If this circumstance is adverse to the identity of the comets of 1668 and 1843 there is another which would rather tend to support it, were it not that there appears to be an oversight in the record. Zach in an article, "Ueber einige unberechnete Cometen, deren Bahnen man vielleicht noch auffinden und berechnen könnte," in vol. xxviii of his *Monatliche Correspondenz*, refers to the comet of 1668, and, after mentioning the observations of Cassini and others, he adds that in the *Philosophical Transactions* for 1668 there is an observation of a comet, which places it on March 7 in longitude 16°, with 20° 30′ south latitude, and he asks, "Ist diess die *Cassinische Spina?*" referring to the title of the tract in which Cassini gave his observations of the phenomenon in March, 1668, viz: "Spina, Celeste meteora osservata in Bologna, il mese die Marzo 1668" (Bologna, 1668 in fol.). If we suppose the comet of 1843 to have arrived at perihelion February 24·284, Greenwich time, at 8 p.m., on March 7, its place would have been in longitude 16°·0, with 20°·4 south latitude, as observed, and the agreement gives an importance to the reputed observation, if it could only be traced. It was first remarked by Schumacher (*Astron. Nach.*, No. 484) that the observation mentioned by Zach does not occur in the *Philosophical Transactions*: his words are: "Diese Beobachtung 1668 März 7, Länge 0ᶻ 16°, südliche Breite 21½° steht nicht in dem von Herrn v. Zach angeführten Bande der *Philos. Transactions* und, wenn das Register der *Phil. Transact.* genau ist, in keinem der ersten 70 Bände." We find on a careful examination of the volumes or numbers of this work containing reference to the comet of 1668 as indicated in Maty's Index, that there is no such observation recorded. There are two articles bearing upon this comet: (1) in vol. 3 for 1668, in No. 35, May 18, 1668—which gives a translation of Cassini's description of its appearance, from the Italian, and a notice of its having been observed at Lyons, Toulouse, Toulon, &c., though not at Paris, and (2) in vol. 9 for 1674, in No. 105, July 20, 1674 (though not occurring in the list of contents to this number on the first page): this second notice chiefly refers to the observations of P. Valentin Estancel in Brazil, taken from *Giornale de' Letterati*, September 31 (*sic*) 1673—a journal printed at Rome.

Perhaps some of our readers may have opportunity of making further search in the libraries for information relating to the comet of 1668, though we are aware that much was done in this direction in 1843. It would be of interest more particularly if the observation which Zach would appear to have somewhere met with, could be traced.

VARIABLE STARS.—The following times of maxima and minima of variable stars during the ensuing two months are extracted from the ephemeris prepared by Prof. Winnecke for the first part of *Vierteljahrsschrift der astronomischen Gesellschaft* for 1880 (15. Jahrgang):—

| | | | |
|---|---|---|---|
| Aug. | 2. S Ursæ maj., *min.* | Aug. | 30. R Comæ. |
| | 3. R Leonis. | Sept. | 2. U Virginis. |
| | 4. S Sagittarii. | | 3. R Draconis. |
| | 11. S Pegasi. | | 5. W Scorpii. |
| | 12. R Sagittarii. | | 8. R Virginis. |
| | 15. V Tauri. | | 9. R Arietis, *min.* |
| | 16. R Persei. | | 10. R Vulpeculæ. |
| | 18. R Ursæ maj. | | 16. R Ophiuchi. |
| | 21. T Herculis, *min.* | | 19. R Camelopardi. |
| | 24. S Vulpeculæ, *min.* | | 20. T Virginis. |
| | 25. S Herculis, *min.* | | 20. R Aquilæ, *min.* |
| | 28. R Aurigæ. | | 21. S Cephei, *min.* |
| | 28. R Sagittæ, *min.* | | 21. S Vulpeculæ. |
| | 29. S Aquarii. | | 29. R Bootis, *min.* |

Prof. Winnecke has August 2 for the date of approaching maximum of *Mira Ceti*; the formula in Prof. Schönfeld's last Catalogue gives August 10·8; perhaps some reader of NATURE may be able to say, in due course, when the maximum actually occurs. The amount of perturbation by the formula for Epoch 15 = + 37d·3.

