I. Scholia et emendationes in Halieuticon P. Ouidii Nasonis. [pp. 1–11.]
[Second title.] P. Ovidii Nasonis Halievticon liber.

II. Aqvatilivm Animantium Enumeratio iuxta Plinium, emendata et explicata serie literarum. [pp. 12–92.]
[Running titles.] Catalogvs Aqvatilivm, and Divisio Aqvatilivm.

III. Eorvndem Nomenclator Germanicus longe copiosissimus. Et alia quaedam ad Piscium historiam pertinentia. [pp. 93–280.]
[Running title.] Teütsche namen der Fische vnd Wasserthieren.
Tigvri apud Andream Gesnerum F.
[Date of Prefaces 1556.]

In consequence of the foregoing, after *Ovidius Naso* (Publius), "Halieuticon: hoc est, de piscibus libellus, mute quam ante hac emendatior et scholiis illustratus . . . per Conradum Gesnerum. Tiguri apud Gesneros fratres [1530?] 8°" should give place to the following: Part I. of Gesner's De piscibvs et Aqvatilibvs, "Scholia et emendationes in Halieuticon P. Ovidii Nasonis." "P. Ovidii Nasonis Halieuticon liber." pp. 1–11. Tigvri apud Andream Gesnerum F. [1556.]

The date for the first Frankfort edition of Aldrovandi is 1623 instead of 1629; and Gronow gives that of the second as 1640 instead of 1645. That given by the latter as Venice, 1616, is omitted. Three editions of Aelian (1556, 1611, and 1616), given by some authorities, do not appear. Future revision of the work will probably introduce the names of such works as those of Schomburgk's Fishes of British Guiana (1852), and Spix and Agassiz' Fishes of Brazil (1829), both of which give information on angling. The latter figures on plates A to G the various methods of capture in use among the natives.

Our authors have given us a work of great importance to all interested in the subjects of which it treats.

WEEKLY SUMMARY OF THE PROGRESS OF SCIENCE.

ASTRONOMY.

Mass of a planet from observation of two satellites. — M. Struve recommends measurement of the positive angle and distance of a satellite from another satellite, and not from the primary planet. A series of such measurements on satellites of Jupiter has been begun at Pulkova. The observations occupy one-third the time, and are considered two or three times as accurate as those by direct reference to the centre of the planet. They are free, moreover, from the unknown constant errors inseparable from the latter, — an advantage which Prof. A. Hall, in this paper, considers cheaply purchased at the price of greater difficulties in computation. He shows, that, while the solution of six normal equations requires seventy-seven auxiliary quantities, that of twelve (the elements of both orbits being involved by the new method) requires four hundred and forty-two, and therefore nearly six times the labor. But these twelve equations give the period and mean distance of each satellite, and hence two values of the planet's mass. Mr. W. B. Taylor objected to such special designations as 'peri-Saturnian,' 'apo-Jovian,' for the apsides of satellites' orbits when general names were needed. He suggested 'peri-apsis' and 'apo-apsis.' — (*Phil. soc. Wash., math. sect.; meeting* April 26.) [919

Periodicity of auroras. — Professor Sophus Tromholt has discussed the observations of auroras made by Prof. S. Kleinschmidt at Gotthaab, in Greenland, from 1865 to 1880, together with other observations in northern latitudes, and finds that for polar regions the maximum of auroras corresponds with the minimum sun-spot period, the reverse of what has been noted in temperate zones. The yearly maximum is at the winter solstice, while, in lower latitudes, maxima occur at the equinoxes. Weyprecht has shown that the yearly maximum is due to an oscillation of the auroral zone toward the south at the equinoxes, and toward the north at the solstices. The same explanation is given of the eleven-year period, corresponding with the sun-spot period. Prof. Lemström's production of an artificial aurora is mentioned. — (*Observ.*, April, 1883.) M. MCN. [920

Report of work of the Royal observatory, Cape of Good Hope. — In the report for 1882, Dr. Gill states that the observations for the difference of longitude between the observatory and Aden are completed. The great comet was observed on every clear night from Sept. 7, and photographs were obtained on six nights The heliometer measures for the parallax of certain southern stars are nearly concluded. In connection with observations in the northern hemisphere, *Victoria* and *Sappho* have been observed for determining the solar parallax by Galle's method. Time of contact at the transit of Venus was noted by six observers, and heliometer measures were made during the transit. — (*Monthly not.*, March, 1883.) M. MCN. [921

MATHEMATICS.

Infinitesimals. — Mr. M. H. Doolittle looks on infinitesimals, differentials, and zero as having the same denotation, but different connotations. He proposes, in cases where the value of a function becomes indeterminate, to call that value which is continuous with those for preceding and succeeding values of the variable the *serial* value. The differential coefficent, in this view, is the serial value of the ratio of two increments when those increments become zero. — (*Phil. soc. Wash., math. sect.; meeting* May 9.) [922

PHYSICS.

Electricity.

On secondary batteries. — Professor Barker gives a brief history of secondary batteries from the discovery of electrolytic polarization by Gautherot, in 1801, to the invention of the Faure cell, together with the results of his own experiments upon cells of this latest form.

In charging his series of thirty-four cells by means of a Gramme machine, he used, in order to prevent discharge by a current backward through the machine when the electro-motive force of the latter fell, a 'cut-out,' in which an electro-magnet, through which the current flows, forces the end of a metal bar against a spring, pressing it down, and thus keeping the circuit closed while the current flows in the desired direction. When the current begins to fail, the reaction of the spring opens the circuit.

Using this cut-out, Prof. Barker found that the secondary battery could be employed with great advantage in steadying the current furnished to a series of Edison lamps by a Gramme machine driven by a gas-engine. For this purpose he connected the Gramme and the battery as if for charging, the cut-out being in the circuit, and connected, also, the poles of the battery with the lamps. The electro-motive force of the machine was made very nearly equal to that of the battery, so that, just after each explosion in the gas-engine, the machine prevailing sent a current through the lamps, and also a small current through the battery, slightly charging it; but, before the next explosion occurred, the electro-motive force of the machine had fallen to such a point that the battery now sent a current to the lamps. It is stated, that, although the engine gave only one explosion in four strokes, the pulsations in the light entirely disappeared when the above arrangement was adopted.

