

and Mr. Olmsted, and recommended to the legislature of 1880 the passage of an Act to provide for acquiring title to the necessary lands by the exercise of the right of eminent domain, leaving it to a future legislature to consummate the purchase by appropriating the amount for the payment of the awards, if the sum should seem a reasonable price for the property. Such an Act passed the Assembly, but was defeated in the Senate, although the movement was supported by petitions signed by the most distinguished men of this and other countries. The report of the State Survey, with its complete descriptions, illustrations, and maps, then became the basis of a systematic effort on the part of a few determined friends of the Falls to educate and arouse public opinion to save the scenery of Niagara. Early in 1883 this movement ripened into the organisation of an association to promote legislation for preserving the scenery of the Falls of Niagara, Mr. Howard Potter of New York being president, and Hon. J. Hampden Robb, chairman of the executive committee.

Through the efforts of this Niagara Falls association an Act was passed, in 1883, providing for a commission, entitled "The commissioners of the state reservation at Niagara," and giving them power to proceed through the courts to condemn the lands needed. Ex-Lieut.-Gov. William Dorsheimer is the president of this board; and the other members are President Anderson of Rochester University, Hon. J. Hampden Robb, Hon. Sherman S. Rogers, and Andrew H. Green. With some modifications made necessary by changed conditions, they adopted the plan proposed by the State Survey. The lands selected were then surveyed, and their value appraised by a commission of very high character, appointed by the court, the total value of the lands being \$1,433,429.50. The report of the commissioners of the reservation was made to the present legislature, and a Bill to appropriate this sum was introduced. The Niagara Falls association worked in every part of the state to arouse public opinion to the importance of making this appropriation, and the commissioners laboured most earnestly among the legislators and the people. The battle was a hard one against ignorance and narrow-minded selfishness; but the victory is complete. The legislature, by more than a two-thirds majority, has appropriated the \$1,433,429.50, and the governor has approved the Act.

After six years of almost continuous effort on the part of the active friends of this enlightened project, it is secured by a law which declares that the lands are purchased by the state in order that they may be "restored to, and preserved in, a *state of nature*," and that every part of them shall be for ever free of access to all mankind.

#### NOTES

WE understand that on the receipt by the Science and Art Department from the Foreign Office of a despatch from Her Majesty's Minister at Washington forwarding communications concerning the proposed change in the time for beginning the astronomical day, as recommended by the recent International Meridian Conference at Washington, the Lords of the Committee of Council on Education requested the following Committee to advise them as to what steps should be taken in the matter. Prof. J. C. Adams, F.R.S., the Astronomer-Royal, Capt. Sir F. Evans, K.C.B., R.N., the Hydrographer of the Navy, Gen. Strachey, R.E., C.S.I., F.R.S., Dr. Hind, F.R.S., and Col. Donnelly, R.E. In accordance with their recommendations copies of the Report of the Delegates to the International Prime Meridian Conference at Washington, together with the resolutions adopted by that body, have been sent to various departments of the State, and to the following Societies, &c.: Society of Telegraphic Engineers, Royal Astronomical Society, Royal Society, Submarine Telegraph Company, Eastern Telegraph

Company (Limited), Eastern and South African Telegraph Company (Limited), Eastern Extension, Australasia and China Telegraph Company (Limited), Railway Clearing House. They have been informed that these resolutions of the Prime Meridian Conference appear to my Lords of the Committee of Council to be such as commend themselves for adoption. But before informing the American Government to that effect their Lordships would be glad to receive the opinion of the various societies on the subject.

THE annual meeting for the election of Fellows of the Royal Society was held at Burlington House on Thursday, June 4, the President in the chair. The following were elected:—Major A. W. Baird, R.E., Philip Herbert Carpenter, D.Sc., Sir Andrew Clark, Bart., M.D., Andrew Ainslie Common, F.R.A.S., Staff-Commander Ettrick William Creak, R.N., Prof. Edward Divers, Henry Hicks, M.D., William Mitchison Hicks, M.A., Francis R. Japp, Ph.D., Arthur Milnes Marshall, M.D., Prof. Henry Newell Martin, D.Sc., Cornelius O'Sullivan, Prof. John Pery, Prof. Sydney Ringer, Sidney Howard Vines, D.Sc.

