orbicularis*), European, presented by Mr. E. A. Hambro; two Smooth-headed Capuchins (*Cebus monachus*) from South-east Brazil, a Negro Tamarin (*Midas ursulus*) from Guiana, two Grant's Zebras (*Equus granti*) from North-east Africa, four Hutchin's Geese (*Bernicla hutchinsi*) from Arctic America, six Dark-green Snakes (*Zamenis gemonensis*), two Lacertine Snakes (*Coelpeltis mopsessulana*), a Vivacious Snake (*Tarbophis fallax*), European, deposited.

OUR ASTRONOMICAL COLUMN.

NEW SPECTROSCOPIC BINARIES.—In a paper communicated to the Astronomical and Astrophysical Society of America Prof. Frost and Adams announce the discovery of six stars of the Orion type having variable radial velocities, and two or three stars of the same type which are supposed to be spectroscopic binaries.

Of the former, δ Ceti shows a range of velocity from +6 to +16 km. per second, and its period is short; the velocity of ζ Tauri has a range of +7 to +34 km. per second, and a probable period of about fourteen days; the spectrum of this star is rather peculiar, in that the hydrogen lines β and γ are sharp and strong, whilst the other lines (some of them metallic) are faint. In the case of ν Eridani a variation in the velocity of +3 to +26 km per second is indicated.

Two or three other stars of the Orion type are suspected of having variable radial velocities, but the facts are not yet fully established. The proportion of spectroscopic binaries found amongst the stars of this type which have hitherto been examined is 1 : 5 (*Science*, n.s., vol. xvii. No. 426).

THE SPECTRUM OF COMET 1902 *b*.—In a communication to the March *Bulletin de la Société de France*, M. de la Baume Pluvinel discusses the spectra of comet 1902 *b*, which he has obtained, using a prism of $20^\circ 18'$, mounted in front of an objective the focal length of which was four times its aperture.

In a spectrum obtained on October 24, with one hour's exposure, the positions of fifteen condensations (*i.e.* images of the comet) were found to be measurable; the spectrum of Vega was photographed on both sides of the cometary spectrum as a comparison.

Two condensations at $\lambda 472$ and $\lambda 389$ respectively were found to be by far the strongest, these radiations evidently accounting for almost all the actinic light emitted by the comet, and, therefore, in photographing such objects it would be advisable to use an objective which brings these two radiations to the focus simultaneously.

Of the other condensations measured, the most important one extends from $\lambda 409.2$ to $\lambda 400.0$, and was far more intense on a negative obtained on October 13, when the comet was at a greater distance from the sun, than on the one obtained on October 24.

The conclusion arrived at from the detailed examination and discussion of the spectrum is that in the light emitted by this comet occur (1) the chief radiations emitted by carbon in the electric arc, viz. $\lambda 364$, $\lambda 518$ and $\lambda 472$ belonging to the spectrum of hydrocarbons, and $\lambda 389$ belonging to the cyanogen (?) spectrum; (2) the radiation $\lambda 431.2$, which appears in the flame spectra of the hydrocarbons; and (3) a group of radiations, $\lambda 409.2$ to $\lambda 400.0$, which corresponds to no carbon group.

MISSING ASTEROIDS.—In *Circular* No. 69 of the Harvard College Observatory Prof. E. C. Pickering directs attention to the fact that of the five hundred minor planets already discovered, sixty-eight have not been observed for the last five years, and the last observations of about twenty-five of them were made from ten to thirty years ago. He then proceeds to point out the danger that may arise from allow-

ing these objects to remain unobserved, and their elements and ephemerides uncomputed, for an observer can never be certain whether the object he is observing is a new discovery or not, and so might pass over such an object as Eros, supposing it to be one which had been recorded previously.

