graduated to degrees and fractions thereof, and provided with a vernier reading to three minutes. It can be used, like an ordinary paper or ivory protractor, for hasty plotting, and combines triangles and scales in one instrument. For careful and precise work, it is said to be equal to the best special instrument, and to be no higher in price. —— Mr. E. V. d'Invilliers read a paper on some characteristics and the mode of occurrence of the brown hematite (limonite) ores in central Pennsylvania, taking for his field of illustration the lower Silurian limestone valleys of Centre county. He described the anticlinal structure of these valleys, and the great erosion, aerial and subaerial, which these rocks (six thousand feet thick) have undergone, influencing the position and character of many of the present ore-deposits. He noted three varieties of ore: 1°. The wash and lump hematite of the Barrens; 2°. The true limestone 'pipe ore.'; 3°. An intermediate *transition* variety. The first is always associated with the sandy magnesian beds low down in the series of No. 2, or below five thousand feet beneath the overlying Hudson-River slates of No. 3. This class shows rounded ore and flint balls, and tough, barren clay, and are secondary or derived deposits of irregular shape. They have been tested a hundred feet deep, and contain from 45% to 53% iron, and .051% to .113% phosphorus. The almost total absence of bisulphide of iron is noticeable. The cost of mining is about a dollar and a half per ton. The transition variety was assigned a position in the formation from thirty-five hundred to five thousand feet below the slates. They are characterized by a more calcareous clay, are compact, amorphous, liver-colored ores, containing from 40% to 49% iron, and from .115% to .365% phosphorus. The pipe ores occur usually higher in the limestones than either of the other two, but in this county *below* the four hundred feet of upper Trenton layers. These ores occur *in situ* between parallel walls of limestone, in plate-like masses, scales, or as cylindrical pipes in bunches eight or ten feet long, while feathering out both in line of strike and dip. The deeper banks show the repeated occurrence of crystals of iron pyrites in all stages of metamorphism. They occur at great depths, and show from 45% to 53% iron, and from .100% to .185% phosphorus. The flint or quartz grains accompanying them are rarely water-worn; and this clay is very calcareous and easily washed, not requiring the jigging necessary for cleansing the lower ores. Cost of mining these ores varies from ninety cents to a dollar and a quarter per ton.

New-York microscopical club.

June 6. — Rev. J. L. Zabriskie read a notice of Appendicularia entomophila Peck, a new fungus parasitic on the fly Drosophila nigricornis Loew. The fly, determined by Dr. H. A. Hagen of Cambridge, was noticed at Nyack, N.Y., between the 13th and 31st of March last, infested with the fungus. But infested specimens have not since been found. In the spring of 1880, three specimens of the same fly, similarly infested, were captured at New Baltimore, N.Y. These latter specimens were preserved and mounted; but, from lack of time and opportunity, the true nature of the parasite was not then recognized. The fungus has been submitted to Prof. C. H. Peck, New-York state botanist, who has kindly examined it, and named it Appendicularia entomophila. It is closely related to the Sphaeronemei of the family Coniomycetes. Like Sphaeronema, the fruit has a bulbous conceptacle, surmounted by a long beak perforated at the apex, where the spores ooze out in a globule; but, unlike any described Sphaeronema, this has the conceptacle seated upon the broad summit of a pedicle as long as the conceptacle itself; and also on one side of the summit of the pedicle and at the base of the conceptacle, it has an erect, leaf-like appendage, with strongly serrate margins, like a white-elm leaf folded along its midrib. The spores are slender, pointed at each end, and divided by a septum into two unequal cells, one cell being twice as long as the other. The total length of the fruit is from .02 to .03 of an inch, and that of the spores from .001 to .002 of an inch. The conceptacles of the fungus project directly from different points of the surface of the fly; so that they are found in all positions, — erect, horizontal, and dependent. They grow sometimes singly, but oftener in clusters of two, three, or more, and are found most frequently on the tibiae of the hind-legs, but also springing from the inner posterior surfaces of the abdominal rings, from the costal vein of the wing, from the head, and from the thorax. One of the New-Baltimore flies had about fifty of these conceptacles on various parts of the body and limbs.

NOTES AND NEWS.

