

diplococcus said to be invariably present in cases of scarlatina and found in the throat secretions, blood, scales and urine of persons suffering from scarlet fever. He has spent much labour and time in endeavouring to place the title of this *Diplococcus scarlatinæ* beyond dispute. The papers submitted, judging by the abstracts supplied by Prof. Conn, were of a high order, and the existence of such a society suggests that bacteriology in this country might well be accorded a more important place amongst the sciences than it at present occupies.

THE ninth edition of Mr. Bennett H. Brough's deservedly successful "Treatise on Mine-Surveying" has been published by Messrs. C. Griffin and Co. The book has been carefully revised, and new devices and appliances of importance are described. "The chief additions," we read, "consist of notices of the use of a spring balance for maintaining steel bands at a constant tension, of Mr. Langer's method of surveying with the hanging compass in the presence of iron, of Mr. Troye's method of marking underground stations, and of Mr. Landis's method of determining the volume excavated in open workings." By keeping his book up to date in this way, Mr. Brough makes his manual most valuable to mining students and mine-agents, who regard it as an essential volume for their libraries.

THE additions to the Zoological Society's Gardens during the past week include a Brown-headed Stork-billed Kingfisher (*Pelargopsis gurali*), an Eastern Calandra Lark (*Melanocorypha bimaculata*), an Eastern Linnet (*Acanthis fringillirostris*), a Glossy Calornis (*Calornis chalybeius*), a Small-billed Mountain Thrush (*Oreocincla dauma*), a Large Pied Wagtail (*Motacilla maderaspatensis*), an Ashy Wood Swallow (*Artamus fuscus*), a Bay-backed Shrike (*Lanius vittatus*), an Indian Great Reed Warbler (*Acrocephalus stentoreus*) from British India, a Pale Rose-finch (*Rhodospiza obsoleta*) from Afghanistan, presented by Mr. E. W. Harper; three Changeable Lizards (*Calotes versicolor*) from India, presented by Mr. R. C. McLaren; four Two-banded Monitors (*Varanus salvator*) from the East Indies, a Stump-tailed Lizard (*Trachydosaurus rugosus*) from Australia, four Changeable Lizards (*Calotes versicolor*) from India, twenty-four Black-spotted Lizards (*Algiroides nigro-punctatus*) from the Borders of the Adriatic, deposited; a Tasmanian Wolf (*Thylacinus cynocephalus*) from Tasmania, purchased; two Barbary Wild Sheep (*Ovis tragelaphus*) born in the Gardens.

OUR ASTRONOMICAL COLUMN.

DISTORTION OF SUN'S DISC AT HORIZON.—Prof. W. Prinz, of the Royal Observatory of Belgium (Brussels), has obtained several large-scale photographs of the setting sun, which show most distinctly the considerable deformation of the disc when near the horizon. The instrument employed was a photo-heliograph by Steinheil. A reproduction of one of the photographs accompanies the note in *Mem. della Soc. degli Spettroscopisti Italiani*, vol. xxxi. pp. 36-39. In this case the ratio of the vertical diameter to the horizontal one is as 75:84 = 0.893.

THE CROONIAN LECTURE.¹

A PECULIAR interest—the parallel of that which in the plant organism belongs to chlorophyll—attaches to hæmoglobin, for, unlike any other chemical component of the animal body, in virtue of its special chemical and physical attributes, this remarkable substance may in the strictest sense be said to possess a definite and unique physiological function.

The region of the solar spectrum which the author formerly investigated was that comprised between the lines F and Q

¹ "On Certain Chemical and Physical Properties of Hæmoglobin" By Dr. Arthur Gamgee, F.R.S., Professor Emeritus of Physiology in the Owens College. Read before the Royal Society on March 13.

(4861—3280). The question whether oxy-hæmoglobin presents definite absorption for light of shorter wave-lengths has since been examined. Soret, whose observations were not conducted with solutions of hæmoglobin, but merely with diluted blood, observing by the aid of his fluorescent eye-piece the cadmium spark spectrum, found that diluted blood, in addition to the absorption band in the extreme violet, exhibited two additional bands. One of these, coinciding with the 12th cadmium line (3247), he considered to be probably due to hæmoglobin; the other, coinciding with the 17th cadmium line (2743), he assumed to be caused by serum albumin, his observations having previously shown that all albuminous and albuminoid bodies, with the exception of gelatin, are characterised by an absorption band in the position of the 17th cadmium line.

Employing solutions of many times crystallised oxy-hæmoglobin of great purity and of varying concentration, and with the aid of the sparks of a powerful induction coil, the author has obtained a series of photographs of the cadmium spark spectrum with and without the interposition of the solutions. The examination of these photographs shows that solutions of oxy-hæmoglobin which are sufficiently transparent to allow the ultra-violet spectrum of cadmium to be photographed present no absorption bands corresponding either to the 14th or the 17th cadmium lines. The absorption band observed by Soret in correspondence with line 14 is, therefore, not due to the blood colouring matter, but to some other organic constituent present in the blood.

Having referred to his researches communicated to the Royal Society in June 1901, and illustrated the main facts by actual demonstrations, the author discussed (1) observations on the influence of temperature on the behaviour of oxy-hæmoglobin in the magnetic field; (2) observations on the ferro-magnetism of the ferro-albuminates.

He next dealt with the question of the specific conductivity of solutions of pure oxy-hæmoglobin. After a laborious investigation on this branch of the subject, the following conclusions were arrived at:—

(1) Although solutions of oxy-hæmoglobin possess a low conductivity, this is very much higher than has been found in the previous observations of Stewart, all of which were made at 5° C.

(2) The conductivity of solutions of oxy-hæmoglobin increases rapidly with increase of temperature, and undergoes remarkable and permanent changes when the solution is kept for even short periods at any temperature above 0° C.

These results explain the impossibility of obtaining data which can be considered trustworthy concerning the absolute specific resistance of solutions of oxy-hæmoglobin.

Continuing the researches contained in his first communication to the Royal Society on the results of the electrolysis of oxy-hæmoglobin, the author has found that when pure solutions of oxy-hæmoglobin are subjected to electrolysis, there occurs a separation of oxy-hæmoglobin in a colloidal, but perfectly soluble form. He has worked with currents of from 12 to 24 volts, and the intensity of the electrolysis current measured by a milliampere-meter placed in the circuit has varied in different experiments between 0.1 and 3.0 milliamperes.

By employing an electrolytic cell in which the anode is separated from the kathode by an animal membrane (sheep's intestine or pig's bladder), it is seen that the first action of the current is to cause a separation of colloidal hæmoglobin in the anode cell. This colloidal hæmoglobin falls as a beautiful red cloud, leaving a perfectly colourless, supernatant liquid. On stirring it instantly dissolves.

The further action of the current is to cause a rapid and entire transfer of the colloidal hæmoglobin from the anode to the kathode cell. With an electrolytic cell, of which each compartment had a width of 5 mm. and contained 2.5 c.c. of a 1 per cent. solution of O₂Hb, complete precipitation and transfer occurs within 60 minutes.

On reversing the direction of the current by means of a communicator, the hæmoglobin returns again in the direction of the positive current into the original cell from which it started.

The author adduced evidence which proves that the precipitated colloidal, but yet perfectly soluble, hæmoglobin represents the undecomposed molecule of the blood-colouring matter.

The probable nature of the process which occurs under the influence of the current was discussed, as well as the character o.