Prof. Barker states that his experiments entirely confirm those of Gladstone and Tribe as to the formation of lead sulphate when a secondary cell remains in open circuit. In several cases the acid of the cells disappeared entirely in this way, and lead sulphate formed the entire coating on both plates. On attempting to re-charge such a cell, the resistance was found to be very high, and torrents of gas were evolved from both plates. After a time the resistance fell to its normal value, and the waste of gases ceased, though not till a considerable quantity of energy had been lost.

It appears, moreover, that in the cells employed, although they were intended to be all of like dimensions and construction, there was great difference of storing-capacity and of resistance. After an hour's use on the lamp-circuit, different cells gave on a tangent galvanometer deflections varying from 87° to 0°. When the discharge was continued for a long time, so as nearly to exhaust the battery, it was found that many of the cells were reversed, so as to be now opposing the action of the others. "In place of continuing uniform as a single cell, the electro-motive force of a series of cells begins to fall when about half the charge which it ought to be capable of yielding has been drawn from it." In the Planté cell the local action is far less than in the Faure, the lead peroxide in the former being very much harder, so that not a trace of the sulphate was found in such a cell after six months of frequent use. Prof. Barker appears, therefore, to consider the Planté cell more promising than the Faure, in spite of the much greater time required to form it. — (*Proc. Amer. assoc.; Montreal meeting*, 1882.) E. H. H. [923

CHEMISTRY.

(*General, physical, and inorganic.*)

Ammonio-argentic iodide. — By digesting argentic iodide with a solution of ammonia, A. Lougi obtained the compound NH_3AgI. — (*Gaz. chim. ital.*, 1883, 86.) C. F. M. [924

Bleaching-powder and analogous bodies. — The constitution of this substance is again reviewed by Lunge and Naef. In 1882 Kraut objected to the formula, Cl — Ca — O — Cl, first proposed by Odling for the dry salt, and apparently confirmed, in 1880, by Lunge and Schaeppi. Kraut's objections were twofold. In the first place, he asserted that all the chlorine in bleaching-powder was expelled by a mixture of carbonic dioxide and hypochlorous acid, and, secondly, that bleaching-powder was analogous to the lithium salt (LiCl + LiOCl). In answering the first objection, Lunge and Naef affirm that Kraut must have started with a basic calcic chloride, which, with hypochlorous acid, gave, first, bleaching-powder, from which carbonic dioxide set free the chlorine, —

$$Ca\begin{matrix}Cl\\OH\end{matrix} + HOCl = H_2O + Ca\begin{matrix}Cl\\OCl\end{matrix}. - Ca\begin{matrix}Cl\\OCl\end{matrix} + CO_2 = CaCO_3 + 2Cl.$$

They further assert that $CaCl_2$ may be decomposed by hypochlorous acid ($CaCl_2 + Cl_2O = CaOCl_2 + Cl_2$). Concerning the second point urged by Kraut, Lunge and Naef find that eighty-eight per cent of lithic hydrate is converted into the basic chloride, while, according to Kraut, fifty per cent only should enter into the reaction, if it is analogous to bleaching-powder. Chlorine is not eliminated from the lithium salt by carbonic dioxide at ordinary temperatures. At higher temperatures the chlorate is formed, and oxygen evolved. The strontium salt corresponding to bleaching-powder, when treated with carbonic dioxide, behaves in a manner strictly analogous to the calcium salt. The authors regard these facts as sufficient to establish the formula, Cl — Ca — O — Cl. — (*Berichte deutsch. chem. gesellsch.*, xvi. 84.) C. F. M. [925

Action of certain vegetable acids upon lead and tin. — Mr. F. P. Hall tried the action of acetic, tartaric, and citric acids upon lead, tin, alloys of these metals, and upon cans that had been used to preserve fruit. In a solution of approximately the same strength as common vinegar, these acids exerted a much greater corrosive action upon tin than upon lead, whether acting upon the metals separately or in the form of alloys. Both metals were dissolved freely, especially from the cans. The lead probably came from the solder, since it was not detected in the tin of which the cans were made. In the composition of tin foils, every variation was found between samples that were free from lead and those which contained a very high percentage of this metal. — (*Amer. chem. journ.*, iv. 440.) C. F. M. [926

(*Analytical.*)

Direct estimation of chlorine in presence of bromine or iodine, and of bromine in presence of iodine. — According to the observations of G. Vortmann, metallic chlorides are not affected when boiled with the peroxide of lead or of manganese and dilute acetic acid, and only with difficulty by the concentrated acid. Bromides are decomposed by plumbic, but not by manganic peroxide, while iodides are readily decomposed by either. To determine chlorine in presence of bromine, the latter may be expelled by evaporating the solution to dryness with plumbic peroxide and dilute acetic acid. Iodine may be expelled from a mixture of a chloride and an iodide by either plumbic or manganic peroxide and acetic acid. Manganic peroxide is also used to decompose an

iodide in presence of a bromide. In a mixture of the three haloid salts, both bromine and iodine may be removed by plumbic peroxide; or first the iodine by manganic peroxide, and then the bromine by plumbic peroxide. These methods fail to give accurate results when the relative percentage of chlorine is small. — (*Sitzungsber. kais. akad. Wien*, lxxxvi. 244.) C. F. M. [927

AGRICULTURE.

By-products from rice. — The chief by-products of the preparation of rice for market are 'douse,' or bran, 'rice-flour,' and 'polish.' The bran consists of the hull, or pericarp, with a portion of the outer proteine-bearing layer of the true seed adhering to it. The rice-flour is produced by pounding the grain, freed from the hull, in wooden mortars, to complete the removal of the testa and proteine-bearing layer of the seed. It consists of the latter mixed with more or less of the starchy interior portion of the seed. The rice then passes under stiff brushes, which remove the last traces of the outer layer, and more or less starch. The refuse from this process is the rice polish. Analyses of these materials indicate that they are valuable feeding-stuffs, and show them to be decidedly rich in fat and proteine. — (*Rep. N. C. exp. stat.*, 1882, 87.) H. P. A. [928

Analyses of cotton-seed. — The following analyses of the hulls and kernels of cotton-seed were made at the North Carolina agricultural experiment-station.

