first discovered several years ago, the report affirms, it was nearly a mile in length, and at the bottom of the "gulch" presented a sheer precipice of ice about 150 feet in height. Later in the season it had been considerably reduced both in length and bulk; but earlier in the following year it had regained first dimensions. The rocks on the sides of this immense mass of moving ice are said to show all the characteristic signs of glacier action. The location of this interesting natural curiosity is said to be in the Mosquito Range, about fifteen miles north of the Pass; and, being very inaccessible and out of the ordinary line of travel, the fact of its being discovered at this late day is accounted for.

THE experiment of sending up three connected balloons will be tried in Lille at the end of next May. The balloons are now fitting in the vestibule of the Palais de l'Industrie of the Champ de Mars, Paris; there will at the same time be a descent in a parachute by M. Tavis.

M. YON, one of the administrators of the Paris Captive Balloon, is publishing a pamphlet on the construction of a new directing balloon, devised on the plan worked out by M. Giffard in his great experiment executed at Paris in 1852. The only difference is that the motive screws are two, and placed laterally and attached to the ring. A captive balloon fitted up according to the principles practised so successfully by M. Giffard in Paris and in London is being constructed now at Brussels, in the vicinity of the next national exhibition, which will be opened on June 19 to celebrate the fiftieth anniversary of Belgian independence. The number of exhibitors amounts to 6,000, so that an exceedingly fair specimen will be offered to the world of Belgian resources and industry.

THE additions to the Zoological Society's Gardens during the past week include a Vervet Monkey (*Cercopithecus lalandii*) from West Africa, presented by Mr. L. Samuel; a Garnett's Galago (*Galago garnetti*) from East Africa, a Marsh Ichneumon (*Herpestes paludosus*) from South Africa, presented by Mr. A. Chirnside; an African Civet Cat (*Viverra civetta*) from Africa, presented by Mr. P. Lembery; a Banded Ichneumon (*Herpestes fasciatus*) from West Africa, presented by Mr. A. Ferris; a Common Jay (*Garrulus glandarius*), British, presented by Mrs. A. Dutton; two Graceful Ground Doves (*Geopelia cuneata*) from Australia, deposited; a Black Saki (*Pithecia satanas*) from the Lower Amazons, a Cape Hyrax (*Hyrax capensis*), a Robben Island Snake (*Coronella phocarum*) from South Africa, a Great-billed Rhea (*Rhea macrorhyncha*) from South America, purchased; an Amherst Pheasant (*Thaumalea amherstiæ*) from Szechuen, China, received in exchange.

OUR ASTRONOMICAL COLUMN

THE SOUTHERN COMET.—Dr. Gould, Director of the Observatory at Cordoba, has addressed to Prof. Peters of Kiel an interesting letter with observations of the great southern comet. The tail was seen at Cordoba on January 31. Two evenings later, when Dr. Gould first perceived it, the length was certainly 35°. Careful drawings of its position amongst the stars were made independently by two observers until February 14, after which it had not been distinguishable; it was then not less than 37° in length, but was seen with difficulty, and was scarcely brighter near the head than at its extremity. Even at greatest brilliancy about February 7, its light was nowhere superior to that of the Milky Way in Taurus. Dr. Gould states that from the first no nucleus had been discernible in the telescope, the head always appearing "cloud-like and filmy, and elongated in the direction of the tail, which it did not very much surpass in brilliancy;" indeed "the inordinate length of the tail and the great faintness of both tail and head" were very remarkable features in the appearance of the comet. Observations for position were obtained on six evenings between February 6 and 15, which have enabled Dr. Gould to claim priority in pointing out the probable identity of this comet with the great comet of 1843. Calculating from the observations on February 6, 9, and 12, he deduced the following first approximation to the elements:—

Perihelion passage, January 27·4185 M.T. at Washington.

Longitude of perihelion	280° 26′ 59″
,, ascending node	7 50 28
Inclination	35 5 30
Logarithm of perihelion distance	7·719160

Motion—retrograde.

So that, he remarks, the perihelion distance given by this first rough approximation is such that the comet's centre of gravity would have passed at a distance from the solar surface equal to only one-eighth of the sun's own radius.

Dr. Gould also refers to the discussion which took place in 1843 as to the possible identity of the comet of that year with the one observed in southern latitudes in 1668, and concludes:—"Although Hubbard's discussion shows that the observations of 1843 can be best represented by an ellipse of more than 500 years, and although the intervals of 175 years between 1668 and and 1843, and 37 years from the perihelion of 1843 to the present time, are not commensurable, still this argument against identity does not seem very forcible."

