dried state, and it is to be regretted that none have found their way into this Exhibition, as they might have stimulated us to endeavour to do something to improve the art, which in most of our anatomical museums is now almost obsolete.

The methods of preserving the hard parts of invertebrate animals, such as insects, molluscs, and coral animals, in a dry state, are so generally understood, and so fully described in many special treatises,[1] that there is no occasion to detain you with them at present. The best illustration in the present collection of this branch of the subject is the very valuable and instructive preparation of the Exoskeleton of the common lobster (No. 3904 *e*) prepared by Mr. E. T. Newton, and exhibited by Prof. Huxley, which is a model of a class of preparations which might be largely employed in teaching zoology. I may also call attention to a small series of preparations contributed by Prof. H. Landois, of Münster (No. 3878), which purport to show something of the life history and habits of several species of insects, an idea which might be more fully carried out in biological museums, and to the typical collections of the shells of molluscs exhibited by Mr. R. Damon (Nos. 3808 to 3811).

(*To be continued.*)

OUR ASTRONOMICAL COLUMN

THE NEW STAR IN CYGNUS.—On the evening of December 13 this star, as regards brightness, was about midway between 75 Cygni and Bessel's star, Weisse XXI. 1004, the *Durchmusterung* magnitudes of which are 5·2 and 6·5 respectively, giving for the new star a magnitude of about 5·8 to 6·0, as stated last week. On December 20 it was not more than 0·25m. brighter than Bessel's star, indeed at moments it was difficult to say which was the brighter of the two; its present rate of decline is therefore slower than during the first ten days after the discovery. In the foggy sky of December 20, there was a yellowish tinge in its light, not perceptible in Bessel's star. A further careful search through our star-catalogues has failed to reveal any previous observation of a star in this position. It falls in one of the two zones, the re-observation of which has been undertaken at Bonn.

THE BINARY STAR 6 *p* ERIDANI.—It may be hoped that some one of our southern observers is putting upon record measures of this double star, of which, so far as we know, none have been published since those of Mr. Eyre B. Powell at Madras, at the beginning of 1861, when the angle of position was 253°, and the distance 4″·9. Altering the node in Capt. Jacob's second orbit to 109° 40′, and assuming the peri-astron passage to have occurred 1817·64, with a period of revolution of 117·48 years, the measures from 1835 to 1861 are very closely represented, without change in inclination, distance of peri-astron from node, or semi-axis major. Dunlop's measures in December, 1825, which are of doubtful interpretation, would, with Jacob's correction, differ 6½° from the computed angle. Later measures than those of 1861 are required for a decision on the true form of orbit. *α* Centauri and *h* 5114 (R.A. 19h. 17m. 50s., N.P.D. 144° 34′ for 1876) are equally to be recommended to the close attention of the southern astronomer.

When a systematic remeasurement of the double stars of Sir John Herschel's Cape catalogue, which are out of reach in these latitudes, is undertaken (and we know of no more desirable or more interesting work in the miscellaneous astronomy of the other hemisphere), a large accession to the list of binaries may be anticipated. Perhaps M. O. Struve has not in 24 Comæ Berenicis—detected the most rapid of the revolving double stars, which it may remain for a southern observer to bring to light.

PERIODICAL COMETS IN 1877.—Of the known comets of short period only one—that of D'Arrest—has been predicted for the ensuing year, though if the elements of De Vico's comet of 1844 have not undergone a violent change since that appearance, it may be expected to be in perihelion also within the next twelvemonths.

D'Arrest's comet will arrive at its least distance from the sun on May 10, but will not be nearest to the earth until October; its positions when observations should be most feasible, are not favourable for observers in the northern hemisphere. M. Leveau's elaborate ephemeris affords every possible assistance towards its detection. At its last visit in 1870 this comet was excessively faint, and was not observed at more than four or five of the numerous European Observatories.

Surely there must soon be an end of the dearth of discoveries of new comets which has prevailed since the beginning of December, 1874.

