teristic to permit of their being placed specifically. The formation represented belongs to the pliocene or later miocene, although its exact position is somewhat uncertain. The tapir had been found in several states; and the mastodon was, of course, widely distributed; but neither the rhinoceros nor the camel-like remains represented in the collection had before been found east of the Mississippi. Professor Heilprin regarded the discovery of importance as lending decided support to Professor Hilgard's views regarding the former distribution of land in the region of the Gulf of Mexico, and the probable connection of Florida with Mexico. Similar fossils had, he believed, been found in the Mexican plains. The bed-rock near Archer, Fla., belongs to the oligocene formation. —— Mr. Joseph Willcox announced that he had again found in Florida, specimens of Nummulites Willcoxi Heil., which had been regarded as of so much interest when collected by him a year ago. The examples now submitted for inspection had been obtained about fifteen miles north-east of the original locality on Cheeshowiska River, and about a hundred and fifty feet above the sea. Professor Heilprin commented on the importance of the discovery of the more elevated region just reported as indicating where the nummulitic formation could actually be seen. The other specimens were collected not more than two feet above tide-water, and were not, therefore, absolutely indicative of the position of the parent rock. From association with the Orbitolites, we can state that the beds belong to the upper oligocene age. The genera Nummulina, Orbitoides, Heterostegina, Quinqueloculina, Triloculina, and perhaps Biloculina, together with Spirorbulina, were represented in the masses of rock received from Mr. Willcox. The remains of fresh-water mollusks were associated with them, specimens of microscopic Paludina having been determined. This association of fresh-water with marine organisms might indicate the former emptying of a river into the sea, or the presence of fresh-water swamps in ancient Florida. The elevation of the locality whence the fossils were obtained need not be regarded as complicating the problem; for it must be remembered that this in no way represents the original height of the formations.

Philosophical society, Washington.

March 29. — Dr. J. S. Billings spoke of the uncertainty of measurements of cranial capacity. The best results, without the division of the skull, are obtained by means of shot, which is poured in, and afterwards measured; but even these are poor. The same observer does not obtain closely approximate results from successive measurements of the same skull, and different observers obtain widely different results. He then exhibited a series of composite photographs of skulls, each photograph being derived from a series of adult male skulls of one race. In the formation of each negative, the plate was exposed successively to from seven to eighteen skulls. —— Prof. G. Brown Goode spoke on fisheries exhibitions, describing especially the international exhibitions at Berlin (1880) and London (1883). —— Mr. M. H. Doolittle began a communication, which was completed at the following meeting.

April 12. — Mr. M. H. Doolittle completed his communication on music and the chemical elements. The mathematical theory of music requires the satisfaction of the equation $2^x = \frac{3}{2}^y$ nearly, in which, for equal temperament, $x =$ the number of equal intervals in the octave, and $y =$ the number of these intervals that correspond to a nearly perfect fifth; and, for untempered music, $x =$ the number of approximately equal intervals in the octave, and $y =$ the number corresponding to a perfect fifth. This equation gives $\frac{x}{y} = \frac{\log \frac{3}{2}}{\log 2}$ nearly, $= \frac{176031}{301030}$ nearly; and, by the method of continued fractions, we obtain the succession of approximations, $\frac{3}{5}$, $\frac{7}{12}$, $\frac{24}{41}$, $\frac{31}{53}$, etc. For scales appropriate to major thirds, but disregarding fifths, we may substitute $\frac{5}{4}$ for $\frac{3}{2}$ in the above equations, and obtain the approximations, $\frac{1}{3}$, $\frac{9}{28}$, $\frac{10}{31}$, etc. For the chord having the vibration ratio 7:4 we may obtain in like manner the approximations, $\frac{4}{5}$, $\frac{31}{26}$, etc. The fraction $\frac{7}{12}$, belonging to the first series, is the base of the chromatic scale, and, less directly, of the diatonic. The fractions $\frac{3}{5}$ and $\frac{4}{7}$, of the first and third series, probably represent all the five-toned scales of primitive music. Pentatonic, chromatic, and diatonic scales have thus a mathematical basis, and are in a proper sense natural. There is reason to believe that simple mathematical principles underlie the phenomena of chemistry, and that the quantitative relations of the elements are expressible in the derivatives of small prime numbers. There is, therefore, no *a priori* absurdity in looking for a correspondence of musical and chemical ratios. If the keys of a piano be arranged with seven consecutive keys in a line, the next seven in the next line, and so on, the columns give successions of musical fifths. It has been shown, that when the chemical elements are arranged in the order of their atomic weights, in lines of seven, the columns contain elements remarkably similar to each other. If the piano-keys be arranged in lines of twelve, the columns give octaves; but nothing is developed from a similar arrangement of the chemical elements. The general conclusion was reached, that there is no deep significance in the coincidence of the number seven in the diatonic scale and in the chemical groups. —— Mr. Henry Farquhar then reviewed the theoretical discussion in Professor Tait's article on mechanics, in the Encyclopaedia Britannica, dissenting from several of his positions.

