is a frightful seething whirlpool, whence the creamy waters rush, after the mad conflict, into the narrow rocky channel before alluded to, and go hissing away through the capricious zigzag chasm."

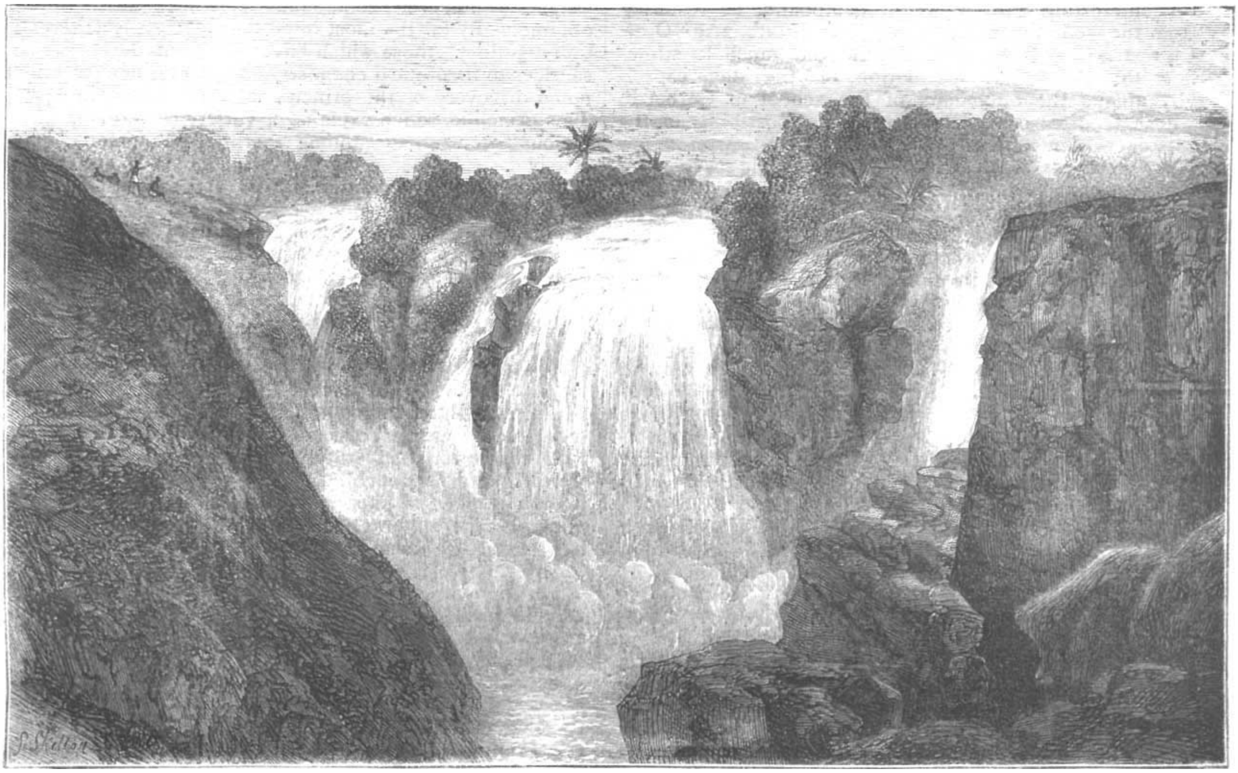

FIG. 4.—Mozi-Oa-Tunia (the Victoria Falls).—The West Falls.

In the appendices and throughout the work Major Pinto gives many astronomical and meteorological observations which are of real scientific value. Altogether his work is one of the most attractive and instructive of recent narratives of African travel.

ETIENNE HENRY SAINTE-CLAIRE DEVILLE.

WE regret to record a serious loss to French chemistry in the death of the celebrated professor, Sainte-Claire Deville, which occurred July 1, at Boulogne-sur-Seine. Étienne Henry Sainte-Claire Deville was born March 11, 1818, on the island of St. Thomas, in the Antilles, and was of Creole origin. Like most of the youth in the French colonies, he was sent to Paris to undertake a course of study. Of his two brothers who also proceeded to France to enter upon active careers, one, the late Charles Sainte-Claire Deville, devoted himself likewise to science, and we have had occasion more than once to refer to his remarkable geological investigations in these pages. While the Creole element has rarely lacked in the artistic and literary circles of the French capital, we believe that the two brothers in question furnish the only notable instance in which science has profited from the highly imaginative and versatile Creole temperament. It is related of the young Henry that on completing his collegiate studies, he hesitated for a long time in making his choice between music and science. His decision was due in a great measure to the enthusiasm awakened at the time by the brilliant lectures and no less brilliant investigations of Jean Baptiste Dumas. Guided by the counsels of the latter, he equipped a laboratory, and commenced a series of investigations so fertile of results that in a short time he was ranked among the most promising of the younger school of chemists. In 1844 he entered upon professorial duties in accepting the Chair of Chemistry in the Scientific Faculty of Besançon, where, notwithstanding his comparative youth, he was appointed dean of his faculty. In 1851 he was called upon to succeed Balard as Professor of Chemistry at the *École Normale* of Paris. Gladly exchanging the comparative obscurity of a provincial university town for the manifold advantages of a Parisian professorship, he devoted himself with such ardour to the duties of his new position that, after a short lapse of time, the laboratory of the *École Normale* became one of the central points of chemical investigation, not only in France but in all Europe. In 1854 he accepted, in addition to his usual duties, a lectureship at the Sorbonne, which, fourteen years later, was changed for a full professorship. His favourite field of activity remained, however, the *École Normale*, and it was with difficulty, some months since, that he felt himself called upon to relinquish active professorial duties in consequence of rapidly increasing feebleness.

