α CENTAURI.—The measures of this star which have lately appeared in NATURE show that we are yet without any satisfactory orbit, and it is much to be desired that it may be closely watched during the next few years. Mr. Gill it is understood intends to establish a good epoch in the autumn with Lord Lindsay's heliometer at Ascension. It does not appear to be too late to secure measures which will possess the greatest interest in the actual near approach of the two fine stars forming this splendid binary.

THE PRESENT COMETS.—Elements of Winnecke's comet of April 5 calculated by Dr. Plath of Hamburg, upon the same extent of observation as those of Mr. Hind, published in this column last week, are almost identical therewith, and consequently negative the idea of ellipticity of orbit, notwithstanding the certain degree of resemblance with the comets 1827 II. and 1852 II., and near equality of intervals. On May 14 the comet approaches within 10° of the pole of the equator, near the 5½ m. star, B.A.C. 1211. It will be visible with telescopic aid some weeks longer.

We subjoin positions of the comet discovered in America by Mr. Lewis Swift on April 11, and by M. Borrelly at Marseilles three nights subsequently, also calculated by Dr. Plath.

For 12h. Berlin M.T.

	R.A.	Decl.	Log. distance.
	h. m. s.	° ′	
May 10 ...	6 8 18 ...	+56 7·0 ...	0·1243
,, 12 ...	6 27 1 ...	54 22·5 ...	0·1275
,, 14 ...	6 43 53 ...	52 30·2 ...	0·1315
,, 16 ...	6 59 5 ...	50 32·1 ...	0·1362
,, 18 ...	7 12 46 ...	48 30·3 ...	0·1417
,, 20 ...	7 25 2 ...	46 25·9 ...	0·1479
,, 22 ...	7 36 11 ...	44 21·8 ...	0·1545
,, 24 ...	7 46 15 ...	+42 17·7 ...	0·1617

M. Wolff, of the Observatory at Paris, observed the spectrum of Winnecke's comet on the morning of April 11, which he found analogous to the spectra of various comets he had observed since the year 1868, from the faintest to the brilliant comet of Coggia in the summer of 1874. All have exhibited the three bands, yellow, green, and blue, but M. Wolff remarks that the nature of this cometary matter is completely unknown. He did not succeed in obtaining the spectrum of the third comet of the present year, in which, like several other observers, he noticed a resolvable appearance.

BIOLOGICAL NOTES

ZOOLOGICAL CLASSIFICATION.—In a recent paper in *Pflüger's Archiv*, M. Hoppe-Seyler wonders at the readiness with which systematic zoology has ranked amphioxus with the vertebrates, from mere one-sided consideration of the presence of a *chorda dorsalis*, and the position of the nerve-cord above, and the alimentary canal below. A sound system groups species which are similar not merely in morphological respects, but in their whole organisation. Amphioxus has, beyond the chorda, nothing in common with vertebrates; it has no closed vascular system with red blood corpuscles, no liver which forms a gall, no proper brain, and it contains no gelatine-yielding tissue, which occurs in all vertebrates and also in the cephalopoda, but in no other invertebrata. In their entire highly-developed organism, the cephalopoda, stand nearest to the vertebrata; the amphioxus should have a place further down. M. Hoppe-Seyler further points out that comparing the composition of tissues from the lower organised animals upwards, we meet first with mucin yielding tissues, then with those yielding chondrin, then, in the cephalopoda tissues yielding glutin; the formation of actual bones does not occur in all vertebrata, and is likewise wanting in cephalopoda. Exactly the same order is seen in the stages of development of an embryo, *e.g.* of the hen in the egg, and it is difficult to think that the agreement is accidental.

LUMINOUS CAMPANULARIÆ.—The late Prof. Paolo Panceri recently made minute researches at Amalfi, near Naples, with a view to determine the exact seat of the light-giving organs in Campanulariadæ. The Gulf of Amalfi seems to be a favourite haunt of these minute animals, and Prof. Panceri found them abundantly on the algæ covering the rocks near the shore, particularly upon *Fucus ericoides*. The light of these polyps is intermittent, and only appears when the animals are touched or moved; fresh water, however, has the property of fixing it for a little time. It was principally with species of *Campanularia flexuosa* that Prof. Panceri made his interesting investigations, and the special question he wished to decide was whether it is the external cellular stratum (or ectoderm), or the internal one (endoderm) of which these animals are composed, which is the actual seat of the light. He found, by means of ingenious microscopical contrivances that the luminous movements of these polyps have their seat in the cells of the ectoderm, and not elsewhere, and that these cells alternately and successively show the light and again become dark, after being touched or placed into fresh water. Not only the bodies of the polyps, but also their slender stems and even the feet with which they adhere to the plants or rocks, contain these luminous cells. Prof. Panceri has published an account of his researches in the January part of the *Rivista Scientifico-industriale*.