ANCIENT SOLAR ECLIPSES.—In NATURE (vol. xv., p. 116), Sir George Airy notes a difference in the path of the shadow in the total eclipse of B.C. 763, June 14, given in this column (p. 65) from that defined by a direct calculation from Hansen's Tables. In explanation of this difference it should be stated that our elements of the eclipse of B.C. 763, as also (with one exception) for other eclipses to which we have from time to time referred, are obtained by the use of Damoiseau's Lunar Tables of 1824, with the main arguments, and one or two of the principal equations adapted to the elements resulting from Sir George Airy's laborious discussion of the observations of the moon at the Royal Observatory, Greenwich, from 1750 to 1830, combined with M. Leverrier's Solar Tables, and the introduction of Hansen's last values of the terms in longitude, anomaly and node depending on the square of centuries.

METEOROLOGICAL NOTES

THE STORM OF MARCH 12, 1876.—We turned with considerable interest to the account of this storm, which passed over the south of England on March 12, as published in the *Journal* of the English Meteorological Society for July. The interest was all the greater, seeing that the account was drawn up, at the request of the Council of that Society, by Mr. Scott, assisted by Messrs. Gaster and Whipple, that descriptions of the same storm had been previously published by Prof. Quetelet, Dr. Neumayer, and the late M. C. Sainte-Claire Deville, and that another paper on the same subject was intimated by Dr. Buys Ballot. The widespread interest which this storm has called forth is seen at once on looking at the nine weather maps and tables of Mr. Scott's paper, which show it to be one of the most remarkable storms of recent years, whether regard be paid to the rapid rate of its propagation eastwards, estimated by Dr. Neumayer at seventy-seven miles per hour over part of its course; to the rate of the barometric fluctuation, almost unprecedented in these islands, the bar meter at Kew having risen 0·407 inch during the two hour from 2 to 4 P.M.; or to the violent contrasts of temperature and weather on the two sides of the storm at comparatively short distances apart. To illustrate the subject with greater fulness a woodcut is given showing the automatic registrations of the different meteorological instruments at Kew, and tables of pressure and temperature for every ten minutes during the most interesting phase of the storm. To these curves a noteworthy and novel feature is added in the form of a curve showing the electrical changes from positive to negative, and *vice versâ*, at the time. The *hourly readings of their self-recording instruments* for March were moreover published shortly after by the Meteorological Office. On turning to these two barometric records taken from the same instrument at Kew, referring to the same time, and published by the same authorities, and comparing them together, we meet with nothing but confusion. Of the whole of the eleven instances on which readings are printed in the two records for the same instants of time, no two agree, the eleven differences being in order, + 0·006, − 0·024, − 0·008,

[1] The most recent being "Notes on Collecting and Preserving Natural History Objects," edited by J. E. Taylor, Ph.D., and published by Hardwicke and Bogue, London, 1876.

− 0·040, − 0·020, − 0·001, − 0·040, − 0·004, − 0·012, − 0·027, and + 0·003 inch. Whether or not the readings in the paper be reduced to sea-level, no information being given on this point, the whole observations or at least one of these two records are entirely wrong. In explanation of discrepancies previously pointed out, it was stated by the office that the original photographs may not admit of a precision closer than 0·020 inch. In this case, however, such an explanation is out of the question. Equally loose and inaccurate are the descriptions of the Kew curves, even though the main design of this costly system of registration is to furnish data for exact comparisons being instituted among the different meteorological elements. Thus it is stated that the electricity, having been strongly negative, returned again to positive between 6 and 8 A.M., whereas the change occurred all but instantaneously about 6.45 A.M.; that simultaneously with the time of maximum temperature, about 12.20 P.M., the wind, which had been west "suddenly became north," whereas the change was not of such a character as to be described by the words simultaneous and sudden, seeing that about fifteen minutes elapsed as the wind veered from west to north; that "the barometer rose rapidly until 4 P.M., at an average rate of about 0·005 per minute," whereas this rapid rate of increase of pressure was spread over no more than the fifty minutes from 2 to 2.50 P.M. It is needless to remark that the data of this singular storm thus put before us are worse than useless and it may be also stated that a number of the barometric observations at Kew, as published in the *Hourly Readings* for March, are of such a character as to render a verification by comparison with the originals very desirable.

