WEEKLY SUMMARY OF THE PROGRESS OF SCIENCE.

ASTRONOMY.

Rings of Saturn. — Mr. William B. Taylor recalls attention to the announcement made by Otto Struve in 1851, that the observations of two hundred years showed the rings of Saturn to be widening, and the inner edge of the inner bright ring to be approaching the body of the planet. Later observations tend in the same direction; and, though there may have been unintentional exaggeration in Struve's numerical results, there seems little reason to question the general fact.

Accepting the only tenable theory of the rings, — that they are composed of discrete particles, each revolving in its own orbit, — we may, by Kepler's law, compute the period of rotation of any part of the ring. Assuming the period of the inner satellite (Mimas) to be 22 h. 37½ m., the computed period of the outer edge of the ring is 14 h. 30 m.; of the dividing-stripe, 11 h. 20 m.; of the inner edge of the bright ring, 7 h. 12 m.; of the inner edge of the dusky ring, 5 h. 45 m.; and of the ring as a whole (supposed solid), about 10 h. 50 m. The period of the planet is 10 h. 14 m.

With the complex perturbations induced by the exterior satellites, it is evident that no particle of the ring can revolve in a circular orbit; and it follows, that, in a space so crowded with particles as to give a continuous light, there must be much interference. Whether the collisions at intercepting orbits result in heat or in disintegration, they necessarily tend to a degradation of motion, and hence to a shortening mean radius-vector and a diminishing period.

It thus appears that Struve's conclusions, based on observation, have a rational theoretic basis. The rings are falling toward the planet, and will eventually be absorbed. Indeed, on the generally received meteoric theory of their constitution, it is impossible to regard their present condition otherwise than as an evanescent phase of a progressive evolution.

Mr. Taylor points out that the relation between the rotation periods of the planet and the ring, and the relation between the rotation periods of Mars and its satellites, not only fail to impeach the nebular hypothesis, as some have supposed, but even fail to be anomalous.

If the planet had a velocity of rotation equal to that of a satellite revolving at its surface, it could not approach the spherical shape. And, the concrete form having once been assumed, the rate of rotation must necessarily and continuously diminish through the influence of solar tides, until eventually the planetary day and year are identical. — (*Phil. soc. Washington; meeting* Oct. 13, 1883.) [355

ENGINEERING.

Emery's U. S. testing-machine, Watertown arsenal, Mass. — This machine is described from general and detailed drawings furnished by the designer. The machine excels in strength, capacity, durability, accuracy, and sensitiveness. The demand is said to have been: 1°. A machine to test to 800,000 pounds, and so delicate that it would test a single horse-hair. 2°. Attachments enabling it to seize and hold uninjured, while applying such loads, all usual sizes and shapes of specimens. 3°. Safety against injury by shocks of recoil. 4°. Accessibility of samples and straining parts, while in operation, for purposes of measurement and inspection. 5°. Small cost of operation.

The machine was tested, when finished, to 1,000,000 pounds, and under smaller loads, ranging down to a single horse-hair, with success; and was accepted by the U.S. board appointed to test iron, steel, and other metals. The loads are applied by a hydraulic press; and the weighing is done through reducing-pressure cushions and water-columns terminating at a point of connection with weigh-beams without knife-edges and having extraordinary sensitiveness. Mr. Emery is constructing smaller machines, and scales and pressure gauges involving the nicer and more remarkable devices introduced in the large machine, at the works of the Yale & Towne company, at Stamford, Conn. Mr. Emery's inventions are expected to aid effectively in securing a more exact knowledge of the properties of the materials of construction, and of their value in structures. — (*Amer. mach.*, July 21.) R. H. T. [356

