OUR ASTRONOMICAL COLUMN

MINOR PLANETS.—The number of discoveries in the group of minor planets during the year 1879 is *twenty*, against *twelve* in the preceding year, so that there is no present indication that we are getting to the end of them. Elements more or less approximate have been calculated for seventeen out of the twenty new ones, but no one of the orbits has any peculiarity. We subjoin their ordinal numbers, names so far as published, discoverers and dates of discovery, with their magnitudes at the time.

192	Nausikaa	...	Palisa	...	Feb. 17	...	11
193	Ambrosia	...	Coggia	...	Feb. 28	...	12
194	Procne ...	...	Peters	...	March 22	...	10·5
195	Euryclea	...	Palisa	...	April 28	...	12
196	Philomela	...	Peters	...	May 17	...	10
197	Arete ...	...	Palisa	...	May 21	...	12
198	Ampella	...	Borrelly	...	June 13	...	11
199	Byblis ...	...	Peters	...	July 9	...	11
200	Dynamene	...	Peters	...	July 27	...	11
201	Penelope	...	Palisa	...	Aug. 7	...	10·5
202	Chryseis	...	Peters	...	Sept. 23	...	11
203	Pompeia	...	Peters	...	Sept. 27	...	11
204	Callisto ...	...	Palisa	...	Oct. 8	...	12
205	... ...	...	Palisa	...	Oct. 13	...	12
206	Hersilia ...	...	Peters	...	Oct. 15	...	11
207	... ...	...	Palisa	...	Oct. 17	...	12
208	... ...	...	Palisa	...	Oct. 21	...	13
209	Dido ...	...	Peters	...	Oct. 22	...	11
210	... ...	...	Palisa	...	Nov. 12	...	11
211	... ...	...	Palisa	...	Dec. 10	...	10·5

The elements will be found in Nos. 109-127 of the *Circular zum Berliner Astronomisches Jahrbuch*.

THE MELBOURNE OBSERVATORY.—The fourteenth Report of the Board of Visitors to the Observatory, presented to the Governor of Victoria, with the Report of the Government astronomer for the year ending June 30, 1879, has been received. The great reflector is stated to be in capital working order, but unexpected difficulties have been met with in placing the results of work with it before the astronomical public, this work consisting mainly of drawings of nebulæ in Sir John Herschel's catalogue. Fifty-four of the smaller nebulæ and clusters contained in it have been observed and compared, and the great majority found to agree well with the Cape descriptions. "Some, however, have considerably changed, whilst others are completely altered in appearance." Five nebulæ described by Herschel have not been found after careful search. The drawing of the great nebula around η Argus made in March, 1875, still accurately represents its appearance. Observations of the trifid nebula No. 4355 were made on ten nights for comparison of those by Holden and Trouvelot with the Washington refractor. Stress is laid upon the need of a transit-circle of increased capacity, and it is understood that the Government propose a vote for this purpose.

THE BIELA COMET METEORS.—Contrary to what had been anticipated by more than one astronomer who has given special attention to the subject, from present information it would appear that the earth passed the descending node of Biela's comet at the end of November last, without encountering any portion of the meteoric swarm, which, in November, 1872, was moving in its orbit. The earth would reach the node on the morning of November 28, or perhaps earlier; the comet attains its least distance from our track thirty-two hours after its nodal passage, or, with Michez's orbit of 1866, in about heliocentric longitude, 67° 19'.

URANOMETRIA ARGENTINA.—Within the last week we have received this very important work from the Director of the Cordoba Observatory, Dr. B. A. Gould. Some account of it was lately given in this column from an article in the Buenos Ayres *Standard*, but we shall revert to it at an early date. Its publication will form an epoch in southern sidereal astronomy.

THE CLOSE BINARY 85 PEGASI.—We learn from Mr. Burnham that his recent measures fully establish the physical connection of the close components of this star. A mean of five nights' measures gives:

1879·46 ... Position 284°·6 ... Distance 0″·75.

The earlier mean result being:

1878·7 ... Position 274°·0 ... Distance 0″·67.