Prof. Pickering concludes that it is a much more important work to rediscover all those minor planets previously recorded and determine their elements than to go on adding to the list by the discovery of new ones. Acting on this conclusion the Harvard observers prepared a list of all the asteroids, brighter than the eleventh magnitude, which have not been observed during the last five years, and have already photographed (21) Lutetia and (22) Kalliope (on plates obtained on January 21 and 22), which were last observed in 1897 and 1896 respectively, and they find that the error of the ephemeris given for the latter is large enough to render the finding of this object a difficult matter.

A RICH NEBULOUS REGION IN THE CONSTELLATION LYNX.—Whilst pursuing a photographic search for the minor planet (475) Occlo with the Bruce telescope, Prof. Max Wolf has discovered from his plates a region situated on the borders of Ursa Major and the Lynx which is especially rich in small nebulous patches. One particularly dense region is about the point $\alpha=8h. 2m.$, $\delta=+46^\circ 5'$ (1855), the centre lying between the two stars B.D.+48°.1366 (8.5m.) and B.D.+48°.1368 (8.4m.), where, in a circle having a radius of thirty minutes of arc, he was able to count at least forty small faint nebulae.

Two of the nebulae, having the positions $\alpha=8h. 3'0m.$, $\delta=+46^\circ 25'$ and $\alpha=8h. 3'7m.$, $\delta=+46^\circ 9'$ respectively, are worthy of particular notice. The first was observed by W. Herschel, and appears in his catalogue as iv.55. It is bright, apparently round, has a diameter of about 1' and several condensations, and should appear as a beautiful object in a large reflector.

So far as Prof. Wolf is aware, the second has hitherto not been recorded. It has a length of about 3.5 minutes of arc, is rectilinear and very narrow, and is moderately bright. It includes in its northern boundary a faint star the position angle of which is 350° , and lies about 1' west of the star B.D.+46°.1371 (9.3m.) (*Astronomische Nachrichten*, No. 3847).

THE BIRDS OF BEMPTON CLIFFS.

A VERY interesting and beautifully illustrated account of the birds frequenting the chalk cliffs of Bempton, Yorkshire, and of the eggging industry carried on by the natives, appears in part i. of the *Transactions* of the Hull



FIG. 1.—Newly-hatched Puffin. (From the "Birds of Bempton Cliffs.")

Scientific and Field Naturalists' Club. The author, Mr. E. W. Wade, commences by waxing enthusiastic over the wonderful sight presented by these precipitous cliffs when they are visited, in spring and summer, by swarms of seabirds, among which guillemots are now predominant. In

former days the bird-life appears, however, to have been even more abundant than at the present day, this being especially the case with regard to kittiwakes, which were once found in thousands where there are now hundreds. So numerous, indeed, were these birds that there is a record of the heaps of twitch left in a field on a Saturday to be carted on the Monday having been carried off in the meantime by the gulls for nest building. The usual ruthless massacres of the old days were, however, responsible for so reducing the numbers of these birds that they were well-nigh exterminated by the time the Protection Acts once more gave them a chance.

After referring briefly to the puffin and the razorbill, accompanying his notice of the former by an excellent figure of a young bird (herewith reproduced), the author treats in considerable detail of the breeding habits and eggs of the guillemot. Attention is called to the number of young ones and eggs which are destroyed by falling down the cliffs when the birds are suddenly frightened, the author expressing his belief that a guillemot will intentionally roll its egg from the ledge on which it rests if she thinks it is about to be carried off. The remarkable variation displayed by guillemot eggs naturally claims a share of attention, although the author confesses that he is unable to give any reason for the phenomenon. In this connection it may be