DR. GILL has recently paid a visit to the workshop of the Messrs. Repsold, and gives an account of the great Russian telescope, with several particulars not contained in Professor Newcomb's report (*Science*, No. 60). The tube, instead of being cigar-shaped, as in the Washington and Vienna telescopes, is cylindrical, and therefore no larger at the centre than at each end. The object of choosing this form is in order that the centre of gravity of the tube may be as near as possible to the polar axis of the instrument. The central part is of cast-iron. The steel plates diminish in thickness from the centre towards the object-glass, so that the whole structure is extremely rigid. In order to get a sufficient field of view, the micrometer has been made about a foot long. The micrometer contains a small spectroscope, so arranged that the spectrum of any celestial object can be observed without any change of the instrument. It is expected that the telescope will be mounted at Pulkowa during the coming autumn. Some delay, however, has been experienced in getting the dome into working order, and this may still farther delay the mounting of the instrument.

— A memorial tablet, in honor of the late Professor Charles F. Hartt of the geological survey of Brazil, has been placed in the library of Acadia college, Wolfville, N.S. It was here that Professor Hartt

received his collegiate training, and first manifested that interest in the study of nature which became so fully developed, and yielded such good fruit, in after years. The sisters of Professor Hartt were present on the occasion of the unveiling of the tablet, and have presented to the college a fine crayon portrait of their brother, by Black & Co. of Boston.

— It has long been the custom of certain entomologists to form albums of butterflies' wings by pressing the wings on gummed paper. The scales adhere to the paper; but, after they are stripped off, the scales lie with the under side exposed. Milani and Garbini, in the current volume of the *Zoologischer anzeiger* (p. 276), describe the following method of transferring the scales to a second piece of paper, so that they may lie right side up. After the first paper is dry, the second piece is painted with a solution of gutta-percha; the two pieces are then pressed together, and allowed to dry; they are next soaked in water until the gummed paper can be pulled off, and left or washed until all the mucilage is dissolved; the paper with the scales is then dried in the sun. The gutta-percha solution is prepared by soaking five parts gutta-percha, cut very thin, in fifty parts sulphuric ether for twenty-four hours, then adding two hundred parts benzine in which five parts of elemi have been previously dissolved.

— Holmes's 'Art in shell' is an extract from the second annual report of the Bureau of ethnology, shortly to appear. It contains a hundred and twenty-six pages, and fifty-six plates. A small portion of the matter has appeared previously in the second volume of the Washington anthropological society's transactions. Even the present paper is not final, but is to be regarded simply as an outline of the subject, to be followed by a more exhaustive monograph of the 'art in shell' of all the ancient American peoples. The first few pages treat of shells used as implements and utensils, either unchanged by art, or converted into vessels, spoons, knives, scrapers, agricultural implements, fishing appliances, weapons, and tweezers. Much of this matter is familiar; but it is admirably grouped together and illustrated, and new facts are brought to light. Shells were for ornamental purposes converted into pins, beads, pendants, perforated plates, and engraved gorgets. Mr. Holmes studies the beads as to their form in perforated shells, discoidal beads, massive beads, tubular beads, and *runtees;* and as to their uses for ornament, for currency, and for mnemonic purposes. The chapter on wampum will give great pleasure to many readers, but that portion of the paper which treats of engraved gorgets possesses the most absorbing interest. "Many of the gorgets obtained from the mounds and graves of a large district have designs of the most interesting nature engraved upon them." For the purposes of description and illustration, they are presented in the following order: the cross, the scalloped disk, the bird, the spider, the serpent, the human face, the human figure. In addition to the many theories of the origin of the cross symbol, Mr. Holmes suggests the following: "The ancient Mexican pictographic manuscripts abound in representations of trees, conventionalized in such a manner as to represent crosses. By a comparison of these curious trees with the remarkable cross in the Palenque tablet, I have been led to the belief that they must have a common significance and origin." Those familiar with the paper of Dr. Joseph Jones on the antiquities of Tennessee will remember a rosette-like, carved shell, in rough outline resembling a Mexican calendar. Mr. Holmes describes and figures a number of these, believing them to be calendar disks. The bird disks are not very interesting, either in form or variety, although the occurrence of odd forms in widely separated areas will occasion some astonishment. On the contrary, the spider gorgets are both novel and beautiful. If we are not mistaken, it was Col. Hilder of St. Louis who first drew attention to these wonderful objects. Major Powell tells us that the Shoshones regard the spiders as the first weavers, who taught their fathers the art. The wild tribes call the Navajos, spiders. And down in the bottom of a mound, on the breast of a skeleton, lay the disks of the Busycon, on whose concave surfaces were carved the image of this ancestral spinner, bearing the cross symbol on his back. The serpent symbol is a familiar object in aboriginal art, and we are not surprised to find it on shell disks. The remarkable similarity of some of these serpent forms, on disks found in mounds, to the representations of the same animal in Mexican and Central-American antiquities, is barely hinted at by the writer, and dismissed for want of space. The mask gorgets are very rude and uninteresting, but the most astonishing of all are those depicting the human figure. In looking at the drawings, one does not know which to admire more, — the cleverness of the artist in masking his design, or the shrewdness of Mr. Holmes in the interpretation of it. You are asked to look at the image of a man in plate lxxi. You surrender the task as hopeless. The author guides your eye here and there, and you are convinced and delighted. The close examination of the subsequent figures assures you that he is right. We cannot close this brief notice without calling attention to the wonderful unfolding of new problems by the solution of older ones. In the same volume that will contain this paper, by Mr. Holmes, the mound-builders will be severed from Mexico and Central America; but here are new facts to explain, even more perplexing than the old.

