In order to obtain clear and convincing results in the investigations under discussion, a long series of analyses of the air from the well and regularly ventilated mine was made at the same time that barometric observations were taken. For the latter purpose a barograph was placed in the lowest part of the mine, at a depth of 230 metres, and the close correspondence between the changes of pressure at the surface and in the mine was ascertained. There a large number of daily analyses were made of the air taken from the ventilator, and also of air taken from a level in the seam by an independent apparatus.

These experiments were commenced in the beginning of June, 1885, and are still going on. The first report published by the archducal finance director in Teschen, based on the experiments made from June 5 to July 13, shows, that, when the barometer fell, the proportion of explosive gas in the ventilator and mine increased. The later experiments confirm this result in the most striking manner. The report referred to expresses the results of the early experiments as follows: —

1. The proportion of explosive gas in the mine air, generally speaking, decreases with increasing atmospheric pressure, and increases with a decreasing pressure.

2. The proportion of gas increases more rapidly the more suddenly the barometric curve falls, and decreases more rapidly the more suddenly the curve rises.

3. The development of the gas does not depend on the absolute amount of barometric depression.

4. If the barometric curve ascends at first suddenly and then slowly, or remains stationary for some time after reaching a maximum, a slow increase of gas is observed. If, after a sudden fall of the barometer, the pressure continues to decrease slowly, or remains stationary some time after reaching a minimum, a slow decrease of gas is observed. The maximum and minimum of the barometric curve, therefore, do not always correspond to the minimum and maximum of the gas curve.

Not content with these observations, a further series of experiments was undertaken. Work on the mine was stopped, and the air-supply shaft was closed while the ventilator was kept running, This experiment was begun at noon on June 20, and continued twenty-seven hours. In order to obtain the usual number of revolutions of the ventilator, the steam-pressure had to be increased. The barometric pressure in the mine sank 2.2 millimetres in five minutes, while the proportion of gas at the ventilator (which was ventilating other workings at the same time) rose to 0.83 per cent, and, at the level where separate collection was made, to about 0.40 per cent. In subsequent experiments a barometric depression of 4 millimetres was reached in the mine, the ventilator stopped, and in one case the gas in the level reached 1.35 per cent. This artificial depression of from 2.2 millimetres to 4 millimetres is certainly small in comparison with the natural variations in atmospheric pressure which are going on all the time, but its sudden production accelerated proportionally the flow of gas in the mine. Of the five severest accidents in coal-mines which have happened recently, four occurred during periods of especially low barometer. The accident at Polish Ostran on the 8th of October, 1884, occurred when the barometer sank 11 millimetres in forty-eight hours. The explosion at Karwin on March 6, 1885, took place on the second day of the fall of the barometer, which lasted three days and amounted to 16 millimetres. That at Saarbrücken occurred also on the second day of a fall of about 13 millimetres; and that at Clifton Hall on June 18, 1885, took place at the beginning of a fall. The accident at Dombran on March 7, 1885, is generally attributed to coal-dust. To these five accidents must now be added that at Spekul in Banat, which took place at nine o'clock in the morning of Oct. 29, 1885. In the absence of more accurate data, it may be remarked that on the 28th of October the barometer was 754.2 millimetres at seven in the morning, at Hermannstadt; on the 29th it was 750.6 millimetres, and on the 30th 749.8 millimetres.

It is superfluous to enlarge upon the experiments at Karwin. They confirm the views of the English experts and those expressed by Cowen before the English parliament in 1878, and it may be presumed that they will produce a change of opinion in other countries where those views are not known. They show the great importance of the barometer in coal-mining. The isobar-charts, which are obtaining a wider publication every year, show the daily progress of barometric minima over Europe, and they should be consulted in future by the managers of every coal-mine. The order is already in force at Karwin, forbidding blasting at all dangerous points on the approach of a barometric depression, and, if the danger increases, all work is to be suspended. M.

NOTES AND NEWS.

DR. PALISA of Vienna detected still another small planet, April 5: it was of the thirteenth magnitude, and will bring the total number of these bodies up to 257.

— The national museum has received a fine speci-

men of a ten-foot gray shark of strange form, of the Mediterranean species, — the first one of its kind ever taken in American waters. It was caught on the Carolina shores by the life-saving crews.

