are more or less opaque, while the phenomena attendant upon the glows indicate no such opacity. The cosmic-dust theory incurs many of the same objections, besides being inherently improbable. In the ensuing discussion Prof. E. B. Elliott argued that the phenomena were electrical; and Prof. H. M. Paul sustained the volcanic-ash theory, pointing out that Mr. Hazen's conclusion as to the simultaneousness of the first appearance of the phenomenon at remote points depended on a special interpretation of imperfections of the record, depending on cloudiness, and claiming the equal privilege of interpreting them in another way.

Ottawa field-naturalists' club, Canada.

Feb. 28. — Dr. George M. Dawson read a paper on the occurrence of phosphate deposits. After showing that phosphatic materials were essential to the life both of plants and animals, he pointed out that the natural cycle of the rotation of these substances was interrupted by the action of man, and that large quantities of matter which should return to the soil were withdrawn from it and taken elsewhere. The cropping of the soil impoverishes it, and prevents it from yielding as abundantly as formerly, unless the loss is compensated by the application of phosphatic fertilizers. The grain exported from the port of Montreal in a single year has been estimated to contain 2,574 tons of phosphoric acid, which implies the total exhaustion, in as far as phosphates are concerned, of 75,000 acres of good land, to renew which would necessitate the application of some 6,000 tons of apatite. It is easily seen that there must always be, under the present condition of affairs, an extensive demand for phosphatic materials; and it becomes necessary to inquire where specially concentrated natural sources of supply may be found. The occurrence of such deposits was traced from the guano, which accumulates in exceptionally dry climates, on islands frequented by immense numbers of sea-birds, and such recent deposits as the 'mussel muds' of Prince Edward Island, through the so-called coprolite beds of England, Carolina, and elsewhere, to the more concentrated and metamorphosed deposits found in the older rocks of Canada and Norway. The main facts in regard to the mode of occurrence of apatite deposits in the Laurentian rocks of Canada were explained, and the great economic importance of such accumulations was considered. —— Mr. Fraser Torrance who, as a mining-engineer, has had large experience with the deposits found in the vicinity of Ottawa, gave a very interesting description of the character of some of the deposits, and of the difficulties met with in working them, owing to the irregular manner of the deposition of the mineral; which cannot be considered as occurring either in veins or in beds, but as passing from one to the other without any regularity of transition. The methods in which the present surface-workings are conducted are such as to throw most serious difficulties in the way of any future mining of the lower deposits. The imperfect manner in which apatite has hitherto been manufactured in Canada was described; and it was stated that it was highly probable that much of the mineral which was mined in Canada and exported to Great Britain returned, either in the raw or manufactured condition, to the United States. —— Mr. F. D. Adams reported the detection by him, in minerals received from Arnprior, of a specimen of rock identical with that in which apatite occurs in Norway, and which had previously been known only from Norway and Finland.

Boston society of natural history.

March 5. — Prof. A. Hyatt read a paper on the larval theory of the origin of cellular tissue. He reviewed the history of investigation among sponges; concluding, that, though true metazoa, they possessed characteristics which showed them to be derived from protozoa. The parallel between the development of the cell and egg in the tissue is strictly parallel with the evolution of nucleated from unnucleated forms in protozoa. Recent investigations have removed all objections to the homology of the egg or any cell with the adult of the nucleated protozoon; and the principal mode of reproduction by division is the same in all these forms. The egg builds up tissue by division after being fertilized by the male or spermatozoon, just as the protozoon builds up colonies after fertilization. Spontaneous division of a cell which undergoes encystment takes place, and the spermatozoa which result from this are true larval monads. These resemble the monads derived from division of the encysted bodies of protozoa in their forms and in their activity. They differ in being able to fertilize the female or ovum at once, instead of being obliged to grow up to maturity before arriving at this stage. Thus all cells may be regarded as larval protozoa, and eggs and spermatocysts as encysted larval forms, the spermatozoa being equivalent also to larval forms which have inherited the tendencies of the mature forms in the protozoa at the earliest stages. Thus the origin of the tissues in the metazoa is in exact accord with the law of concentration and acceleration in heredity. The cells are larval, which, in accordance with this law, have inherited the characteristics and tendencies of their adult ancestors in their earliest stages. The three layers can be accounted for as larval characteristics inherited from colonies of Infusoria flagellata, which had two forms (protective and feeding zoons), and then three (protective, feeding, and supporting), these corresponding to ectoderm, endoderm, and mesoderm. —— Dr. M. E. Wadsworth read a paper on the structure of the earth's interior, which he held to be a molten or semi-fluid mass, which will gradually cool and solidify.