— A laboratory for bacterial research has been founded in the Pathological institute of Munich, and the first course of lectures, founded on Dr. Koch's latest methods, has begun.

— Dr. Emmerich, an assistant in the Hygienic institute of Munich, professes to have discovered the cause of an epidemic of inflammation of the lungs, by which a hundred and sixty-one persons were attacked, through discovering the peculiar bacteria of the disease in the plaster of the infected house.

— Mr. Huxley's report of last year's salmon-fishing confirms his own assertion that very little is known about the influences which regulate salmon-supply. The take of salmon and sea-trout has increased and

diminished in defiance of all theories; and Mr. Huxley is equally unable to establish any consistent relation between the take of salmon, and the proportion of grilse present in succeeding years; a large take being sometimes followed by scarcity, and sometimes by abundance of grilse. Mr. Huxley's sympathy with manufacturers has grown with his experience; and, while he acknowledges the importance of the rivers, his confidence in the power of legislation has diminished with experience, but he still insists on the necessity of it. The two points brought out by the continued experiments of Mr. George Murray of the British museum, are, that the fungus may attack fish with whole skins, and otherwise perfectly healthy, and that an excess of lime in the water is not a predisposing cause of the disease.

— The *Popular science monthly* states that Professor John Trowbridge of Harvard university has written a text-book for schools, which D. Appleton & Co. have in preparation. It is entitled 'The new physics,' and admirably carries out the principles of the new education, in requiring the pupil to become familiar with the properties of matter and the phenomena of force by performing experiments for himself.

— A new series of science text-books, each of which is the work of an able specialist, is being brought out by D. Appleton & Co. The 'Physiology,' by Roger S. Tracy, M.D., sanitary inspector of the New-York city health department, and the 'Chemistry,' by Prof. F. W. Clark, chemist of the U. S. geological survey, are now ready. Before Sept. 1, will be issued the 'Zoölogy,' by C. F. Holder, and J. B. Holder, M.D., curator of zoölogy of the American museum of natural history of New York; and the 'Geology,' a new elementary book, by Professor Joseph LeConte of the University of California. Other volumes are to follow soon.