Engineering of the great statue of Liberty. — Mr. Ch. Talausier describes the details of engineering involved in the design of Bartholdi's statue of 'Liberty enlightening the world.' The plan was conceived by M. Bartholdi in 1871, while *en voyage* for the United States. On the hundredth anniversary of the declaration of independence, France offered the great statue to the United States. It was accepted, is now nearly completed, and preparations for its erection on Bedloe's Island, in New York harbor, are being made. The statue is of copper, carried and strengthened by an inner skeleton of iron, One arm, carrying the torch, was sent to the Centennial exhibition at Philadelphia in 1876, and has since been on exhibition in New York. The sculptor first made a model 2.11 m. high, which was then copied on a fourfold scale; and the statue was constructed from this model in sections by similarly enlarging each section. For each piece, a 'centre,' or mould, was made of wood, on which the copper could be worked and fitted. The sheet-copper epidermis of the statue is composed of 300 pieces, and weighs 80,000 kilograms (178,000 lbs.). The iron frame weighs 120,000 kilograms (264,000 lbs.). When finally erected, the sheets of copper will be riveted together with copper rivets 5 mm. in diameter (0.2 in.), and spaces 25 mm. (1 in.) apart. The iron skeleton is to be secured to the foundation at four points by 12 foundation-bolts 0.15 m. (6 in.) in diameter, and extending 15 m. (49.7 ft.) into the masonry. The variation of form and dimensions, with varying temperature, is provided against by the elasticity of every part; and corrosive action is to be checked by

painting with red lead all points of contact of iron and copper. The height of the statue is 46 m. (150.9 ft.) from base to top of its torch, and 34 m. (111.5 ft.) to the top of the head. The index-finger is 2.45 m. (8.04 ft.) long, the eye is 0.65 m. (2.2 ft.) in diameter, and the nose is 1.12 m. (3.67 ft.) long. A dinner of 26 covers has been given in the trunk of the statue. The total weight will be 200,000 kilograms (440,000 lbs.). The granite pedestal will be 25 m. (82 ft.) high, and the cost of the whole not far from 1,200,000 francs ($240,000 nearly). The maximum pressure of the wind on the surface of the statue is reckoned at 87,000 kilograms (191,400 lbs.). —(*Le génie civil*, Aug. 1.) R. H. T. [357.

METALLURGY.

The basic process at Peine works, Germany — All difficulties at these works are said to have been overcome, and phosphoric pig is being made into Bessemer steel.

Analyses of the steel vary as follows: —

	1	2
Manganese	0.47	0.30
Phosphorus	0.06	0.02
Sulphur	0.06	0.03
Carbon	0.14	0.09

The cinder yields the following analysis: —

Silica	2.45
Ferric oxide	5.74
Ferrous oxide	15.10
Manganous oxide	2.75
Alumina	2.85
Lime	46.82
Magnesia	1.14
Phosphoric acid	22.23
Sulphuric acid	0.38
Sulphur	0.54

The Ilsede pig used in the above works contains 2.5 % to 3.1 % phosphorus. The walls of the converter stand 80 to 95 blows; the bottoms, 16 to 24 blows. — (*Eng. min. journ.*, July 14.) R. H. R. [358

Copper production of the world. — Messrs. Henry Merton & Co. of London have compiled statistics of production of copper in tons, from which the following figures are selected: —

	1879.	1880.	1881.	1882.
Chili	49,318	42,916	37,989	42,909
United States	23,350	25,010	30,882	39,300
Spain and Portugal	12,751	14,559	15,693	15,893
Germany	9,976	11,776	13,718	14,235
Australia	9,500	9,700	10,000	8,950
England	3,462	3,662	3,875	3,875
All other countries	39,299	41,278	45,981	46,451
Totals	147,656	148,901	158,138	171,613

The figures are claimed to have been compiled with great care. —(*Ibid.*, July 14.) R. H. R. [359

AGRICULTURE.