NOTES AND NEWS.

THE National academy of sciences will hold its next annual session at the National museum, Washington, commencing April 15, at eleven A.M. An election of five new members will be held. This will not make good the vacancies of the past year; for, of the ninety-eight members on the roll a year ago, six have since died, — Professors Alexander and Guyot

of Princeton, Gens. Humphreys and Warren of the Corps of engineers, Dr. LeConte of Philadelphia, and Professor Lawrence Smith of Louisville. Dr. Engelmann, whose death we recently announced, was an honorary member, and, like all the others excepting Gen. Warren and Professor Smith, a foundation member. Only eighteen of the fifty foundation members of 1863 now remain. We shall soon print memoirs and portraits of Dr. Engelmann and Gen. Humphreys.

— Another effect of the great eruption of Mount Krakatoa has been recently noticed. It was followed by a series of barometric waves which seem to have spread almost over the entire world. Professor Förster of Berlin says, The great eruption in the Straits of Sunda, which happened on the morning of Aug. 27, gave rise to an atmospheric wave which showed itself for five or six days in the records of the self-registering barometers in all parts of the world. In the barometric markings which are registered by the Commission of weights and measures in Berlin, in order to have a permanent record of the minuter variations, these effects of the volcanic eruption appear with striking clearness.

The first atmospheric wave from this source appeared in Berlin about ten hours after the catastrophe. Supposing it to have taken the shortest course from its origin to Berlin, this time would indicate a speed of somewhat more than a thousand kilometres per hour, agreeing very closely with the velocity of sound. This result is in complete accord with barometric records in other parts of the world. About sixteen hours afterward a second and entirely similar barometric wave appeared, which, however, is to be considered as the arrival of the same wave by the longer circuit over America and Europe. In fact, if we take the difference of the two courses, — the one from the Straits of Sunda to Berlin over the East Indies, and the other over America, — we shall find that to the above velocity of propagation corresponds the delay of sixteen hours in the arrival of the wave by the American route. It thus appears that the entire wave completed the circuit of the earth in a time which must have amounted to thirty-six hours. In fact, thirty-six hours later there did appear in Berlin, in a direction from the East Indies, another perceptible wave corresponding closely to the first one, but somewhat diminished in strength. The corresponding return from America took place in a period of some thirty-four or thirty-five hours. This is brought into agreement with the other period by the consideration that the atmosphere in general has a motion from west to east. A third wave was recognized after an interval of thirty-seven hours from this time. The diminishing strength of the waves prevented the returns of the single waves from being accurately followed, but small variations of an unusual kind are seen in the record until the 4th of September. We can therefore be satisfied that the atmospheric waves caused by the volcanic eruption were powerful enough to make the entire circuit of the earth three or four times, and that in the beginning the variations of pressure amounted to one five-hundredth of the entire atmospheric pressure. We are thus obliged to recognize the operation of force through which the heated gases and masses of volcanic dust might be carried into very high regions of the atmosphere.

Mr. Baillaud of Toulouse has communicated to the French Academy of science similar observations of the phenomena, from which he concludes the velocity to have been 349 metres per second. This, also, is very nearly the velocity of sound. From the intervals between the waves, he finds that the waves made the circuit of the earth at the average rate of 324 metres per second.

The most important conclusion to be drawn from these extraordinary observations is, that a mass of air or gas of which no one had before formed a conception must have been ejected by the volcano.

— The entomologists of Washington and Baltimore have decided to form an entomological society. A preliminary meeting was held at the house of Dr. C. V. Riley on the evening of Feb. 29, at which Rev. J. G. Morris of Baltimore presided, and Mr. B. P. Mann acted as secretary. A committee was appointed to draw up the necessary regulations, and to call a future meeting for organization.

— A vineyard proprietor near Nimes, having had several complaints made to him about his wines, requested M. Barthélemy, of the Faculty of sciences at Toulouse, to analyze them for him. In some of them a rather large proportion of arsenic was found, larger than the trace sometimes found in red wines. The wine from one barrel tested contained no arsenic at all, and in this instance the cask containing the wine was a new one: it had not been previously used. The other barrels had been cleaned, after use, with 'drogue,' which, in point of fact, is diluted sulphuric acid; and the sulphuric acid of the central districts of France has of late years contained so much arsenic, that M. Barthélemy has sometimes used it to obtain a supply of that material.