NOTES AND NEWS.

THE 'circulars' of Johns Hopkins university now appear so frequently, and with such varied and valuable contents, that they may already be looked upon as among the most important contributions to learning in our country. This is the more remarkable as no less than five important serial publications are issued under the auspices of the university, and in large measure are devoted to contributions from its

members. Baltimore has thus taken its place as one of the leading centres of science and learning in our country, and bids fair soon to outstrip older centres in the renown which must follow. The circular for April follows hard after that of March; and we notice in it a number of interesting facts, with abstracts of valuable papers which give an insight into the intellectual delights and activities surrounding the young university. Dr. Brooks gives an outline of the work of the Chesapeake zoölogical laboratory, from its beginning six years ago, dwelling especially upon its service in studying the propagation of the oyster. The lecture of Dr. Martin on modern physiological laboratories, and the account of that lately constructed for the university, are reprinted from *Science*. Reviews or analyses of books published by the officers of the university, and abstracts of papers in philology, history, mathematics, and other branches of science, fill up a large part of the number. We observe that an attempt is to be made to construct a map of the region about Baltimore, including about six hundred square miles, on the scale of two inches to a mile, based mainly on work already effected by the U. S. coast-survey.

— After the U. S. fish-commission steamer Albatross left Aspinwall, April 2, a line of soundings was started for Old Providence Island, about 250 miles distant. Casts were made at intervals of from ten to twenty-five miles. Starting with 707 fathoms, 17 miles from Aspinwall, the water shoaled to 611 fathoms at 27 miles, reached the maximum, 1,900 fathoms, 77 miles from port, and then shoaled gradually to 339 fathoms close to the reef off Old Providence.

On leaving Catalina harbor, on Old Providence Island, April 9, the Albatross laid a course for a doubtful bank 109′ distant, in latitude 14° 53′ north, longitude 80° 20′ west, sounding at intervals of about eleven miles. The water increased gradually in depth to 1,151 fathoms on the reported bank, where it was supposed to break at times. The spot was carefully located by astronomical observations. After crossing a bank lying between Thunders knoll and Rosalind bank, a course was laid north-west for a vigia marked on hydrographic-office chart No. 394 in latitude 18° 30′ north, longitude 83° 16′ west. The depth gradually decreased to 920 fathoms, 75 miles from Thunders knoll, then suddenly increased to 3,169 fathoms at 105 miles. This was the greatest depth found in the Caribbean, and the sounding was made under adverse circumstances. On the first trial, the stray line parted, after something over 200 fathoms had run out, the sounding-rod, water-bottle, and shot being lost. It is difficult to explain this accident, unless it is to be attributed to a shark or some other fish; as the strain on it at the time did not equal one-tenth of its tensile strength. On the second attempt, all the wire was run off the reel without reaching bottom; and the shot had to be reeled in, more wire added, and finally the sounding taken. The bottom was a light yellow ooze, with a trace only of foraminifera.