Manuring with potash salts. — In a large number of experiments in which potash salts (sulphate and chloride) were applied in the spring, and within three days of the time of sowing, Farsky found the effect to be a decrease of the crop. It is evident, from the author's statements, that the salts were applied in too large quantity in the immediate neighborhood of the seed. Experiments with the crude Stassfurt salts gave more favorable results in many cases. Potassium chloride gave, in most of the trials, better results than the sulphate, and fall manuring better than spring. The effect in the second year was often better than that in the first. — (*Biedermann's centr.-blatt.*, xii. 459.) H. P. A. [360

Manuring oats. — An extensive series of experiments by Beseler and Märcker gave the following interesting results: —

Manuring with phosphoric acid alone produced no notable increase of the total crop or of the grain. Manuring with nitrogen alone, in the form of nitrate of soda, gave an increase of crop roughly proportional to the amount of nitrogen applied. With a light manuring of nitrogen, addition of phosphoric acid produced a further increase of crop: with a heavy manuring of nitrogen this was not the case.

Manuring with phosphoric acid alone did not increase the percentage of proteine in the grain. Manuring with nitrogen alone increased the proteine, but diminished the fat. Addition of phosphoric acid to the nitrogenous manure restored the fat to its original amount, or even raised it above that point. The quality of the grain was best when the total amount of the crop was greatest. In these experiments the total nitrogen of the crops equalled about fifty-five per cent of the amount applied as manure. — (*Ibid.*, xii. 472.) H. P. A. [361

GEOLOGY.

Synchronism of geological formations. — Professor A. Heilprin called attention to Prof. Huxley's conclusions, that, 1°, formations exhibiting the same faunal facies may belong to two or more very distinct periods of the geological scale as now recognized, and, conversely, formations whose faunal elements are quite distinct may be absolutely contemporaneous; and that, 2°, granting this disparity of age between closely related faunas, all evidence as to the uniformity of physical conditions over the surface of the earth during the same geological period falls to the ground. Prof. Heilprin maintained that it can be readily shown by a logical deduction that the first conclusion is almost certainly erroneous, and that the second derives no confirmation from the supposed facts. If, as is contended, several distinct faunas, or faunas characteristic of distinct geological epochs, may have existed contemporaneously, then evidences of inversion in the order of deposit ought to be common, or, at any rate, they ought to be indicated somewhere; since it can scarcely be conceived that animals everywhere would have observed the same order or direction in their migrations. Why has it so happened that a fauna characteristic of a given period has *invariably* succeeded one which, when the two are in superposition all over the world (as far as we are aware), indicates precedence in creation

or origination, and never one that can be shown to be of later birth? Surely these peculiarities cannot be accounted for on the doctrine of a fortuitous migration. Nor can it be claimed, that, through the interaction of the evolutionary forces, a migrating fauna with an early-life facies will in each case, at the point of its arrest, have assumed the character of the later-day fauna which belongs to that position. Therefore it appears inexplicable that a very great period of time could have intervened between the deposition of the fauna of one great geological epoch at one locality, and that of the same or similar fauna at another locality distantly removed from the first. In other words, the migrations — for such must undoubtedly have been the means of the distant propagation of identical or very closely related life-forms (unless we admit the seemingly untenable hypothesis that equivalent life-forms may have been very largely developed from independent and very dissimilar lines of ancestry) — must have been much more rapidly performed than has generally been admitted. What applies to the broader divisions of the geological scale also applies to the minor. Thus the subordinate groups of a formation are almost as definitely marked off in the same order, the world over, as are the formations themselves. After breaks in formations, the appearance of characteristic fossils is largely the same; whereas, on the theory of synchronism of distinct faunas, such a succession would certainly not be constant. The opinion held by the older geologists was therefore probably correct; namely, that formations characterized by the same or very nearly related faunas in widely separated regions belong, in very moderate limits, to approximately the same actual age, and are to all intents and purposes synchronous or contemporaneous. —(*Acad. nat. sc. Philad.; meeting* Oct. 2, 1883.) [362

METEOROLOGY.