— Mr. Winter Blyth has recently been employed to analyze imported canned fruits (apricots, tomatoes, etc.) in order to ascertain the amount of contamination by metal in them. In twenty-three samples the amounts found, calculated as stannous hydrate, ranged from 1.9 grains to 14.3 grains per pound, the mean amount being 5.2 grains. The juice and fruit in some instances had a metallic taste. Several of the tins showed signs of corrosion. The *Journal of the Society of arts* says, "The little that is known of the action of stannous hydrate may be summed up in a few lines. Doses of about .174 gram per kilogram of body-weight cause, in guinea-pigs, death with signs of intestinal irritation; but with doses smaller than .17 to .2 gram the effects are uncertain, and the animals generally recover. Hence, supposing a man to be affected in the same proportion, he would have to take from three to four drams, or consume at a meal ten pounds of the most contaminate of Mr. Winter Blyth's tinned fruits. But it is not a question of immediate deadliness: it is rather one for inquiry as to the action of small repeated doses continued for a long time.

— As long ago as 1868, René de Semallé made the statement before the Paris geographical society, that, granting the general diminution of the Indians of the United States from year to year, the decrease has been arrested in the case of the Iroquois and other partially civilized tribes; and that there will arrive a time when the general decline will reach its lowest point, and will be followed by an increase, normal and continuous. The total disappearance of a tribe is something very rare. At Nablous we find the Samaritans still protesting toward the temple of Jerusalem, destroyed eighteen hundred years ago. In the struggle for existence, before re-adjustments are made, the weak begin to decline before the strong; but, after the bloody struggle is over, each party to the conflict finds itself undergoing modifications which are the conditions of survival. In using the figures of the census reports and of the Indian-office report, M. Semallé falls into the error, pointed out by Mr. Simonin, of supposing that the Indians have increased by birth simply because there seems to be the addition of several thousands in the census. The truth is, there are many causes of fluctuation; such as crossing the border, and moving from place to place. The truth remains, however, that the Indians are slowly increasing.

— Dr. Delaunay is the author of a paper in the memoirs of the Société d'ethnographie, upon the inferiority of precocious races. The term precocity,' as applied by biologists to individuals, explains a similar phenomenon as applied to societies. Claude Bernard tells us that the force of development is greatest in the inferior animals, and that this precocity is an evidence of inferiority, and excludes longevity. The inferior races of men mature most rapidly. An Eskimo, African, Arab, or Cochin-China child of one year is farther advanced in body and mind than a white child of the same age. The young Japanese at Paris excel the French boys up to the sixteenth year; and then there is an arrest of development. M. Delaunay makes the same assertion respecting puberty, cranial sutures, the different centuries of history, sex, the various periods of the same life, strength of constitutions, and different parts of the same body. The inferior races, by virtue of their precocity, became civilized before the superior races, and then suffered an arrest of development, became extinct or fossilized. The races and the civilizations of China, Egypt, etc., have evolved just as the individual Chinaman or Egyptian has evolved. On the contrary, the higher modern societies have developed slowly, just as develop the men who compose them. We may go farther, says M. Delaunay, and affirm, that, as the members of the body develop with different degrees of rapidity, so do the various groups or classes of the same society. The author combats the idea that our modern civilizations are the children and heirs of the older ones, from which they sprang, and without which they would not now exist. Speaking of the French, he affirms that they did not descend from the Aryans; that their language is not Aryan; that their domestic animals did not come from Asia; that their civilization is Celtic, not Greek and Roman. Finally, the civilization of Europe has been retarded by influences from Asia. Not to speak of cholera, plague, and other maladies, two-thirds of our intellectual lives are spent in perpetuating the errors and exploded fancies of Asiatic, Greek, and Roman thinkers and myth-makers.