— In his 'Historical account of the Taconic question in geology,' which Dr. T. Sterry Hunt contributes to the recent Transactions of the Royal society of Canada, we find the most complete and systematic of Dr. Hunt's many contributions to this much controverted section of geological history; and even those who do not accept his conclusions must feel grateful for this clear and concise statement of the grounds upon which they rest. The introductory chapter is devoted to an explanation of the classification of the older rocks of eastern North America, proposed by Eaton in 1832, the abandonment of which is regarded as having materially retarded the progress of American geology. The second chapter is a brief history of the geological survey of eastern New York by Emmons and Mather, and an explanation of their divergent opinions concerning the age of the rocks east of the Hudson River and Lake Champlain. Dr. Hunt accepts the name of Ordovician, proposed by Lapworth in 1879, for the rocks called Cambro-Silurian of late years, and including the Chazy, Trenton, Utica, and Hudson-River groups of this country. The older rocks of eastern Pennsylvania are discussed in the third chapter; and the argument for the Taconian or pre-paleozoic age, of the major part at least of the primal, auroral, and matinal of Rogers in the great Appalachian valley, seems to be greatly strengthened by the comparison of the stratigraphy of this valley with that of the Kishacoquillas, Nippenose, and other anticlinal valleys of central Pennsylvania. Typical Potsdam and calciferous are said to be wanting in this state. The gneisses and schists south-east of the great valley are referred to the Laurentian and Montalban systems; and the rocks of South Mountain, to the Arvonian and Huronian. In the fourth chapter, Dr. Hunt traces the distribution of the Taconian system beyond the original areas in Massachusetts, New York, and Pennsylvania, and cites many new facts sustaining his view of its distinctness from the paleozoic above, and the eozoic below. The occurrence of Scolithus and other fossils in the Taconian is asserted; and of especial interest, in this connection, is the discovery by Powell and Walcott in the Grand Cañon of the Colorado, below the base of the Cambrian, of over ten thousand feet of uncrystalline rocks holding Stromatopora-like forms. The next two chapters are devoted to the upper Taconic of Emmons, the Quebec group of Logan, including the Potsdam and calciferous; and the memoir concludes with a general sketch of the paleozoic history of North America.

— Mr. E. J. Maumené has published the result of his investigations into the existence of manganese in wine. In *Cosmos les mondes* for May 17 he gives thirty-one instances in which he detects manganese in the state of a double tartrate of the protoxide of manganese and potash.

— 'The records of the geological survey of India,' part ii., for 1884, contains a note on the earthquake of the 31st of December, 1881, by Mr. R. D. Oldham. This earthquake was felt over a large portion of the Indian peninsula and Bengal, occasioning considerable damage in the Andaman and Nicobar Islands. Mr. Oldham has been enabled to trace the earth-wave with much certainty over a large area, to add considerably to our knowledge of seismic phenomena, and to construct a good map showing the area of disturbance.

— The renewal of the Damoiseau prize by the French academy, for the revision of the theory of the satellites of Jupiter, is announced for the year 1885.

— Dr. Hyades, a member of the French meteorological mission to Cape Horn, attached to it for the purpose of observations on natural history, has published a contribution to Fuegian ethnography, which is interesting as supplementary to the observations of Mr. Bridges, the missionary of the South-American missionary society. Dr. Hyades refers in terms of high appreciation to Mr. Bridges' study of the Galgan language, of which he has compiled a manuscript dictionary, which he has had completely to recast twenty times before bringing it to perfection, and which certainly ought to be published. Some specimens of the vocabulary and of the grammatical struc-

ture of the language are given. The missionaries have succeeded in improving the material condition of the Fuegians, and have induced some of them to adopt agricultural, pastoral, and other industrial pursuits.

— In the current volume of the Proceedings of the American academy, Mr. Arthur Searle publishes an elaborate and exhaustive reduction of all the accessible observations of the zodiacal light. The paper gives the position of the axis of the cone, and the apparent boundaries of the light, as determined by nearly six hundred and fifty different observations by Jones, Heis, Lewis, and others; and tables appended give monthly means and other data which summarize the results in a very complete manner.

Mr. Searle does not indulge in much theoretical discussion as to the nature of the zodiacal light, but he points out that the apparent slight deviation of the axis of the cone from the ecliptic is most probably due to the effect of atmospheric absorption, and calls attention to the necessity of more refined methods of observation. He says, —

"If atmospheric absorption has the importance here assigned to it in the study of the zodiacal light, we cannot expect to determine the true position of the light on any occasion by the simple methods heretofore in use. We must either discover exactly what an observer means by the boundary, and to what extent this boundary will be displaced by given changes of brightness, or we must resort to direct photometric observations. The last course will probably be preferable."

He suggests a modification of the method employed by Wolf in tracing out the nebulosity about the Pleiades, — a method which consisted essentially in watching the visibility of the threads of a reticle, which disappeared whenever the telescope was directed against unilluminated sky.

In this connection he mentions the interesting fact that the Milky Way appears to be about two magnitudes brighter than the mean brightness of the sky; which would mean, of course, that a square degree of the Milky Way gives between five and six times as much light as an average square degree of the rest of the sky.