THE Davis lectures upon zoological subjects will be given in the Lecture Room in the Zoological Society's Gardens, Regent's Park, on Thursdays, at 5 p.m. The first was given on Thursday, June 4, the subject being "Rhinoceroses and their Extinct Allies," by Prof. Flower, LL.D., V.P.R.S. The others are:—Thursday, June 11, "Apes and Lemurs," by Dr. St. George Mivart, F.R.S.; Thursday, June 18, "The Structure of the Swan," by Prof. W. K. Parker, F.R.S.; Thursday, June 25, "The Domestic Cat," by J. E. Harting, F.L.S.; Thursday, July 2, "Recent Advances in Zoology," by Prof. F. Jeffrey Bell, M.A.; Thursday, July 9, "The Ancestors of Birds," by F. E. Beddard, M.A.; Thursday, July 16, "The Animals of New Guinea," by P. L. Sclater, F.R.S.

IN the second edition of his work, "*Surl'Origine du Monde*," M. Faye has promulgated the following hypothesis regarding the relations between the geological epochs and the stages of the terrestrial cosmogony. The history of the earth he divides into six stadia. The first is that in which the earth was a glowing ball. The second he calls the *Anteozoic period*, in which total darkness supervened on the extinction of the earth's glow. The third is the *Primary period*, during which there was a feeble illumination from the sun, which was then just coming into existence. During the *Secondary period* the sunlight went on increasing as the sun itself grew larger and assumed its proper shape. In the fifth stadium, which is that of the *Tertiary period*, there was complete solar illumination, and the sun soon attained the maximum of its activity; while in the last stadium, that of the *Quaternary period*, there has been a slight diminution of the solar activity (rather surmised than demonstrated), accompanied by the disappearance of every cosmogonic influence and the establishment of perfect stability in almost all directions. Oscillations in the earth's crust and feeble volcanic manifestations are almost the only instances of cosmogonic change still observable.

WE have received from MM. Fol et Sarasin a copy of a paper by them on the depth to which the light of the sun will penetrate into the sea. It will be remembered that in November last they recounted the results of their experiments on the same subject in the Lake of Geneva. The present paper describes similar experiments made in the Mediterranean off the zoological station and harbour of Villefranche. By means of photographic plates they have proved that in the month of March, in the middle of a sunny day, the rays of the sun do not penetrate beyond 400 metres below the surface of the Mediterranean. This is established by seven separate experiments, at varying

depths and different hours of the morning. At 380 metres, shortly before 11 a.m., the impression on the plate was less than that which would have been left on exposure to the air on a clear night, without a moon. Between 1.20 and 1.30 p.m., at a depth of 405 to 420 metres, there was no trace of any impression whatever on the plate. Light clouds do not appear to cause any notable diminution in the depth to which the light penetrates. In the Lake of Geneva the writers also undertook a new series of investigations to determine the effect of the season on the penetration of light. They give 200 metres as the extreme limit for winter in the lake; but they found that there is as much light at 380 metres in the Mediterranean as at 192 metres in the Lake of Geneva; and by a comparison of these with previous experiments, it appears the light penetrates from 20 to 30 metres deeper in March than in September; in the month of August, perhaps the difference is a little more. Compared with the series of plates exposed in the lake, those of the Mediterranean are characterised by a slower and more regular gradation. This gives rise to the idea that while in the lake the light would be promptly intercepted by the deeper layers, more or less disturbed or muddy, in the Mediterranean the absorption proper to pure water would be the principal, if not the sole factor in arresting the luminous rays.