— François Lenormant, who recently died at the early age of forty-six, was a most enthusiastic student of antiquity. A man endowed with great power of work, and interested in all archeological research, he was in recent years more specially concerned with the early Asiatic civilizations. The study of the cuneiform inscriptions had for him special charms. The most interesting use which he has made of these researches is to be found in his book, *Les origines de l'histoire*. Here he finds in the literature of the cuneiform inscriptions abundant material for comparison with the early traditions of the Jews and of other nations, as to creation, the deluge, and a whole circle of primitive beliefs. One of the latest fruits of his pen is a translation of the book of Genesis, in which, by the use of different kinds of type, he distinguishes the portions which he supposes to have come from different authors. Though a good Catholic, M. Lenormant did not allow his religion to interfere with his science, nor his science with his religion. Himself a religious spirit, he claimed for investigation the fullest freedom, and denied the propriety of dividing science into a Christian and a non-Christian faction.

— Mr. T. Lewis writes as follows in *At home*: —

There is, as may naturally be supposed, no important break in the chain of mounds stretching along the Mississippi valley from its lower regions to Minnesota; for they are very numerous along the river-bluffs up to the mouth of the St. Croix. They are then met with at intervals on the plateaus and headlands of the Mississippi as far north as Little Falls. In like manner they occupy the River St. Croix from its mouth to Yellow River, if not beyond that point. They are also found in abundance on the lower Minnesota River, and continue up that stream to Big Stone Lake, thence along that lake and Lake Traverse, and down the valley of the Red River to beyond Winnipeg in Manitoba. About the geographical centre of Minnesota, and in the westward region adjacent, aboriginal earthworks are often discovered; there being some particularly noticeable ones in Otter Tail county. In the north-eastern quarter of the state, with one or two slight exceptions, we have no authentic account of the existence of any artificial mounds. There are also many mounds around Lake Minnetonka and along Crow River: indeed, there are more or less on nearly every small stream and lake in central and southern Minnesota. The largest one known in the state is situated on the lower end of Dayton's Bluff in St. Paul, its former height being eighteen feet. Another very handsome mound is located in the village of White Bear, near the lake shore: it is conical in form, and thirteen feet high. Occasionally elongated mounds and embankments have been met with that have been termed 'forts;' but definite surveys and much critical examination are required before it

will be safe to adopt the term as expressive of their true character and use.

This indicates how poorly represented is the state of Minnesota in mounds of any kind. The variety and contents give as little satisfaction as the distribution. Mr. Lewis well says, that the "task of thoroughly examining artificial earthworks by excavation is so onerous, and the prospect of finding any thing of material value to pay for it so slight, there being scarcely any thing but the knowledge acquired to compensate the labor, that few persons care to undertake such work for so poor a return."

— The Dorpat Naturforscher-gesellschaft has received by bequest A. Schrenk's collection of Mollusca, which has been named by Mr. S. Clessin, and arranged by Dr. Max Braun. A hundred and eight species of land and fresh-water shells are known to occur in the Baltic provinces, and of these the Dorpat collection now contains eighty-eight.

— Dr. M. Braun has continued his faunal exploration of the Finland Bay, and in connection therewith has studied the physical characteristics of the water. The temperature diminishes, and the amount of salt increases, with the depth; but the water is so shallow that in severe storms the whole is stirred, mixing the colder and salter water of the bottom with the top layers. The water thus varies greatly, and this fact must have a great influence upon the life in the bay. The observations are being continued by Commander H. von Roth, and, when completed, are to be carefully worked up.

— Zoölogists and microscopists will welcome the two instalments, just appeared, of Bütschli's learned and thorough treatise on the Protozoa, which is to form vol. i. of the new revision of Bronn's classical 'Thierreich.' Parts xx.–xxv., just received, are entirely devoted to the Flagellata. This work is important not only from its intrinsic value, but also because it is the first comprehensive scientific work on the Protozoa ever published, and must, as such, be very efficient in spreading fuller and more correct knowledge concerning this much misunderstood group of animals. The utter lack of conciseness is the worst, and, at the same time, a serious and inexcusable, defect of this invaluable volume.

— In the *American journal of science and arts*, vol. xxiii., 2d series, p. 276, a letter from Rev. George Jones, U.S.N., to Professor Silliman, written at Quito, Ecuador, Dec. 13, 1856, describes a fall of ashes from Cotopaxi, which was thirty miles distant, in which a purple sky was noted. The paragraph in which the mention is made runs as follows: "Yesterday morning we noticed that at the south the sky had an unusual appearance, being of a purple color for about 90° along the horizon, and so up to about 45° in height, the edge of this being mixed up with patches of white. About 12 o'clock ashes began to fall, first in small quantities; but by 8 o'clock the fall had got to be so considerable as to powder the clothes quickly, on our going out: and people coming into a house would look as we do at home when coming in from a snow-storm."

