

A BEAUTIFUL optical phenomenon, which has not yet been satisfactorily explained, is described by M. F. Folie in the *Bulletin* of the Belgian Academy. It was observed about a mile from Zermatt on August 13 at 8.30 a.m. "On our right, towards the east, on the steep flanks of the mountains which enclose the valley of the Viège, rose a group of fir trees, the highest of which projected themselves against the azure of the sky, at a height of 500 m. above the road. Whilst I was botanising my son exclaimed: 'Come and look: the firs are as if covered with hoar-frost!' We paid the most scrupulous attention to the phenomenon. To make sure that we were not misled by an illusion we made various observations, both with the naked eye and with an excellent opera-glass." It was observed that not only the distant trees, but those lining the road, glittered in a silvery light, which seemed to belong to the trees themselves, and that the insects and birds playing round the branches were bathed in the same light, forming an aureole round the tops of the trees, somewhat resembling the light effects observed in the Blue Grotto. It is suggested that the light was reflected from the snow. Since it disappeared as soon as the sun rose above the hill, and has never been seen except in the presence of snow, this explanation appears plausible, but it is highly desirable that further and more detailed observations should be made of this *spectacle féerique*.

THE Tasmanian Official Record is henceforth to be issued tri-annually instead of annually, and a handbook has been issued to take its place during the intervening years. This handbook (which is described on the title-page as "for the year 1892") contains a brief epitome of the historical portion of the Official Record, and summarises in a convenient form the more important statistical information contained in the detailed tables of the last volume of the general statistics of the colony.

MESSRS. ASHER AND CO. will publish shortly an English translation of the "Recollections of the Life of the late Werner von Siemens," the well-known electrician, and brother of Sir William Siemens. Two editions of the German original, published in December last, were issued in the course of a few weeks.

THE course of four winter lectures in connection with the London Geological Field Class will this year be delivered by Prof. H. G. Seeley, F.R.S., on Tuesday evenings, at the Memorial Hall, Faringdon Street, the subject being "The Fossil Reptiles of the Thames Basin." All particulars may be had of the Hon. Sec. Mr. J. H. Hodd, 30 and 31, Hatton Garden, E.C.

THE bacterial purification which takes place in a river during its flow has been recently attributed in part to the process of sedimentation which the micro-organisms in the water undergo, but it would seem that yet another factor must be taken into account. Buchner, in some investigations which he has recently published ("Ueber den Einfluss des Lichtes auf Bakterien," *Centralblatt für Bakteriologie*, vol. II, 1892, also vol. 12, p. 217) shows that this diminution of the numbers present may be also assisted by the deleterious action which light exercises upon certain micro-organisms. A systematic series of experiments was made by introducing typhoid bacilli, *B. coli communis*, *B. pyocyaneus*, Koch's cholera spirilla, also various putrefactive bacteria, into vessels containing sterilized and non-sterilized ordinary drinking water. As a control, in each experiment one vessel thus infected was exposed to light, whilst a second was kept under precisely similar conditions, with the exception of its being covered up with black paper, by means of which every particle of light was excluded. The uniform result obtained in all these experiments was that light exercised a most powerful bactericidal action upon the bacteria in the water under observation. For example, in one water in which at the commencement of the experiment 100,000 germs of *B. coli communis* were present

in a c.c., after one hour's exposure to direct sunlight *none* were discoverable, whilst in the darkened control flask during the same period a slight increase in the numbers present had taken place. Even the addition of culture fluid to the flasks exposed to sunlight could not impair in the least the bactericidal properties of the sun's rays. In the flasks exposed to diffused daylight the action was less violent but still a marked diminution was observed. In his later experiments Buchner has employed agar-agar, mixing a large quantity of particular organisms, pathogenic and others, with this material in shallow covered dishes and then exposing them to the action of light and noting its effect upon the development of the colonies. For this purpose strips of black paper cut in any shape (in the particular dish photographed by Buchner letters were used) were attached outside to the bottom of the dish, which was then turned upwards and exposed to direct sunlight for one to one and a half hours and to diffused daylight for five hours. After this the dish was incubated in a dark cupboard. At the end of twenty-four hours the form of the letters fastened to the bottom of the dish was sharply defined, the development of the colonies having *taken place in no part of the dish, except in those portions covered by the black letters*. Some interesting experiments on the same subject have also recently been made by Kotljar (*Centralblatt für Bakteriologie*, December 20, 1892). In the course of these investigations the author found that of the coloured rays of the spectrum the red favoured the growth of those bacteria experimented with, whilst the violet rays acted prejudicially, although less so than the white rays. The exceedingly interesting observation was made that the violet rays actually favoured the sporulation of the *Bac. pseudo anthracis*.