His only remark as to the theoretical explanation of the zodiacal light is the following: —

"I have merely to remark, with regard to the ordinary meteoric theory, that it gains greatly in simplicity if we dispense with all the imaginary meteoric bodies, or rings, with which it has usually been connected, and retain merely the conception of meteoric dust diffused throughout the solar system. It may be shown mathematically, if we regard the meteoric particles as solids reflecting light irregularly, that an appearance like the zodiacal cone, with an indefinite vertex, would result. On this subject the work of Geelmuyden may be consulted."

We suppose that by 'diffused throughout the solar system,' he means diffused mainly in the plane of the ecliptic. Indeed, it could be shown, that, if we started with an indiscriminate spherical distribution of meteoric dust around the sun, the disturbing action of the planets would ultimately convert it into an approximately discoidal distribution in a plane coincident with the mean plane of their orbits. At any rate, it is not easy to see how an indiscriminate distribution should lead to any thing but a glow-cone with a *vertical* axis.

There can be no question that Mr. Searle has done an important service to science in collecting and editing in so excellent a manner the hitherto scattered observations relating to his subject.

— Dr. Ernst Haeckel of Jena has been elected a member of the Linnean society for his studies of sponges, Medusae, etc.; also Dr. Alexander Kowalevsky of Odessa, for his zoölogical researches, and Dr. S. Schwendener of Berlin, for his studies in cryptogamic botany.

— The twelfth part of Edwards's 'Butterflies of North America' is almost entirely devoted to the polymorphic and wide-spread Lycaena pseudargiolus, two plates with over sixty figures being devoted to it. Such wealth of illustration is exceedingly rare and correspondingly valuable, particularly with the more fleeting and less known early stages. Nineteen colored drawings of the larva alone are given; and in execution the illustrations have never been surpassed in the most expensive and careful iconographs. The next number will complete the second series, and we are glad the author shows no sign of discontinuing his costly undertaking.

— The slight tendency to lateral cutting possessed by rivers, on account of the earth's rotation, and known sometimes as 'von Baer's law,' has had its efficiency denied about as often as it has been granted, by those who have written on the matter; and, when granted, it has been too often admitted only for streams following meridional directions.

Mr. G. K. Gilbert contributes a new element to the discussion of 'the sufficiency of terrestrial rotation for the deflection of streams,' in a paper read to the National academy of sciences in April, and recently published in the *American journal of science*. Taking Ferrel's measure of the deflective force that comes from the earth's rotation, Mr. Gilbert shows, by a remarkably simple consideration, that its value is not so much in throwing the whole stream against its right bank, as in selecting the swifter threads of the current, and carrying them against the bank; and, further, that this action will have especially well marked development in meandering streams, where it will aid the cutting on the meanders of right-hand convexity, and diminish it on those of left-hand convexity. For the Mississippi, the selective tendency thus determined toward the right bank is nearly nine per cent greater than toward the left; but it is not stated that the valley form has been noticeably affected by this preference. On Long Island, however, the form of the valleys is clearly controlled by the earth's turning, as was first suggested by Mr. Elias Lewis some years ago, and recently confirmed by Mr. I. C. Russell.

The article by Mr. Gilbert advances the question not only by properly applying the law to rivers flowing in any direction, but further by giving it a more delicate analysis than it has yet received, with the conclusion that in certain favorable cases the form of a valley may be decidedly influenced by this hidden control. While the result is of interest to physical-geographers, the method of analysis has a wider

importance. The application of mathematics to terrestrial physics has too often been fruitless from dealing with problems in a simplified or idealized form that departs too widely from the complications of natural conditions. This was notably the case with the supposed demonstrations obtained by Hopkins in his geological speculations. It is therefore gratifying to find that the increased value of von Baer's law, now found by Gilbert, comes essentially from a close consideration of the actual rather than of the ideal conditions of river-flow. It is an advance in the application of mathematics as well as in the explanation of facts.