M. Ceraski of the Moscow Observatory draws attention to an object which evidently deserves close observation. On June 23 he remarked that the *Durchmusterung* star R.A. oh. 49m. 39s., Decl. 81° 5′·6, 7′·5m., increased from 9m. to about 7′·5m. between 17h. 40m. and 19h. 35m. Moscow sidereal time. Carrington estimated this star 7·9. Schwerd observed it four times, and his estimates of magnitude are strongly indicative of variability; thus it is called 8 on December 11, 1827; 6·7 on March 11, 1828; 8 on the following night, and 10 on May 12 in the same year. It is No. 130 in Carington's Catalogue, the place for 1855·0 being in R.A. oh. 49m. 38·9s., Decl. 81° 5′ 33″. The star was also observed by Lalande in March, 1790, as an eighth magnitude (Fedorenko 145).

## BIOLOGICAL NOTES

THE EVOLUTION OF DIBRANCHIATE CEPHALOPODS.—Dr. J. Brock, in the last number of Gegenbaur's *Morphologisches Jahrbuch* (vol. vi. p. 185), gives his reasons for dissenting from von Ihering's conclusions on this subject. He has dissected spirit-preparations of many of the principal genera, and he discusses the evidence derived from the shell, the funnel, the muscular system, the radula, the nervous system, and the vascular excretory and reproductive systems. Three anatomically well-marked phyla or groups of genera are made out, of which the Œgopsidæ are the most ancient, and from this group the other two—the Myopsidæ and the Octopods—are derived. The Œgopsids he further divides into two groups—the Ommastrephidæ and the Loligopsidæ, the comparative antiquity of which cannot yet be determined; they are of great interest because they both show important connections with the two other phyla. The Œgopsid forms are primarily true Belemnites, and later developed into the Sepia type, from which stock also the decapods with simple horny shells sprang independently. The octopods, the most highly differentiated phylum, but with an organisation showing a very early origin, and branching from the main type, afford some evidence of relationship to the type of Loligopsis, although they cannot be regarded as having originated from them. Most probably they had a common origin from the primordial dibranchiate form with ten arms. Dr. Brock relies considerably on the oviduct being double in the Œgopsidæ, and single (by reduction) in Myopsidæ; but unless he can support his theory by more developmental facts it can hardly attain sufficient credit for practical use in classification.

ON A CASE OF APPARENT INSECTIVORISM.—Prof. Baillon, at a recent meeting (April 7) of the Linnean Society of Paris, read the following notes:—*Peperomia arifolia*, Miq., of which the variety argyreia is cultivated in so many greenhouses, has the leaves more or less deeply peltate. I have seen stalks on which the peltation on certain leaves was so exaggerated as to show on a cross-section a depth of nearly four centimetres. When the concave stalks take a suitable direction, water, principally that from sprinkling, would accumulate and rest in these receptacles, so well prepared to preserve it. Many small insects would fall into this water and be drowned. Last year, when the season was warm and when the windows of the house were often open, the number of insects was very considerable, and these, soaking in the water, gradually fell into decay, and it was remarkable that there was during this not the least sign of any putrescent odour. Those who believe in the doctrine of insect-eating plants may perhaps in this be led to find an argument favourable to such theories. They will add that the variety of colours so strikingly seen in these leaves constitutes the agent of attraction for the insects to come and be devoured. Three reflections, each of a different sort, here present themselves: 1. Is it not remarkable that the exaggerated peltation of these leaves is in this case accompanied by an apparent insectivorism, and that the leaves of the plants known up to this by botanists as carnivorous owe their sac-like, horn-like forms only to an excessive peltation of their limb, as we demonstrated in the evolution of the leaves in Sarracenia (*Comp. rend.*, lxxi. 630)? 2. How can it be considered as a proof of insectivorism, that plants such as the Urticularia grow better in a fluid containing albuminoid compounds, when other plants grow equally favourably in the same kind of fluid, which latter are never for a moment thought of as carnivorous? 3. How do the chief priests of our science reconcile the two ideas, that the surface of the leaves of plants are unable to absorb pure water in contact with them, and that the same surface daily absorbs water charged with albuminoid substances and the like?