— Dr. E. M. Crookshank, in a recent paper on the cultivation of bacteria (*Journ. roy. micr. soc.*), describes and figures a peculiar fungus, Actinomyces (or the 'gray fungus'), the cause of a singular disease known as actinomycosis, occurring rarely in man, but not uncommonly in cattle. The fungus is believed to gain an entrance to the animal by the mouth, through the food, or possibly through the medium of a wound of the gums or a carious tooth. It sets up inflammation, resulting in the formation of a new growth, resembling a tuberculous nodule, which eventually terminates in large tumors. In cattle the lower jaw is usually affected, and then the upper jaw and neighboring parts, but the parasite may also occur in the lungs and the subcutaneous and intermuscular tissue. In man the pulmonary formations tend to break down early, forming fistulae and sinuses. In other cases the disease may originate in the intestines, or occur in the bones and other tissue. It may be transmitted by inoculation among cattle and rabbits, and presumably to man. The fungus is visible to the naked eye, appearing in the form of rosettes composed of club-shaped elements, and either colorless or of a yellowish or yellowish-green tinge.

— A recent communication, by Dr. Macgowan, to the China branch of the Royal Asiatic society, in relation to a supposed ancient phonograph, has elicited articles on the subject from several correspondents of the *North China herald*. The instrument to which Dr. Macgowan referred is known as 'the thousand-li speaker,' and is described by a writer of the seventeenth century. A correspondent of the *North China herald*, writing from Pekin, quotes from the 'Things of which Confucius did not speak,' and describes the instrument as follows: "It was a bamboo tube covered with a disk of glass and opened by a key. After speaking into it several thousand words, it was closed and carried to a distance not exceeding a thousand li. On opening it and applying the ear, a voice was still distinctly heard. If carried a greater distance, the voice became indistinct." Although the existence of such an instrument as a phonograph in China, in the seventeenth century, may be doubted, it is interesting to note one suggestion of Dr. Macgowan's. A thousand li in China is a considerable distance, and travelling in carts, or on horseback, over such abominable roads, is by no means a pleasant pastime ; and it is probable, that, from the jogging and bumping up and down sustained by the instrument, its mechanism would become disarranged, and the imprints on the metallic plates (if there were such) effaced, before a thousand li were travelled over. So long a distance, therefore, would be sufficient to cause the 'voice within the tube' to grow indistinct.

— Under the name of 'crystallized hopeine,' the *Chemical news* states that a substance is sold, having a slight odor of hops, but which has in its appearance, its crystalline form, and in all its reactions, a close resemblance to morphia.

— Contrary to the ordinary experience with copper salts, M. du Moulin, says the *Chemical news*, has succeeded in administering doses of half a gram to one gram of basic copper acetate to dogs and rabbits for six weeks without producing poisoning. Copper oxide and carbonate have also been administered to rabbits for a year without producing any appreciable injury.

— The French association for the advancement of science will hold its fifteenth meeting at Nancy, Aug. 12 next, under the presidency of Professor Friedel.

— The total amount of diamonds discovered in the diamond-fields of South Africa in 1885 is estimated at not less than 2,440,788 carats, valued at over twelve millions of dollars. The quantity is greater, but the value less, than the finds for the years 1883 and 1884. In 1884 the most valuable diamond now known was obtained, weighing, when first discovered, four hundred and fifty-seven carats, but which will be reduced, by cutting, to two hundred carats.

— Gambetta's brain was stated by Mr. A. Bloch, a few months ago, to be of unusually small size, weighing only 1,160 grams or 38.4 ounces. At the meeting of the Société d'anthropologie of March 18, Professor Duval added, further, some interesting details of its conformation and structure. In comparison with brains of subjects who were known to have been of deficient mental powers, such as possess only a feeble development of the third frontal convolution, Gambetta's brain was found to have an extreme development of this convolution, and the fissures very numerous and very complicated. This development furnishes confirmatory evidence of Broca's discovery of the localization of speech in this convolution. In addition to other peculiarities, the right quadrilateral lobe was found to be very complicated, with numerous fissures in its lower part; and the occipital lobe was extremely reduced, especially on the right side.

