may jump 16 feet perpendicularly; but such jumps are rare, and he can only state with certainty that it has taken place at the Hellefos, in the Drams River, at Haugsend, where two great masts have been placed across the river for the study of the habits of the salmon, so that exact measurements may be effected. The height of the water in the river of course varies, but it is as a rule, when the salmon is running up stream, 16 feet below these masts. The distance between the two is 3½ feet, and the Professor states that he has seen salmon jump from the river below across *both* masts. As another example of high jumping, he mentions some instances of Carratunk waterfall, in Reumbec, in North America, where jumps of 12 feet have been recorded. Prof. Landmark further states that when a salmon jumps a fall nearly perpendicular in shape it is sometimes able to remain in the fall, even if the jump is a foot or two short of the actual height. This, he maintains, has been proved by an overwhelming quantity of evidence. The fish may then be seen to stand for a minute or two a foot or so below the edge of the fall in the same spot, in a trembling motion, when with a smart twitch of the tail the rest of the fall is cleared. But only fish which strike the fall straight with the snout are able to remain in the falling mass of water; if it is struck obliquely, the fish is carried back into the stream below. This Prof. Landmark believes to be the explanation of salmon passing falls with a clear descent of 16 feet. The professor believes that this is the extreme jump a salmon is capable of, and points out that, of course, not all are capable of performing this feat.

IN the new part of the *Transactions* of the Essex Field Club (vol. iv. part 1) the first and perhaps most interesting paper is Prof. Boulger's presidential address on the "Influence of Man upon the Flora of Essex."

ACCORDING to the *Chinese Recorder*, Dr. Wallace Taylor, a missionary doctor of Osaka, Japan, has made important discoveries regarding the origin of the disease *kakké*, or *beriberi*, as it is known in Ceylon. He traces it to a microscopic spore, which is often found largely developed in rice, and which he has finally detected in the earth of certain alluvial and damp localities.

WE have received from Denver the first volume of the *Proceedings* of the Colorado Scientific Society. Denver as a western mining camp, with an evil reputation, and Denver the capital of the State of Colorado, are places separated by ages of civilisation; but mining is prominent in both. The members of the Scientific Society appear from the list to be mainly civil or mining engineers, metallurgists, geologists, assayers, &c., and the papers are largely on these subjects, *e.g.* the estimation of arsenic, and of copper; the ore deposits of the Summit districts of Rio Grande county, Colorado (the principal paper in the volume), löllingite, &c. There are, however, other papers: there is the report by a commission of the society on the Artesian wells of Denver, a paper on extinct glaciers of the San Juan mountains, while one of the members, Mr. van Diest, read several papers on subjects connected with the Malay Archipelago, such as the formation of hills by mineral springs in the Island of Java, the geology of the Sumatra, and the method of mining there 250 years ago, the methods of smelting employed by the Chinese at Banka, &c. There is certainly plenty of vitality in the new society, and doubtless it will grow with the growth and strengthen with the strength of the magnificent State from which it takes its name.

THE additions to the Zoological Society's Gardens during the past week include a Bonnet Monkey (*Macacus sinicus*) from India, presented by Mr. J. S. Stevens; two Turtle Doves (*Turtur communis*), European, presented by Mr. J. Hare; four Martinican Doves (*Zenaida martinicana*), a Moustache Ground Dove (*Geotrygon mystacea*), four Dominican Kestrels (*Tinnunculus dominicensis*), a Green Bittern (*Butorides virescens*) from the West Indies, presented by Dr. A. Boon, M.R.C.S.; a Golden Eagle (*Aquila chrysaetas*) from Perthshire, presented Mr. Chas. J. Wertheimer; two Larger Hill Mynahs (*Gracul. intermedia*) from India, presented by Mr. Thomas Hudson; an Indian Python (*Python molurus*) from India, presented by Mr. Harrington Laing; four Proteus (*Proteus anguinus*), European, presented by Mr. Cook; a Red-headed Cardinal (*Paroaria larvata*), a Yellow Hangnest (*Cassicus persicus*) from South America, deposited; a Vulpine Phalanger (*Phalangista vulpina*), two Snow Birds (*Junco hyemalis*), a Northern Mocking-bird (*Mimus polyglottus*), bred in the Gardens.

ASTRONOMICAL PHENOMENA FOR THE WEEK, 1885, AUGUST 9–15

(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 August 9

Sun rises, 4h. 38m.; souths, 12h. 5m. 13·6s.; sets, 19h. 32m.; decl. on meridian, 15° 45′ N.: Sidereal Time at Sunset, 16h. 46m.

Moon (New on August 10) rises, 3h. 19m.; souths, 11h. 1m.; sets, 18h. 34m.; decl. on meridian, 15° 37′ N.

Planet	Rises h. m.	Souths h. m.	Sets h. m.	Decl. on meridian ° ′
Mercury ...	7 20	13 45	20 10	4 13 N.
Venus ...	7 3	13 47	20 31	7 55 N.
Mars ...	0 52	9 12	17 32	23 48 N.
Jupiter ...	6 45	13 34	20 23	8 48 N.
Saturn ...	0 57	9 6	17 15	22 29 N.

August 9, 10, and 11.—Principal nights for observation of the August (Perseus) meteors.

August	h.	
12 ...	2 ...	Jupiter in conjunction with and 2° 30′ north of the Moon.
12 ...	9 ...	Mercury in conjunction with and 1° 55′ south of the Moon.
12 ...	12 ...	Venus in conjunction with and 2° 13′ north of the Moon.

DR. PERKIN ON THE COAL-TAR COLOURS[1]

Anthraquinone Series

I MUST now draw your attention to the important class of colouring matter compounds obtained from anthracene or anthraquinone.

Alizarin and the other colouring matters related to it form one of the most important branches of the coal-tar colouring industry, and is one of special interest, because alizarin was the first instance of the production of a natural colouring matter artificially. It will be quite unnecessary for me here to say much about the madder root, which was the original source of alizarin, and was grown in such enormous quantities, but now is nearly a thing of the past; nor will I enter into the early chemical history of alizarin, and all the laborious work which was bestowed upon it by Dr. Schunck and others. As you are probably all aware, the relationship of alizarin and its formation from the coal-tar hydrocarbon anthracene was the result of the labours of Graebe and Liebermann, the researches which culminated in this being of a purely scientific nature. The original process for obtaining it has, however, not been found of practical value, but a new one in which sulphuric acid could be used in place of bromine was afterwards discovered by Caro, Graebe, and Liebermann in Germany, and by myself in this country, apparently simultaneously. A second process was also discovered by me, which was worked nearly all the time I was engaged in this industry. In this dichloranthracene was used instead of anthraquinone, and the product thus obtained yielded colours of a brilliancy which it has been found, even to the present time, difficult to match by the anthraquinone process.

At the time of the discovery of artificial alizarin, anthracene

[1] The President's Address at the annual meeting of the Society of Chemical Industry (not the Institute of Chemistry as stated last week). Continued from p. 307.