The currents, which had been light since leaving Old Providence, now became strong and irregular. On reaching the position assigned to the vigia, 66 miles from the deep sounding above mentioned, a sounding was taken in 2,829 fathoms. While making this distance, and taking two intermediate soundings, the vessel was so beset by strong and erratic currents, that it was only by locating each position astronomically that it could be kept anywhere near the desired locality. If these currents have been encountered by other navigators, who were steering a course without taking hourly observations, a very brief period would be required to take them sufficiently out of their reckoning to account, not only for the vigia mentioned, but the soundings of H.B.M.S. Phoebe and Rosario to the eastward of Misterioso bank, which was itself, doubtless, reported in a multitude of positions before it was finally located on the charts of to-day. From this point, the Albatross sailed for Key West by way of Cape San Antonio, reaching port, April 15.

— The annual session of the American oriental society was held in Boston, May 7. Since the last meeting, the society has lost by death an unusually large number of its members; its president, Hon. S. Wells Williams, and Dr. Ezra Abbot, being among the number. Dr. Abbot, who resigned his office two or three years ago, had served the society as recording secretary for more than thirty years. Tender and appropriate tributes were paid to the memory of both of these men; the former having been the foremost Chinese, and the latter the foremost biblical, scholar of America. In the election of officers, Professor Whitney of New Haven was chosen president, and Professor Lanman of Cambridge, corresponding secretary. Baltimore was selected as the place for the next meeting.

Nine papers were presented to the society, four of which discussed Sanskrit topics. Prof. C. R. Lanman gave an account of Protap Chundra Roy's enterprise in furnishing gratuitous editions and translations of the ancient Hindu classics, noticed elsewhere in our notes. He also read a paper on one of the spurious stanzas of the Rig Veda (10, 18, 14), illustrating by remarks on the stanza the subject of Vedic criticism. Professor John Avery of Brunswick, Me., presented a paper on the unaugmented verb-forms in the Rig Veda and the Atharva Veda. Professor Whitney, who read a paper on the study of Sanskrit *versus* that of the Hindu grammarians, showed that a study of the literature itself is the only proper way to learn Sanskrit. He gave many illustrations of the artificial and arbitrary character of the grammars.

Prof. I. H. Hall of Philadelphia gave some notes on a Çippus from Tarsus, now in the Union theological seminary at New York, bearing a Greek inscription. He pointed out that the name Paul, which occurs in the inscription, cannot, as has been supposed, be that of the great apostle. Professor Hall read a second paper on a Shapira roll in Philadelphia. He thinks that no part of this Hebrew document can be older than the last century, while part of it possibly belongs to the present century. The remarkable fact about it is, that an age of more than a thousand years has been assigned to it, which would make it the oldest known Hebrew manuscript. This great

antiquity is supported by a letter from the celebrated Tischendorf. It appears that the late Mr. Shapira, so noted for his dealings in antiquities, palmed off on some too credulous purchaser the Philadelphia roll, aiding himself in the fraud by a letter which Tischendorf had intended to apply to two other rolls. Professor Hall gave, also, some notes on Cypriote inscriptions in the New-York metropolitan museum.

A paper was read from President W. A. P. Martin of Peking, on the northern barbarians in ancient China. Dr. Carl Lehmann of Hamburg read a paper on the relation of *n* to *sh* in proto-Babylonian (Sumero-Akkadian). The fact that *n* in one of the dialects corresponds to *sh* in the other, the reader accounted for by the aid of the transitional sounds *l* and *r*, and he adduced support for his view both from Indo-European and from Semitic grammar. Prof. D. G. Lyon of Cambridge made remarks on some recent Assyrian publications, mentioning his own '*Keilschrifttexte Sargon's*,' Delitzsch's 'The Hebrew language viewed in the light of Assyrian research,' Haupt's '*Das babylonische Nimrodepos*,' Strassmaier's '*Alphabetisches verzeichniss*,' and Bezold and Hommel's '*Zeitschrift für keilschriftforschung und verwandte gebiete.*'

