

nesium are capable of formation, one of which is unstable, and, as shown by Messrs. Jones and Taylor, is decomposed by water with evolution of a mixture of hydrogen and boron hydride, while the other is permanent both in the presence of water and acids. It is this stable boride, which M. Moissan has obtained in good crystals, which is so difficult to remove from the substance which has hitherto been considered as amorphous boron, and its formation should be avoided as much as possible. When magnesium and boric anhydride in the proportions above indicated—convenient quantities being 70 grams of the former and 210 grams of the latter—are heated to redness in a closed crucible, a somewhat violent reaction occurs, the crucible becoming vividly incandescent. Upon cooling, a reddish-brown mass is found, which is readily detached from the crucible, and is impregnated throughout with crystals of magnesium borate. The interior portion is then powdered, and successively treated with water and hydrochloric acid, alcoholic potash, hydrofluoric acid, and lastly with distilled water. This product, even after such exhaustive treatment, upon drying *in vacuo*, is found to contain only 95 per cent. of boron. In order to remove the 5 per cent. of the stable boride, the product is again heated to redness in the midst of a large excess of boric anhydride, and the extraction and washing repeated as before. The percentage of boron is by this means raised to 98.3 per cent., the remaining impurity being a mere trace of the boride and 1.3 per cent. of nitride of boron. These remaining impurities have finally been eliminated by employing a crucible rendered impenetrable to the furnace gases, the nitrogen of which rapidly causes the formation of nitride, by means of a mixture of titanous acid and charcoal. In addition to the laborious method above indicated, by which tolerably large quantities of pure boron may be obtained, M. Moissan further shows that it may be prepared in smaller quantities by the reduction of boric anhydride by magnesium in a stream of hydrogen, when, after extraction, a pure product necessarily free from nitride is obtained. And lastly, M. Moissan describes an electrolytical method of preparing it. Fused boric acid is rendered a good conductor of electricity by the addition of 20 per cent. of its weight of borax. Upon passing through the fused mixture a current of 35 amperes, a little sodium is liberated at the negative pole, and combines with the platinum electrode to form an alloy, while amorphous boron and oxygen are liberated at the positive pole. The greater portion of the boron, owing to the high temperature of the reaction, recombines with the oxygen with most brilliant incandescence, but a portion escapes combination, and may be isolated in the pure state as a chestnut-coloured powder.

THE additions to the Zoological Society's Gardens during the past week include a Green Monkey (*Cercopithecus callitrichus* ♂) from West Africa, presented by Mr. George W. Bowles; a Toque Monkey (*Macacus pileatus*) from Ceylon, presented by Mr. Arthur Wallis; a Bauer's Parrakeet (*Platycercus zonarius*) from South Australia, presented by Mr. Edward F. Baillou; two Alpine Accentors (*Accentor collaris*), European, presented by Lord Lilford, F.Z.S.; four Coqui Francolins (*Francolinus coqui* 2 ♂ 2 ♀) from South Africa, presented by the Hon. F. Erskine; a Green Toad (*Bufo viridis*), six Painted Frogs (*Discoglossus pictus*), European, three Moorish Toads (*Bufo mauritanica*) from Tunis, purchased.

#### OUR ASTRONOMICAL COLUMN.

THE WARNER OBSERVATORY.—“The Warner Observatory is distinctively a private institution built for the purposes of original discovery rather than the ordinary routine work of most other Observatories.” This sentence begins a recently-published history and work of the Warner Observatory, Rochester, N.Y., from 1883 to 1886. Under such favourable conditions as these,

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it is not wonderful that a considerable amount of work should be done. Mr. Lewis Swift is the Director of the Observatory, and, upon assuming command, he selected the discovery of new nebulae as his principal field of labour. The first unrecorded nebula was found on July 9, 1883. Since then more than 400 others have been detected; and their positions and descriptions have been published from time to time in four catalogues. The observations are now brought together, and will therefore be more useful than heretofore. In the volume containing them are printed the Warner prize essays. One of these, by Prof. Lewis Boss, treats of “Comets: their Composition, Purpose, and Effect upon the Earth”; and there are several others on the coloured skies seen about the time of the Krakatã eruption. Mr. Henry Maine endeavours to show that a physical connection existed between these red sunsets and solar activity. The Rev. S. E. Bishop, of Honolulu, also describes the brilliant glows in question; ascribing them to the introduction of finely divided matter into the higher regions of the atmosphere.

MEASUREMENT OF SOLAR PROMINENCES.—In *Comptes rendus*, tome cxiii. p. 353 (1891), M. Fizeau pointed out that the velocities attained by solar prominences were comparable with the earth's orbital velocity, and remarked that, on account of this circumstance, prominences must suffer a displacement from their true position. If this were so, and the argument appeared to be sound, then the apparent heights reached would have to be increased or diminished according to the velocity with which the prominences were projected. Mr. Henry Crow has pointed out an apparent error in this reasoning (*Astronomy and Astrophysics*, January, p. 90). He says:—“The author here neglects the fact that, at any given instant, each point of the solar disk and of the prominence, whether in motion or at rest, is sending to the observer rays, all of which are affected by the same correction for aberration. I say the ‘same’ correction, since the change in celestial longitude or latitude from one part of the sun's surface to another would affect the aberration quite inappreciably. If there be relative motion among the parts of the prominence, then, since at any instant aberration affects all these parts to the same extent, the prominence will be projected upon the slit of the spectroscope in its true proportions.” So the study of the solar surface is apparently not to be complicated by the introduction of a new correction. In this connection it may be remarked that, in a letter dated February 12, Prof. Hale writes: “You may be interested to know that I have just succeeded in photographing all the prominences around the sun with a single exposure.”

#### THE AUSTRALASIAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE.

THE Australasian Association for the Advancement of Science held its fourth annual meeting at Hobart, Tasmania, from January 7 to 14 inclusive. The meeting was in every way successful, and the proceedings afford ample and most satisfactory evidence that much excellent work is being done among our Australasian kinsfolk in every branch of science. The President was His Excellency Sir Robert Hamilton, Governor of Tasmania. The people of Hobart accorded to the members of the Association a most hearty welcome, and did everything in their power to make the occasion a pleasant and memorable one. Visitors from a distance had the advantage of being able to travel both by sea and land at greatly reduced fares, and everything of scientific interest in Tasmania was clearly explained for them in a capital hand-book issued from the Government Printing Office. Mr. Robert Giffen attended the meeting, and was cordially received. He delivered a lecture to the members of the Association on “The Rise and Growth of the British Empire.”

Great credit is due to the Hobart *Mercury* and other local papers for the enterprise they displayed in reporting the proceedings.

At the meeting of the general Council on January 7, the chair was taken by Baron von Mueller, past President, as Sir James Hector, the retiring President, was prevented by ill health from being present. It was formally decided that the fifth annual meeting of the Association should be held at Adelaide, and practically decided that the sixth should be held at Brisbane. Prof. Tate will be President of the Adelaide meeting.