RESPIRATION IN FROGS.—Mr. A. C. Horner has sent us an account of some interesting observations he has made on the spawning or deposition of ova in the frog (*Rana temporaria*). We are only able to give the conclusion of his paper:—I will now give a few facts connected with respiration which I have observed in these frogs. They can croak when they are immersed under water, but, as no air-bubbles escape, I was at first puzzled. I find, however, by holding my nose and shutting my mouth, that I can make a somewhat similar sound; but they seemed to croak louder when only the head and upper part of the body were under water than when their whole body was immersed, and as they distend their sides in the act of croaking, I thought it possible they might be able to draw in air by the rectum or the pores of their skin. When a frog out of water is touched suddenly, he shuts his eyes and distends his abdomen, and the same thing occurs when under water. Yet how is it that they can distend their abdomen without admitting more air? for they can distend it very fully, and I should think must require to expel all the air from the thoracic into the abdominal cavity. When a frog is under water, his sides sometimes pulsate rhythmically, just as when he is out of water, and about every ten seconds. Perhaps it is connected with the circulation of blood.

THE WOODPECKER.—In the April session of the German Ornithological Society Prof. Alton concluded the recital of his investigations on the habits of the woodpecker. The peculiar drumming sound often caused by it was shown on various grounds to be entirely disconnected with the search for insects as hitherto supposed, and was regarded as a call to the opposite sex. Dr. Brehm defended the woodpeckers against the charge of seriously injuring the trees, and considered the slight damages resulting from them as more than compensated by the colour and animation which they gave to the otherwise sober and quiet forests.

THE FLAMINGO.—At the same session Herr Gadow stated that by a study of the digestive organs of the flamingo he had found that it did not belong to the duck family as hitherto classified, but was to be placed among the storks, being very closely allied to the latter, although properly an intermediate link between the two families.

COPPER IN THE BLOOD.—The presence of copper in the blood of human beings and domestic animals has been placed beyond doubt by the investigations of various chemists, but has gene-

rally been regarded as an accidental circumstance due to the use of copper utensils in the preparation of food. M. S. Cloez, of Paris, recently examined the blood of a roebuck shot in the forest of Essarts, and found copper oxide present to the extent of 5½ milligrammes per kilogramme of blood. As this result would tend to show that copper is a normal constituent of the blood, the question which next awaits solution is that of the method of its entrance into the animal system.

THE RESPIRATION OF PLANTS.—We have already noticed the investigations undertaken by Prof. Borodin on the processes of respiration in plants. We find in the seventh volume of the *Memoirs* of the St. Petersburg Society of Naturalists the paper of Prof. Borodin in full, accompanied by a series of graphic representations, by means of curves, of his important measurements. We cannot attempt here to give a *résumé* either of the varied experiments made by the author or of the important questions arising from Prof. Borodin's inquiry, and discussed by him. As to the experiments themselves, we can only state that the reader will find in the paper a thorough discussion of their value and of the value of various methods used for the study of the subject. The main result is that in darkness the energy of respiration of a branch gradually decreases; a temporary action of light, however, increases it, this increase being mostly the result of the influence of the less refrangible rays (red, &c.), and it takes place only when the surrounding air can supply the plant with a sufficient amount of carbonic acid. The decrease of energy of respiration is caused by the decrease of the stock of starch in the plant, and the increase under the influence of light takes place because of the formation, under this influence, of a new stock of starch. Thus, other conditions remaining the same, the energy of respiration depends upon the existence in the branch of non-nitrogenous plastic substance; this is the material for respiration, the exhaled carbonic acid being the result of oxidation of a certain part of non-nitrogenous organic matter. While following the author in his discussion of this subject and of the opinions of Garreau, Pflüger, and Sachs, we further notice the importance of a fresh supply of oxygen in the atmosphere surrounding the plant as resulting from M. Borodin's experiments and the contributions they make to the most important and yet very obscure question as to the influence of temperature upon respiration. These important questions will be the subject of further studies, which the author proposes to continue for many years.