For the stars A and C Mr. Burnham finds:

1879·9 ... Position 28°·7 ... Distance 15″·40.

BIOLOGICAL NOTES

A BLIND ISOPOD.—For some years past, Prof. Forel, of the Academy of Lausaune, has been engaged in investigating the animal forms to be met with in the great depths of the Lake Leman. These researches have been published from time to time since 1869 in the *Journal* of the Vaudois Society of Natural History, and the series is apparently brought to a close in the recently published number of the journal in which he sums up the general results, and enumerates no less than seventy-six species of animals described as discovered in the Lake at depths of from 100 to 300 metres. Among these is one new blind form, closely related to our own very common fresh-water Isopod called *Asellus aquaticus*. When drawn up from the water it is found constantly associated with *Niphargus puteanus*. It is of a whitish colour, through which the brownish-coloured alimentary canal is easily perceptible. When placed in an aquarium it lives but a short time. The organs of vision are only rudimentary. The species comes near to *A. cavaticus*, and has been named by H. Blanc *A. forellii*.

NOTES ON CRUSTACEA.—Dr. P. P. C. Hoek of Leiden has published some very interesting results of his investigations among the smaller crustacean forms made at the Netherlands Zoological Station. One series of notes are devoted to the anatomy and systematic descriptions of the species of Caprellidæ met with, viz., *Podalirius typicus*, Kröyer, *Caprella linearis*, Lin., and *Leptomera pedata*, Abilgaard. Another series treats of several species of Corophidæ. Those met with were: *Corophium crassicorne* (Hoek confirms Norman's statement that the *C. Bonellii* of Bate and Westwood is the female of this species); *C. longicorne*, *Cerapus difformis*, *Podocerus falcatus*, *Orthopalame Terschellingi*, nov. gen., nov. sp. (this new genus belongs to the sub-family Podocerinæ), and *Amphitoe littorina*. A third series is devoted to an account of *Orchestia cavimana*, Heller, found by Dr. Noman at Zalt-Bommel, a town in the province of Gelderland. It is more than 80 kilometres from the sea; the water is not brackish, but the amphipods were not even found in the neighbourhood of a stream, but in a walled-in garden some slight distance therefrom, in a corner of which, under some flower-pots, and while in search for onisci, the species was taken. It would appear to be the same as the one described by Heller as found on Olympus by Dr. Kotschy, at a height of some 4,000 feet, in moist spots in the neighbourhood of a spring. Mr. Noman found the species in the same locality again in August last (1879). The distribution of some of the other species of *Orchestia* is also referred to. Series four treats of some insufficiently-known Gammaridæ, such as *Atylus swammerdammi*, *Calliopius lævisculus*, *Melita obtusata*, *Cheirocratus brevicornis*, n. sp., *Ampelisca æquicornis*. Series five gives some short anatomical remarks on Gammaridæ. These researches are illustrated by six plates, and form portion of the *Reports* of the Netherlands Zoological Station.

PTYALINE AND DIASTASE.—Physiologists have differed in opinion as to the action of the gastric juice on ptyaline and on diastase. While some hold that the saliva is destroyed in the gastric juice, others maintain that it continues, in the stomach, its action on starch. Recent researches by M. Defresne (*Comptes rendus*) appear to throw light on the subject; they prove, on the one hand, that the saliva is paralysed in pure gastric juice, whereas with mixed gastric juice, containing only organic acids, saccharification proceeds as well as in the mouth. Ptyaline, then, like pancreatine, is an excellent reagent for demonstrating the difference between mixed and pure gastric juice. The latter, as M. Defresne has proved, owes its acidity to hydrochloric acid, combined doubtless with leucine; the former to organic acids, probably combined also with azotised matters. Ptyaline and diastase, therefore, are not two identical substances, from a physiological point of view. Ptyaline saccharifies the starch in mixed gastric juice, as well as in the mouth; it is only paralysed an instant in pure gastric juice, and then recovers its action in the mixed gastric juice and in the duodenum. Diastase or maltine is irrecoverably destroyed in hydrochloric solutions or in pure gastric juice, and after having passed into the mixed juice it is profoundly altered; for, if it still dissolves starch, it no longer saccharifies it.