— Quintino Sella, the Italian statesman and *savant*, who died at Biella, March 14, and was buried at Oropa, was born at Mosso, near Biella (Piemont), July 7, 1827, and was named 'the fifth,' as holding that number in a family of sixteen children. His father was a wealthy woollen manufacturer, and he was educated as a mining-engineer at the School of mines in Paris. His scientific works, although few, are all remarkable for their accuracy and acuteness of observation, showing the true spirit of original research. From 1857 to 1861 he published several memoirs on crystallography, — '*Sulle forme cristalline di alcuni sali di platino e del boro adamantino*,' and '*Sulle forme cristalline di alcuni sali derivati dall' ammoniaca*;' later, two important geological and technical descriptions of the valley of Biella and the mining industry of the Island of Sardinia, and also his '*Lezioni di cristallografia.*'

Sella was one of the three founders of the '*Club alpino Italiano*,' October, 1863, and its president at the time of his death. On the 17th of July, 1865, in company with his lifelong friend, Felice Giordano, director of the geological survey of Italy, Sella undertook the climbing of the Matterhorn (Sylvio or Cervin) from the Italian side, starting from Breuil in the Val Tourmanche. After an unsuccessful attempt, they reached the summit only three days after the celebrated ascension of Whymper and his unfortunate companions. As president of the Reale accademia dei lincei of Rome, he remodelled entirely this old scientific institution, which was removed in January last to the celebrated palace Corsini. He was also president of the International geological congress at Bologna, 1881; corresponding member of the Institut of France; and foreign member of the Geological society of London.

As a statesman, Sella ranked among the first. He was thrice secretary of the treasury, and chief of the constitutional party of the right. On his first appointment to the treasury, in March, 1863, he found Italy on the verge of the greatest financial difficulties, if not of a catastrophe; but, by his good management, in less than ten years he restored the Italian exchequer to a normal condition, balanced the expenses with the receipts, and has been justly called, by the president or speaker of the house of representatives, the '*Salvator del l'onore d'Italia.*' The '*Camera dei deputati*' has appropriated '100,000 *lire, per un monumento alla memoria di Quintino Sella*,' to be erected in front of the treasury (*Ministerio delle finanze*) at Rome.

— Protap Chundra Roy is a wealthy gentleman of Bengal, who has retired from business, and is devoting his leisure to the work of the Bharat Karyalya. This is an organization somewhat similar to the American tract society, but with a strangely different purpose. It is an institution for the printing and gratuitous distribution of the classics of India; the Mahā-bhārata, the Rāmāyana, and the Harivansa being the works first chosen. Already 13,783,500 printed forms have been gratuitously distributed, or are in course of distribution. Such a surprising result of well-directed and truly patriotic zeal deserves to be mentioned and recognized by all who are interested in the elevation and enlightenment of India, and especially by Sanskrit students in America. For Chundra Roy is now undertaking the publication of an English prose translation of the Mahā-bhārata in an edition of twelve hundred and fifty copies, two hundred and fifty of which, according to the generous and wide-reaching plans of Mr. Roy, are intended for the scholars of Europe and America. Sanskrit scholars, therefore, who desire to have their names placed on the free list, may forward their addresses to the publisher, No. 367 Upper Chitpore road, Calcutta, British India.

— Dr. Höpfner and a young scientific companion will shortly start for Ovamboland and the interior of Africa to explore for the Bremen geographical society. They have been supplied with instruments for astronomical observations by a member of the society: in return, they will send home periodical reports of their progress, and charts of the district explored. The same society is sending an expedition to Bonin Island, South Japan, to investigate its geography and natural history.