— Anent the opinion of Mr. Perry, that a max-

imum of earthquakes is coincident with the mean perigee, Dr. D. J. Macgowan recently submitted the following statistics to the Seismological society of Japan. They partially confirm also Professor Milne's observations that cold weather furnishes the maximum of frequency. Of 738 continental shocks, there occurred, in the

1st	month, 65	7th	month, 70
2d	" 82	8th	" 70
3d	" 72	9th	" 56
4th	" 49	10th	" 43
5th	" 46	11th	" 65
6th	" 63	12th	" 88

The first day of the first month occurs about Feb. 6, or at the new moon which falls nearest to the point when the sun is in the 15th degree of Aquarius. On these seismic records, the Chinese seldom designate the day of the month (moon) when earthquakes occur, yet a considerable number may be found. Seventy-two cases show twice as many in the first and second as in the third and fourth quarters of the moon's phases, — forty-eight in the former period, and twenty-four in the latter. The sixth day shows the largest number, 12; none took place on the 2d, 5th, 13th, or 14th; one occurred on each of the following: 4th, 7th, 17th, 20th, 22d, 23d, 24th, 28th, 29th. Hours are rarely given: so far as they go, they show that a large majority are nocturnal.

— The third annual report of the Massachusetts agricultural station deals chiefly with feeding-experiments and experimental researches upon the use of fertilizers, and the relative nutritive characters of prominent farm-crops. It contains a considerable amount of matter that will be of value to the agriculturalist.

— The well-known embryologist of the fish commission, Mr. John A. Ryder, is now engaged in studying the development of the mud-minnow (Melanura limi), and finds some remarkable amoeboid movements of the eggs before they are hatched. This is somewhat peculiar, and is the first time that it has been observed. By a series of ingenious contrivances, he is enabled to watch the process of development from the moment the fish is hatched until it assumes the characters of the adult.

— The London *Athenaeum* announces that Sir Henry Roscoe will probably be the president of the British association for 1887, when the association will hold its meeting in Manchester.

— Dr. W. N. Bullard, in a paper lately read before the Massachusetts medical society, gives a detailed analysis of the various symptoms of tea-poisoning, obtained from the study of a large series of cases. He arrives at the important conclusions, that the action of tea is cumulative, and is more pronounced on the young and those in a depressed physical condition, although persons otherwise healthy not infrequently show poisonous symptoms; that as a rule in the class of people examined by him, chiefly adult women, the average amount needed to cause poisonous symptoms was a little less than five cups daily; and that chronic tea-poisoning is a frequent affection, whose most common symptoms are loss of appetite, dyspepsia, palpitation, headache, vomiting and nausea, combined with nervousness, and hysterical and neuralgic affections, frequently accompanied by constipation and pain in the region of the heart.

— It has now been determined, says the London *Graphic*, to deal in a somewhat new manner with the difficult problem presented by the disposal of London sewage, which was a few years back considered solved by the simple process of emptying it into the Thames. For some months experiments have been made on what is known as the precipitation method; that is, the sewage is left in a tank until its solid portion separates, the separation being hastened by the addition of lime and protosulphate of iron. Hitherto a million gallons a day have been dealt with, but it is now determined to increase the plant so as to deal with nine times that quantity of sewage. Under this treatment the liquid portion becomes as clear as fresh water, and can be emptied direct into the Thames. The solid portion, or sludge, will be pressed into blocks resembling so much clay, and will be taken out to sea, to be discharged in deep water, where it can do no harm.

— According to Dr. E. Naumann, the director of the geological survey of Japan, the principal coal-deposits in the country are found in Kinshin and Yesso. The most productive coal-mine is that at Takashima, at which mine the daily production amounts to 750 tons. The mine of next importance is at Müke, which produces about 500 tons. The coal-fields at this spot are supposed to contain 150,000,000 tons, and it is probable that in the future Müke will become the principal coal-mine of the country. The production of coal in Japan during the year ending June 30, 1881, was 890,000 tons.

— At the congress of German physicists next September, there will be an exhibition of scientific photographs, to which all foreign scientists are invited to contribute, especially astronomers, spectroscopists, geologists, botanists, zoölogists, surgeons, etc. Further information may be obtained by addressing Dr. H. W. Vogel, 124 Kurfürstenstr., Berlin, W.

— The subject of an interesting paper by Mr.