INTESTINAL WORMS IN THE HORSE.—H. Krabbe has published in the *Oversigt over det K. Danske Videnskabernes Selskabs*, No. 1, 1880, p. 33, an interesting account of the occurrence of intestinal worms in the horse. As this animal is spread over the greater part of the habitable world, and under conditions of life very varied, it might be supposed that, like man and the dog, it would not be equally affected with these parasites, nor with the same species. For to determine with some degree of accuracy the worms which in Denmark are found in the intestinal

canal of the horse, Mr. Krabbe examined, during the last four years, the bodies of one hundred horses which were brought for anatomical purposes to the Veterinary College at Copenhagen, between the months of September and April in each session. In these horses he found *Tænia perfoliata*, 28 times; *T. mamillana*, 8 times; *Ascaris megalocephala*, 16 times; *Strongylus armatus*, 86 times; *S. tetracanthus*, 78 times (in 67 horses out of 86); and *Oxyuris curvula*, twice. Of *T. perfoliata* the number found was mostly less than 25; sometimes it was over, and twice between 100 and 200 were found, while once no less than 400 were met with. In general they were lodged in the cæcum. *T. mamillana* of Mehlis, a species overlooked by Dujardin and most French writers on the subject, was described and figured by Gurlt in 1831; generally less than 25, but sometimes up to 72, were met with, mostly in the anterior part of the small intestines (*T. plicata*, R., was never met with). The Ascaris never occurred in larger numbers than 11. *S. armatus* was never met with in the small intestine; in the cæcum it was common; much less so in the first portion of the colon, where very fine specimens of a dark bluish red colour were found; generally the number met with was below 25, but once nearly 200 were found. Of 1,409 samples, 1,029 were females and 380 males. *S. tetracanthus* was found in the cæcum and throughout the colon. The literature of this subject would appear to be very scanty, and the author hopes that the attention of veterinary surgeons in other parts of the world may be attracted to this subject. Ample opportunities of following it up exist in British India, America, and the Cape of Good Hope district.

THE DOMESTICATION OF DEER.—A very interesting correspondence is published in the *American Naturalist* for June between Mr. Brown, the superintendent of the Philadelphia Zoological Gardens, and Mr. J. D. Caton. It relates chiefly to the question of the domestication of species of deer. Of the twelve species kept in the Philadelphia Gardens the mule deer (*Cervus macrotis*) have bred during 1878 and 1879; of five fawns one died when two days old; the other four, though most carefully nursed and fed with astringent food, as well as supplied with iron water and gentian powders, &c., all died of a diarrhœa caused by malignant disease. Five specimens of moose-deer and eight of caribou died at periods varying from three months to two years and five months in the moose and not beyond nine months in the caribou from hypertrophy of the heart. The pronghorn (*A. americana*) all died speedily from diarrhœa or hypertrophy of the heart; change of food and tonics seemed to have no effect upon them. Of ten or twelve individuals none lived more than fifteen months. The wapiti and common deer (*C. virginianus*), however, have done well, and several fawns were raised of *C. campestris*, *C. aristolelis*, and *C. dama*. Of *C. leucurus* the Gardens possessed but a single specimen. In the case of the mule deer Mr. Brown is disposed to account for the mortality by the difficulty of supplying them with a sufficient amount of their proper (arboreal) food, which has to be replaced by dry food and grass. Mr. Caton, writing from Ottawa, Illinois, states that he had lost the last of his stock of mule deer and also of *C. columbianus*, and that he is satisfied that they cannot be successfully domesticated in his grounds. He concludes that they get at something which does not agree with them; indeed all his experimen's with ruminants, *fera naturæ* whose natural habitat is confined to the United States west of the Missouri River, have proved failures. Mr. Caton has succeeded well in hybridising the Virginian deer with the Ceylon deer and the Acapulco deer. The hybrids seem to be perfectly healthy and prolific, several of the hybrids from the Virginian deer and Acapulco buck having borne perfectly healthy twin fawns. On some of the hybrids the metatarsal gland is wanting, and on some it is present, while some have it on one hind leg and not on the other.

THE FIDDLER CRABS.—Mr. J. S. Kingsley, in a further contribution to the *Proceedings* of the Academy of Natural Sciences of Philadelphia, revises the genus *Gelasimus*, and as a result he makes a great reduction in the number of species. This has been done, not with any desire to overturn the work of others, but as the result of a study of the forms known all over the world. The range of many species is greatly extended. He refers the genus to the family Macrophthalmidæ of Dana; and it is characterised by its rhomboidal carapace, broad in front, elongated eye-stalks, and a great inequality of the chelipeds or nipping feet of the male. The latter is the most constant character of value. The species fall into two groups according as the front between the eyes is very narrow or wide; and the latter have males with a five-jointed or seven-jointed abdomen.