— At Ekhmeem, a large provincial town of Upper Egypt, situate about halfway between Assiout and Thebes, Professor Maspero, returning from his annual trip of inspection up the Nile, has just found, according to *Nature*, a hitherto undiscovered and unplundered necropolis of immense extent. As far as has been yet ascertained, the necropolis dates from the Ptolemaic period; but, as the work of exploration proceeds, it will probably be found that it contains more ancient quarters. The riches of this new burial-field would meanwhile seem to be almost inexhaustible. Five great tombs or catacombs, already opened, have yielded a hundred and twenty mummies; and, within the short space of three hours,

Professor Maspero verified the sites of over a hundred more similar catacombs, all absolutely intact. The necropolis of Ekhmeem, at a rough estimate, cannot contain fewer than five or six thousand embalmed dead. Of these, perhaps not more than twenty per cent will turn out to be of archeological or historical value; but the harvest of papyri, jewels, and other funeral treasures, cannot fail to be of unprecedented extent. Ekhmeem is the ancient Khemnis, — the Panopolis of the Greeks. Its architectural remains are insignificant.

— The Alert, the store-ship of the Greely relief expedition, and the last of the vessels to sail, left New York, May 10. The Bear sailed from New York on the 24th of April, and reached St. John's, May 2; while the Thetis, the flag-ship of the fleet, and supposed to be the stanchest of the three, sailed from New York on that day, and reached St. John's on the 9th. Every thing that could be suggested in the way of equipment has been done for the party, and it is to be hoped that the pluck and discipline of the *personnel* will atone for their lack of experience.

— The subject of the thesis for the annual Walker prize of the Boston society of natural history, this year, was 'The life-history of any animal or plant.' Two essays only were offered in competition, and the first prize only was awarded: this was gained by Mr. Albert H. Tuttle, of the Harvard medical school, Boston, for a study of the embryology of Luuatia heros, with numerous illustrations.

Prof. A. E. Verrill has in press a very important paper entitled Second catalogue of Mollusca recently added to the fauna of the New-England coast and adjacent parts of the Atlantic, consisting mainly of deep-sea species, with notes on others previously reported. These are chiefly derived from the dredgings of the fish-commission, are well illustrated, and worked up in the full and careful manner characteristic of the author. It appears in the Transactions of the Connecticut academy of sciences, and is illustrated by Emerton.

— The annual report of the zoölogical gardens of Cincinnati states that over eight hundred animals are on exhibition, and that a hundred and twenty-seven were bred in the gardens last year, including a grizzly bear. The most noteworthy addition during the year was that of a young hippopotamus, which promises to become the main feature of the collection. Nearly twenty-eight thousand dollars were received from visitors' fees.

— The additions to the American museum of natural history in New York seem not to have been so numerous or important last year as in previous years. The museum has, however, received its first bequest (five thousand dollars, from Mr. W. E. Dodge), and makes it the occasion to establish a permanent endowment-fund. The absence of such a fund, and the absolute dependence of this fine museum upon annual subscriptions and grants, have been very weak points in its organization, and have seriously disturbed its scientific friends. They will not be satisfied until it is permanently endowed.

— The New-York anthropological society was organized Dec. 28, 1883, the aim of which is to prosecute researches in the sciences of anthropology and psychology.

— In the third *Bulletin* of the Natural history society of New Brunswick, just issued, Mr. G. F. Matthew describes in detail the discovery and examination, by a small summer party belonging to the society, of a village of the stone age, at Bocabec, on Passamaquoddy Bay. Indications of the former site of over thirty huts were recognized, each of circular form, bordered by a raised edge of gravel, and surrounded by the shells of a kitchen-midden. A plan of the village, and a section of one of the more typical hut-bottoms, is given, together with descriptions of the various articles—including implements of stone, bone, and ivory, as well as pottery — found in and around them; and various conclusions are drawn as to their antiquity, and the habits, food, and ethnic relations of their former possessors. The *Bulletin* also contains a report of the botanical committee, giving a list of over eighty species first found in the province during the last year, and of which one (Ornithopus scorpioides L.) is probably new to America; and a list, the first authentic one yet published, of New-Brunswick mammals, by M. Chamberlain. It includes forty-three terrestrial, and five marine species. It is noticed, that, while the panther and wolf have nearly or quite disappeared, the Virginia deer (Cariacus virginianus), though still not common, is increasing.