The lateral tendency of rivers was first noticed in the case of the Volga, which undercuts its right bank, as it should in this hemisphere. Other examples are found in North Carolina, in the channels of the streams flowing eastward to the coast, where the southern banks are the steeper; again on Long Island, and on the plains of New Zealand. But the radial valleys of south-western France afford better illustrations than any of these, inasmuch as their forms are accurately shown on the great map of the army engineers. North of the Pyrenees, about the towns of Tarbes and Auch, there is an old sandy delta deposit spread out by the rivers from the mountains while this region was still under water; and since its elevation, the streams formed upon it all follow its gentle slopes, diverging like the ribs of a fan from the higher centre toward the lower margin, and cutting down their channels into the old delta plain. There is nothing here in the flat layers of unconsolidated sands to determine an unsymmetrical form in the valleys: and yet they all show most distinctly a gentle slope on the left, and a steeper slope on the right; longer lateral branches on the left, and shorter ones on the right; and many of the highways, constructed parallel to the streams on the as yet unbroken uplands, are clearly closer to the streams on their left than on their right. All this is a direct effect of the earth's rotation.

It is customary, in speaking of the deflective force that arises from the earth's rotation, to say that it acts to the right in the northern hemisphere, but to the left in the southern. The reason for this is not found in a change in the direction of the force, but only in a change in our way of looking at it. It is as if one should look at the face of a watch in the northern hemisphere, and say that the hands turn to the right, and then, on going to the southern hemisphere, look at the back of the watch, and say that the hands turn to the left. Let us therefore suggest that the geographers of the southern hemisphere look at their winds and storms and streams from the proper side, just as they look at their watches; and, although this would involve them in the slight inconvenience of standing on their heads, it would give them the moral satisfaction of seeing that the deflective forces of the earth's rotation, as well as the hands of their watches, always 'make for the right.'

— Mr. Lockyer has given an account of a recent visit to the observatory at Nice, the building of which is due to the munificence of Mr. Bischoffsheim, the well-known French banker. In connection with this, Mr. Lockyer presents some striking ideas respecting the future of physical observations of the heavenly bodies. He suggests that it is now time to abolish the observer entirely, and that any astronomer would be losing his time by attempting to draw either the nebula of Orion or the spectra of stars. Photography should take the place of hand-drawing for both of these purposes. He pictures an astronomer, one thousand years hence, in a room filled with photographs giving a picture of every part of the heavens, from pole to pole, as it appears to us in the nineteenth century. By using a different form of telescope, the expense of a dome could be avoided. Altogether, Mr. Lockyer's suggestions are well worthy the attention of all engaged in planning observatories.

— In 1885 an exhibition of inventions is to be held at South Kensington under the patronage of the Prince of Wales. The first part of the exhibition is to be of all inventions made or brought into use since 1882; the second part is to be of all musical instruments invented since 1800. The committee of the first exhibition includes many of the most eminent scientific men in England.

— The *Illustrirte zeitung* reports an interesting discovery in the department of photography. Eleven years ago Professor Vogel of Berlin explained a method by which the effects of colors, such as blue and yellow, might remain unchanged as to light and shade, and which would overcome this difficulty of photography. He has now worked out a process on this principle with practical success: it is published in the *Photographischen mittheilungen*, and the German photographic society has awarded him a prize for it.

— Professor Carnoy, of the Catholic university of Bouvain, announces a work on 'Biologie cellulaire,' which will treat of the general characters of cells, both animal and vegetable. He proposes to deal with the general organization, chemistry, and physiology of cells, basing his work upon original observations, either new, or confirmatory of previous researches. He promises over four hundred new illustrations, engraved with great care and accuracy. The scheme is ambitious; but, if well carried out, it will secure us a valuable book on an aspect of biology too little heeded at present. Professor Carnoy is a botanist, whose reputation will rise high if his volume fulfils the promises of the prospectus. It is to be published at Lierre, Belgium, by Joseph Van In & Cie. The price to subscribers is twenty-five francs.

— If an observatory is to be judged by the number of its astronomers and the variety of its work, that of Paris must rank as the first in the world. The most important work now in progress is the construction of the great catalogue of stars observed during the past thirty years, the printing of which has been commenced. The Bischoffsheim circle, known as the 'cercle du jardin,' has thus far been used only for day observations. One of the most important improvements has been the introduction of the shallow amalgamated basin for holding the quicksilver used in the artificial horizon. Very careful experi-

ments have been made to ascertain whether the level of the quicksilver in this basin remains unchanged after any slight motion. To test this, alternate observations were made with the amalgamated and with the ordinary basin. The results show conclusively that the amalgamated basin preserves its level perfectly. Moreover, the disturbance produced by the passage of carriages in the neighboring street is scarcely perceptible, so that it is now possible to observe the nadir at any hour of the day with perfect ease. The result is, that one of the great objections to building an observatory in the neighborhood of a railway is done away with.

