birds. —— Mr. Romyn Hitchcock exhibited a series of specimens of Orbitolites, and made some remarks upon the results of the work of Dr. William B. Carpenter as finally set forth in vol. vii. of the report of H. M. S. Challenger. —— Prof. C. V. Riley presented some personal reminiscences of the late Dr. George Engelmann, which were supplemented by remarks from Dr. George Vasey and Professor Lester F. Ward. —— Mr. Richard Rathbun exhibited a large mass of coral (Oculina, sp.) recently obtained from Key West, growing on the end of a crowbar, which, when further studied, would probably yield some clew to the rate of growth of the species. —— Mr. M. G. Ellzey spoke on the prepotency of the male parent, giving the results of twenty-five years' experience in breeding horses, dogs, and other kinds of live-stock. The male parent he believes to be prepotent in the transmission of hereditary traits, except where some extraordinary circumstance intervened. In the case of hybrids between the horse and the ass, a cross is always marked by prepotency of the ass; and in all crosses of two species the male is always prepotent. Mr. Dall called attention to the danger of drawing conclusions from observations upon the external characters of the products of the union of two species. —— Dr. Leonard Stejneger exhibited two magnificently mounted specimens of the great Kamtchatkan sea-eagle, Thalassaetus leucopterus; also a specimen of the bald eagle, Haliaetus leucocephalus, and a specimen in immature plumage of another species, probably undescribed, and probably in the adult state entirely white. The rivers of Kamtchatka abound greatly in salmon, and eagles are in consequence particularly numerous.

Mathematical section, Philosophical society, Washington.

Feb. 20. — Mr. H. Farquhar showed the application of two kinds of empirical formulae to observations of the diminution of amplitude of a freely oscillating pendulum at different atmospheric pressures. When the amplitude and the time were connected by the equation of a hyperbola with four constants (the term involving the amplitude square being omitted), the observations could always be perfectly satisfied. The chief advantage of this form, however, was the ease with which the constants could be calculated from the observations by least squares. A formula more convenient in practical application gave for the time a constant, divided by the nth power of the amplitude; where n was a fraction proportional to the square root of the atmospheric pressure, and equal to about one-third for a pressure of thirty inches. The initial time, or time of an infinite amplitude, was a third constant to be determined; and it should be determined separately for all intervals within which the correction for amplitude is desired. Great nicety in the calculation of n was not necessary: the nearest tenth, or reciprocal, of a whole number, would suffice. The accuracy of this formula was shown by tables to be quite as close as the observations called for. When n became zero, the nth power was replaced by the logarithm of the amplitude, and the initial time was that of amplitude unity. The use of an empirical formula, of higher practical convenience than those usually adopted, — resulting from application of the theory that the diminution results from two resistances, proportional respectively to the velocity (or amplitude) and to its square, — was defended on the ground that this theory is itself empirical, and is well known to fail altogether for very high velocities. The proposed formula supposed in effect one resistance proportional to the $1 + n$ power of the velocity of the pendulum.

NOTES AND NEWS.

From *Nature* we learn that Sir Joseph Hooker has been nominated one of the vice-presidents for the Montreal meeting of the British association. Instead of Mr. Crookes, Prof. W. G. Adams will give one of the public lectures. For the Aberdeen meeting in 1885, Sir Lyon Playfair will be proposed as president. A well-attended meeting of the organizing committee of the chemical section has been held under the presidency of Professor Roscoe. Promises of papers were received from several well-known chemists, and a small executive committee was formed to draw up a list of papers, and to communicate with Canadian and American chemists. Section G has been particularly active. The committee has prepared a list of subjects for papers which it is thought would be interesting to English visitors if treated by engineers and mechanicians in Canada: a good supply of papers is expected, both from this country and America. Sir J. H. Lefroy has accepted the presidency of the geographical section. We regret to learn that Professor Williamson, the general treasurer, will be unable to be present; and the council have decided to engage the services of Mr. Hamy Brown as 'financial officer,' while Professor Burdon Sanderson has virtually consented to act as deputy for the treasurer at Montreal.

— The last number of the *Harvard university bulletin* contains further instalments of Mr. Winsor's bibliography of Ptolemy's geography and the Kohl collection of early maps; the former containing some very interesting comments on the knowledge of America about the middle of the sixteenth century, the latter relating exclusively to maps of the new world issued in the first half of the same century. Mr. Bliss's classed index to the maps in *Petermann's mittheilungen* will be completed in the next issue, and we may expect its separate publication in a few weeks. It will prove a great convenience.

— At the request of the navy department, the fish-commission steamer Albatross, Capt. Tanner commanding, was fitted out during the winter for the purpose of carrying on a series of deep-sea soundings and dredgings in the Caribbean Sea, a region very little known in respect to its depths. The vessel left Washington Jan. 1, and reached St. Thomas on the 17th, and, after coaling, proceeded on her voyage, making the following ports: Curaçoa, Trinidad, the Island of Oruba, Alta Vela, Jacmel, Gonaives, Santiago de Cuba, Navaza, and Kings-

ton (Jamaica), where she arrived March 1. She left Kingston March 11, and arrived at Aspinwall, *viâ* Savanilla, March 25. On her return from Aspinwall she will proceed *viâ* Cape San Antonio to Key West, expecting to arrive at the Washington navy-yard about the middle of May. The expedition has been a great success in all respects; numerous satisfactory series of soundings and temperatures having been taken, and large numbers of marine animals obtained. In the collections incidentally obtained during the stop of the steamer at Trinidad were two specimens of the guacharo-bird, Steatornis caripensis, which is such a rarity in museums, and two of the great fishing-bat.