Tornado studies. — A study of the tornado of June 7, 1882, in the valley of Säby, has been made by Fineman. It embraces investigations upon the course of this tornado, and the accompanying atmospheric conditions, which are not different from those pointed out by Finley in the case of tornadoes in the United States, and includes a general investigation of the theory of tornadoes, with references to the work of other authors in this field of inquiry. The author refers to the combination of great humidity, high temperature, and absence of wind, as the special condition of tornado formation, and investigates the characteristic phenomena shown in its progress. He further discusses the relation of tornadoes and thunder-storms, and urges increased study in solar radiation and the gyratory motion of fluids, in order to throw light upon this and other meteorological investigations. — (*Sur la Trombe*, June 7.) W. U. [363

Notes. — The annual re-union of the council of the meteorological bureau of France was held in March. The leading discussions related to observations in agricultural meteorology, the securing of reports of thunder-storms and rainfall statistics, and the transmission of telegraphic messages in the interest of the science (*Ann. soc. met.*, March, 1883). —— A valuable contribution to our knowledge of the surface-temperatures of the Atlantic along the coasts of Portugal, Senegambia, and Brazil, has been made by M. Hautreux from the observations taken on the steamers which traverse this region (*Ann. hydr.*, viii. 1883). —— The *Zeitschrift* for August contains a number of climatological articles, discussing observations made at Stuttgart, Frankfort, Lyons, Puebla, Quadalajara, and in southern Brazil. —— The *Annuaire* for May contains a contribution to the study of the climate of central Africa, by M. Angot, from observations, which are rather fragmentary, made at three missionary stations, mostly in 1881. —— Rev. Clement Ley is preparing a work upon the observation of clouds. The international committee, at its meeting in 1882, appointed a committee, consisting of Messrs. de Brito Capello, Clement Ley, and Hildebrandsson, to draw up a scheme of instructions for the observation of cirrus-clouds. —— Dr. Selah Merrill, U. S. consul at Jerusalem, has submitted to the State department a report upon the climate of Palestine, based upon observations covering a period of twenty-two years. An extract is published in the August Weather review of the signal-office. — W. W. [364

GEOGRAPHY.

(Arctic.)

Arctic notes. — The Austrian Jan Mayen expedition arrived at Vienna, Aug. 22, and were received with public festivities. No illness had occurred during their stay on the island. The observations taken are satisfactory. Rich collections have been made, and numerous photographs taken. —— The latest news from the English party under Capt. Dawson, at Fort Rae in the North-west Territory, is favorable, and observations were going on with regularity. Spectroscopic observations of the aurora borealis have been very satisfactory, though the phenomena have not been particularly brilliant. —— Satisfactory accounts have also been received of the work done by the Swedish expedition to Spitzbergen, which has returned without loss or accident. —— Reliable information has at last been received from the Schieffelin party, on the Yukon, near its junction with the Tananah River. They have returned to San Francisco all well. Gold had been discovered twelve miles up from its mouth, on a small river falling into the Yukon. The bed-rock was slate, and the gold found was in smooth washed particles in loose gravel. Winter setting in prevented further search, and the season was found to be too short for satisfactory results in placer mining. Mr. Schieffelin warns prospectors against coming rashly into the country, unprovided with supplies and tools, as nothing suitable for prospecting work can be had there. —— Later reports from the Arctic Ocean north from Bering Strait give little improvement in the conditions or catch of the whaling-fleet over previous advices. The whalers were anticipating better luck toward the end of the season. —— A button and coin obtained at Cape Prince of Wales, from the natives, about a year ago, have been forwarded to the Navy department in the idea that they might be relics of