— The Amherst college scientific association, organized in 1883, has for an object the promotion of scientific knowledge among its members. It consists of the heads of the scientific departments of the faculty as honorary members, and of active members chosen by the association, at the close of the year, from the members of the junior class recommended by the faculty. At present the membership is limited to twelve. Meetings are held weekly, and consist either of an address by some member of the faculty upon scientific subjects, or a paper read by one of the members, followed by questions and discussions. During the present year the society has listened to President Seelye, on science; Dr. Hitchcock, on social science; Professors Todd, on mountain observatories; Emerson, on the state of geology one hundred years ago; Tyler, on the biblical idea of nature; and Pond, on student-life in Germany. Some of the papers read thus far, by members of the association, are on the relation of chemistry to civilization, the Iatro age of chemistry, eggs, alchemy, the phlogistic theory, the condensation of gases, state of ornithology a hundred years ago, the nebular hypothesis, and proofs of the antiquity of man in the eastern United States.

— M. J. Deniker has prepared for the *Revue d'ethnographie* a sketch of the Ghiliaks, who live about the mouth of the Amoor River, based chiefly on the elaborate works of Schrenk and Seeland, published in St. Petersburg, the former in 1881, the latter in 1882. The Ghiliaks are mentioned for the first time by Witsen (1707); but they have been visited by Russian travellers since, although several distinguished ethnographers have confounded them with the Ainos, Tunguses, etc. The word 'Ghiliak' is a Russian corruption of the Tunguse word 'Kilé.' The people call themselves Niback. Their country is quite restricted. Their villages are sparsely scattered along the valley of the lower Amoor to the Okhotsk Sea. The Oltchas, a Tunguse tribe, adjoin them on the south: the Samagheres, of the same stock, are on the west. Besides the valley and the mouth of the Amoor, the Ghiliaks people the neighboring shore of the Okhotsk Sea. Beyond the Tatar Straits, they are found all along the northern part of Saghalin, the southern part being peopled by the Ainos. According to Schrenk, they form, together with Yukagirs, Ainos, Kamtchadals, Koriaks, Chukchis, and Eskimo (extant), and Ostyáks (disappearing), and Omoks, Anaules, Kottes, etc. (disappeared), the family of Palaeasiatics, who have been pushed back by the later invading Mongoloids. The average height is 1.62 m. for males, 1.50 m. for females. They are dolichocephalic (76.5). M. Deniker gives detailed descriptions of their measurements, physiognomy, maladies, and character; their food, meals, habitations, housekeeping, clothing, occupations (both of men and women), arms, and transportation; their marriages, polygamy, cremation, religion, myths, and language. A singular custom exists of betrothing children at five or six years of age, in which case the father of the husband adopts the girl, and keeps her until the marriage takes place. After the death of a husband, the wife marries the husband's brother, although she

may decline if she please. The Ghiliaks burn their dead; while the Oltchas and Orotches suspend theirs from the trees, or bury them. Their superstitions and religious practices are very interesting, especially the *fête* of the bear, which takes place in January, and lasts fifteen days.

— Mr. J. G. Vassar has given an additional ten thousand dollars to Vassar college for the better support of the chemical and physical departments of the Vassar brothers' laboratory.

— A prize of five thousand pounds was offered by the Indian government for the best machine for the treatment of rhea fibre. In 1869 a Mr. Greig of Edinburgh made a machine for this purpose; but it did not fulfil the conditions laid down, so the full prize was not awarded. Another competition took place, but was unsuccessful. Some rhea fibre experimented on in 1852 by Dr. Forbes Royle was in strength, as compared with St. Petersburg hemp, in the ratio of 280 to 160, while the wild rhea from Assam was as high as 343. Rhea has the widest range of possible applications of any fibre, as shown by an exhaustive report on the preparation and use of rhea fibre by Dr. Forbes Watson. Last year, however, says the *Engineer*, witnessed the solution of the question of decortication in the green state in a satisfactory manner by Mr. A. Favier's process. This process consists in subjecting the plant to the action of steam for a period varying from ten to twenty-five minutes, according to the length of time the plant had been cut. After steaming, the fibre and its adjuncts were easily stripped from the wood. Mr. Favier's process greatly simplified the commercial production of the fibre up to a certain point; but it still stopped short of what was required, in that it delivered the fibre in ribands, with its cementitious matter and outer skin attached. Various methods of removing this were tried without success, until a year ago the whole case was submitted to the distinguished French chemist, Professor Frémy, member of the Institute of France. Professor Frémy carefully investigated the nature of the various substances, and found that the vasculose and pectose were soluble in an alkali under certain conditions, and that the cellulose was insoluble. He therefore dissolves out the cutose, vasculose, and pectose by a very simple process, obtaining the fibre clean, and free from all extraneous adherent matter, ready for the spinner.