THE additions to the Zoological Society's Gardens during the past week include a Macaque Monkey (*Macacus cynomolgus* ♂) from India, presented by Mr. A. Sandbach; a Triton Cockatoo (*Cacatua triton*) from New Guinea, presented by Mr. Arthur Harter; a Gannet (*Sula bassana*) British, presented by Mr. F. W. Ward; two Tuatera Lizards (*Sphenodon punctatus*) from New Zealand, presented by Mr. W. H. Purvis; two Wanderoo Monkeys (*Macacus silenus*) from the Malabar Coast; a Straw-necked Ibis (*Carphibis spinicollis*) from Australia; four Snow Buntings (*Plectrophanes nivalis*); six Wild Ducks (*Anas boschas*, 3 ♂ 3 ♀) British, purchased; a Meadow Bunting (*Emberiza cia*) European, received in exchange; two Shaw's Gerbilles (*Gerbillus shawi*) born in the Gardens.

OUR ASTRONOMICAL COLUMN.

COMET HOLMES.—*Edinburgh Circular*, No. 37, announces that Palisa, telegraphing from Vienna, states that Comet Holmes now resembles an 8 m. star with a nebulous envelope 20" of arc in diameter.

A further observation made by Prof. Schur in Göttingen on January 19 showed that the nucleus was of the 10th magnitude, and could not be considered at all brighter than that magnitude. For the latter observation the air, as regards clearness, was all that could have been desired.

At South Kensington, on January 18, the comet was observed as a hazy star and estimated to be about the 8th magnitude.

The following ephemeris is that given by Schulhof:—

Date.	R.A. app.			Decl. app.
	h.	m.	s.	
Jan. 26 ...	1	35	33.0	+ 33 42 3
27 ...	36	58.7	...	42 51
28 ...	38	25.1	...	43 44
29 ...	39	52.1	...	44 43
30 ...	41	19.8	...	45 46
31 ...	42	48.1	...	46 55
Feb. 1 ...	44	17.0	...	48 8
2 ...	1	45	46.5	33 49 26

On January 30 the comet will lie very nearly between β Andromedæ and β Trianguli, about one-third of the distance from the latter star.

COMET BROOKS (NOVEMBER 19, 1892).—The following ephemeris of Comet Brooks is due to Ristenpart, and is given in *Astronomische Nachrichten*, No. 3142 :—

1893.	R.A. (app.) h. m. s.	Decl. (app.) ° ' "	Log r .	Log Δ .	Br.
Jan. 26 ...	23 35 8 ...	+40 34'3 ...	0'0921 ...	0'0471 ...	2'94
27 ...	38 53 ...	39 34'1 ...	...	...	...
28 ...	42 22 ...	38 36'8 ...	0'0950 ...	0'0688 ...	2'62
29 ...	45 37 ...	37 42'2 ...	...	...	...
30 ...	48 40 ...	36 50'2 ...	0'0981 ...	0'0898 ...	2'35
31 ...	51 32 ...	36 0'5 ...	...	...	...
Feb. 1 ...	54 14 ...	35 13'1 ...	0'1015 ...	0'1101 ...	2'11
2 ...	23 56 48 ...	34 27'7 ...	...	...	...

This comet, which will be found to be in the constellation of Andromeda, will lie about $3\frac{1}{2}^\circ$ to the south of α Andromedæ on January 27.

PHOTOGRAPHIC ABSORPTION OF OUR ATMOSPHERE.—The question of the degree with which our atmosphere absorbs photographic rays has become very important owing to the adoption of photography, so that any work enlightening us on this subject is anxiously listened to. Prof. Schaeberle, who has been making investigations in this direction, has just completed a memoir which is being published by the University of California, but in the meanwhile he has issued a table setting forth simply the final results. The absorption in the following table is expressed in photographic magnitudes, and must be added to the unknown atmospheric absorption at the zenith.

Z. D.	Phot. Absorp.	Z. D.	Phot. Absorp.
5 ...	0'00	50 ...	0'44
10 ...	0'01	55 ...	0'56
15 ...	0'04	60 ...	0'71
20 ...	0'07	65 ...	0'89
25 ...	0'11	70 ...	1'12
30 ...	0'16	75 ...	1'45
35 ...	0'21	80 ...	1'94
40 ...	0'28	85 ...	2'68
45 ...	0'35	90 ...	5'00

HARVARD COLLEGE OBSERVATORY.—The forty-seventh annual report of this Observatory, by Prof. Pickering, opens with a reference to the death of Mr. George B. Clark, to whose "genius for mechanical devices, indomitable perseverance, and devotion to the interests of the observatory, we are indebted for the success of many of our most useful instruments." Of the most important matters mentioned in the report are the permanent establishment of an observing station in South America, where the unsteadiness of the air is for the most part eliminated, the construction of a suitable building for the housing of photographs and the approaching completion of the Bruce photographic telescope. The work done with the various instruments during this period has been considerable. With regard to the Draper telescope, as many as 2777 photographs have been taken, while those taken with the Bache instrument number nearly 2000. The Boyden department, which is situated at Arequipa, in Peru, has been making great progress, the results of which have been frequently inserted in *Astronomy and Astrophysics*. The eight surfaces of the objective of the Bruce telescope have, as Prof. Pickering informs us, been ground and polished, and the results up to the present, according to tests made on a star, are very satisfactory. This instrument, when finished, is destined for the Arequipa station.