Putnam, who was lost on the ice during the Jeannette search. They were said to have come from the body of a drowned white man. The natives of this region are fond of inventing such stories, especially since the search expeditions, as they suppose they will be paid for them. Navy brass buttons have been an article of trade on this coast for many years. The fact that Putnam had no such buttons on his clothing when lost, settles the case in regard to these particular objects. —— Bove discusses in the bulletin of the Italian geographical society the meteorological observations made on board the Vega during her voyage in Siberian seas. His article is a *résumé* of the work of Hildebrandsson, elsewhere published. —— In the Bulletin of the *Paris société de géographie*, A. Bellot summarizes the history of the Jeannette expedition, and the distribution of the international polar stations. His paper is accompanied by a map. — W. H. D. [365

(*Asia.*)

Population of Japan. — The last census (January, 1883) gives a total population of 36,700,118 souls, nearly equally divided between the sexes, the males being about one per cent in excess. Kioto, the imperial city, contains 709,000, and Tokio, the capital, 1,064,000 inhabitants in round numbers. — (*Bull. soc. géogr. Mars.*, June.) W. H. D. [366

Petroleum in the Caucasus. — According to the British vice-consul at Batum, Mr. Peacock, the oil-region of the Caucasus covers some 1,200 square miles. The most productive locality is the Apcheron peninsula, where the wells far exceed those of Pennsylvania. The total production has risen from 500,000 barrels in 1873, to about 4,000,000 barrels in 1881. The export from Baku has increased at the rate of 1,250,000 barrels in two years. According to the daily papers, a pipe-line is projected from the oil-region to Baku; and the American producer must rely on the quality of his product, rather than on its cheapness, for the future of our export trade. — (*Brit. cons. rep.*, 1882.) W. H. D. [367

BOTANY.

Observations on yeast fungi. — The fifth part of Brefeld's '*Botanische untersuchungen*' forms a volume of over two hundred pages, with thirteen quarto plates, and treats of the development of the Ustilagineae. The author considers principally the germination of different species of Ustilago, Thecaphora, Geminella, and Tilletia; and, besides sowing the spores in water, he sowed them in nutritive fluids, and by this means was able to get more luxuriant growths than other students of this order of fungi. The germination of the different species may be classed under two different types. In the one, a short promycelium is given off by the spore, and the sporidia are borne laterally; while, in the second type, a whorl of cells is borne at the tip of the promycelium. By using nutritive fluids instead of water, Brefeld was able not only to obtain luxuriant growths of sporidia, but also to keep them alive for several months, or even a year. He believes that the sporidia are merely conidia, and in his cultures they produced fresh crops of conidia for an indefinite period. He further considers that the so-called conjugation of the secondary cells of species belonging to the second type, as Tilletia, is not a sexual process at all, but merely a fusion such as exists in other orders of fungi. When cultivated in nutritive fluids, the whorls of secondary cells do not conjugate or fuse, but produce conidia directly; while in water, which is not favorable to further growth, a fusion takes place. He calls the conidia 'hefe,' from their resemblance to the forms of Saccharomycetes; the difference being, that in one case, although the yeast-like form can be made to propagate itself in fluids indefinitely, we know that it came originally from some species of Ustilagineae, whereas, in the other case, illustrated by the beer ferment, we cannot tell of what form it was originally the conidia. He refers to other hefe-forms in the Hymenomycetes and Ascomycetes. In *Exoascus aureus* he states that the polysporic condition of the so-called asci is nothing more than a hefe-like growth of a few round spores within the ascus. In short, he believes that all yeast-like forms are merely conidia, and denies the autonomy of the Saccharomycetes; nor does he believe that they are closely related to the Ascomycetes. — W. G. F. [368

Insect fungi. — Hoffmann figures an interesting branched variety of the rare Torrubia cinerea Tul., on an adult Carabus from Germany, under the name of var. brachiata. The typical form occurs on Carabid larvae. — (*Flora*, Aug. 21.) W. T. [369

ZOÖLOGY.

Mollusks.