	Kernels.	Hulls.
Water	6 27	9.16
Ash	4.03	2.28
Proteine (N × 6.25)	29.25	2.19
Crude fibre	4.38	47.12
N. fr. extract	19.52	38.67
Fat	36.55	0.58

The whole seed consists of about equal parts of kernels and hulls. The ash of both hulls and kernels is very rich in potash and phosphoric acid.— (*Rep. N. C. exp. stat.*, 1882, 97.) H. P. A. [929

GEOLOGY.

Lithology.

The Rastenberg granite. — This rock, microscopically studied by Koller, is a porphyritic granite composed of quartz, orthoclase, plagioclase, biotite, and hornblende. These form a medium crystalline mass in which large orthoclase crystals are embedded. Dihexahedral quartz, which is usually present in such rocks, was absent from this. The orthoclase was found to belong to the microperthite variety. While the large crystals were orthoclase, the smaller ones were mostly plagioclase, lying between oligoclase and albite, or, according to Tschermak's theory, between Ab_2An and Ab_1An_3. The absorption and pleochroism of the hornblende were not strong. The colors were, for a, light yellowish-brown; c, clear grass-green; b, dark brownish-yellow; while $a < c < b$. — (*Min. petrog. mitth.*, v. 215.) M. E. W. [930

The rocks of the Wechsels. — In a paper relating to the lithology of the Wechselgebirge, by Böhm, the rocks are classified as, 1°. Micaceous rocks, divided into albite-gneiss, granulitic-albite-gneiss, mica-schist, epidotic-mica-schist, and quartzite; 2°. Chloritic rocks, into chlorite-gneiss and chlorite-schist; 3°. Hornblendic rocks, into diorite-schist and hornblende-epidote-schist. Descriptions of the microscopic characters are given. Rutile and titanite were found in the rocks, while an observed indistinct striation of the quartz was said to be caused by fluid or glass inclusions. — (*Min. petrog. mitth.*, v. 197.) M. E. W. [931

Rhyolite from Yellowstone Park. — Chemical analyses of two specimens of rhyolite have been made by Mr. W. Beam with the following results: —

Sp.gr.	SiO_2.	Al_2O_3 + Fe_2O_3.	CaO.	MgO.	Na_2O.	K_2O.	(Ignition) H_2O.	Total.
2.40	77.00	13.40	1.25	1.19	3.43	3.62	0.70	100.59
2.60	77.90	14.55	0.40	trace.	2.10	4.63	1.00	100.58

Since but little ferric oxide was obtained, it was estimated with the aluminia. The rock in the first analysis is stated to be a porphyritic obsidian, and, in the second, a quartz trachyte. These names and the analyses indicate that the rocks are rhyolites. — (*Amer. journ. sc.*, xxv. 106.) M. E. W. [932

Meteorites.

The Atacama (Bolivia) meteorite. — This supposed meteorite has been regarded as a pallasite or syssiderite (Science, p. 41), according as the classification of G. Rose or Daubrée is followed, closely allied to the Siberian form found by Pallas. Dr. S. Meunier dissents from this opinion, although holding that both are specimens of concretionary veins (Science, p. 18), — a view for which the present writer is unable to see any basis. A chemical and mineralogical examination showed, according to Meunier, that the non-metallic part had the following composition: —

Pyroxene	9.00
Schreibersite	4.00
Chromite	1.20
Anorthite	0.10
Pyrrhotite	0.50
Olivine	85.20
	100.00

— (*Comptes rendus*, xcv. 1384.) M. E. W. [933

The Mocs meteorite. — Professor A. Koch has continued his papers on the fall of meteoric stones in the vicinity of Mocs in the Siebenbürgen, Feb. 3, 1882. He reports from this fall 912 pieces, weighing collectively 174,113 gr. A chemical analysis, made by his brother, Frank Koch, showed that their average composition was as follows: —

SiO_2	42.74	Mn	0.57
Al_2O_3	trace	Ni	1.38
Fe	7.93	Co	trace
FeO	20.86	S	2.61
CaO	2.78	P	0.41
MgO	15.95	C?	0.19
Na_2O	1.20	Chromite	1.56
K_2O	0.21		
Li_2O	trace		
MnO	1.12	Total	99.51

Koch states that the meteorite fragments are composed of nickeliferous iron, magnetic pyrites, taenite, and silicates. The chemical analysis indicates that they belong to the peridotites. — (*Min. petrog. mitth.*, v. 234.) M. E. W. [934

MINERALOGY.

Löllingite. — Mr. W. F. Hillebrand described an interesting variety of this mineral, recently found on Teocali Creek, Gunnison County, Col. It occurs in aggregates of spheroidal bodies, showing radiate structure when broken, in a gangue of calcite or ba-

rite, and associated with proustite, argentite, native silver, and other minerals. — (*Col. scient. soc.; meeting* April 2.) [935

PHYSICAL GEOGRAPHY.

Ocean currents south of Africa. — On the charts published by the London meteorological office (1882) the following currents are shown at the meeting of the Antarctic, Atlantic, and Indian oceans: first, the Agulhas current, moving south-west along the eastern coast of Africa, with a velocity of 51 knots a day in summer (December to February), 46 in winter, and a maximum of 108. It is 4–5° C. warmer than neighboring water of the same latitude, and in summer carries a temperature of 25° C. to lat. 35°, and 21° to lat. 39°. As the water in Table Bay is much colder, it would seem that this current does not enter the Atlantic, except temporarily, in summer time, but, on meeting the Antarctic current about lat. 40°, long. 23° E., is turned back to the Indian Ocean in a north-easterly direction. That this is not a simple continuation of the Antarctic current is shown by its warmth, as well as by the rapid changes of temperature and the alternation of warm and cold bands about lat. 40°. Second, the Antarctic current south of lat. 40°, moving north-east or north-north-east. This is rather independent of the prevailing winds, which follow the parallels closely. As its strength and northward deflection are greatest, and its temperature and density are least, in summer, it is thought to be strongly influenced by the melting of Antarctic ice. West of long. 20° it gives off branches that flow north, along the west coast of Africa. — (*Ann. der hydrogr.*, 1883, 1, 63.)