DIURNAL BAROMETRIC RANGE AT LOW AND HIGH LEVELS.—We have recently received from Mr. W. W. Rundell, a paper on this important subject, published about two years ago in the *Journal* of the Meteorological Society of London, based on observations made under the direction of Gen. Myer during May, 1872, on Mount Washington, New Hampshire, at heights of 2,639 and 6,285 above the sea, hourly from 6 A.M. to 6 P.M., and at 9 and 12 P.M., and at Portland, Maine, 54 feet above the sea and near the coast, at 7 and 8 A.M., and at 2, 5, 9, and 12 P.M. The means of atmospheric pressure, temperature, and humidity, are given for the different hours of observation, to which are added interpolated values for the hours of the day for which no observations were made, by drawing a fair curve passing through the observed values plotted off on a moderately large scale. These various averages are laid down in sets of curves accompanying the paper. The point of interest raised by such a discussion consists in the presentation of these three vital meteorological elements at three stations not far apart from each other, but very differently situated as regards height above the sea, and the probability that some light may thereby be thrown on one of the most difficult problems in physics. On examining the curves the attention is at once arrested by the remarkable character of the curve of the diurnal barometric range at Portland, which represents the morning maximum as occurring at 6 A.M., and the afternoon minimum at 2 P.M. Deductions of a somewhat large nature are drawn from the times of occurrence of these and others of the maxima and minima of the paper tending to show that they stand to each other in certain definite relations. Since, however, the facts of observation afford no instance of the morning maximum occurring in May at such places as Portland at 6 A.M., and the afternoon minimum at 2 P.M., we were led to calculate afresh the averages from Gen. Myer's figures with the result that the averages of the six hours of observations published in the paper are all in error in amounts varying from + 0·027 inch to − 0·004 inch. The fresh averages, it may be remarked, give an amplitude of range and hours of occurrence of the extremes accordant with what has been observed in latitudes and situations similar to that of Portland in May. It is obviously premature to discuss the various points raised until the necessary data be put in order before us, and the interpolated values for the unobserved hours be laid down on a method based on a wide knowledge of observed values for the same hours at places similarly circumstanced.