The "*Argus* Summary for Europe," published at Melbourne on February 19, contains three positions of the comet, communicated from the Observatory, which are as follow:—

	Right Ascension. h. m. s.	Declination. ° ′ ″
Feb. 9 at 9 p.m. ...	23 41 14·5 ...	− 33 43 52
10 at 9 p.m. ...	23 58 23·0 ...	− 33 44 58
14 at 9 p.m. ...	1 2 15·6 ...	− 33 21 7

These places are termed approximate, and on comparing with the positions received from Dr. Gould and Mr. Gill's rough ones, it is evident that the declination of February 14 has been misprinted, and should be − 32° 21′ 7″. It is stated that on this date the nucleus had become very faint, and "even with the great telescope the tail could only be seen as a thin wisp extending eastwards from the head for a couple of degrees. The head itself appeared simply as a faint nebulous mass with a slight central condensation." Beyond the fact that the comet had passed the perihelion and was rapidly receding from us, nothing definite appears to have been known of the orbit at Melbourne up to February 19, and it is clear that at the Cape up to February 24 its similarity to that of the comet of 1843 had not been remarked, the elements which we have published from Mr. Finlay being entirely different. So that, as we have remarked, it is probable that Dr. Gould has priority in drawing attention to one of the most striking facts connected with the periodicity of comets.

From the first approximate position determined at Cordoba, and the Melbourne observations of February 9 and 14, Mr. Hind has calculated the following orbit, which still further adds to the probability of the identity of the great comets of 1843 and 1880:—

Perihelion passage, January 27·5272, M.T. at Greenwich.

Longitude of perihelion	278° 3·7
,, ascending node...	0 5·7
Inclination	36 9·3
Logarithm of perihelion distance	7·81749

Motion—retrograde.

Prof. Winnecke also has found that the elements of 1843 represent, with very trifling differences, Dr. Gould's place of February 4 and Mr. Gill's rough positions of February 10–15, and thinks there can hardly be a doubt that the bodies are identical.

PHYSICAL NOTES

M. PAUL BERT lately described a tele-microphone to the Académie des Sciences of Paris. The instrument thus denominated differs only in detail of construction from a form of microphone publicly described eighteen months ago in England. The transmitter of the telemicrophone consists of a tolerably thick disk of ebonised rubber, suitably mounted, to the centre of which one of the carbons is attached; the other carbon is kept lightly in contact with it with a pressure which can be adjusted by magnetic means, a small armature of iron being affixed to it, to which

a steel magnet can be approached at will. The receiver is an ordinary Bell telephone. It is claimed that the voice is transmitted with less alteration of timbre than is usual with other telephones, and that there is a remarkable absence of the scraping noises that are almost inseparable from the employment of carbon transmitters.

If rumour speaks truly, we are to hear shortly of another scientific invention worthy to stand beside the telephone or the phonograph in point of interest. Announcements of a mysterious *telephote* or *diaphote*, the discovery of two rival American inventors, have lately appeared in the paragraph columns of the non-scientific press, the instrument or instruments in question being declared capable of transmitting light as the telephone transmits sound. The rumour to which we allude, however, and of the truth of which we have authoritative information, is based upon the fact that Prof. Graham Bell has deposited in the Smithsonian Institution a sealed package containing the first results obtained with a new and very remarkable instrument first conceived by him during his sojourn in England in 1878.

M. Marcel Deprez has recently described two important instruments to the Physical Society of Paris. The first is a galvanometer adapted for measuring very strong currents of electricity, and consists of a series of soft iron needles placed between the limbs of a steel horseshoe magnet of great directive force. Parallel to the plane of these needles and of the poles of the magnet are wound a few coils of stout wire to carry the current. The needle sets itself almost instantly in the position of equilibrium; hence it is suitable to measure currents which exhibit rapid variations in strength. The second invention of M. Deprez is an apparatus adapted for continuously registering the total amount of energy developed by a current; an industrial problem of great importance. The current is passed through an electrodynameter, being, however, bifurcated; the larger portion traversing the outer coils, the smaller portion traversing a wire of high resistance and then passing through the movable inner coils. The product of these two partial currents is proportional to the energy of the current; and as the mutual action of the two coils is also proportional to the product of the two partial currents, nothing more is needed than an appropriate registering apparatus to integrate the various portions of the total amount of energy. In this manner the amount of energy expended in the production of an electric light under any particular circumstances may be determined.

At a recent lecture before the Society of Arts Dr. Heaton exhibited a large number of applications of Balmain's luminous paint, a substance based upon the famous "phosphorus" of Canton, and upon the phosphorescent powders investigated by Becquerel. Amongst other interesting matters it was shown that a can of hot water placed upon a shining surface of the paint dims its brilliance, though it recovers on cooling. The application of a lump of ice produces a contrary effect. A tube of "Canton's phosphorus," prepared more than a century ago by Canton himself, was shown still to possess phosphorescent properties.