Landshells of Gibraltar. — Kobelt reports, that the fauna of the Rock of Gibraltar is very peculiar, many characteristic species of the Mediterranean being wanting. The genus Leucochroa, for instance, is represented neither in Gibraltar nor on the opposite coast of Morocco. Certain species of Cyclostoma and Pomatias are equally absent from both shores. Twenty species of landshells, including three undescribed species and two new varieties, were obtained on the Rock in May, 1881; but it is supposed that this is a more or less incomplete exhibit, the season of the year being not the most favorable. The locality is peculiarly interesting on account of its intermediate position between Spain and Morocco. The sea-fauna of the Bay of Gibraltar is also very rich, and contains many rare or peculiar forms. — (*Journ. conch.*, iv. no. 1.) W. H. D. [370

Absorption of the shell in Auriculidae. — Crosse and Fischer illustrate and describe the peculiar absorption of the inner parts of the upper whorls of the shell in this family, and also in the genus Olivella. These animals appear to have the power of dissolving entirely the internal partitions of the shell, from a point some distance inside the aperture to the very apex. The only exception in the family Auriculidae is the genus Pedipes, in which the partitions were found intact. The absorption is not always complete, nor are the same parts invariably

missing. Complete absorption was observed in Melampus, Auricula, Blauneria, Marinula, Tralia, Alexia, Monica, Plecotrema; only partial absorption in Cassidula and Scarabus. The case of Olivella is more remarkable; since the allied groups Oliva, Ancillaria, etc., do not, according to the authors, present this peculiarity at all. — (*Journ. de conchyl.*, xxii. 3.) Tryon, however, observes that in Oliva reticularis he has found the walls absorbed away, so that very little of the substance remained, and considers it probable that all shells with close volutions are in the habit of absorbing them internally. It is certainly the case with many of them. — (*Man. conch. Olivella*, p. 64.) W. H. D. [371

Crustaceans.

Anatomy of the spider-crab, Libinia. — E. A. Andrews gives a very careful description, illustrated with three excellent photolithographic plates, of the anatomy of Libinia emarginata, the common spider-crab of the eastern coast of the United States. The paper, which was originally presented as a graduation thesis for the bachelor's degree in the Sheffield scientific school, describes fully the structure of the body-walls, appendages, and the alimentary, circulatory, nervous, and reproductive systems. The structure throughout agrees very closely with that of Maia squinado of Europe. Mr. Andrews's work will be found a very useful guide for American students, as it is the only description thus far published of the whole anatomy of any American brachyuran. — (*Trans. Conn. acad.*, vi., Aug., 1883.) S. I. S. [372

A new host for Cirolana concharum Harger. — Rev. Samuel Lockwood announced the discovery of this isopod in the interior of the edible crab, Callinectes hastatus Ordway. The crab was an adult female, and the parasites were crowded in the left side of the carapace. Incredible to say, there were twenty-three full-grown specimens, measuring three-fourths of an inch by about a quarter of an inch each. The ovaries and the tissues on the left side were completely honeycombed. How long the animal could have lived, and what its real sufferance of pain was, are questions. But with these predaceous wolves, literally consuming its inwards, it surely would soon succumb. It seemed to Mr. Lockwood that they must, when in the swimming larval state, have entered near the eye-stalks of the crab, which, with a large catch of others, was taken at the close of February in Raritan Bay, New Jersey. From the size of the parasites, it would seem they had been in possession some three months. The determination of the isopods was due to the kindness of Mr. Oscar Harger. The query how so large a number could have entered the same place, and at the same time, he thought was met by the supposition that the crab had found a nest of the larvae, and was feeding on them, when a part of the batch entered the host, as conjectured above. — (*New Jersey st. micr. soc.; meeting* March 19.) [373

Arachnids.