THE CLIMATE OF GENEVA.—A large work on this subject has just been published by Prof. Plantamour, in which are discussed with clearness, precision, and great fulness, the observations made at the observatory during the past fifty years, on temperature, pressure, moisture, rainfall, winds, clouds, and thunderstorms. The hourly averages of the different elements of each month for each year and for groups of years are given, as well as the averages for each day of the year, and the average or sums of the pentades and months for the long periods during which the observations have been made. There is thus amassed in a handy form in one volume of 263 pp. 4to., data for the elucidation of the climate of this part of Switzerland, as well as for larger inquiries which fall to be dealt with by comparative meteorology, and for the investigation of many cosmical questions. Among the specialties of the climate of Geneva, the most interesting, perhaps, are those which arise from its position with reference to its lake. The variations in the direction and force of the wind during the day show land and lake breezes of a strongly marked character—the breeze from the lake prevailing at those hours of the day when the temperature of the land is in excess of that of the lake, and the land-breeze during the rest of the day. In December, when the land at no hour of the day is warmer than the lake, no breeze from the lake prevails. In January, however, the breeze from the lake begins slightly to prevail, and in an increasing degree in succeeding months, forming a marked feature in the climate of the town during the greater part of the year, and leaving its impress in nearly all directions on the different meteorological elements. During the winter months, when no breeze from the lake prevails, or but a feeble one, the vapour curves show only one daily minimum, occurring about sunrise, and one maximum about 2 P.M.; whereas during the other months, from March to October, there occur two daily minima, one about or shortly before sunrise, and the other from 2 to 4 P.M., and two maxima, one from 8 to 11 A.M., and the other from 6 to 10 P.M., according to season. Equally marked are the curves of the hourly variations of cloud, the maximum during the winter months occurring about sunrise and the minimum about sunset. During the warm months, however, there are two daily maxima and minima—the first maximum occurring about or shortly after sunrise, and the second, which is by far the larger of the two, about 6 P.M., and the two minima shortly after midnight and from 9 to 11 A.M. These variations in the moisture of the air of Geneva are attributed by Plantamour to the condensation and evaporation which take place at the surface of the earth, and to the ascending and descending aërial currents consequent on the diurnal march of the temperature. These are undoubtedly true causes concerned in bringing about diurnal hygrometric changes, but they are insufficient to explain the strongly-marked double maxima and minima observed at Geneva. This will be evident by a simple reference to the hygrometric curves for such places as Valentia, Toronto, and Oxford, which either exhibit no second maximum at all, or if they do, so faintly marked as to form no outstanding feature of the curves. The explanation, in all probability, of this peculiarity of the Geneva hygrometric curves is to be found in the relative size of Lake Geneva which is just large enough to occasion a strong breeze during the day from the lake *all round its shores*. On the setting in of the breeze, the air having been some time previously resting on the surface of the lake is therefore moist, and while this continues the first daily maximum is reached. As, however, the breeze continues, *the air feeding it must necessarily, owing to the com-*

parative smallness of the, lake come from higher strata of the atmosphere, and since this air has been but a brief time in contact with the surface of the water the lake breeze becomes constantly drier till the afternoon minimum from 2 to 4 P.M. The breeze thereafter diminishes in force, the air consequently becomes moister till the greater maximum is attained about the time of the day when the breeze from the lake falls to a calm. This special feature of the climate of Geneva well deserves the closest investigation, particularly in its relations to the curves of temperature, pressure, and clouds. Among the other points discussed may be mentioned an examination of Deville's cold and warm periods of the year by the long series of the Geneva Observations; a comparison of the temperature of the water of the Rhone, as it issues from the lake, with that of the air, showing the mean annual temperature of the water to be 3°·7 higher than that of the air, a point of some importance in connection with questions affecting oceanic circulation; the distribution through the year of strong northerly and southerly winds, and the variations, regular and irregular, in the amount and duration of the rainfall.

CLIMATE OF LUND.—A paper of considerable value has been published by H. A. V. Tidblom, in *Lunds Universitets Arsskrift*, tom. xii., on the meteorological observations made at the observatory at Lund from 1741 to 1870. The observations, which are very fully discussed, embrace the temperature, winds, rain, snow, thunderstorms, and auroras, and their great value lies in the long period, viz. 130 years, over which they extend. The highest observed temperature during the 118 years ending 1870 was 94°·1, and the lowest — 13°·9, both occurring in 1845. Northerly and easterly winds prevail in winter and spring, north-westerly in summer, and south-westerly in autumn—these winds being of special interest from their relation to the prevailing winds in the south of Norway in the corresponding seasons. Hail falls on an average 5 days in the year, snow 37 days, and rain 122 days. March is the month of smallest and least frequent, and August of greatest and most frequent rainfall. Thunderstorms reach the maximum in the last half of July and first half of August, very few occurring from the middle of October to the middle of April. The greatest number of auroras occur in April and September, and the variations through the different years are very great, a remarkable maximum period occurring from 1776 to 1790, since which latter date the number has been singularly few.

WEATHER SUMMARY.—M. H. Tarry's *Histoire de l'Atmosphère* for July and August, 1876, has been received. The publication, which recently began to be published in *Les Mondes*, aims at giving a summary and discussion of the meteorological elements of the northern hemisphere, which it is possible to collect within a month or two of their occurrence. It is thus calculated to be a useful supplement to the weather maps of Europe and America, and to the International Meteorological Observations of the United States, and as such it deserves the active support of the meteorologists of different countries.