At least the occasional passage of the Agulhas current into the Atlantic is shown by the drifting of a bottle thrown overboard off the coast of Natal (lat. 29° 24′ S., long. 33° E.) Dec. 7, 1880, and found on the coast of Brazil (lat. 17° 30′ S.) Aug. 11, 1882. The distance traversed was probably 4,500 nautical miles, or an average of over seven miles a day. — (*Id.*, 61.) W. M. D. [936

Earthquakes on the Armenian plateau. — H. Abich adds a chapter on earthquakes to his geological description of this region, which contains much of importance concerning the volcanoes and other physical features of Armenia, with fine illustrations in maps and views. The two chief seismic centres are the Ararat volcanic group and the Palandokän near Erzerum. At the former, in 1840, a great landslide was produced by a shock, of which Abich's previous description (*Verh. gesell. f. erdk. Berlin*, iv. 1845, 28) is here reprinted. At the latter, on May 21, 1859, strong vertical and horizontal oscillations were felt; and, in a few minutes after the first disturbance, over a third of the town's eight thousand houses were in ruins, and five hundred people were killed or mortally wounded. It was noticed that heavily-built houses suffered more than lighter ones, and that the destruction was much greater in the central, higher part of the city, which stood upon a rocky basis, than in the lower suburbs on the alluvial plain. The earthquake of Shemaka, May 31, 1859, is described in detail, and the general relation of the Armenian with the Mediterranean vulcano-seismic disturbances along the belt between latitude 37° and 40°, from the Caspian to the Atlantic, is discussed. An extended list, compiled from old Armenian chronicles, is added, showing fifty-two earthquakes from 350 to 1650 A.D., in many of which the destruction was very great. — (*Geol. forsch. kaukas. ländern.* ii., *geol. armen. hochlandes, westhälfte. Vienna*, 1882.) W. M. D. [937

The north German plain. — From the Straits of Dover eastward, between the flanks of the Eifel, Harz-, Erz-, and Riesengebirge on the south, and the shore of the North Sea and the Baltic on the north, the country is low and generally flat. Westward from the Elbe, the plain is hardly more than 20 met. above sea-level, except on the Luneberg heath, which rises to 80 met. Eastward from the Elbe, the highest ground is found in lake-plateaus (*seenplatte*) of Mecklenburg (about 100 met.), Pommerania (100), and Prussia (110), with plains of much less elevation and more level surface, both north and south. The gradual rise from the sea is also shown by the low levels of the Rhine (36 met.) at Cologne, 130 miles from the coast; the Weser (40 met.) at Minden, 100 miles inland; the Elbe (45 met.) at Magdeburg, 150 miles; the Oder (20 met.) at Frankfurt, 125 miles; and the Weichsel (41 met.) at Thorn, 110 miles. This flat surface does not end at the shore, but continues under the Baltic and the North Sea. In addition to the stratified sands and clays which cover a great part of this plain, it contains many large erratic bowlders and unstratified deposits, which have heretofore been generally considered the results of a great flood, or of iceberg transport; but recently these deposits have been closely examined, and within the past five years a large number of German geologists have found reason to believe that their low northern country was invaded in post-tertiary time by an ice-sheet extending outward from Scandinavia. Bernhardi (1832) was the first to make such a supposition, but looked to the polar regions for the source of the ice. After him came Agassiz and Naumann (1844); but their observations were overlooked, until, in late years, Berendt, Credner, Helland, Penck, and others, all denied the importation of erratics by floods or by icebergs, and contended for the action of land-ice. Their results are summarized by Th. H. Schunke, briefly as follows: the unconsolidated deposits of north Germany consist, in part, of stratified sands and clays, with land, fresh and marine fossils, for which no explanation has been generally accepted, except that it was accumulated under water; and, in part, of compact, unstratified sheets of drift containing numerous subangular stones, 90 % of which are foreign (from Scandinavia, etc.), 80 % are scratched, and many are of great size. Stones of local origin are carried against the present direction of river-flow, and sometimes to a higher level than their source. Several of the few rock ledges appearing through this drift-covering have been found rounded and striated; and the clayey strata that often underlie the unstratified drift are discovered greatly disturbed, compressed and folded. Pot-holes are very common. All this is best explained by glacial action, perhaps alternating with open water and floating ice. No terminal deposits are yet found, clearly marking the farthest advance of the ice; but the lake-plateaus, a little way inland from the Baltic coast, have all the characteristics of terminal moraines. Elsewhere the surface is lower and more even, being generally levelled off with a sheet of stratified sand, or covered with still more recent moors. The rivers are moderately depressed below the general surface. It has been suggested that the Weichsel and Oder were displaced from their lower courses when the ice-sheet reached the '*seenplatte*,' and then turned westward, near Bromberg and Frankfurt, to join the Elbe above Wittenberg, their old east-to-west channel being much larger than the streams which now occupy it. Although the action of land-ice is thus generally admitted, many questions are by no means settled; notably, the character of the water-basins in which

the stratified deposits were laid down, and the double or treble alternation of these with sheets of unstratified drift. — (*Kettler's zeitschr. wiss. geogr.*, iii. 1882, 101, 138.) W. M. D. [938

BOTANY.