With regard especially to the spectra and composition of nebulæ, M. Fiévez, of the Brussels Royal Observatory, has recently, following the example of Huggins, experimented as to whether an alteration in the luminous intensity of a gas, *without modification in the temperature or the pressure of this gas*, may involve disappearance of one or several lines in the spectrum. The method he adopted was that of projecting, by means of a lens, on the slit of a spectroscope, a real image of the luminous body (part of a Plücker tube), and then altering the intensity of this image, either by reducing the aperture of the projection-lens or by displacing a diaphragm pierced with a circular opening between the lens and the image projected. Hydrogen and nitrogen were the gases. With the former, as the brightness diminished the line H disappeared first, then the line C, the line F remaining last. The lines which disappeared did so by gradually diminishing in length. Nitrogen gave like results, and the following additional experiment was of a confirmatory nature:—If, at a moment when most of the lines are extinguished, the aperture of the slit be increased without changing the position of the screen, the lines that had disappeared return. It seems, then, well established that a gas, though possessing several spectral lines, may be manifested in the spectroscope by presence of a single line, the others remaining invisible by reason of the little brightness of the luminous body. On this ground certain nebulæ showing the lines of nitrogen and hydrogen which longest resist extinction are considered by M. Fiévez (with Dr. Huggins) to contain those gases, and the *relative* invisibility of the other lines (*relative* because they might probably be perceived with more powerful telescopes) is attributed to an absorption in space acting equally on rays of any refrangibility.

Some experiments by M. Ziloff on the magnetisation of liquids are described in the *Journal de Physique* for March. It appears, *inter alia*, that the magnetic coefficient of the aqueous solution of perchloride of iron is not constant, but that it is a function of the magnetising force. As the latter is increased the magnetic coefficient increases, reaches a maximum for a determinate value of this force, and then diminishes, at first rapidly, and then slowly.

The action of salts on water-absorption by roots, as studied by Sennebier, Sachs, and Burgerstein, having been left in some doubt, M. Vesque has recently made fresh experiments, and on the following plan:—First, the influence of salt and salt mixtures was tried on the absorption of water by the roots of uninjured plants whose aërial parts were subject to unchanged atmospheric conditions. Then their influence on water absorption by a severed branch, then on that of severed roots. M. Vesque's conclusions from the first series of experiments are as follows:—1. Under ordinary conditions, *i.e.* the plants suffering no lack of mineral nutriment, distilled water is better absorbed than solutions of salts and nutritive liquids. 2. When plants have been exposed a longer or shorter time to the influence of distilled water they absorb better the solutions of salts and nutritive liquids than pure water. 3. Even a short contact of the roots with distilled water acts favourably on the absorption of salts, and conversely a temporary contact of the roots with a salt solution on that of distilled water. 4. The influences are greater the more concentrated the solutions of the salts and the nutritive liquids. 5. There is no qualitative difference between absorption of the solution of an isolated salt and a nutritive liquid. The experiments with severed roots and branches yielded similar results. These also absorbed more distilled water when they had previously been in salt solution, and took up more salt solution when they had stood for more or less time in distilled water.

At a recent lecture at the Conservatoire des Arts et Métiers, on the Industrial Applications of Artificial Refrigeration, M. Raoul Pictet produced a veritable sensation by coining a medallion in frozen quicksilver of the weight of fifteen kilogrammes.

GEOLOGICAL NOTES

Devonian Rocks of Belgium.—We have just received the first descriptive memoir issued by the Geological Survey of Belgium. It is a quarto pamphlet of some seventy pages by Prof. Malaise, containing an account of fossiliferous Devonian and Cretaceous localities. The author has been at work collecting his materials for more than twenty years, and he now publishes a list of 173 places in Belgium from which Devonian fossils have been obtained. These places are arranged stratigraphically, and the names of the fossils found at each are given. As a contribution to the local geology of Belgium the pamphlet will doubtless prove of service. It is evidently a piece of laborious and painstaking work, of the kind that ought to precede the broad generalised summaries which the Survey will eventually be able to present for the information of the world. There is attached to it an index map, on which each of the fossiliferous localities is marked with a coloured spot, to which is attached a symbol indicating its geological horizon. Though the map is not, in the ordinary sense, a geological one, it tells its story clearly, and will be a convenient guide to those who purpose to visit the fossiliferous sites among the Belgian Devonian rocks. Prof. Malaise prefixes to his statistics a short introduction, in which he traces the history of Devonian classification in his own country and gives the subdivisions of the Devonian system which his own labours have led him to adopt. He modifies Prof. Gosselet's arrangement, taking the Couvin shales and limestone with *Calceola* out of the Inferior and placing it in the Middle Devonian group, together with the Givet limestone, but leaving the shales with *Spirifer cultrijugatus* in the Lower. These shales he regards as containing a fauna transitional between that of the Lower and that of the Middle division of the Devonian system. Prof. Gosselet has observed that if the Couvin limestone is