EXISTENCE OF THE CHAMOIS IN THE ABRUZZI.—A recent communication of Mr. C. J. Forsyth-Major to the *Bulletin* of the Club Alpino Italiano, records the occurrence of the Chamois (*Rupicapra tragus*) on the Gran Sasso d'Italia in the Northern

Abruzzi. Mr. Forsyth-Major made an expedition into this district with the object of identifying the so-called "Chamozzo" of the inhabitants, and ascertained that this animal, now nearly extinct, was either the chamois of the Alps or a closely allied form. At Isola del Gran Sasso he was shown the horns and skin of an example shot in 1878. The present existence of the chamois so far south in Italy, although mentioned in several works, has not been previously authenticated.

MOVEMENT IN THE LEAVES OF CONIFERS.—Dr. Maxwell Masters (Linnean Society, December 4) has called attention to the contrasts to be drawn between the leaves of the spruce firs (*Picea*) and those of the silver firs (*Abies*) as regards their arrangement, relative position, form, relative size, and internal structure, as described by Bertrand, MacNab, Chatin, and others. The leaves of the silver firs are endowed with a power of motion in virtue of which they are raised or depressed. On the other hand, the leaves of the spruces are comparatively motionless. In those cases where the leaves have the power of movement there is usually a well-marked layer of "palisade cells" which are absent in the motionless leaves. This circumstance has led Dr. Masters to correlate the differences before alluded to with varying degrees of functional activity, and with the adaptations manifested to secure as far as possible to each leaf an equally favourable amount of exposure to light, &c. The very remarkable movements of revolving nutation observable in the "leader shoots" of many conifers during their season of active growth were mentioned as having been investigated by him and the rotation duly registered on a disk.

GEOLOGICAL NOTES

CRUSTACEA IN THE OLD RED SANDSTONE.—The occurrence of eurypterid crustaceans of the genus *Pterygotus* in the Tilestones of Herefordshire and Worcestershire, and in the Old Red Sandstone of Forfarshire, has long been well known. These organisms have been regarded as characteristic of that section of geological time in the British area represented by the Ludlow and Lower Old Red Sandstone formations. Murchison used their presence in the Arbroath flagstones as an argument for placing these strata in his "Lower" division of the Old Red Sandstone, while on the other hand he argued from their absence in the Caithness flagstones and from the dissimilarity of the fishes, that these northern deposits must be of later age. He therefore classed the great flagstone series of Caithness and the Orkney Islands as "Middle" Old Red Sandstone, thus bringing this series of formations into correspondence with his favourite threefold classification of the Devonian system. Recently, however, in the first part of his memoir "On the Old Red Sandstone of Western Europe," published in the *Transactions of the Royal Society of Edinburgh*, Prof. Geikie has pointed out that the contrast between the fish fauna of the Arbroath flagstones, or the ancient basin which he terms "Lake Caledonia" and that of the northern basin or "Lake Orcadie," is by no means so marked as Murchison believed, and that the characteristic *Pterygotus*, on which the author of "Siluria" laid so much stress as an Upper Silurian and Lower Old Red Sandstone type, occurs on several horizons and at different localities in the Caithness and Orkney basin. An important discovery confirmatory of the extension of these crustacea into the northern area has recently been made by Mr. James Linn in the course of the Geological Survey of Elginshire, now in progress. From the valley of the Spey he has obtained numerous fragments of what must have been a remarkably large *Pterygotus*, though the specimens so far found hardly admit of specific identification with the *P. anglicus* of Forfarshire. *Pterygotus* has thus been discovered in Orkney, Caithness, and on the Moray Firth, not only over an extensive geographical area, but throughout a wide vertical range of strata. These crustaceans must evidently have had a considerable and prolonged development in the waters of the northern basin of the Lower Old Red Sandstone period.