(*Physiological.*)

Formation of cystoliths. — These concretions are very abundant in the tissues of many families of plants; notably, the nettles, hops, and elms. Chareyre traces what he considers a plain connection between these epidermal concretions in this group and the hairs over them. In some cases the calcification begins high up in the hair, and, having proceeded as far as its base, gives rise to a concretion at the surface of the leaf, but in most cases goes on to form a calcareous mass below this. This subepidermal concretion is the cystolith. It is an interesting fact that similar concretions should occur in perfectly smooth leaves of closely allied plants. Did these once possess hairs of like character? — (*Comptes rendus*, April 9.) G. L. G. [939

Rate of growth of desert-plants. — Capus has added some interesting facts to our knowledge of the vast influence of plenty of water upon growth. In the botanic garden at Samarcande, Turkestan, he found that Ailanthus glandulosus grew, during the first year, .21 of a metre; it grew .33 in the second, and .89 in the third, — all of which were years in which no irrigation-water was furnished. In the fourth year, *with* water, the growth was 10 metres. He thinks that this tree, together with Gleditschia triacanthos and Robinia, is particularly adapted to desert-culture on account of its possessing tissues in which water is easily retained; but he gives no anatomical details to support his view. — (*Comptes rendus*, April 16.) G. L. G. [940

(*Systematic.*)

The Pomaceae. — Wenzig of Berlin gives a conspectus of the genera and species of this group as defined by him, — an abstract of his previous papers in *Linnaea* and elsewhere. According to his views, our species of Pirus appear under Malus and Sorbus, while Crataegus is merged in Mespilus. Crataegus spathulata, C. aestivalis, and C. arborescens, however, are referred to Cotoneaster; and for C. cordata he forms the genus Phalacros. He admits four American species of Amelanchier. — (*Jahrb. bot. gart. Berlin*, 1883.) S. W. [941

The Turneracae. — A very complete monograph of this order has been made by Urban of Berlin. Bentham and Hooker recognize three genera (Turnera, Erblichia, and Wormskioldia), which are all united by Baillon under Turnera. Urban defines five genera, restoring Piriqueta (of which Erblichia is made a section) and Streptopetalum, and adopting Balfour's recent genus, Mathurina. Piriqueta is characterized mainly by the presence of a corona upon the throat of the calyx, — an organ not previously observed, and important as confirming the close relationship of the order to the Passifloraceae. Eighty-three species are described, mostly belonging to Turnera and Piriqueta and to the warmer regions of America, from Carolina and Mexico to the La Plata, but chiefly Brazilian. The other small genera are confined to Africa; the monotypic Mathurina, to Rodriguez Island. The single species found within the United States, but occurring, also, in the West Indies and Brazil, is referred to Piriqueta (P. Caroliniana, Urban). In Mexico are found one species of Piriqueta and three of Turnera, the 'Damiana' (T. aphrodisiaca, Ward) being made a variety of the widely distributed T. diffusa of Willdenow. — (*Jahrb. bot. gart. Berlin*, 1883.) S. W. [942

ZOÖLOGY.

Tentacles of the Physalia. — Commodore Phelps, U.S.N., is contributing a series of articles under the title 'Reminiscences of the old navy,' one of which contains a notice of a Portuguese man-of-war captured in the harbor of Porto Grande, St. Vincent's Island, Cape de Verdes, whose tentacle was a hundred and seventy-five feet long. Notes are also given on the steamer-duck, the enormous spider-crabs of the Straits of Magellan, and on the life of the albatross. A fine large specimen of the latter was caught off the La Plata River in 1844, and marked. It was again caught in 1868. — (*United serv. rev.*, March.) C. E. M. [943

Protozoa.

Parasitic monads in the blood of fishes. — Mitrophanow has found two species, which he describes as new flagellate monads. They were obtained — one from Cobitis fossilis, the other from Barassius vulgaris — by letting the animal's blood flow into a half-per-cent salt solution. The parasite of the first-named fish occurs in several varieties, and is named Haematomonas cobitis. It is worm-shaped, pointed at both ends, has a flagellum on the front end, and an undulatory membrane on the side. It is 30 to 40 μ long, and 1 to $1\frac{1}{2}$ μ thick, and is very active in its movements. The second species is named H. carassii, and differs from the first by its greater length and more developed membrane.

In connection with this subject, the author criticises Gaule's views regarding the cytozoa observed in the frog's blood, and expresses his agreement with Lankester's description of them as parasites, given in the *Quart. journ. microsc. sc.*, Jan., 1882. — (*Biol. centralbl.*, iii. 35.) C. S. M. [944

A social Heliozoon. — Dr. Joseph Leidy exhibited drawings, and described a singular Heliozoon recently sent to him from Lake Hopatcong, New Jersey. It occurs mostly in groups composed of numerous individuals, one of the bunches, of an irregular cylindroid shape, containing upwards of a hundred. They reminded one of a mass of tangled burrs. They remained nearly stationary even for twenty-four hours, and exhibited so little activity, that, without careful scrutiny, they might readily be taken for some inanimate structure. The individuals composing the groups appeared to be connected by mutual attachment of their innumerable rays, and none were observed to be associated by cords of protoplasm extending between the bodies of the animals, as seen in Raphidiophrys elegans. Some of the individuals were in an encysted, quiescent condition. The active specimens resembled the common sun-animalcule, and measured from 0.024 to 0.036 mm. in diameter. They were observed to feed on two species of Actinophrys. After some hours a few individuals appeared to have separated from the surface of one of the groups, but they were as stationary and sluggish as when in association with the others. — (*Acad. nat. sc. Philad.; meeting* April 24.) [945

Mollusks.

Italian Limaces. — These form the subject of a monograph by Lessona and Pollonera. The authors find nine Arionidae and twenty-nine Limacidae existing in Italy which have hitherto been much confused in publications on the subject. Of the thirty-eight species, twenty-two properly belong to Italy, which possesses thirteen of the others in common with the continent of Europe. One is common to all the

shores of the Mediterranean, and two are cosmopolitan. The dentition and anatomy form the subject of two chapters, and are well illustrated. — (*Mem. acad. sc. Torino*, ii. xxxv.) W. H. D. [946

Molluscan fauna of Sardinia. — The land and fresh-water shells collected by Caroti and others on the island of Sardinia are treated of by the Marquise Paulucci in a separately reprinted paper. The island possesses thirty-one peculiar species, and one hundred others, which are also found elsewhere. The work, which is of a systematic and faunal character, is believed to be very complete, and extends to 247 pages and 9 plates. — (*Bull. soc. mal. ital.*, 1883.) W. H. D. [947

East-Indian Pulmonata. — Godwin-Austen, some time since, published an article in explanation of a plate prepared from drawings by the lamented Stoliczka, of rare and curious land-mollusks, which the latter had observed in a living state during his explorations. In this way some valuable data were made available for students. He has now contributed another similar paper and plate in which species of Oxytes, Rotula, Macrochlamys, Euplecta, and Rhyssota, are represented. In the same publication, Möllendorf contributes several articles on Clausilia of eastern Asia, the Nicobars and Japan. — (*Journ. Asiatic soc. Bengal*, March, 1883.) W. H. D. [948

Crustaceans.