A TASMANIAN CARNIVOROUS PLANT.—Dr. B. Crowther, of Campbell Town, Tasmania, writing to *The Mercury* (Hobart Town), November 26, 1876, states that he was furnished with a plant which grows on rocky ground, whose crevices contain rich organic soil, different from the peaty soil Darwin's grew in. It is quite obvious, he states, on careful examination, that the plant lives to a great extent off the small flies and gnats it obtains. It is about six inches in height, and from its single vertical stem project from one to two dozen small foot-stalks, at irregular and variable distances. On the summit of each foot-stalk is a rounded disc, placed horizontally, about half an inch in circumference, fringed with tentacles of different sizes. In the centre is a hollow, with small fine filaments projecting vertically; on the ends of both the filaments and also tentacles are little reddish glands which secrete a sticky substance. The fly rests on the outer zone, is conveyed by the sticky tentacles to the centre, which at once closes upon the victim so tightly that a bulging may be seen corresponding to the fly inside. After it has been consumed, the trap again opens, showing the *débris* of the fly, which are doubtless washed away by the rain, so as to allow the trap to again set for another victim. The plant described by Dr. Crowther is evidently *Drosera peltata*, Smith, a well-known Australian species (in herbaria). It is not referred to by Mr. Darwin in his work on "Insectivorous Plants;" and any more exact information respecting its habits of life, and the mode in which it captures insects would be a very useful addition to our knowledge of these plants, especially if accompanied by drawings.

BOTANY OF NEW GUINEA.—The distinguished Italian naturalist and traveller, Dr. Beccari, has commenced the publication of a new illustrated work called "Malesia," for the purpose of bringing before the scientific world his numerous botanical discoveries in New Guinea and the Eastern Archipelago. The first number of "Malesia" has just been issued at Genoa, and is occupied with an article upon the palms of New Guinea and the adjacent islands. Fifty species of palms were collected by Dr. Beccari in these countries, many of which were previously unknown.

NOTES

MR. C. J. LAMBERT has presented to the Chemical Society 1,000*l.* and to the Royal Microscopical Society, 500*l.*, from a bequest of 25,000*l.* left by his late father, to be appropriated to benevolent and scientific purposes.

WE regret to learn that Prof. M'Crady who, on the death of Prof. Agassiz, succeeded to the Chair of Zoology in Harvard College, has found it necessary to tender his resignation to the authorities of the University. This step is all the more to be lamented as judging from the terms of the resignation, which we have read, it has been caused by a desire on the part of Prof. M'Crady to raise the standard of zoological education in the college to a higher level than was deemed advisable by the authorities. We hope that some means may be found of retaining Prof. M'Crady's services to the University. He is well known as an eminent original worker in an important department of zoological research.

WE regret to announce the death of a Russian geologist, Prof. N. P. Barbot-de-Marny. Having begun his scientific work in 1852, taking part in Hoffmann's exploration of the Ural, M. de Marny continued until 1876 his valuable work of the geological exploration of Russia. He explored the Kuma-Manych depression, the provinces of Archangel, Vologda, Volhynia, Podolia, and Kherson, and all the lines of railway radiating from Moscow, as well as those of Kief, Azov, Tsaritsin, Orenburg, and Caucasus. In 1874 he took an active part in the difficult exploration of the Aral-Caspian expedition and explored the Amu-Darya. The *Mines Journal* and the *Memoirs* of the Mineralogical and Geographical Societies, as well as those of the St. Petersburg Society of Naturalists, one of the presidents of of which he was for a long time, contain about 110 of his valuable papers, besides which he was the author of some important volumes. His "Formation Stage" was an important addition to our knowledge of the Tertiary of South-eastern Europe. He died at the age of forty-five, leaving a family, a library of books, many MSS., and—no money.

THE President of the Royal Academy is always very catholic in his invitations to the annual dinner, certainly one of the chief events of the London year. On Saturday last science was largely and well represented, and Dr. Hooker, in his reply to the toast of Science, happily performed what at first sight would seem a hard task under the circumstances. Dr. Hooker showed that the incongruity between art and science was only apparent; that art lends valuable aid to science, and that all true art must really be based on scientific principles; and that moreover the two have this in common, that success is unattainable in neither unless by close observation, enthusiasm, and the skilful exercise of the imagination. Some may be inclined to think that the new Grosvenor Gallery is more scientific in its method of selection