

of visitors to particular departments for the purpose of study or research it has increased from 146,891 in 1882 to 182,778 in 1887 to the reading-room, from 1452 in 1885 (when the room was opened) to 11,802 in 1887 to the newspaper-room, and from 2709 in 1882 to 14,238 in 1887 to the various departments in the new building in Cromwell Road. The students who frequent the reading-room will agree with the principal librarian's remarks as to the inadequacy of the accommodation of that room, and will hope that his recommendation to provide a separate room for "the throng of readers for general information" may be speedily carried out. Amongst the more important donations to the Museum during the past year were the following: stone implements from Japan and Greenland, ancient Peruvian pottery and masks, presented by the trustees of the late Mr. Christy; a collection of Andamanese objects from the Colonial Exhibition, by M. V. Portman; a valuable collection of ethnological objects from the Nicobar Islands, by E. H. Man; a remarkable collection of objects of the Late Celtic period, found in graves at Aylesford; a large collection of stone implements from Japan, presented by Sir Alexander Cunningham. The arrangement of many of the sections in the ethnographical gallery has been altered in the past year. Thus several sections of Asiatic islands have been revised to make room for the two large series from the Andaman and Nicobar Islands. Amongst the Oriental and ethnographical acquisitions during the year were the following: a collection of Indian antiquities, consisting of relic caskets of various kinds with various Buddhist sculptures, &c., presented by General Sir Alexander Cunningham; a number of antiquities from Siam and Burma, presented by E. M. Satow; seventy-six specimens of Chinese porcelain with armorial devices, presented by the Rev. F. Warre; a number of ethnographical specimens collected in the Pacific Islands by H. J. Veitch; and an extensive collection of specimens from New Guinea, including models of houses, boats, &c., collected by H. H. Romilly, and presented by the Queensland Commissioners of the Colonial and Indian Exhibition.

WITH regard to the natural history collections great progress has been made in the arrangement and description. Two cases have been placed on the floor of the Great Hall, illustrating general laws in natural history. The specimens in one case have been presented by Mr. Henry Seebohm, and show that what are regarded as two distinct species of crows (the *Corvus cornix* and the *Corvus corone*) may unite and produce offspring. The second case illustrates the effect of domestication on pigeons. The great collection of birds, which was formed chiefly by the late Marquess of Tweeddale, has been given to the Museum under certain conditions by Mr. R. G. Wardlaw-Ramsay, together with his large ornithological library. The collection comprises nearly 40,000 bird-skins, and is particularly valuable to the Museum, as it is very rich in birds of the Philippine Islands, Andaman Islands, &c., in which the Museum was very deficient. A collection of butterflies, anthropological objects, skins of birds and mammals, sent from Wadelai by Emin Pasha, has reached the Museum. The Commissioners present at the Indian and Colonial Exhibition gave some fine specimens of the flora of Australia and New Zealand. The zoology department is now overcrowded, 270,000 specimens having been added in the space of four years.

THE King of Italy, acting on the recommendation of the Minister of Public Instruction, has issued a decree regulating the manner in which Italy proposes to celebrate the fourth centennial of the discovery of America by Columbus. This will consist mainly in the publication of the collected works of the great navigator, and of all the documents and charts which will throw any light upon his life and voyages. This will be accompanied by a biography of the works published in Italy upon Columbus and the discovery of America from the earliest period down to

the present time. The head of the Royal Commission charged with the preparation of this edition is Cesare Correnti, President of the Italian Historical Institute; and among its members are Signors Amari, Cantu, and Desimoni, and the Marquis Doria. An appropriation of 12,000 lire has been made to cover the expenses of this work, which is now fairly undertaken for the first time. Various editors have published portions of the writings of Columbus, as Navarrete the account of his voyages, and Major his letters; but no one has yet collected all his writings into a single edition, though an index to them was published in 1864.

THE British Consul at Chicago in a recent report refers to an interesting experiment in some of the Western States in afforestation. He says that in the vast prairies of the western half of Dakota, Nebraska, and Kansas, the eastern part of Colorado, and in the plains of Dakota and Wyoming, there is an almost total absence of trees, and hence the moisture is very deficient. In the forest regions and amongst the mountains, lumber and firewood have rapidly decreased from the reckless way in which old and young trees have been cut. This waste has been restrained by various Acts, principally by the Timber Culture Law, which regulates the disposal of lands. In Nebraska, fifteen years ago, a voluntary movement was started for the encouragement of planting and forestry in general, and one day in the year, called "Arbor Day," was set apart for that purpose. On that day trees are planted by prominent persons, and by the local bodies. This example has been followed by almost every other State named above, and "Arbor Day" is now a public holiday in those regions, the date being fixed by the Governor. So great has been the progress that in Kansas alone there are now no less than 250,000 acres of artificial forest. The kind of trees planted varies very much with the district and the taste of the planters. White elm is said to be the best tree, being of rapid growth and yet hardy. Oak, walnut, maple, elm, ash, catalpa, pine, tulip-tree, linden, and others, have all been found to flourish.