Victor Mindeleff at the last meeting of the Washington anthropological society was 'The snake-dance of the Moqui Indians.' His paper was supplemented by the remarks of Dr. H. C. Yarrow, who visited New Mexico last summer for the purpose of studying in detail this peculiar and somewhat remarkable ceremony. This dance of the Moquis is, according to Dr. Yarrow, a prayer or supplication to their deity for rain. It is conducted by a secret order known as the Antelope and snake men. Snakes are employed under the belief that they are the sacred guardians of the clouds. The snakes used are largely venomous species (mostly rattlesnakes), although three or four harmless species were identified by Dr. Yarrow. Strange as it may seem, the Indians are seldom bitten, although they handle them with the utmost impunity. Painted in the most hideous and fantastic fashion, each participant catches a snake about the middle of the body with his teeth, and holds it in this position while he performs the dance. For several days previous to the ceremony, the snakes are taken through a course of treatment, which consists in stroking them repeatedly, and causing them to drink a decoction of some plant which they claim to be an antidote to the venom of the snake. This treatment renders them somewhat stupid and sluggish, which, in all probability, accounts for the few casualties which occur, although Dr. Yarrow saw rattlesnakes brought in fresh from the plains during the ceremony, and employed in the dance. Their non-combativeness can then be explained, he thinks, only upon the hypothesis of some hypnotic influence exerted by the attendant. An elaborate report on this subject by Dr. Yarrow will be published by the bureau of ethnology.

— Mr. Alvan Clark received April 9, from the Russian minister in Washington, the gold medal awarded to him a year ago by the emperor of Russia on recommendation of Otto Struve, the astronomer at Pulkova, who has charge of the great telescope made by Mr. Clark for the Russian government. The medal is of solid gold, 3-16 of an inch thick, and 3 5-8 inches in diameter. On one side a handsomely engraved wreath of oak-leaves encircles the words '*Praemia digno*,' and on the other side is a profile likeness of the emperor, surrounded by the inscription, 'Alexander III. *Totius* Russiae imperator.'

— The first annual report of the Montreal botanic garden gives a list of the known gardens of the world, from which it appears that there are one hundred and ninety-seven, the most of them, it is believed, scientific in character. Germany has the largest number, — thirty-four; Italy, twenty-three; France, twenty; Great Britain and Ireland, twelve; West Indies, six; and the United States, five. More than half of all are supported by the state, and only about five per cent by private enterprise; the remainder, by the city, and educational institutions. Nearly ninety per cent are free to the public, and more than two-thirds are open on Sundays. The one at Montreal will include about seventy-five acres, although only about eighteen will constitute the garden proper, within which will be the various buildings, pond, and all the beds of herbaceous plants.

— Mr. Brayton Ives, formerly president of the New York stock exchange, and well known as a collector of books, has written a preface for the American edition of Mr. George Rae's work, 'The country banker; his clients, cares, and work,' which Messrs. Scribner have just issued. As Mr. Bagehot's 'Lombard Street' pictured the life and cares of the city banker, Mr. Rae's describes the not less interesting life of the country banker.

— Now that the time is approaching when sail-boats, great and small, are to be put into commission, Messrs. Charles Scribner's Sons' announcement of a practical 'Boat-sailer's manual' is very timely. The author is Lieut. Edward F. Qualtrough of the navy. He has made a complete treatise on the management of sailing-boats of all kinds, and under all conditions of weather; containing, also, concise descriptions of the various rigs in general use at home and abroad, directions for handling sailing-canoes, and the rudiments of cutter and sloop sailing.

— Mr. Andrew Carnegie's new book, 'Triumphant democracy,' will be published on April 17.

— The Numismatic and antiquarian society of Philadelphia has undertaken the preparation of an archaeological map to embrace the valleys of the Delaware and Susquehanna rivers, and desires co-operation in this important work. The map is intended to show the location of all the principal remains attributed to the Indian tribes who formerly occupied these regions. It will include contiguous portions of the states of Pennsylvania, New York, New Jersey, Delaware, and Maryland. Societies and individuals are earnestly requested to furnish whatever information they may possess concerning the following classes of antiquities: gravel deposits (paleolithic); artificial shell-heaps; cave retreats; encampments or village sites; earth-works; old fields; quarries; work-shops; surface deposits of implements, or caches; large rocks in place, used as mortars; rock inscriptions (*in situ*); burial-places; tumuli, or mounds; Indian trails. A full description and accurate location of any of the above should be

given. How far and in what direction from nearest town? On or near what stream, if any? On whose property? The occurrence of native objects of copper, or articles of European introduction, should be mentioned. Communications may be addressed to Henry Phillips, jun., secretary, Philadelphia.