New species and variability of fresh-water Copepoda and Cladocera. — Under the deceptive title of 'Heterogenetic development in Diaptomus,' C. L. Herrick describes some varietal forms of species of Diaptomus, describes a new species of Epischura, and discusses the homologies of the limbs in the genus; remarks upon entozoic parasites of Entomostraca, mentioning the occurrence of such parasites in Cyclops and Daphnia; and describes new species of Cyclops, Daphnia, Scapholeberis, Simocephalus, and Ceriodaphnia, and some post-embryonal stages of Daphnia. The paper is illustrated by three plates. — (*Amer. nat.*, April, May, 1883.) S. I. S. [949

Crustacea in the Leyden museum. — Dr. J. G. DeMan, in No. 3 of his Carcinological studies, gives notes on a number of species of Portunidae and Ocypodoidea, most of them from the East Indies and the west coast of Africa, and describes a new Geothelphusa from Java, and two new species of Sesarma from the west coast of Africa. He adds Plagusia depressa to the small but increasing number of species of world-wide range, extending its habitat from the West-Indian region to the west coast of Africa and Amboina. — (*Notes Leyden mus.*, v. 150.) S. I. S. [950

Arachnids.

Polymorphism and parthenogenesis of acarids. — In an article on the gamasids, Berlese begins with a *résumé* of the anatomy of the group, and then reports his observations on the development of these animals. In this family nearly one hundred species have been described, but many of them are only polymorphic forms. An adult form may be reached through two series of metamorphoses. One is short, comprising only the larva, nymph and adult: it may be called the 'normal' series. In the long or 'abnormal' series the number of forms is greater, because a variable number of generations may intervene. Thus, to give an example, Gamasus tardus produces a larva which changes into a nymph, and the nymph into the adult tardus. Now, G. stercorarius also produces similar young stages; but the adult stercorarius may change into a nymph, and that nymph becomes a tardus. The nymphs cannot reproduce. Moreover, stercorarius may be produced either directly, or by metamorphosis of another apparently adult form. The order of change cannot be reversed. Except in the final form, parthenogenetic reproduction seems to be common; and perhaps the impregnated eggs alone and always produce males. No morphological character has been detected by which the final forms may be distinguished from the reproducing-nymphs. For this reason no new species of this family can be described until the metamorphoses have been completely worked out.

Berlese has worked out three species, — Gamasus tardus, stabularis, and coleoptratorum. In each there are three different nymphs, each of which has its two sexual forms, besides which are the larva and the two sexual adults, making twelve forms in all. Finally there may be other intermediate varieties.

Berlese has also observed a true paedogenesis, in that the nymphs of Tachynotus inermis in one developmental series change directly into the adult, but, in the second, produce an egg, although they have no sexual orifice. — (*Arch. ital. biol.*, ii. 108; *Bull. soc. ent. ital.*, xiv. 88.) C. S. M. [951

Insects.

The Lucanidae of the United States. — Fuchs issues in a separate form, with a plate, his synopsis of this group, which the Brooklyn entomological society has been publishing by instalments in its bulletin. Enlarged figures are given of the antennae of each of the fourteen species. [952

The European Lixidi. — The biology, and particularly the food-plants, of the insects of this group in its various stages, are given in a tabulated form by Bargagli. Their food is shown to be largely composed of thistles. — (*Bull. soc. ent. ital.*, xiv. 312.) [953

Thorax of Diptera and Hymenoptera. — Brauer compares the thorax of Diptera and Hymenoptera, and concludes that no part of the first abdominal ring ever enters into the formation of the thorax of the former. Latreille's 'segment médiaire' is to be met with only in Hymenoptera. Hammond's view, that the metanotum disappears in the imago of Diptera, is found untenable; and the thorax is composed exactly as in Lepidoptera and Cicada. The thoracic stigmata belong to the meso- and metathoracic rings. Unfortunately the three accompanying plates are very obscurely drawn. — (*Sitzb. akad. wissensch. Wien*, lxxxv.) E. B. [954

Color-preferences of insects. — Bennett and Christy have added a considerable number of careful observations to those already recorded, on the habits of insects when visiting flowers, which show, that, as a general thing, butterflies do not confine themselves to a single species in many successive visits; while flies are more constant, and bees, especially Apis, are markedly so. Lepidoptera seem most fond of red or pink, and of other colors in the following order: yellow, blue, and white. The preferences of Diptera are white, red or pink, yellow; and, of Hymenoptera, generally red or pink, blue, white, yellow. Bombus selects colors in the order, red, blue, white, yellow. — (*Nature*, March 29.) W. T. [955

VERTEBRATES.

Histogenesis of nerve-fibres. — His has studied this subject on human embryos. In one only, 2.15 mm. long, it was found that the nucleated bodies of the cells of the medullary plate were already more

crowded towards the central canal, early marking the central position of the ganglion-cells. The cells send out processes, most of which extend radially: hence the majority of the cells, but not all, are bipolar. Perhaps the irregular outrunners are amoeboid processes. There is at this stage nothing which can properly be called nerve-fibres. In an embryo of five millimetres length, the number of cells in the spinal cord is greatly increased. They lie closer together, thickest centrally; and their nuclei, except in the peripheral portion, have for the most part their long axes running radially. Throughout the cord there is a system of radial fibres, many of which may be seen to be prolongations of the cells. The fibres form a more or less well-marked external layer around the cord; their external ends generally present a trumpet-like enlargement. The roots of the nerves are formed by the outgrowth of these fibres. The motor roots are first developed. They appear first as processes of the ventral cells of the cord, penetrate the limiting membranes, and so enter the body-wall. The posterior roots arise later. His believes that the cells which Balfour, Sedgwick, and others have described as forming the beginning of the roots are merely those which grow out to become the ganglion-cells distributed in the course of the nerves. — (*Arch. anat. physiol., anat. abth.*, 1883, 163.) C. S. M. [956

Reptiles.