THE additions to the Zoological Society's Gardens during the past week include a Squirrel Monkey (*Chrysothrix sciurea*) from Guiana, presented by Mr. George Miles; a Rhesus Monkey (*Macacus rhesus* ♀) from India, presented by Mr. J. Witham; a Kinkajou (*Cercoptes caudivolvulus*) from Venezuela, presented by Dr. A. Batchelor, F.R.C.S.; a Black-backed Jackal (*Canis mesomelas* ♀) from South Africa, presented by Lieut. Lionel de Lantour Wells, R.N.; a Roseate Cockatoo (*Cacatua roseicapilla*) from Australia, presented by Mrs. J. de la Mare; a Sulphur and White-breasted Toucan (*Ramphastos vitellinus*) from Rio Negro, presented by Dr. C. E. Lister; an Alligator (*Alligator mississippiensis*) from Florida, presented by Mr. Michael Millard; two Sharp-nosed Crocodiles (*Crocodilus acutus*) from Nicaragua, presented by Mr. E. A. Williams; a Common Viper (*Vipera berus*), British, presented by Colonel C. S. Sturt; a Grey Lemur (*Haplemur griseus*) from Madagascar, received in exchange; a Barbary Wild Sheep (*Ovis tragelaphus* ♀) from North Africa, deposited; a Brazilian Cariama (*Cariama cristata*) bred in the Gardens.

ASTRONOMICAL PHENOMENA FOR THE WEEK 1888 SEPTEMBER 16-22.

(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 September 16

Sun rises, 5h. 39m.; souths, 11h. 54m. 34'6s.; sets, 18h. 10m.; right asc. on meridian, 11h. 38'0m.; decl. 2° 23' N. Sidereal Time at Sunset, 17h. 54m.
Moon (Full on September 20, 5h.) rises, 16h. 57m.; souths, 21h. 25m.; sets, 2h. 0m.*; right asc. on meridian, 21h. 10'2m.; decl. 17° 45' S.

Planet.	Rises.		Souths.		Sets.		Right asc. and declination on meridian.	
	h.	m.	h.	m.	h.	m.	h.	m.
Mercury..	7	24	13	1	18	38	12	44'2 ... 5 8 S.
Venus....	7	20	13	3	18	46	12	46'4 ... 3 58 S.
Mars.....	12	23	16	22	20	21	16	6'5 ... 22 29 S.
Jupiter...	11	54	16	11	20	28	15	55'0 ... 19 45 S.
Saturn....	1	57	9	30	17	3	9	13'4 ... 16 52 N.
Uranus...	7	43	13	17	18	51	13	0'5 ... 5 47 S.
Neptune..	20	33*	4	20	12	7	4	2'3 ... 18 58 N.

* Indicates that the rising is that of the preceding evening and the setting that of the following morning.

Occultations of Stars by the Moon (visible at Greenwich).

Sept.	Star.	Mag.	Disap.	Reap.	Corresponding angles from vertex to right for inverted image.	
					h. m.	h. m.
16 ...	30 Capricorni ...	6	...	21 47	...	23 I ... 128° 28'
19 ...	B.A.C. 8274 ...	6	...	20 56	near approach	176 —
Sept.	h.					
19 ...	4 ...					Mercury in conjunction with and 1° 40' south of Venus.
22 ...	15 ...					Sun in equator.

Variable Stars.

Star.	R.A.		Decl.		Sept. 21,	h. m.
	h.	m.	h.	m.		
U Cephei ...	0	52'4	81	16 N.	...	4 54 M
T Arietis ...	2	42'1	17	3 N.	...	21, m
Algol ...	3	0'9	40	31 N.	...	17, 20 15 m
R Leporis ...	4	54'5	14	59 S.	...	18, m
T Monocerotis ...	6	19'2	7	9 N.	...	21, 3 0 M
ζ Geminorum ...	6	57'5	20	44 N.	...	19, 0 0 m
S Canis Minoris ...	7	26'6	8	33 N.	...	19, M
S Cancri ...	8	37'5	19	26 N.	...	22, 1 11 m
V Boötis ...	14	25'3	39	22 N.	...	22, m
U Coronæ ...	15	13'6	32	3 N.	...	16, 1 6 m
S Libræ ...	15	15'0	19	59 S.	...	22, M
S Scorpii ...	16	11'0	22	37 S.	...	16, M
U Ophiuchi... ..	17	10'9	1	20 N.	...	19, 3 22 m
R Scuti ...	18	41'5	5	50 S.	...	19, M
β Lyræ... ..	18	46'0	33	14 N.	...	20, 21 0 m ₂
η Aquilæ ...	19	46'8	0	43 N.	...	18, 23 0 m
T Vulpeculæ ...	20	46'7	27	50 N.	...	19, 21 0 m
W Cygni ...	21	31'8	44	53 N.	...	20, M
δ Cephei ...	22	25'0	57	51 N.	...	20, 3 0 m

M signifies maximum; m minimum; m₂ secondary minimum.

Meteor-Showers.

	R.A.	Decl.	
Near ε Tauri ...	64	21 N.	Swift; streaks.
,, η Aurigæ ...	74	41 N.	Sept. 21. Swift; streaks.
,, χ Orionis ...	89	18 N.	Very swift.
	98	44 N.	Very swift; streaks.