INFLUENCE OF FORESTS ON OZONE.—In a note by M. L. Fautrat in the *Bulletin Hebdomadaire*, No. 475, of the Scientific Association of France, it is shown from observations made at Halatte and Ermenonville, that less ozone was observed in forests, particularly forests of pine, than in the open country, and more ozone at a height of 46 feet above the ground than near the surface.

NOTES

THE Loan Collection of Scientific Apparatus is to be finally closed on the 30th inst.

THE Danish Geographical Society enters upon its existence under royal auspices. In accordance with the invitation of the King of Denmark, the first public session was held in the royal palace at Copenhagen, on December 22, accompanied by appropriate festivities. The King has accepted the position of Protector of the Society, while the Crown Prince is active president.

THE veteran chemist, Prof. F. Wöhler, has been elected president of the German Chemical Society for the coming year.

A TELEGRAM received by M. Sidoroff from Capt. Wiggins, and communicated by the former to the St. Petersburg papers, announces that on December 13 Capt. Wiggins and his shipmaster, M. Svanenberg, left Krasnoiarsk on their way to St. Petersburg.

OUR readers may remember that at the International Conference on the means for exploring Central Africa thoroughly and systematically, held at Brussels last September under the presidency of the King of Belgium, invitations were issued to the different countries represented to form local committees for the furtherance of this object. The German National Committee was formed last week under the presidency of Prince Henry VII. of Reuss, and embraces many of the most distinguished names in the empire. A committee has already been intrusted with the duty of preparing the statutes for a permanent association, the German Society for African Exploration, which is to be under the patronage of the Crown Prince, and expects to enter vigorously and energetically upon its chosen field.

THE *Daily News* correspondent at Rome writes that the Marquis Antinori has sent to the Italian Geographical Society a long account of the journey of the Italian African Expedition of which he is leader. The expedition has, after many hardships and delays, reached Shoa, the king of which has received the members in his capital, Liccé, with the greatest hospitality. The Marquis has taken steps to make Shoa a scientific *entrepôt*, as a basis of operations for exploring the equatorial lakes. When the letter left the Marquis was preparing an extended scientific report of his journey to be forwarded to the Italian Society by a courier.

IN the last session of the Berlin division of the German and Austrian *Alpen-Verein*, Dr. Scholle delivered an elaborate address on the orography of the Bernese Alps. He regards them as distinguished from the mountains of other alpine regions by the following peculiarities:—The valleys are unusually deeply cut. The mountains inclosing these valleys are remarkable for their relative as well as their absolute heights, and the horizontal projection of their tops lies always at but a short distance from the bottom of the valleys. Finally, the topmost points of the mountains are generally visible from the valleys, and their commanding appearance imparts to the landscape its most picturesque and magnificent features.

THE *Bulletin* of the French Geographical Society for November contains a paper by Dr. Jules Carret on the Displacement of the Polar Axis, in which he gives a summary of arguments in favour of displacement which will appear at length in a work about to be published by him.

THE following particulars are given by Prof. Desor in the last number of the *Bulletin* of the Society of Natural Sciences at Neuchâtel, as to the burial-ground of the inhabitants of the lake-dwellings discovered last winter on the shores of the Lake of Neuchâtel at Auvernier. The burial-place is about 100 feet distant from the well-known lake-dwellings of this locality, at the foot of a hill, and it was shut up by some 7 feet of earth washed by rains from the slopes of the hill. It has a quadrilateral form (1·6 metre long and 1·12 broad), and is built of flat granitic stones covered with two large flag stones of gneiss, these last necessarily having been cut artificially. The burial-place thus belongs to that class of dolmens which are known in England as "stone-cists," and it establishes therefore a new link between the true dolmens and the lake-dwellings. Assiduously