ORGANS OF DEEP-SEA ANIMALS.—During his researches on the fauna of the Caspian Sea, M. O. Grimm has studied the modifications which are undergone by the organs of sense in animals which inhabit great depths. Among them several have well-developed organs of sight, which seems to prove that even at very great depths light is not completely absorbed. Such are the Caspian *Mysis*, the *Gammaracanthus caspius*, several *Bœckiæ*, and others, but on the contrary, there are at the same depths many species whose eyes are quite atrophied, and in these species we observe that other organs of sense receive a greater development. Such is the case in *Niphargus* and *Onesimus*. But, whilst *Niphargus caspius* bears well-developed organs of smell and of touch on its antennæ, in *Onesimus*, which, as well as the former, has but rudimentary eyes, only organs of touch are to be found on its jaws. M. Grimm explains this last difference by the circumstance that the former species usually remains in water, whilst *Onesimus* likes to remain in the mud at the bottom, where it searches for its food very much like a mole.

## CHEMICAL NOTES

IN the *Journal* of the American Chemical Society, vol. ii., Mr. P. Collier describes a new mineral from the Champlain iron region, which resembles thorite in its physical properties, but differs therefrom in containing a relatively large quantity of uranium. Analysis showed 9·96 per cent. of uranic oxide, and 52·07 per cent. of thoric oxide, with 19·38 per cent. of silica, the remainder consisting of oxides of lead, aluminium, iron, calcium, magnesium, and sodium, with moisture and combined water.

MR. COLLIER gives an account, in the same journal, of experiments he has made, which seem to point to a new possible source of crystallisable sugar. He finds that the juice of various varieties of fully ripe sorghums contains from 13 to 15 per cent. of sucrose, with 1 or 2 per cent. of glucose.

SPECIAL attention has been recently given to the liquids included in the microscopical pores of certain minerals, and it has been shown by Zimmler that these pores contain not only water, but also sometimes carbonic acid. Prof. Karpinsky publishes now in the *Memoirs* of the St. Petersburg Society of Naturalists the results of his experiments on the liquid contained in the pores of the Uralian amethyst. The mineral having been broken in a tube filled with mercury, the fluid immediately evaporated, and being brought in contact with a solution of oxide of barium, proved to be carbonic acid (1·07 cubic millimetres at 30°). The pressure under which the carbonic acid was liquefied may be estimated as seventy-three atmospheres, which would correspond to a pressure of a column of water 2,336 feet high.

AT the meeting of the French Academy of May 17, 24, and 31, notes were read by MM. Ditte and Berthelot, on the cold produced by the action of acids on hydrated salts, *e.g.*, hydrochloric acid on hydrated sodium sulphate. The action is regarded as complex: an exothermal chemical reaction occurs in accordance with Berthelot's "law of maximum work," but unless the products of this action are totally insoluble, secondary changes take place; these changes are chiefly conditioned by the amount of heat evolved in the primary action. In the special cases in question the heat disengaged in the chemical change is less than the heat absorbed in the liquefaction of the water of crystallisation which separates from the hydrated salt, hence the sum of the heat changes is negative.

THE densities of chlorine, bromine, and iodine at high temperatures cannot yet be regarded as determined. Victor Meyer, in a recent paper in the *Berliner Berichte*, admits the justice of Crafts' criticism of his determinations of temperature (see NATURE, vol. xxi. p. 561, letter by Dr. Armstrong); his latest results give for iodine at about 1,050°, a density equal to $\frac{2}{3}I_2$, and at an extremely high temperature (exact numbers not yet given), a density of 4·55, which nearly corresponds with that calculated on the supposition that at this temperature the iodine molecules are entirely dissociated into atoms (calculated number = 4·39). Meyer and Crafts, working by Dumas' method, and using an iodine thermometer, find the density at 1,468° to be 5·05 (calculated for $\frac{2}{3}I_2$, 5·83; for I, 4·39). The density for free chlorine seems to be normal ($Cl_2$), even at extremely high temperatures; but if the chlorine be produced in the vapour-density