SOCIETIES AND ACADEMIES.

PARIS.

Academy of Sciences, September 3.—M. Janssen, President, in the chair.—Microbism and abscess, by M. Verneuil. The ordinary type of abscess is studied in connection with the new light thrown on the subject by microbic researches on suppuration. The almost constant presence of the micro-organisms described by Klebs, Pasteur, and others, shows that they are in all probability the real and exclusive cause of pyogenesis, a conclusion placed almost beyond doubt by the fact that, when introduced into the animal system, these organisms invariably produce suppuration and abscesses. A classification is given of the microbes in question, which are divided into two distinct groups: (1) pyogenic microbes, properly so called, which are normally present, such as the orange, lemon, white, and other varieties of Micrococcus and Diplococcus; (2) those which occur irregularly in the purulent matter, but which may exist normally in the system apart from any pyogenic symptoms or centres of

suppuration—various kinds of Bacteria, Vibriones, Bacilli, &c. A classification follows of abscesses themselves, based on the etiology of pyogenesis as well as on their pathological anatomy and physiology.—Inscription giving the details of a lunar eclipse, by M. Oppert. This inscription, the text of which was first published by Strassmaier in the *Zeitschrift für Assyriologie*, vol. ii., is referred to the year 24 B.C., 232 of the era of the Arsacides. It describes the eclipse as having been predicted by the astronomer Uruda (Orodes), and as taking place, as predicted, in the month of Nisan, on the 13th night, at the hour of 5 and 51 parts, which is reduced to Monday, March 23, 9h. 30m. p.m., Paris mean time.—The fluorescent compounds of chromium and manganese, by M. Lecoq de Boisbandran. These substances are studied and prepared synthetically with a view to determining their several degrees of oxidation.—Note on the position of some points on the Brazilian seaboard, extracted from a memoir of the Comissão de Longitudes, by M. Cruls. The places, whose positions are here astronomically determined by the officers attached to the Brazilian Hydrographic Service, are Cape Frio, oh. 4m. 34'05s. (with probable error 0'12s.), east of Rio de Janeiro; and Santos, oh. 12m. 33'44s. (with probable error 0'20s.), west of Rio de Janeiro.—On the measurement of the refraction indices of crystals with double axis, by M. Charles Soret. These measurements are here effected by the observation of the limiting angles of total reflection on any facets.—Physiological action of the chloride of ethylene on the cornea, by M. Raphael Dubois. In a previous paper (*Comptes rendus*, vol. civ., No. 26, 1887) the author showed that the chloride of ethylene (C₂H₄Cl₂) introduced in any way into the system produces in the dog, several hours after waking, an opacity of the cornea of a very remarkable character. Here he studies the nature of this phenomenon, and determines the mechanism by which it is produced.

BOOKS, PAMPHLETS, and SERIALS RECEIVED.

Eclectic Physical Geography: R. Hinman (Cincinnati).—Solutions of the Examples in an Elementary Treatise on Conic Sections: C. Smith (Macmillan).—Chart for Great Circle Sailing, Nos. 1 and 2: R. A. Proctor (Stanford).—Les Tremblements de Terre: F. Fouqué (Baillière, Paris).—Die Structur und Zusammensetzung der Meteoriten, Liefg. 1, 2, 3: A. Brezina and E. Cohen (Stuttgart).—The Speaking Parrots, Part 5: Dr. K. Russ (U. Gill).—The Flowering Plants of Wilts: Rev. T. A. Preston (Wilts Archaeological and Natural History Society).—Results of Experiments at Rothamsted on the Growth of Root Crops: J. H. Gilbert.—Memoranda of the Origin, Plan, and Results of the Field and other Experiments at Rothamsted.—On Infant Feeding and the Value of Preparations of Pure Alpine Milk: Dr. Nachtigal (Ridgway).—Proceedings of the Bristol Naturalists' Society, vol. v. Part 3 (Bristol).—Proceedings of the American Academy of Arts and Sciences, New Series, vol. xv. Part 1 (Boston).—Meteorological Record, vol. vii. No. 28 (Stanford).—Quarterly Journal of the Royal Meteorological Society, July (Stanford).

CONTENTS.

	PAGE
Experiments on the Growth of Wheat	465
The Japanese Volcanic Eruption	466
Calculation of Ranges, &c., of Elongated Projectiles. By Rev. F. Bashforth	468
The British Association	469
Section B—Chemical Science.—Opening Address by Prof. William A. Tilden, D.Sc. Lond., F.R.S., F.C.S., President of the Section	470
Section D—Biology.—Opening Address by W. T. Thiselton-Dyer, C.M.G., M.A., B.Sc., F.R.S., F.L.S., President of the Section	473
Section E—Geography.—Opening Address by Colonel Sir C. W. Wilson, R.E., K.C.B., K.C.M.G., D.C.L., LL.D., F.R.S., F.R.G.S., Director-General of the Ordnance Survey, President of the Section	480
Notes	485
Astronomical Phenomena for the Week 1888	
September 16-22	487
Societies and Academies	488
Books, Pamphlets, and Serials Received	488