Restoration of limbs in Tarantula. — Rev. Henry C. McCook remarked that a tarantula exhibited to the meeting had been kept in confinement nearly a year, fed during winter on raw beef, and in summer on grasshoppers. In the spring it cast its skin by a laborious process, in the course of which it lost one foot and two entire legs. This summer again, during the latter part of August, the animal moulted. The moult as exhibited is a perfect cast of the large spider, — skin, spines, claws, the most delicate hairs all showing, and their corresponding originals appearing bright and clean. The moulting occurred during Dr. McCook's absence, but was just finished when he returned. When the cast-off skin was removed, it showed, as might be supposed, the dissevered members to be lacking. On looking at the spider itself, however, it was seen that new limbs had appeared, perfect in shape, but somewhat smaller than the corresponding ones on the opposite side of the body. The dissevered foot was also restored. The loss of the opportunity to see the manner in which the legs were restored during moult was greatly regretted, but we have some clew from the careful and interesting studies of Mr. Blackwall. Several spiders whose members had been previously amputated were killed and dissected immediately before moulting. In one of these the leg, which was reproduced, was found to have its tarsal and metatarsal joints folded in the undetached half of the integument of the old tibia. Another like experiment was made with an example of Tegenaria civilis. The reproduced leg was found complete in its organization, although an inch in length, and was curiously folded in the integument of the old coxa, which measured only one-twenty-fourth of an inch in length. Dr. McCook's tarantula had lost both legs close to the coxae; and in the moult the hard skin formed upon the amputated trunks was wholly unbroken, showing that the skin had been cast before the new leg appeared. We risk nothing in inferring, that, as in the case of Blackwall's Tegenaria, the rudimentary legs were folded up within the coxae, and appeared at once after the moulting, rapidly filling out in a manner somewhat analogous to the expansion of the wings in insects after emerging. — (*Acad. nat. sc. Philad.; meeting* Sept. 25.) [374

VERTEBRATES.

Birds.

Anatomy of the Passeres. — Mr. Forbes finds the syrinx, as well as all other points examined, of Orthonyx spinicauda and O. ochreocephala, to be strictly oscinine. The carotid of the first is peculiar in that it accompanies the vagus nerve instead of running in the hypophysial canal. On anatomical grounds, O. ochreocephala is separated from the Australian form as Cletonyx of Reichenbach. Contrary to Prof. Parker, Mr. Forbes finds a perfectly oscinine syrinx in Petrocca. — (*Proc. zoöl. soc. Lond.*, 1882, 544.) J. A. J. [375

Respiratory organs of Apteryx. — Under this title, Prof. Huxley gives a succinct account of the lungs and air-sacs as typically found in birds, and notes that the respiratory organs are separated by an oblique septum from the cardio-abdominal cavity, as in the crocodiles. The lungs of Apteryx are strictly

avian, in no wise mammalian, though poorly developed. Prof. Huxley considers them to show a fundamental resemblance to those of crocodiles. The introduction of so many new terms is to be regretted. — (*Proc. zoöl. soc. Lond.*, 1882, 560.) J. A. J. [376

ANTHROPOLOGY.

Indian courtship. — Mrs. H. S. Baird recites a bit of her own observation respecting Indian courtship half a century ago in Wisconsin. When a youth falls in love, he places himself a little way from the maiden's wigwam, wearing one blue and one red legging. He then plays in a minor strain an air upon the flute, pib-pi-gwan. If he is permitted to proceed, he knows that there are no objections to his addressing the loved one. If the parents have objections to him, he is informed that he is too noisy, etc. In the latter case he discontinues his serenades: in the former the flute-playing gives place to visits, the father saluting, and saying, 'Come in, friend: there is room for you;' upon which all the family give a sort of hitch up, to make room for one more around the fire. The young man seats himself by the door, and next to the daughter; as the eldest son and daughter always sit nearest the door, on each side of it. The lover then produces a few small pine sticks, one of which he lights at the fire, and hands to the maiden. If she takes it, he is accepted: if she does not, but lets him hold it until it goes out, he is rejected. When the time arrives for them to be united, the parents of the young man bring valuable presents, such as furs, while the parents of the bride bring ornamental work. These are distributed among the friends. The bride is dressed by her sister-in-law, and conducted to her place in the wigwam to await alone the coming of her husband. In other cases, when father-right prevails, she goes to his home. A man can have as many wives as may be required to dress his game and carry it home. — (*Wisc. hist. soc.*, ix. 311.) J. W. P. [377