— The botanical collection of the late Charles F. Parker of the Philadelphia academy of sciences has been purchased for the Princeton herbarium. It is remarkably good as to the New Jersey flora.

— The report of the U. S. solar-eclipse expedition has just been ordered to be printed by Congress. Among its contents are, meteorology of Caroline Island, by Mr. Winslow Upton; botany of Caroline Island, collections by Dr. W. S. Dixon, U.S.N., and identifications by Prof. W. Trelease; notes on the zoölogy of Caroline Island, by Dr. W. S. Dixon, U.S.N.; memorandum on the butterflies, etc., of Caroline Island, collections by Dr. J. Palisa, identifications by Messrs. Herman Strecker and Arthur G. Butler; chemical constituents of the sea-water of the lagoon of Caroline Island, determined by Messrs. Stillwell and Gladding; observations of twenty-three new double stars, by Prof. E. S. Holden and Prof. C. S. Hastings; plans for work on the day of the eclipse, by Prof. E. S. Holden; reports on the eclipse; report in regard to the photographic observations of the eclipse, by Mr. H. A. Lawrance.

— Twenty-three years ago Mr. W. Nelson was in the habit of collecting fresh-water shells in a small pond near the Black Hills, Leeds. At that time only four forms were to be found there, — Sphaerium lacustre, Pisidium pusillum, Planorbis nautileus, and Limnaea peregra. After thirteen years an additional species, Planorbis corneus, made its appearance. These were the only species found there until the spring of 1883, when, to the surprise of the collector, six species previously unknown there made their appearance successively. This remarkable increase, which is well attested, took place without any apparent change in external conditions at the locality mentioned.

— After solving most of the knotty problems of molecular physics, the Rev. Dr. J. G. Macvicar departed this life, Feb. 12, from Moffat, Eng., aged eighty-three. He is reputed to have had some influence with Smithson in persuading him to establish the Smithsonian institution, and seems to have been much respected among his parishioners.

— An instance of the practical application of science to every-day life is well shown in the building of the capitol building of Dakota, at Bismarck, by the aid of electric light. This building, costing a quarter of a million of dollars, consists of three stories, basement, and sub-basement, measuring a hundred and fifty-five feet by ninety-two feet, and contains over four million bricks, with trimmings of Joliet stone, and has been erected in the midst of winter. The corner-stone was laid Sept. 5, 1883; and on the 10th of January, 1884, a few days more than four months later, a photograph shows the building to lack only the projection of one side and the upper part of the tower. This result was accomplished by the employment of electric light, which half the time replaced the sun, enabling double gangs of men to work day and night. The frozen sand was thawed by a red-hot cylinder; and the mortar, made with boiling water and hot lime, had its moisture absorbed by the dry bricks before it had time to freeze. Although taller, the building is an almost exact duplicate of the new capitol of Minnesota.

— The *Journal of the Society of arts* states that the coal-measures of New South Wales embrace an area of about 23,950 square miles. The seams worked vary from three feet to twenty-five feet in thickness, are nearly horizontal, and are in some localities considerably above sea-level. There are at the present time forty-one collieries at work, employing in the aggregate, above and below ground, 4,125 miners and others. In addition to the foregoing, there are two mines at which very valuable seams of petroleum-oil, cannel-coal, or kerosene shale are being worked. The number of men employed at these mines above and below ground is two hundred and thirty-one. Since 1865, when the working of these seams commenced, the output has been 241,284 tons, valued at £581,046. There are three principal coal-mining districts,— the Hunter River and Newcastle coal-field, situated to the north of Sydney; the Southern or Illawarra coal-field; and the Western or Lithgow coal-field, upon the Great western railway line, about ninety-five miles west from the metropolis. Coal is also being worked near Berrima, between Illawarra and Lithgow; and some seams are known to occur in the country lying between Lithgow and the Hunter River. Sydney, therefore, occupies an almost central position with regard to the coal-mining districts; and beyond these, coal has been discovered in different parts of the colony.

— Director Wild of St. Petersburg, as president of the International polar commission, has sent out invitations for the congress of arctic travellers in Vienna on April 22. The members of the expeditions sent out in August, 1882, by all the great states north of the equator, to make simultaneous observations of meteorological and magnetic phenomena, are expected to attend.

— Dr. George A. Groff has published a fifth revised edition of his 'Book of plant-descriptions, or Record of plant-analyses,' through the Science and health publishing company. It consists principally of a number of blanks to be used in the analysis of flowering plants, and for this purpose may be useful to teachers of small classes who do not wish to go to the expense of having blanks printed. There is also a list of terms used in descriptive botany, not, however,

accompanied by definitions. There is also a list of subjects suitable for theses, — rather an extraordinary array, on the whole, and requiring in a number of cases a much more elaborate equipment than that recommended on a previous page. The tabular view of the vegetable kingdom would better have been omitted altogether, as it is antiquated and faulty in several respects : desmids and diatoms are protophytes, and what coccoliths may be we are unable to say.