Characters of the Hadrosauridae. — Professor Edward D. Cope, after giving a sketch of the classification of the Dinosauria, described in detail the characters of Hadrosaurus and the allied genus Diclonius. The species of the latter, upon which his observations were made, is the Diclonius mirabilis of Leidy, which is represented in Prof. Cope's collection by a nearly complete skeleton, including the skull from the Laramie beds of Dakota. In life, this species presented the kangaroo-like proportions ascribed by Leidy to Hadrosaurus Foulkii. The anterior limbs are small, and were doubtless occasionally used for support, and rarely for prehension. This is to be supposed from the fact that the ungual phalanges are here hoof-like, and not claw-like, though far less ungulate in their character than those of the posterior foot. The inferior presentation of the occipital condyle shows that the head was borne on the summit of a vertical neck, and at right angles to it, in the manner of a bird. The head would be poised at right angles to the neck when the animal rested on the anterior feet by the aid of a V-like flexure of the cervical vertebrae. The general appearance of the head must have been much like that of a bird.

The nature of the beak, and the dentition, indicate for this strange animal a diet of soft vegetable matter. It could not have eaten the branches of trees, since any pressure sufficient for their comminution would have thrown the slightly attached teeth of the lower jaw out of place, and have scattered them on the floor of the mouth. It is difficult to understand, also, how such a weak spatulate beak as these animals possessed could have collected or have broken off boughs of trees. By the aid of its dentate, horny edge, it may have scraped leaves from the ends of branches; but the appearances indicate softer and less tenacious food. Could we suppose that the waters of the great Laramie lakes had supplied abundant aquatic plants without woody tissue, we should have the conditions appropriate to this curious structure. Nymphaea, Nuphar, Potamogeton, Anacharis, Myriophyllum, and similar growths, could have been easily gathered by the double spoon-like bill, and have been tossed by bird-like jerks of the head and neck back to the mill of small and delicate teeth. In order to submit the food to the action of these vertical shears, the jaws must have been opened widely enough to permit their edges to clear each other, and a good deal of wide gaping must therefore have accompanied the act of mastication. This would be easy, as the mouth opens, as in reptiles and birds generally, to a point behind the line of the position of the eye, which was evidently of large size. On the other hand, the indications are, that the external ear was of very small size. There is a large tract which might have been devoted to the sense of smell; but whether it was so or not is not easily ascertained.

We can suppose that the huge hind-legs of Diclonius and Hadrosaurus were especially useful in wading through the water that produced their food. When the bottom was not too soft, they could wade in to a depth of ten or more feet, and, if necessary, drag aquatic plants from their hold below. Fishes might have been available as food, when not too large, and not covered with bony scales. Most of the fishes of the Laramie period are, however, of this kind. The occurrence of several beds of lignite in the formation shows that vegetation was abundant. — (*Acad. nat. sc. Philad.; meeting* April 24.) [957

Mammals.

New character for the Arctoidea. — As further defining the Arctoidea, Flower's third group of the land carnivora, Mr. Jacob Wortman described a peculiarity of the tarsus of these animals, in which the astragalus articulates with the cuboid and the navicular. The character was constant throughout the group, and, he believed, had not before been indicated. — (*Acad. nat. sc. Philad.; meeting* April 24.) [958

ANTHROPOLOGY.

The Foulbes, Peuls, or Fellata. — The nomenclature of ethnology will have to be reduced to some system in a not very distant future. The Bureau of ethnology has endeavored to obtain a complete synonymy of the North American Indian tribes. The work has involved the time and talents of several specialists, and includes several thousands of titles. The names applied to tribes of men, to begin with, have in the hands of authors not always the same inclusion. These names are spelled variously by writers in the same tongue, and with greater variety by those of different tongue. Further, names are often given by the tribe themselves, meaning simply men, location, gens, or parentage; or by their neighbors, meaning all these in each language of tribes in contact; or also including terms of contempt. The reader, therefore, is not astonished to find Ful, Pul, Fulbe, Pouls, Peuls, Foulis, Folos, Foulbes, Fellata, Féllani, Fulan, Futa, etc., applied to those people in western and middle Soudan sprung from negro stock, on which have been ingrafted Arabic blood and religion. Herr Gottlob A. Krause has added somewhat to our knowledge of this people, and especially to their synonymy. They are called Fulan, Felata, by the Arabs; Jfullan, by the Tuaregs; Fillani, Fullani, by the Haussas; Maplatakai, by the Musgus; Felata, by the Kanuri of Bornu; Fulas, by the Mandinkas; Agoi, by the Dschumus of Joruba; Tschilmigo, by the Mossi; Kambumana, by the Gureshas; Folani, Fulga, by the Gurmas; Bale, by the Mfutas and Basutos; Fato, by the Hams; Abate, by the Shukus; and Goi, by the Rupes or Tapas. — (*Das Ausland*, March 3, 1883.) J. W. P. [959