The mounds of Wisconsin. — If one wishes to keep himself informed upon archeology, he must not neglect the volumes of the state historical societies. The Rev. Stephen D. Peet has done a good service, with reference to the emblematical mounds in Wisconsin, by presenting in a condensed form not only the description of the structures, but also the names of the most important works in which references to them may be found. Mr. Peet is well acquainted with the effigy mounds, and therefore adds many original observations, which are in the main extremely cautious. Attention is directed to the difficulty of determining the shape of the mounds, by reason of deformations due to the plough, the tramping of cattle, the wear of the elements, the avarice of relic-hunters, and the encroachments of the modern architect. Again: many of the animals once common have departed from this region, such as the buffalo, moose, elk, antelope, bear, lynx, and wild turkey. If the mounds represented in shape the badges, weapons, and symbols of the natives, they, also, are unfamiliar.

The author ascribes to all these mounds a religious significance, in which opinion he is not warranted by what is known. His reflections upon the cross-symbol, however, are very just. As to the shapes of these structures, we have the mace, double bow, groups of cones, triangular enclosures, besides every variety of animal supposed to have lived in this region. Mr. Peet dismisses the 'elephant mound' with a modest introduction to its sponsor. — (*Wisc. hist. coll.*, ix. 40.) J. W. P. [378

Chinese not homogeneous. — Mr. E. Colborne Baber, secretary to H. M. legation, Peking, makes the following interesting statement: "The population of China is far from being so homogeneous as is generally supposed. I have often heard English people assert their inability to distinguish one Chinaman from another; but it may surprise you to hear that a Chinaman, on first coming into contact with Europeans, makes precisely the same remark of ourselves. At first they have some difficulty in even distinguishing a woman from a man. In spite of a general persistence of type, there is at least as much variation among the natives of the eighteen provinces as there is among the inhabitants of Europe. A thousand years before Christ the Chinese nation occupied a mere fraction of the territory which they now possess. Even then they were not homogeneous in manners or speech, and they were environed by many non-Chinese indigenous peoples. Since then the Chinese have spread, not by ousting or exterminating their neighbors, but by a process of absorption: in other words, they migrated among them, and intermarried with them; and their superior energy and comparative civilization gradually effaced the national characteristics of the surrounding tribes. The same process is going on in Tibet, in Burma, in the Shan country, in Tonquin, and in the Straits Settlements. The Chinese blood has been mingled with such diverse stocks as the Tatar, Turki, Tibetan, Burmese, Mon-annan, Tai, and Polynesian." The discussion of this paper by Sir Rutherford Alcock, Sir Thomas Wade, Col. Yule, and Mr. Colquhoun, is a valuable contribution to Chinese sociology.— (*Proc. geogr. soc. Lond.*, Aug.) J. W. P. [379

NOTES AND NEWS.

THE Maryland oyster commission, which has in view the invention of some plan which should check the depreciation of beds belonging to the state without unduly interfering with trade, met in Baltimore recently. It was suggested that dredging be restricted in various ways, and the available grounds increased by sowing the bottom with dead oyster-shells where none now exist. In 1879 Lieut. Winslow found the average in Tangier Sound to be one oyster to 2.4 square yards. In their recent examination of the oyster area of the state, the commission found that the average of sixty-one beds examined was one living oyster to each 3.7 square yards, showing a rapid and important decrease since 1879. The commission finds, as the result of the examination of forty-six oyster-beds, that there are only 1.35 living oysters to every bushel of dredged shells. While the oysters are