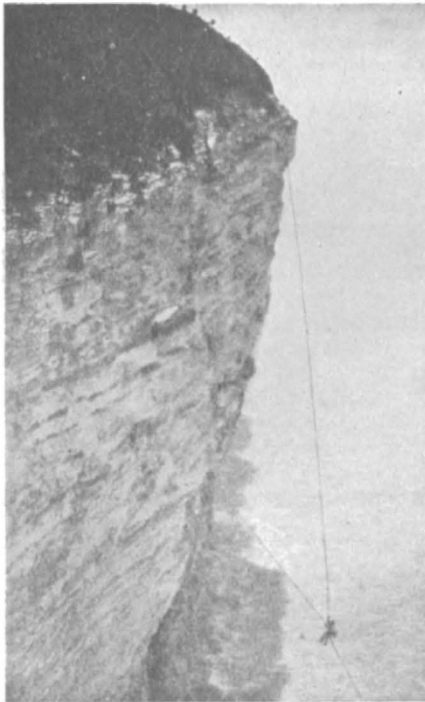


FIG. 2.—A descent in search of eggs. (From the "Birds of Beapton Cliffs.")

mentioned that a magnificent series of these eggs, showing nearly all the chief types of variation, has recently been placed on exhibition in the Natural History Museum.

Cliff-climbing in Yorkshire is always effected by means of ropes, the author describing it as the most delightful and exciting form of gymnastics. Judging from the illustration here reproduced, some of our readers might think it a trifle too exciting. At the present time from 300 to 400 eggs are collected daily during the season, the total take being about 130,000. In spite of this drain the numbers of the birds annually increase. The price of the eggs varies from twelve to sixteen a shilling, abnormally marked specimens fetching from 2d. to 7s. 6d., or even more, each. R. L.

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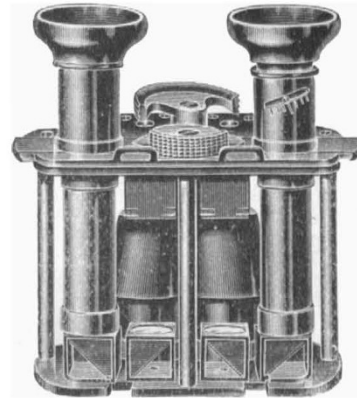
A NEW BINOCULAR.

A NEW form of prismatic binocular, styled the "Service," has recently been issued by Messrs. J. H. Dallmeyer, and there are many interesting features about it for which special advantages may be claimed. As a rule, binoculars consist of two independent optical trains in separate coverings, either hinged together to allow for the different gauges between the separation of human eyes, or made in different sizes to suit these various distances. In the present form the whole optical arrangement is enclosed in one cover, and in consequence of this, six out of the eight prisms employed and the two objective sliding tubes can all be fixed rigidly to one frame, thus ensuring maintenance of adjustment and strength in adverse circumstances.

The separation of the eye-pieces is secured by a screw adjustment situated between them, by which each eye-piece with one prism slides in strong grooves in a lateral direction. For any one individual this adjustment is constant, so that when once the correct position has been attained a permanent mark can be made, and this position quickly regained at any other time; the maximum separation between the centres of the eye-pieces is 70 mm. and the minimum 55 mm., so plenty of latitude is available for abnormal eyes.

There is another screw adjustment for the ordinary focusing, and one of the eye-pieces can be separately adjusted by means of a graduated spiral movement in case the observer's eyes are not similar. All these different manipulations can be easily made when only one hand is available, and the whole mechanism can be fully exposed for cleaning the optical surfaces by simply taking out four screws which in no way interfere with any of the adjustments.

Constructed chiefly of magnalium, and in parts of gun-



metal, the glasses are light in weight, and it is claimed that they are smaller, power for power, than any other prismatic glass yet made. There are five sizes on the market varying in magnifying power from four to twelve times, the former weighing thirteen and the latter sixteen ounces; the smaller sizes are suitable for theatre or night use.

SEISMOLOGICAL NOTES.

THE last publication of the Earthquake Investigation Committee of Japan, issued this year, is of special interest to those engaged in seismometry. In it Prof. A. Tanakadate describes a vertical motion seismometer, in which a mass is so suspended that it is not affected by tilting or by horizontal shocks, and remains in neutral equilibrium for vertical displacements of considerable magnitude. Until this instrument was devised, for large earthquakes at least, vertical spring seismographs, and for that matter horizontal bracket seismographs, have responded to the changes in inclination of their supports, with the result that they have