SALSES OF MOUNT ETNA.—As the result of his recent observations among the mud volcanoes of Paternò on Etna, Dr. A. von Lasaulx gives the following conclusions:—1. The Salses arise from the association of gaseous volcanic emanations with spring-water traversing easily soluble strata in which common salt, gypsum, lime, and other salts occur. 2. The carburetted hydrogen escaping in connection with the salses is produced by the same volcanic emanations with the co-operation of these strata. 3. The so-called eruptions of the mud-volcanoes are merely the squeezing out under pressure of the dissolved and loosened parts of strata, that are disturbed and dislocated by underground movements.

NEW JURASSIC REPTILES.—Prof. Marsh announces in the *American Journal of Science* the arrival at Yale of numerous remains of reptiles from the Jurassic deposits of the Rocky Mountains. He finds that they belong to several distinct groups and throw considerable light on forms already described from the same horizon. Among them he briefly describes a new genus under the name of *Camptonotus*, most nearly allied to *Laosaurus*, and forming with it a distinct family, the *Laosauridæ*. The name of the genus is taken from the fact that, as in *Laosaurus*, the sacral vertebræ are not co-ossified, while some of the other vertebræ even in the same specimen have their neural arches so completely united to the centra that the suture is nearly or quite obliterated. The known remains of *C. dispar* indicate, according to Prof. Marsh, a herbivorous animal about eight or ten feet high. Another species, about three times as large, is named *C. amplus*. One of the largest reptiles yet known (*Brontosaurus*) has recently been brought to light from the same region. It probably belongs to the *Sauropoda*, but has a sacrum composed of five thoroughly co-ossified vertebræ. Fresh specimens have been obtained throwing much new light on the structure of *Stegosaurus*. This dinosaur was covered with huge dermal plates, some of which ranged from two to three feet in diameter. The remains of a much smaller reptile, about the size of a wolf, apparently also a Dinosaur, and probably carnivorous, are included in a new genus, *Cœlurus*.

GEOGRAPHICAL NOTES

NEWS has been received of Herr Carl Boch, on his return to the coast after his travels in the centre of Borneo. He has been up the Klintjouw River as far as Longwai, and thirty miles beyond where no European has yet penetrated. There is, however, but little to see, and the dead silence of an almost uninhabited forest prevails beyond Longwai. The birds of this district, with five or six exceptions, are the same as those found in the highlands of Sumatra. Herr Boch has made some very interesting observations on the inhabitants of those districts, of which he is preparing an account. The Dyaks of the interior are far more wild and savage than those of the coast, and are not, as a rule, partial to seeing strangers, but appear to offer them no harm in times of peace. They are, however, veritable "head hunters," and talk about it in a very free and easy manner. The Rajah, with whom Herr Boch had dealings, had a collection of six, taken from Dyaks of another tribe, not in open fight, but by treachery when they were asleep. A more interesting race, also head hunters, however, and still further removed from civilisation, are the Orang Poonan, or forest people. With these strange border-beings, who construct no houses, but live in the open forest, Herr Boch seems to have made himself quite friends, and regards them as good and honest people—always excepting the little eccentricity in the matter of heads. They are not dark, but fair, and of a yellowish complexion, and as they have allowed Herr Boch to take sketches of both sexes, these will doubtless afford much further interesting information. He proposes now to cross the island from east to west, coming out at Band-jermassing.

A CORRESPONDENT supplies us with the following translation of a letter from Dr. Gerhard Rohlfs, concerning his recent journey in Africa, which may interest our readers. The letter addressed to a German friend, is dated Benghasi, November 10: "When you receive these lines I shall no doubt be in Italy, and, therefore, back in Europe. Your last letter of July 9 I received at Kufra, when I was free again, and already on my return journey. . . . I hope that Stecker, my young companion, will again take up the expedition. The Sueya have partly returned our property, part they are still going to return, and part the Turkish Government will compensate us. If Stecker proceeds by way of Sella and Mursuk, he will probably not encounter too many difficulties. I may communicate to you the statistical fact that the distance between Battifal and Taiserbo is about 400 kilometres. We travelled over this distance in exactly 100 *consecutive* hours, certainly a great feat. Thus we cleared more than 90 kilometres per day. It must be remembered that this was done on foot and on camels, then it will be appreciated. We hardly slept at all, only in the evenings and mornings we