SOLAR OBSERVATIONS AT ROME.—Prof. Tacchini has issued the results of the observations made with regard to the distribution in latitude of the solar phenomena at the Royal Observatory during the third semester in 1892. From the tabulated statement which he gives the following facts may be gathered.

With regard to the eruptions, these phenomena seem to be quite local to the equatorial regions, the relative frequency being 0'667 and 0'333 for the north and south latitudes respectively. The spots, faculæ, and eruptions have their maxima nearly at the same distance from the equator both north and south, the zones being ($\pm 20^\circ$, $\pm 30^\circ$), but the maxima for the prominences extend further north, about latitudes 60° north and south. Prof. Tacchini remarks that in the equatorial zone ($+20^\circ$ — -20°), where the maxima of faculæ, spots, and eruptions are observed, a feeble relative frequency in the prominences is noted, which shows us that we must consider a large number of prominences as the result of conditions "bien différentes par rapport à celles qui déterminent la production des taches

dans la photosphère," whilst the prominences are formed simply in the solar atmosphere. As a case in point, he mentions an observation made on August 1 of last year, of a cloud which, starting at a distance of $264''$, rose to $364''$ without any corresponding alteration at the surface.

THE TOTAL SOLAR ECLIPSE, APRIL 15-16, 1893.—Writing to M. Flammarion about the scientific expedition sent by the Brazilian Government to study the region of the central plateau and to select a site for the proposed new capital, Dr. Cruis, the Director of the Observatory at Rio de Janeiro, adds the following note :—"About the total eclipse of April 16. Will France send any one to observe it? I beg you to make known through the *Review* (*L'Astronomie*) that the Brazilian Government is willing to send a warship to Ceara, on which foreign astronomers who wished to observe the phenomenon could find a passage."

GEOGRAPHICAL NOTES.

A CHANGE has been made in the arrangements for the expedition to Lake Rudolf referred to on p. 235, vol. xlvii. The expedition is to travel by the Tana river instead of the Juba, although its ultimate destination is the same, and Lieutenant Villiers, instead of accompanying it, has joined Sir Gerald Portal's mission to Uganda.

MR. H. J. MACKINDER, M.A., Reader in Geography at Oxford, delivered the first of a course of ten educational lectures, under the auspices of the Royal Geographical Society, on the relation of geography to history, on the 20th inst. The attendance was largely composed of teachers and University Extension students, to whom special terms were offered. The lecturer treated of "the Theatre of History," tracing the development of accurate geographical knowledge from the earliest times in a series of brilliant generalisations. He dwelt upon the contrast between the knowledge of early Greek geographers regarding the true shape of the earth, and their habitual representation of the regions known to them in a circular form. In the middle ages, amongst the half-learned, the map of the known world was elevated to the highest place, the figure of the globe was forgotten, and the doctrine of a flat earth gained currency. At the geographical renaissance the map was adapted once more to the sphere, and the discoveries of Columbus and his contemporaries resulted directly.

The suggestion of Mr. Joseph Thomson to bestow the name of Livingstonia (vol. xlvii. p. 160) on the British sphere of influence north of the Zambesi, in spite of its singular propriety, has, we fear, failed to convince the authorities in charge of the region, who, it appears, have decided to adopt the cumbersome and scarcely accurate title of British Central Africa.

M. MIZON's second expedition to Adamawa has been stopped on the Benué by the breakdown of his steamers, and the sudden falling of the water, he being left without means of progress about two-thirds of the way between Lukoja and Yola.

THE French flag has been formally hoisted on the little islands of St. Paul and New Amsterdam in the South Indian Ocean, midway between the Cape of Good Hope and Australia. St. Paul is an interesting instance of a volcanic island, the extinct crater of which forms a wide sheltered harbour communicating with the sea by means of a single narrow channel. It was one of the French stations for observing the transit of Venus in 1874. French fishermen from Reunion had practically taken possession of the islands in the early part of the century, but the fishing-grounds have long been abandoned.

MR. B. V. DARBISHIRE, M.A. (Oxon.), has been appointed Cartographer to the Royal Geographical Society. He has had the advantage of preliminary training in Germany, and under the Reader in Geography at Oxford.

THE APPROACHING ECLIPSE OF THE SUN, APRIL 16, 1893.¹

I HAD the honour, two and a half years ago, of describing to you the total eclipse of the sun of December 22, 1889, which I had been to observe in the Salut Isles, French Guiana. In spite of very unfavourable atmospheric conditions I was then

¹ Address to the Astronomical Society of France, on November 2, 1892, by M. De la Baume Pluvinel, translated by A. Taylor.