Dialects of Bolivian Indians. — In the northwestern part of Bolivia, along the rivers Beni, Mamore, and Yacuma, live the Cayuába, Mobíma, Canichána, and Trinitaria Indians, who have come under

the influence of civilization. On the east side of the Mamore, from Exaltacion as far north as the mouth of the River Guapore, or Itenez, are the wild Houbarayos, and opposite them the Chacobos. The Cangaparangas are near the head of steamboat navigation on the Madeira. On the River Beni, between 11° and 12° south, is the small tribe of Pacaváras. Their skin is almost white. The Araunas, who are to be found on the banks of the Madre de Dios, are no doubt cannibals. The civilized Tacanas live in the village of Tumupasa, on the River Beni, and eighteen miles north-west of them, in the village of Ysiamas, the uncivilized members of the same tribe. In the little town of Reyes, opposite to them, on the Beni River, are the Marópas, related to the Tacanas. Forty miles up the Beni is the mission of Muchanes; beyond that, Santa Ana; and, farther on, Covendo; in all of which are the Moseténa Indians. In the description of these tribes, Dr. E. R. Heath gives the Smithsonian vocabulary for the Canichána, Cayuába, Mobíma, Marópa, Moseténa, Pacavára, and Tacana. — (*Kansas city rev.*, April.) J. W. P. [960

(*Folk-lore.*)

Folk-lore in Europe. — A noteworthy activity in the field of folk-lore is shown throughout Europe at present. The annual proceedings of the Portuguese folk-lore society have been recently issued at Oporto, edited by De Vasconcellos, author of *Tradicoes populares de Portugal*, and of a considerable number of folk-tales published within recent years.

Italy has done much for folk-lore since 1869, having furnished nearly one thousand folk-tales, and such important works as those of De Gubernatis. Palermo now gives us a folk-lore journal, the *Archivio per lo studio delle tradizioni populari*, edited by L. Pedone-Lauriel.

In France much is done, both in collecting and publishing. Maisonneuve & Co. are issuing a series of works on the folk-lore of all nations. Among the most important that have appeared are Sebillot's *Littérature orale de la Haute-Bretagne; Traditions et superstitions populaires de la Haute-Bretagne;* and Luzel's *Légendes chrétiennes de la Basse-Bretagne.* The same house publishes a folk-lore almanac, the second volume of which has appeared. Besides other interesting matter, this almanac contains the addresses of continental and English folk-lorists, and a carefully compiled folk-lore bibliography of the year.

In Germany and the Slav countries the work of collecting and publishing folk-lore is continually carried on with more or less activity. — J. W. P. [961

The folk-lore society of London. — The *Folk-lore journal*, now in its first year, was established by the Folk-lore society of London to satisfy a want felt for some time. Folk-lore, in the comprehensive sense of the term as now used, is growing in the world's esteem every year, and will continue to grow in proportion as its real scope and value become known. The establishment of this monthly journal was therefore most opportune, and will be welcomed by students of the mental history of mankind. Each number consists of thirty-two pages, octavo, containing generally four articles, and concluding with notes, queries, notices and news, all relating to folk-lore. To this may be added three pages of book advertisements and criticisms printed on the cover. The subjects treated in the first four numbers are: The oratory, songs, legends, and folk-tales of the Malagasy; Babylonian folk-lore; A building superstition; Stories of fairies from Scotland; Folk-tale analysis; Irish folk-tales; Bibliography of folk-lore publications in English; The hare in folk-lore; Anthropology and the Vedas; Index to the folk-lore of Horace; Some marriage customs in Cairnbulg and Inverallochy. — J. W. P. [962

Folk-lore. — The Folk-lore society of London has undertaken an analysis and classification of the folk-tales of all nations. This very important and difficult task has been intrusted to a committee, which has entered upon its labors, aided by several members of the society, who have volunteered their assistance. It is believed that a thorough analysis will reveal the root-stories and their derivatives in the various cycles of folk-tales throughout the world. When these root-stories are discovered, they are to be classified in a satisfactory system, and their derivative stories ranged under them. At a later period, myths, god and hero tales, may be treated in a like manner. A good classification of the folk-tales and myths of mankind would be a monumental work of usefulness. The efforts of the society will be watched with interest. — J. W. P. [963

Brazilian folk-lore. — Though no efforts are made in South America to collect the languages or lore of the aborigines, a volume of Brazilian folk-lore is announced for early publication in Lisbon, under the title of *Contos populares do Brazil*, by Theophile Braga. Though called Brazilian, this collection will, of course, be essentially Portuguese in character.

In the United States we have never made a collection of European-American folk-lore. But trained scholars are now making for the Bureau of ethnology a collection of the folk-lore of the North-American Indians, which, beyond doubt, will be one of the most interesting contributions offered to science for many years. — J. C. [964

Folk-lore dinners. — In 1882 a series of dinners was arranged in Paris to enable folk-lorists to meet in a social and informal manner. During the year four of these symposia were held, presided over by Messrs. Gaston Paris and Loys Bruyère. The same number will be given this year. They are called the dinners of '*Ma Mère l'Oye*' (Mother Goose dinners), and, judging by the accounts, are a decided success. It is suggested to the London society, by one of its members, to follow the example of the French. — J. C. [965

EGYPTOLOGY.

Bibliography. — The intellectual activity engaged, and the progress made, in oriental studies during the year 1882, is strikingly exhibited in the "Bibliotheca orientalis, or a complete list of books, papers, serials, and essays, published in 1882 in England and the colonies, Germany and France, on the history, languages, religions, antiquities, and literature of the east, compiled by Ch. Frederici, Leipzig, London, Paris, New York," 79 p. 8°. The whole number of titles given is 1,284, but, allowing for titles repeated, there still remain between 1,100 and 1,200 publications in 1882 on the east. Of these, 120 were devoted specially to Egypt, and include the weighty names and important works of Leemans, Birch, Brugsch, Chabas, Dümichen, Ebers, Erman, Golenischeff, Lefébure, Lepsius, Mariette, Maspero, Naville, Perrot, Piehl, Pierret, Renouf, Revillout, Schiaparelli, Stern, *et al.* In some schools of Semitic philology it is the fashion to speak contemptuously of Egyptology; but it would not appear to be the part of wisdom to pit pure philology against innumerable stone monuments with legible inscriptions plus a philology represented by an array of scholars the equals in all respects of their detractors. Semitic scholars, with other scholars of antiquity, must accept the well-founded results of cautious study of the monuments of Babylonia and Egypt, or they will find the flood upon them. — H. O. [966