In a communication to *Ausland* on the causes of the Andalusian earthquakes, A. Rzehak, of Brünn, maintains that they are clearly referable to the "tectonic" class of terrestrial disturbances—that is, those which are connected with the process by which mountains are elevated. Evidence of this connection is furnished by the manner in which the disturbed areas are influenced by lines of fault. The entire area of disturbance in the case of the earthquakes of December last is divisible into three zones: (1) the littoral zone in the south, where the shock was most severe; (2) Andalusia proper, which was likewise the seat of pretty severe disturbances; and (3) the central plateau of Spain as far as the Carpetena chain (a section of the Sierra Guadarrama), where, as already pointed out by M. Noguès (*NATURE*, xxxi. p. 417), the shocks completely died out. These three zones are separated by lines of fault. A great fault can be traced not only along the northern slopes of the Serrania de Ronda, but also further eastwards to the district lying north of Malaga. To the north of this line scarcely any places suffered greatly from the earthquake—except those which, like Antequera, Loja, and Archedona, lie close to or immediately beside transverse faults. Elsewhere the degree of shock was tolerably uniform as far as the fault of the Guadalquivir, which bounds the central plateau on the south. A third great fault passes along the south of the Sierra Guadarrama, and there the disturbance seems to have ended.

THE honour of C.I.E. has been conferred upon Mr. Francis Day, Deputy-Surgeon-General (Retired), Medical Department, Madras, and on Mr. J. B. N. Hennessey, late Deputy-Superintendent, Indian Survey Department.

THE Meteorological Society of Vienna has resolved to erect a meteorological station on Mount Sonnenblick, near Tauern, in the central range of the Tyrolean Alps, 3100 metres above sea-level, and thus the highest station of the kind in Europe.

THE Royal Institute of British Architects, on Monday evening, presented to Dr. Henry Schliemann, F.S.A., their Royal Gold Medal. In acknowledging the medal Dr. Schliemann said that our knowledge of prehistoric architecture was very deficient, for our sole informant was Homer, whose scanty information as to the construction and arrangement of the heroic palaces we did not even understand.

THE latest official report of the earthquake in Cashmere states that much damage was occasioned in the north western portion

of the valley. The ground opened, and the villages of Dubgaon, Jamalapar, and Ovan were swallowed up, while sulphurous dust and hot water issued from the cracks. The fort at Gurais and the grain store-houses were buried. A telegram sent from Serinagur on Friday last says:—"The shocks continue every three hours, with much preliminary noise, but a comparatively slight motion." The great shock appears to have travelled in a southerly direction, and to have been felt at several places in Northern India, although it did no damage there.

THE death is announced, at the age of fifty-two, of Robert von Schlagintweit, Professor of Geography and Ethnology at the University of Giessen. He was the youngest of the three brothers Schlagintweit who, on the recommendation of Alexander von Humboldt, and under the special care of Lieut. Col. Sykes, were sent by the British East India Company to explore that country, and especially the mountain regions in the north-west. The results of their researches, which lasted for several years, are recorded in comprehensive works of the highest scientific value.

IMPORTANT experiments in aerial navigation are now being made by Mr. A. F. Gower, well known in connection with the Gower-Bell telephone. The operations being carried on are, it is understood, within the cognisance of the Government, and are more particularly directed towards the adaptation of balloons to war purposes. Several ascents have already been made, and in carrying out his arrangements Mr. Gower appears to have recognised the advantages offered by the position of the town of Hythe, which he has made the centre of his operations. On Sunday week the wind being favourable, one of the automatic pilot balloons invented by Mr. Gower, with appliances for giving out its own gas and ballast, one compensating for the loss of the other, was filled with 2300 feet of gas, and ascended at about 11 o'clock. In the car a written statement was, of course, placed, explaining the ownership of the machine and its object, with the result that it was next heard of at Dieppe, having made a rapid passage of about seventy-two miles in a straight direction and descended at 2.30 in the afternoon. On Monday, another pilot balloon, with a capacity of 4300 feet, was started, and immediately followed by Mr. Gower in his own balloon (containing 23,000 feet of gas). The object of Mr. Gower in ascending was to watch the action of the pilot; but the smaller machine made such rapid progress that it got out of his observation and came down in the vicinity of Paris. Meanwhile Mr. Gower, who ascended about noon, took the French coast at Boulogne at 2.15, and then taking a northerly curve travelled overland to Calais, where he made a smooth descent at 4 p.m. A still more important undertaking was, however, entered upon on Wednesday, when Mr. Gower, Capt. Lane, and Mr. Dale, the aeronaut, ascended in a balloon of 40,000 feet capacity. A good start was made, and the aerial voyagers sailed away in a northerly direction. After a journey of rather more than an hour, they were compelled to descend, owing to the wind taking a slight turn towards the North Sea, and with much difficulty landed on the Isle of Sheppey, having travelled twenty-three miles.