— The New-Brunswick legislature, at its last session, appropriated two hundred dollars towards the assistance of the Natural history society of the province. This is the first recognition of the claims of the society upon the public for support, and will be of much service in helping to defray the cost of publication of their bulletins.

— Mr. G. F. Matthew, whose elaborate article on the Paradoxides of the St. John group is contained in the recently published Transactions of the Royal society of Canada, has in preparation, and will present at the next meeting of the society (May 20), a similar article on the Conocoryphidae of the same group.

— The California academy of sciences has commenced the issue of a new publication, called *Bulletin*, apparently to replace the former Proceedings. The papers in this first number are classified under zoölogy, botanic section, microscopic section, astronomy, and mineralogy, and are mostly very brief and descriptive in character.

— The Calcutta *Englishman* announces another important result in the investigation of the causes of cholera. Dr. Vincent Richards, civil surgeon of Goalundo, has succeeded in doing what the German commission have hitherto failed to accomplish: he has produced the disease artificially. The subjects of his experiment were pigs; and, after many trials, he communicated to one of them what appears to have been

genuine cholera, the animal having died within three hours after the cholera-poison had been administered.

—M. Pasteur and his *collaborateurs* have announced to the French academy that they can render all dogs absolutely proof against the effects of rabies by inoculation, however the virus may be administered.

—Under the heading 'Expeditions to the Kongo region,' the *Frankfürter zeitung* states, that, according to information obtained from a well-informed source, Dr. Passavant of Basle, and Dr. Pauli of Brunswick, arrived, at the end of February, at Madeira, where they met Dr. Chavanne of Vienna. The three travellers were to proceed almost immediately to Africa. Passavant and Pauli, who are travelling at their own expense, proposed to penetrate the interior from the Cameroon delta on the coast of Guinea. Dr. Chavanne, who was to be joined at Madeira by Dr. Lintgraf of Detmold, is, it is stated, directly employed by the king of the Belgians. He has been commissioned to trace the route for a narrow-gauge railway to connect the coast with Leopoldville and Stanley Pool. He intended to proceed directly from Madeira to Banana, and take as the point of departure for his expedition, "the mouth of a small river situated about 5° south latitude." Having completed the survey for the railway, he is to proceed in a north and north-east direction, to explore the course of the River Uelle; the object of this exploration being the establishment of a connection between the Kongo and the Nile. The country situated to the south of the Kongo is to be explored at the same time by Lieut. Wissmann, also on account of the king of the Belgians. Dr. Chavanne was to be joined at Banana by a hundred Zanzibaris; and seven hundred additional Zanzibaris were awaiting there the arrival of a steamer to be sent from Europe, in order to transport it, under the command of Belgian and English engineers, above the falls of the Upper Kongo, to be utilized in Dr. Chavanne's exploration.

—The *Athenaeum* of March 29 states that Coudreau, J. Roche, and C. Demont have arrived at Para. They will devote two years to the exploration of the Amazon basin; paying particular attention to anthropology and natural history, without neglecting purely geographical and commercial questions. They travel under the auspices of the French ministry and marine.

—Dr. Nathorst, of the late Swedish expedition to Greenland, has just issued his report on the geology of Waigatt Strait, near Disco Island, and on the attempt of the Sofia to reach Cape York in 1883.