— An account and hysometric chart are published by Alfred Grandidier of the district of Madagascar, occupied by the so-called Hovas, whose stout resistance to the French has recently attracted much attention. The country is very different from one's preconceived ideas of a tropical island. The word 'Hova,' it seems, refers only to the middle class of the nation, properly called 'Antai-merina,' or 'Merinas,' in contradistinction to the other two classes of nobles and saves. The superior intelligence and discipline of the Me ina race have enabled them to conquer, during the present century, most of the tribes which inhabit that immense island. The district which they specially inhabit is called 'Imerina.' It is a mountainous country, completely destitute of trees and shrubs, and often uncultivated. The higher parts are hardly inhabited, but the valleys and lowlands sustain a dense population. The hills, which are composed of masses of granite and dense red clay, are not fertile; but the smallest valleys, when their situation permits, are transformed into rice-fields by the intelligent and industrious natives. West of the capital, there is a large plain twenty miles square, once a lake or marsh, but now one huge rice-field, which presents a beautiful appearance in the wet season, with little hamlets or large houses rising out of it here and there like islands. Other vegetables and fruits of a sub-tropical character are cultivated with moderate success on the hillsides. In the southern part is an assemblage of peaks reaching to eight or nine thousand feet above the sea. From the highest of these the entire district is visible, and appears like a sea of barren mountains destitute of shrubs or trees, and with numerous detached rocks amid coarse grasses not suitable for cattle, and only useful for fuel. Only the rich can afford to send for fagots to a limited strip of woodland which borders the district on the east. Even the dry grass used by the people for cooking becomes very dear in the rainy season; a single fire, perhaps, costing twelve cents. The population of the district reaches a million, and of Antananarivo, the capital, one hundred thousand. The villages are usually built on the summits of hills, and surrounded by a ditch. They contain for the most part but a few dwellings of inexpensive character, and are near the cultivated rice-lands of their owners, which are very valuable, in some places worth eight thousand dollars an acre. The houses are of an oriental character, commonly with one door and one window opening westward to avoid the raw south-east winds. The houses are arranged quite irregularly, and generally are not very clean. The roads are mere footpaths, and, notwithstanding the multiplicity of water-courses, bridges are very rare.

The people are somewhat smaller than those of other Malagasy tribes, but full of energy and intelligence, and in spite of faults peculiar to barbarism, from which they are only just emerging, exhibit industry, economy, and relative sobriety. In these qualities the other tribes cannot be compared with them. They have large families, though the Merina women are said to become sterile if they leave the mountains for the coast. Manufactures have made but little progress, and are chiefly due to white instruction. The rainy season commences toward the end of November, and lasts until March; but there are few severe storms, except during the period from Dec. 15 to Feb. 25.

— In a paper in the Bulletin of the Moscow society of naturalists upon periodic oceanic oscillations, Trautschold attacks the problem of oceanic alterations of level, and their relations to geological phenomena. His conclusions, based upon a careful study of the past and present physiography of eastern and central Europe and western Asia, are to the effect that many of the phenomena of sedimentation and

deposition attributed by geologists to a subsidence of the crust, are, in fact, due to periodic oscillations, or upheavals of the oceanic surface, producing thereby inundations of the land-masses; and that such is the nature of much of the newer sedimentations, e.g., Jurassic of Russia. The position here maintained, a revival of the views of many of the older geologists, is anticipated by Professor Edouard Suess, who, in his 'Antlitz der erde' (Prague, 1883), clearly indicates the necessity of invoking the assistance of periodic oceanic fluctuations of level to account for the existence of much that has been heretofore attributed to terrestrial subsidence.

