liarly useful as backgrounds for the bright prominence lines, and allows the use of a wide slit. Working with a tangential slit, Prof. Hale has obtained excellent photographs of reversals of H and K. The former line is found to be double, the companion being about 1·5 tenth-metres less refrangible, and possibly coincident with a line of hydrogen at λ 3970·25. The photographs also show three bright lines, which appear to be coincident with the lines α, β, and γ of the hydrogen series. The first of these is seen as a double line, the components of which are separated by a fraction of a tenth-metre.

It is highly probable that a large number of prominences cannot be made out by the ordinary method of observing the C line. These invisible or "white" prominences must therefore be detected photographically. But as it would be an extremely troublesome process to take a set of photographs with the slit tangential to various points on the limb, and as prominences having a considerable elevation could not be easily photographed by this method, another arrangement has been devised which nullifies these objections, and allows eye observations of C to be made while the exposure to the H and K region is going on. Certainly, if Prof. Hale should be able to do for invisible prominences what has been done at Palermo for those visually observable, our knowledge of the relation between the two classes of phenomena and their connection with sun-spots would be considerably extended.

UNIVERSITY AND EDUCATIONAL INTELLIGENCE.

THE following is the list of candidates successful in the competition for the Whitworth Scholarships and Exhibitions, 1891 :—(1) Scholarships, £125 a year each (tenable for three years) :—Robert W. Weekes, electrical engineer; William G. Rennie, engineering student; Thomas G. Jones, engineer; William H. Pretty, mechanical engineer. (2) Exhibitions, £50 a year each (tenable for one year) :—Julian J. King-Salter, student; Louis Martineau, engineer; Harold R. Cullen, engineer apprentice; Frederick Hossack, mechanical engineer; William A. Lelean, engineering draughtsman; William F. Nixon, engineer; John Chambers, draughtsman; Joseph W. Kershaw, student; Charles H. Gadsby, engineer's draughtsman; Frederick Charles Lea, apprentice millwright; George Thomas White, mechanic; Joseph H. Gibson, marine engineer; Henry Fowler, engineer apprentice; Arthur E. Malpas, engine fitter apprentice; James Hall, student; Walter E. Lilly, engineer; Charles Jefcoat, Jun., turner; Percy V. Vernon, fitter; George E. Armstrong, engineer student; Martin DeVille, draughtsman; Richard H. Cabena, marine engineer's draughtsman; Frederick Dodridge, engine fitter; Alfred J. Ward, mechanical engineer; William E. Tubbs, coachmaker; Alexander Norwell, mechanical engineer; Richard Baxendale, draughtsman; Walter Amor, fitter; Thomas Bouts, engineer; Alfred Meyer, draughtsman; John W. Anderson, draughtsman.

The list of successful candidates for Royal Exhibitions, National Scholarships, and Free Studentships, 1891, is as follows :—National Scholarship for Biological Subjects—George S. West, student. National Scholarship for Chemistry and Physics—James Bruce, student. National Scholarship for Mechanics—Sydney G. Starling, student. National Scholarships—Charles H. Sidebotham, student; Bernard E. Spencer, student; James H. Smith, pattern maker; John Ball, engineer; Charles Harold Robinson, tobacconist; George W. Fearnley, student; Charles J. Gray, student; Francis Carroll, student; Ralph M. Archer, teacher; Harry Verney, fitter; James Thompson, teacher. Royal Exhibitions—Hubert Cartwright, student; Walter H. Watson, laboratory assistant; Sidney G. Horsley, student; Charlie R. Cross, student; Watson Crossley, cotton weaver; Samuel D. Crothers, farmer; Peter Pinkerton, student. Free Studentships—David Baxandall, student; Herbert C. Robinson, student; William G. Freeman, student; Charles H. Gadsby, engineer's draughtsman; Stephen Pace, none; William H. Dolman, teacher.

SOCIETIES AND ACADEMIES.

PARIS.

Academy of Sciences, August 10.—M. Duchartre in the chair.—Artificial production of a micaceous trachyte, by MM. F. Fouqué and Michel Lévy. This trachyte was obtained by the action of water under pressure on a glass resulting from the fusion of Vire granite, and at a bright red heat. The rock was homogeneous, and its sections exhibited beautiful octahedral crystals of a variety of spinel in connection with orthoclase and black mica.—Note on an experiment on ostriculture that has been carried out in the fish-pond of the Roscoff Laboratory, by M. H. de Lacaze-Duthiers.—Physiological research on carbon monoxide in a medium containing it in the proportion of one ten-thousandth, by M. N. Gréhant. After passing a mixture containing a ten-thousandth part of carbon monoxide through blood for half an hour, it was found that the respiratory capacity of the blood was diminished from 23·7 to 23·0 per cent. The difference (0·7) represents the amount of oxygen replaced by carbon monoxide. When the gas was passed through under a pressure of five atmospheres, it was found that the respiratory capacity had diminished from 23·7 to 17·2. This result may be applied to the detection of small quantities of carbon monoxide in confined air, and it also indicates that it is not only the percentage proportion of the gas which must be considered in questions relating to the absorption of it by hæmoglobin, for this remained the same in both experiments, viz. $\frac{1}{10000}$th.—On the refraction and dispersion of crystallized chlorate of soda, by M. Frantz Dussaud. The author has measured with five different instruments the refractive index of chlorate of soda at temperatures between 0° and 30°, and for twelve lines in the spectrum. For the sodium line (D) and a temperature of 20° the value obtained is 1·51510. The result for *a* is 1·50197, and for Cd (18) 1·58500.—On the habits of *Gobius minutus*, by M. Frédéric Guitel.—On the pathological types of the curve of muscular action, by M. Maurice Mendelssohn.—On the preventive inoculations of yellow fever, by M. Domingos Freire. The author has inoculated 10,881 persons with cultures of *Micrococcus amaril*. The mortality of those so vaccinated was 0·4 per cent., although the patients lived in districts infected with yellow fever, whilst the death-rate of the uninoculated during the same period was from 30 to 40 per cent. These results have led the Government of the Brazilian States to found an institute for the culture of the virus of yellow fever and other infectious diseases, and to appoint M. Freire the director.—On a new incandescent light, by M. Bay.

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