—The fourth volume of the *Meddelser om Grönland* has appeared, with important contributions to the knowledge of that region. Hammer contributes a study of Jacobshavn Fiord, made during the winter of 1879–80. Another chapter, on the glaciers of North Greenland, is the work of Steenstrup, who also reports on the deposits of nickeliferous iron ore, and on the geognosy and geography of a part of North Greenland. The book also contains researches on the composition of the native iron of Greenland, by Lorenzen, and astronomical positions determined in North Greenland, by Steenstrup and Hammer. It is well illustrated, and contains a *résumé*, in French, of its contents, by Professor Johnstrup. The two succeeding volumes are in press, and will contain a study of the miocene and cretaceous fossils of North Greenland, with an account of the explorations made on the east coast of that country by Messrs. Vandel, Normann, and Holm.

—The royal society of Canada will hold its next annual session at Ottawa, May 20 and following days.

—The work of the Austrian geological institute has been carried on, the past year, by Stache and Teller, with the temporary co-operation of Berwerth and Baron Camerlander, in the central chain of the Tyrol and the easternmost portion of the frontier of Carnithia; by Mojsisovics, Bittner, and Vacek in the north-western part of Styria and in the revision of the calcareous Alps of Salzburg; by Paul and Uhlig in the Carpathians of Galicia; and by Tietze and Hilber in the other portions of Galicia. Von Hauer and Mojsisovics also examined the thermal springs in Baden (south of Vienna), whose temporary intermittence had caused grave apprehensions; and Mojsisovics visited Bosnia, Istria, and Trifail, in Styria, with reference to coal-deposits. Stur studied the coal-formation of Taworzny in Galicia, where the mines had been much damaged by the irruption of water. Paul examined several petroleum districts in Galicia and North Hungary, and searched for coal and salt deposits in the neighborhood of Tuzla in Bosnia, where a boring, executed under his direction, met, at a depth of ninety metres, water saline enough to be used for industrial purposes. Böhm investigated the glacial phenomena in the valley of the Enns. Frauscher studied the eocene faunas of the northern Alps of Upper Austria; Geyer, the todtegebirge of Upper Styria; and Tausch, the cretaceous deposits of Ajka. The library now contains about twenty-nine thousand volumes.

—The commission for the geological survey of Bohemia reports, that, during the past year, Krejci and Feistmantel studied the still imperfectly known western Silurian deposits, which are interrupted by great faults, parallel to the strike of the whole system, and causing a great number and diversity of synclinal and anticlinal foldings; Fritsch surveyed the Teplitz strata, near Podiebrad and Chrudim, and Kafka the Chlomek strata in Glatz; Laube continued his investigations in the metalliferous region of Kaaden and Komotau; the passage of the railway through this region proved that the anthracite zone of the Saxon Erzgebirge continues along the borders of the porphyritic region, at a distance of about five kilometres from the Saxon frontier. As is usually the case in the metalliferous regions of Bohemia, no traces of glacial action could be discovered.

—Mr. J. F. Whiteaves, paleontologist to the Dominion geological survey, has just issued art. iii. of vol. i., Mesozoic fossils, of the paleontological series of the survey, on the fossils of the coal-bearing beds

of the Queen Charlotte Islands, collected by Dr. George M. Dawson in 1878. The formation, by these data, is shown to be cretaceous rather than Jurassic, and is unconformably overlaid by tertiary strata, showing evidence of great disturbance, and supposed to be the representatives of the chief period of mountain-making for the region. The fossils are nearly all molluscan.

— The Marquis de Gregorio has recently published a number of paleontological notices in the *Naturalista siciliano*, which chiefly relate to tertiary forms, especially members of the family Pectinidae, of which, and of the Ostreidae, he has made a special study. He has also proposed, should four hundred subscribers offer themselves, to bring out an international geological and paleontological journal, the articles to be in the languages of the respective authors, and to be copiously illustrated. A bibliography, in French, of geological literature, would form a prominent and useful feature of the proposed journal.