— Naturalists will be pleased to learn of the early publication of Mr. Scudder's extensive work on New England butterflies, which has been nearly completed for a number of years. Those who have seen the elegant colored plates, and are aware of the thorough monographic way in which each species is treated, will appreciate the value of the work. The author is desirous of obtaining additional material for the illustration and description of the earlier stages of a number of species, and will welcome any assistance that may be afforded him in diminishing his list of desiderata.

— Hardly a week passes without the announcement of some new literary or scientific enterprise from Germany. This time it is the appearance of the opening number of a *Zeitschrift für assyriologie* that we have to announce. It is published by Schulze at Leipzig, and Assyrian scholars speak very highly of the part just issued.

— Lea & Son's 'Encyclopaedia of dentistry,' an important work on odontological science now publishing, will contain extended illustrated articles on the teeth of vertebrates, both fossil and recent, and of invertebrates,— on the former by Mr. J. H. Wortman, and on the latter by Mr. W. H. Dall.

— William Paul Gerhard's 'A guide to sanitary house-inspection' (New York, *Wiley*, 1885) will serve as a comprehensive *vade mecum* for the house-holder and house-hunter. It contains succinct and complete instructions for the sanitary inspection of city and country dwellings, and for the choice of their surroundings. Much of the contents common sense and common prudence ought to suggest to the intelligent person; but, unfortunately, common sense and common prudence in sanitary matters are not usually the attributes of the ordinary householder, nor indeed frequently of the educated one, as witness a case of a city physician in good practice who failed to discover in many months that the sewerage connections of his house were untrapped. For those who cannot employ an expert, this book can be recommended as a useful guide in building or in the choice of dwellings.

— Mr. W. T. Hornaday of the national museum will shortly issue his second book, 'Canoe and rifle on the Orinoco,' being a history of his hunting and exploring experiences on that river.

— There has recently been issued by Cupples, Upham & Co. of Boston a pamphlet on the present condition of electric lighting, written by one N. H. Schilling, Ph.D., purporting to be a report made at Munich, Sept. 26, 1885. To whom this report was made is not stated in the volume; but from the statement made at the bottom of p. 5, that 'no business loss has been sustained by us' by the introduction of electricity for lighting the Munich railway-station, "since gas-motors are used for the production of the current," it is natural to suppose that the report was made to one of the gas companies of that city. Similar references occur on other pages, and the report cannot, therefore, be considered an unbiassed statement of the present condition of electric lighting.

LETTERS TO THE EDITOR.

*** Correspondents are requested to be as brief as possible. The writer's name is in all cases required as proof of good faith.*

Preliminary description of a new squirrel from Minnesota (Sciurus carolinensis hypophaeus[1] sp. nov.).

ONE of my mammal collectors has recently sent me from Sherbourne county, Minnesota, a number of specimens of the gray squirrel of that region. The locality is considerably north of the supposed northern limit of the animal's range, and the specimens differ markedly from the previously described varieties of the species. They are as large as, or slightly larger than, their nearest ally, Sciurus carolinensis leucotis, with which they agree in the size and bushiness of the tail and in the color of the upper parts. They differ from it, 1°, in having broader ears, the convexities of which are adorned with large and very conspicuous white woolly tufts, the yellowish-buff being confined to a narrow strip along their anterior borders; 2°, in having the white of the under parts very much restricted. The color of the back and sides encroaches everywhere upon the belly, leaving a small and irregularly defined patch of white in the centre of the abdominal region, and even this is usually much mixed with gray. The breast and throat are grizzled gray, more or less strongly suffused with yellowish fulvous. The pelage is noticeably softer and denser than in the common gray squirrel. C. HART MERRIAM.

Names of the Canadian Rocky Mountain peaks.

I willingly admit the inaccuracy of the correction as to the names of some Rocky Mountain peaks made on my authority by Mr. Ernest Ingersoll in *Science* (vii. No. 165). Had I supposed that Mr. Ingersoll would have thought it worth while to publish any note on the subject, I would have been more precise in specifying the names to which it should apply. Mr. Ingersoll, in his original article, wrote (*Science*, vii. No. 162), "Many of the principal peaks in this part of the range were long ago named Balfour,

[1] Ὑπόφαιος; ὑπό, below; φαιός, dark — in allusion to the dark color of under parts.