A VERY laudable effort at teaching the general public practical astronomy is being made in Christiania. An optician, Herr A. Olsen, has erected a great refractor in the Royal Park—in size said to be the fifth in the world—through which the celestial bodies can be observed by the public for a small fee, while explanations are given of their nature, &c. The interior of the pavilion in which it is mounted is hung with celestial charts and diagrams, as well as views of the planets, the sun, and the moon, for the purpose of facilitating the object in view. The cost of the instrument is very nearly 2000*l.*

INTELLIGENCE has been received at New York, June 9, stating that a waterspout has burst near Lagos, in Mexico. One

hundred persons are reported to have perished, and it is feared that the loss of life will prove even greater.

A WATERSPOUT passed over a portion of the town of Hagenau (Alsace) on May 23 last, doing very great damage to houses and trees.

AT Stendal (Prussian Saxony) a Committee for the erection of a monument in memory of Dr. Gustav Nachtigal has been formed, and contributions towards this object are solicited.

THE Austrian Central Tourist Club has addressed a petition to the Assemblies of all Austrian alpine provinces to pass a law prohibiting the wholesale uprooting of *Edelweiss* now carried on. The petitioners point out that hundreds of thousands of the plants are dug up and sent abroad, even to America, so that there is a fear that the favourite plant of all lovers of the Alps will be totally exterminated, except in a few remote places. In Switzerland, it is stated, for several years past there have been stringent laws in the several cantons against uprooting and selling the *Edelweiss*.

THE rôle of wind in fertilising the ground is remarkably illustrated, according to M. Alluard, by the very fertile valley of Limagne, in Auvergne. The prevalent winds there are west and south-west, and traverse the chain of the Dômes, where are vast deposits of volcanic ashes. Much of this dust is thus carried to the Limagne valley, and settles there of itself, or is carried down by rain or snow. As it contains a large amount of phosphoric acid, potash, and lime, it is highly fertilising, and its very fine state favours rapid assimilation. From observations on the Puy de Dôme, M. Alluard estimates the annual deposit at 348 to 400 grammes per square metre.

WE have received the Calendar of the University of Virginia for the academical year 1884-85. The science department appears to be exceptionally strong and well organised.

ONE result of the recent visit of the Ameer of Afghanistan to India is that his palace at Cabul is to be lit by the electric light. He ordered the necessary apparatus when at Rawul Pindi, and three Cabulese have for some time past been studying its manipulation at Bombay.

WE have received a copy of a lecture by Mr. Thomas Fletcher, delivered before the Parkes Museum of Hygiene, on "Smokeless Houses and Manufactories." It deals mainly with the lecturer's personal experiences of the employment of gaseous fuel in his private residence and manufactory at Warrington, the appliances which he has used, a comparison of the cost with that of coal, the work done, &c. In reply to a question, Mr. Fletcher expressed the opinion that radiant heat is the only possible comfortable way of heating a living-room, and that it is therefore better to mix gas with air to prevent smoke, and heat as large a surface as possible to incandescence.

ACCORDING to a report by the Director of Public Instruction in Tunis, there are at the present moment twenty primary schools in the Regency—eight in Tunis, and twelve in other towns—Susa, Monastir, Sfax, Goletta, &c. In this number are included three schools of the Israelite alliance at Susa, Tunis, and Mehdiâ. The number of pupils is 3974, composed of 2291 boys and 1683 girls. The report states that there are in addition a certain number of primary schools in which the instruction is religious. Of these there are 113 in Tunis, and about 500 in the whole Regency. For secondary instruction there are three establishments, all in Tunis. These contain 23 classes with 38 masters, giving instruction to 416 pupils, of whom 78 are French, 27 Italian, 26 Anglo-Maltese, 74 Jews, 193 Arabs, and 18 of various nationalities.

A MEETING of the National Fish Culture Association was held on Thursday last to consider the question of instituting sea tem-

perature observations with a view to gaining independent and fresh knowledge with respect to our marine food-fishes. The subject of marine stations was discussed together with other matters relative to log-books to be issued to suitable investigators.