— At the meeting of the Royal astronomical society in March, Dr. Gill, director of the observatory at the Cape of Good Hope, gave the following account of his arrangement with Dr. Elkin, which resulted in the measurements of stellar parallax already described in *Science:* "When I was in Strasbourg in 1879, before going to the Cape, I met a young student, Dr. Elkin, a pupil of Professor Winnecke. He was then engaged in writing his dissertation on the parallax of α Centauri, and he requested me to send him observations, which might have been made at the Cape, of that star. At the same time, I told him that I had acquired by purchase Lord Lindsay's heliometer, and intended to have it mounted equatorially at the Cape, to carry on the work of investigation of stellar parallax. This seemed to fire his enthusiasm, and he expressed a great desire to go with me and share my work. I said I could offer him no position, and he replied that he did not want one. So I said, 'If you will be my guest, and come and live with me and share my work, you will be most welcome.' He said he should be happy to do so, and he came to me so soon as he had taken his degree. So we have undertaken a certain amount of work together, and I should like to give a short account of it."

In the account which follows, he refers to the parallaxes of α Centauri and Canopus. The result was about 0.75″ for α Centauri, which shows it to be the nearest known fixed star to our system, though farther than was formerly supposed. The most curious result, however, is that for Canopus, or α Argus, which is, next to Sirius, the brightest star in the heavens, and might therefore be supposed among the nearer ones; but the resulting parallax is only 0.03″, a quantity too small to be relied upon. It would therefore seem that this star is probably ten times the distance of Sirius. In the same connection, Dr. Gill presented to the society an unpublished investigation by Struve, at Pulkova, which gave a parallax of 0.5″ for Aldebaran, a star which no one seems to have before attacked for parallax purposes.

— Professor Pickering, whose work in stellar photometry is so widely known, during his last summer's visit to European observatories was very fortunate in discovering valuable unpublished manuscripts of a large part of the photometric work of Sir William Herschel. First in importance were two unpublished catalogues, which, with the four published in the *Philosophical transactions* of the Royal society, complete the determination of the brightness of all the stars of Flamsteed's catalogue at a time when no other estimates of their magnitudes are known to exist (about a hundred years ago). Professor Pickering's reduction of these catalogues by comparison with a uniform photometric scale (the logarithm of whose light-ratio is 0.4) has shown that Herschel's estimates of magnitudes were much more accurate than has been generally supposed, thus rendering the discovery of the two additional catalogues all the more valuable.

Of much importance, too, was the discovery of the journal of the original comparisons, whose results are contained in all six of these catalogues, thus giving the date of each comparison. At the suggestion of Mr. Chandler, whose forthcoming bibliography of variable stars will be of great value, the observations of the variable stars contained in this journal have been examined with the idea of correcting or checking the periods of some of the well-known variables by these older observations; and the results are given in a paper recently presented to the American academy of arts and sciences by Professor Pickering. The periods of many of the later discovered variables are so irregular, or so little is known of them, that Herschel's observations of these cannot be utilized till these periods are better determined from further observation or discussion; and thus, much of the value of these old observations is still to be determined in the future; but it is well to know that they are now accessible. In the case of two or three of the variables, however, they are sufficient to give corrections to the periods which are of some value, and would be still more so if Herschel had only given the hour, as well as the night, of observation. As it is, the times can only be fixed between the limits of twilight and rising or setting of the star, unless, as the writer would suggest, the order and number of the observations in any one night might fix the limits of time a little more closely in some cases.

— It may not be generally known in the United States, that the publication of the *Journal de zoologie* and of the *Revue et magazin de zoologie* has ceased; that of the former in consequence of the death of Professor Gervais, of the latter for other reasons. As the *Bulletin* of the *Société zoologique de France* covers the scope of these journals, and as the *Société* is very desirous of entering into relations of exchange with the American institutions, it is suggested by the secretary of the Smithsonian institution, that the transfer in question of the address should be made. The institution, as heretofore, will take much pleasure in transmitting parcels addressed to the *Société zoologique*, or to any other of the learned bodies of France.