— Under the auspices of the Paris geographical society, a course of lectures is being given on the following subjects: Mr. Faye, The connection of astronomy and geography at the principal periods of history; Mr. de Lapparent, Reliefs of the globe; Mr. E. Fuchs, Distribution of minerals; Mr. Mascart, director of the weather-bureau, Climate; Mr. Velain, Glaciers, and their action on the reliefs of the globe; Mr. Bureau, Geographical distribution of plants; Mr. Ed. Perrier, The depths of the sea, and their inhabitants; Mr. Alphonse Milne-Edwards, Geographical distribution of animals. The first was given Feb. 11, and the last is put down for March 31. The course will be continued next year.

— From observations of the weather of the past seventeen winters, taken at Lawrence, Kan., by Prof. F. H. Snow, it appears, that, during this period, five winters have had a lower mean temperature and a larger number of zero days than the winter just closed, six winters have had a larger number of winter days, but only one has had a lower minimum temperature. The rainfall (including melted snow) of the past winter has been three-fourths the average amount; the fall of snow has been slightly above the average depth; the cloudiness has been more than two per cent above the mean; the wind has exceeded its average by more than five thousand miles; there has been a single thunder-shower (the average number); there has been one more fog than usual; and the barometer has exceeded its average height.

— Dr. C. V. Riley, of the Agricultural department of Washington, states that the rust which is often seen on oranges, and which decreases their market value by about a dollar a crate, is produced by a mite. He finds that this mite is very susceptible to sulphur and kerosene and milk, which, if judiciously applied early in the season, will preserve the brightness of the fruit.

— Mr. Francis Speir, whose address is South Orange, N.J., has sent out a circular, asking for replies to eleven sets of psychological questions, whose aim is "to cover the field of conscious mental activity in its relations with a possible unconscious cerebral activity." He desires to collect facts of personal experience from those who answer the circular, and to use these facts for the purposes of a classification and co-ordination of the phenomena.

The questions seem to us of very unequal value and definiteness. When Mr. Speir asks, "What is the greatest number of distinct ideas you can consciously have before your mind at one time?" he asks a question that seems to us hopelessly vague. Wundt has tried to give such a question a definite meaning, and to investigate it systematically. Even his results seem to us somewhat ambiguous. For the ordinary observer of subjective states, the question may mean almost any thing or nothing; for what ideas shall he call distinct ? and what is one time ? Still, Mr. Speir may get some intelligible answers to this inquiry; but, as we venture to say, they will not all really refer to the same question. The question, "Can you wake precisely at a given hour determined upon before going to sleep?" is an example of a definite and fair question. But to ask of people in general, "Have you ever dreamed a dream precisely like one your parents or ancestors have dreamed?" seems to us to invite mere idle gossip. The answers, if negative, interest nobody: if they are affirmative, they might interest a collector of folk-lore; for, in telling his dream-experiences, who is very accurate at the best ? In remembering and repeating them over and over, who is free from the manifold errors of memory? But in comparing one's own dreams with the traditions of the dreams of one's grandmother, who will be able to give answers that can be called scientific? The more confident the reply, the less useful, in such a case, the supposed fact. There is a whole folk-lore of family traditions, as yet little known to science, because it is the private amusement of the fireside. Let us leave it all, for the present, to the poets, to the story-tellers, and to our aged female relatives. There are psychical facts nearer to observation, and less subject to whimsical, incalculable sources of error.

We suggest these criticisms because this work of collecting facts by means of psychological circulars is yet in its infancy, and its very life is threatened by any injudicious use of it. Mr. Speir's questions are, in the most of these cases, very fair; but the few injudicious ones endanger the success of his work. Plainly, in asking questions about subjective states, we are in perpetual danger of bad observations as the basis for the answers that we get. What are our safeguards? Plainly, as Mr. Galton's success has shown us, the necessary safeguards are, to ask only perfectly definite questions, to ask questions in whose answer our subject has no disturbing personal interest, and to be careful not to ask questions that popular tradition has already answered by some poetical or otherwise interesting myth. Best of all are the questions whose answer our subject will never before have thought of at all, so that he will have no theory of his own. Unless we take some such care as this, our latest effort at the collection of psychological facts will degenerate into the most tedious of disastrous wanderings. We await with interest Mr. Speir's paper on the results of his inquiry, for most of his circular is promising enough.

— The following singular advertisement appears in the *Deutsch-Kroner zeitung* of Dec. 11: "Magpies shot between Dec. 24 and Jan. 6 are used for a remedy against epilepsy. The undersigned, with whom this medicine is prepared, will be greatly obliged to every one who will send him at that time as many magpies as possible, provided that they have been shot, and not killed by poison or caught in traps. — Castle Tütz, Dec. 5, 1883. Signed: Theodor, Count Stolberg."