— A new observatory has been recently established on a mountain in the south of France, known as Pic de Midi. Here Mr. Thollon has erected his most powerful spectroscope, and reports that he can see daily forty rays of the chromosphere in a region where ordinarily only eight are visible. He also makes the new and interesting observation that the granulations of the photosphere are visible in his spectroscope as fine striae extending through the whole length of the spectrum. What is yet more curious, similar granulations seem to show themselves in the chromosphere, being indicated by the character of the hydrogen lines, which are broken up into small pieces instead of being continuous. It may be remarked, in this connection, that this observatory is not a purely governmental one, but has been constructed with the funds donated by various private individuals and scientific bodies of France.

— The University of the state of Missouri has commenced the issue of a Bulletin of its museum by the publication of a paper on Niagara fossils by Prof. J. W. Spencer, its director. It is mostly devoted to graptolites and Stromatoporidae of this formation, and is illustrated by eight plates, rather rudely executed, but apparently tolerably well drawn.

— The *Academy* announces that Professor Mayor of St. John's college, Cambridge, will be obliged by the communication of any reminiscences of the late Dr. Isaac Todhunter, or of any letters written by him.

— Engineers, manufacturers, and others interested in the progress of mechanical science, and wishing to attend the meetings of the mechanical section of the American association at Philadelphia next September, should send to the secretary (J. B. Webb), at Ithaca, N.Y., for membership blanks, or abstract blanks in case it is their intention to prepare a paper for the meeting.

— It is reported that Prof. C. E. Bessey, of the State agricultural college of Iowa, has been offered a professorship of botany and horticulture at the University of Nebraska.

— We learn from *Engineering*, that Hirn, the French astronomer and physicist, has devised an apparatus for determining the actual calorific power of the solar rays. An alembic of copper containing sulphuric ether is exposed to the sunshine. The heat absorbed volatilizes the liquid, which is condensed in the alembic. Regnault's formula is employed to calculate the solar heat absorbed from the quantity of liquid condensed.

— According to the tables recently published by the Direction générale des contributions indirectes, the total production of alcohols in 1883 amounted to 2,011,016 hectolitres. This is an increase of 244,450 hectolitres over the year 1882, and 508,439 hectolitres more than the mean of the last ten years. This increase is due in great part to the advance made in the manufacture of spirituous liquors by the distillation of farinaceous substances.

— The fifth annual report of the museum of the Ohio Wesleyan university states that the additions during the year amounted to seventeen hundred and ninety. The need of more shelf-room is much felt.

— Dr. H. Ploss, whose well-known work, 'Das kind in brauch und sitte der völker,' appeared last year in its second edition, announces for immediate publication, in parts, 'Das weib in der na ur- und völkerkunde.' The prospectus states that it will treat of the natural history of woman, principally from an anthropological stand-point, and as it appears to the naturalist and sociologist. The work is to be published at Leipzig, by Grieben, in eight lieferungen: price two marks each. When complete, they will form two volumes, 8vo.

— There are now twenty-three countries with a total population of 241,973,011, in which the metric system of weights and measures is the legal standard; four (Canada, Great Britain, United States, and Persia) with a population of 97,639,825, in which the system may be used; and six, including Russia and British India, with a population of 333,266,386, in which the system has no legal standing.

— The report of the North Carolina agricultural experiment-station for 1883 is almost wholly devoted to commercial fertilizers; although a few analyses of fodders are reported, and more or less work is mentioned as having been done for the state geologist and the state board of health which is not reported here. The most generally interesting portion of the report is that concerning the recently explored deposits of phosphatic nodules and rock in the state, some account of which has already been given by Dr. Dabney in *Science*, iii. 31.

— A convention of agricultural chemists, which met in Atlanta, Ga., May 15 and 16, appointed Prof. S. W. Johnson of Connecticut, Prof. H. C. White of Georgia, and Prof. W. C. Stubbs of Alabama, a committee to propose a method for the determination of phosphoric acid in fertilizers. Their report, which is too long for reproduction here, recommends a method for general use for the twelve months following its date, and promises further investigation and a report at a future time. It was resolved by the convention, "that this method be not considered as binding upon any one, but that the convention recommends it to the profession, and hopes that all not bound by conflicting obligations will follow it."