THE additions to the Zoological Society's Gardens during the past week include a Squirrel Monkey (*Chrysolrix sciurea*) from Demerara, presented by Mr. T. C. Edwards-Moss; a Common Badger (*Meles taxus*) from Derbyshire, presented by His Grace the Duke of Devonshire, K.G., F.Z.S.; a Common Badger (*Meles taxus*) from North Wales, presented by Mr. T. W. Proger; two Common Hedgehogs (*Erinaceus europæus*), a Common Viper (*Vipera berus*) from Norfolk, presented by Mr. T. E. Gunn; a Chattering Lory (*Lorius garrulus*) from Moluccas, presented by Mr. H. D. Astley, F.Z.S.; a Red-crested Cardinal (*Paroaria cucullata*) from South America, presented by Miss Hyrzan; a White-tailed Eagle (*Haliaeetus albicilla*) from Perthshire, presented by Mr. H. Tennent Tennent; a Manx Shearwater (*Puffinus anglorum*), a Puffin (*Fratercula arctica*), British, presented by Mr. W. Graham, F.Z.S.; an Egyptian Monitor (*Varanus niloticus*) from West Africa, presented by Mr. H. Denny; an African Lepidosiren (*Protopterus annectens*) from African Rivers, presented by Mr. Cornelius Alfred Malony, C.M.G.; two Slowworms (*Anguis fragilis*), British, presented by Mr. F. J. Guy; a Sharp-nosed Crocodile (*Crocodylus acutus*) from Jamaica, deposited; a Collared Fruit Bat (*Cynonycteris collaris*), an Axis Deer (*Cervus axis* ♀), a Hybrid Lühdorf's Deer (between *Cervus lühdorfi* and *Cervus canadensis* ♂), a Burrhel Wild Sheep (*Ovis burrhel*), two Triangular-spotted Pigeons (*Columba guinea*), a Variegated Sheldrake (*Tadorna variegata*), a Herring Gull (*Larus argentatus*), twenty Spotted Salamanders (*Salamandra maculosa*), thirty Pleurodele Newts (*Molge waltii*), bred in the Gardens.

#### ASTRONOMICAL PHENOMENA FOR THE WEEK, 1885, JUNE 14-20

(For the reckoning of time the civil day, commencing at Greenwich mean midnight, counting the hours on to 24, is here employed.)

##### At Greenwich on June 14

Sun rises, 3h. 44m.; souths, 11h. 59m. 59<sup>o</sup> 9s.; sets, 20h. 16m.; decl. on meridian, 23° 18' N.; Sidereal Time at Sunset, 13h. 49m.

Moon (at First Quarter on June 19, 14h.) rises, 5h. 46m.; souths, 13h. 38m.; sets, 21h. 25m.; decl. on meridian, 17° 37' N.

Planet	Rises		Souths		Sets		Decl. on meridian
	h.	m.	h.	m.	h.	m.	
Mercury ...	2	58	10	56	18	54	20° 45' N.
Venus ...	4	26	12	48	21	10	24° 11' N.
Mars ...	2	18	10	7	17	56	19° 17' N.
Jupiter ...	9	28	16	37	23	46	12° 32' N.
Saturn ...	4	7	12	16	20	25	22° 28' N.

##### Phenomena of Jupiter's Satellites

June	h.	m.	III. tr. ing.	June	h.	m.	II. occ. disap.
14	20	15	III. tr. ing.	18	23	17	II. occ. disap.
	22	37	I. ecl. reap.	20	20	33	II. tr. egr.
16	22	24	IV. ecl. disap.				

The Eclipses of Jupiter's Satellites are such as are visible at Greenwich.

June	h.	Jupiter in conjunction with	of the Moon.
17	15	Jupiter in conjunction with	3° 44' north
18	23	Saturn in conjunction with	the Sun.

#### GEOGRAPHICAL NOTES

AFTER having lost, in December last, their director, Prof. W. G. Erofeeff, and in January one of their most active members, W. A. Domzer, the Russian Geological Commission has again sustained a heavy loss in the death of the distinguished G. P. Helmersen. According to the notice in the last issue of the *Izvestia* of the Commission he began his scientific career more than sixty years ago, at the Dorpat University, and when