— The seventh Saturday lecture in the National museum was on Feb. 16, by Prof. E. D. Cope, on the 'Origin of human physiognomy and character,' — a discourse the main features of which have already been published in the *American naturalist*. On Feb. 23, Mr. John Murdock, late of the signal-service party at the Oglaamie station, North Alaska, gave a very vivid account of 'Eskimo life at Point Barrow.'

— Mr. E. R. Quick has presented to the Brookville (Ind.) society of natural history his entire collection of birds, numbering several hundred specimens, mostly North American. This is one of the largest and best-arranged collections in the state. The society is this year providing a course of free lectures upon popular scientific subjects for the benefit of the citizens of its town. Five of the lectures have been given, and three more are to follow at intervals of three weeks. The last was given by Prof. Jos. F. James of Cincinnati, upon 'Flowers and insects.'

— The museum of comparative zoölogy has published another of its useful 'selections from embryological monographs,' intended to bring together illustrations from the most authentic sources of the early stages of development of various groups of animals. This one is concerned with the Echinodermata, and is compiled by Mr. Alexander Agassiz. It consists of fifteen excellently executed quarto plates, crowded with figures, and accompanied by very simple explanatory text, the bibliography of the subject having already appeared in an octavo form. The protozoa, acalephs, polyps, fishes, and reptiles are announced as in course of preparation.

— All students interested in the study of the brachiopods will be pleased to learn that the last parts of the series of superb monographs of Thomas Davidson, on British fossil Brachiopoda, are completed by the author, and are now in the printer's hands. In a letter received by a correspondent a few days since, from Mr. Davidson, he says that "after thirty-three years of hard labor, in connection with British recent and fossil species, I this year complete my large work; and, indeed, the whole remaining manuscript is in the printer's hands, and being printed. This last part includes, 1, an appendix to the supplements, with plates; 2, an elaborate general summary, with numerous illustrations of the progress of science in connection with the Brachiopoda from 1606 up to the end of 1883; 3, a catalogue of all the British species of the class, some eight hundred and sixty in number, with geologic distribution in time, and full references; 4, a brachiopod bibliography, which I have been compiling during the last forty years. I have some four thousand entries; and it will, I feel sure, prove to be very useful for references. I began it at 1606, and continued it up to the end of 1883." Of the value and character of this great work, this is not the place to speak; but we cannot refrain from expressing feelings of gratitude, respect, and honor to the man who has given his time and means to prepare for publication a work that reflects so much credit on modern science, especially the division of invertebrate paleontology. Mr. Davidson is now in the sixty-seventh year of his age; and we trust that many useful years still remain to him, in which he may contribute information from his studies upon the Brachiopoda of other countries than Great Britain.

— According to the San Diego papers, a large stone lance-head of Eskimo fashion was found deeply embedded in the tissues of a whale taken at the whaling-station on Ballast Point, near the harbor. The species is not named, but the creature was probably Megaptera versabilis. The migrations of the California gray whale, Rhachianectes glaucus, are well known, though it is not hunted by the Eskimo; but those of the other species have been less clearly made out, and facts of this sort are worth putting on record.

— Charles Ashford continues his investigations of the Spicula amoris in British Helicidae. He examined Zonites excavatus and Z. nitidus. Until recently the latter was supposed to be the sole member of its genus which possessed a dart: now the former keeps it company. The arrangement of the secreting-organs is remarkably like that of Zonites intertextus and suppressus, as figured by Leidy. The dart is found in a very small percentage of the total number of adults examined. On the other hand, in Helix virgata ninety-five per cent of the adults examined have furnished darts.

— Dr. Benjamin Sharp, the professor of invertebrate zoölogy in the Academy of natural sciences of Philadelphia, will be inaugurated on Tuesday evening, March 18, on which occasion he will deliver a lecture on 'Methods of biological investigation in Europe.' Professor Sharp's course on biology will begin on Thursday, March 20, at 4.15 P.M.

— Dr. D. G. Brinton, the newly elected professor of ethnology and archeology, will deliver a course of lectures in April, introductory to an extended the thorough course to begin next autumn. The suther jects of the spring series are as follows: 'Prehistoric man in the new world,' 'Origin of the Aryan races b- 'The study of ethnology in the United States,' and 'The civilized races of America.'

— Two of the naval ensigns pursuing a scientific course at the National museum, Mr. Harlow and Mr. Dresel, have been ordered to the Greely relief expedition.