As an investigator, Deville made his *début* in organic chemistry in 1840 with a remarkable study of turpentine oil and various derivatives of the terpenes. His carefully tabulated results form the chief basis of our present knowledge of the different isomeric states of this group. They were followed in 1842 by a research on toluene, the importance of which was only duly felt on the introduction of the aniline colours. After minor investigations of various resins, Deville abandoned organic chemistry to devote himself almost exclusively to the inorganic branch, and announced in 1849 his first grand discovery, that of nitric oxide. By demonstrating the existence of this interesting and important compound, as resulting from the action of chlorine on silver nitrate, $2AgNO_3 + Cl_2 = 2AgCl + O + N_2O_5$, Deville did much to stimulate the theoretical speculation of the day, especially among the opponents of the school of Gerhardt, whose theories did not recognise the possibility of the existence of monobasic acid anhydrides. After a few years devoted to varied studies of metallic carbonates and new analytical processes, he commenced in 1855 the famous research on metallic aluminium, which proved to be one of the crowning features of his lifework. Furnished with ample means by the munificence of Napoleon III., he was enabled to carry out experiments on a large scale, and so rapid was his success that even in 1855 he displayed at the Exhibition of Paris massive bars of this handsome metal, which previously had scarcely been seen in a pure state. The study of this metal and its metallurgical production, as well as of the various compounds of aluminium, carried out during a series of years, forms one of the most remarkable and complete contributions made to inorganic chemistry within a recent period. Deville's perfected process for the preparation of aluminium, as carried out in the two French and the single English establishment in which alone this metal is obtained, consists essentially in heating the double salt of aluminium and sodium, $AlCl_3.NACl$, with metallic sodium, fluorspar or cryolite being added as a flux. The metal thus obtained in the form of a solid regulus is used for a large variety of objects where lightness, strength, and freedom from oxidation are demanded, and forms the essential part of numerous valuable alloys. It has failed partly to meet the extended use to which Deville looked forward, on account of its comparatively high price and the difficulty of welding the metal. Among other industrial branches which we owe to Deville's efforts to create the manufacture of aluminium, such as the production of bauxit and cryolite, mention should especially be made of the manufacture of metallic sodium, the price of which sank in ten years from 2,000 francs to 15 francs per kilogramme. Deville's researches in this direction and his various methods of manufacture are to be found *in extenso* in his classical work, *De l'aluminium, ses propriétés, &c.*, 1859. In union with Caron he applied in 1863 the method found successful in the case of aluminium to the production of magnesium, and thereby created a second branch of industry. The manufacture of this metal, although confined to an annual production of about ten tons, is fully as interesting and ingenious as that which places aluminium within the reach of the industrial and scientific world. In this connection mention should be made of his exhaustive researches, chiefly in company with Débray, on the metals of the platinum group (1859—1862), in the course of which he succeeded for the first time in fusing large quantities of platinum by means of the oxyhydrogen blowpipe. The phenomena accompanying the high temperatures so all-important in the metallurgical operations just alluded to, gradually assumed a leading place amongst the subjects of Deville's researches. After successfully devising lamps and furnaces by means of which a high degree of heat was attainable, and methods by which the temperature could be measured, he proceeded to study a variety of reactions taking place at temperatures scarcely reached before his time. First among the results obtained in this direction reference should be made to the variety of crystallised minerals prepared artificially, such as willemite, greenockite, zircon, periclase, staurolite, &c. This branch of research has been so ably followed up by scholars of Deville, that but few natural minerals exist nowadays of which artificial counterparts have not been prepared. Of much greater importance were the numerous determinations of the vapour densities of bodies which are ordinarily solid, such as the chlorides of aluminium, of iron, and of various rare metals, by means of which the molecular weights of numerous compounds have been satisfactorily obtained. By far the most important of Deville's thermal investigations, those which have rendered the grandest services to theoretical chemistry, are connected with his noted discovery of the principle of dissociation in 1857. This principle, which explains a variety of hitherto anomalous occurrences among thermal phenomena, may briefly be considered as the property of many compound bodies to undergo partial decomposition under the influence of heat in confined spaces, until the liberated gas or vapour has attained a certain tension greater or less according to the temperature. So long as this temperature remains constant, no further decomposition takes place, neither does any portion of the separated elements recombine. If the temperature be raised decomposition recommences, and continues until a higher tension of the liberated gas or vapour, definite for that particular temperature, is attained. If the temperature falls, recomposition ensues, until the tension of the residual gas is reduced to that which corresponds with the lower temperature. The enunciation of this simple, but far-reaching principle has thrown light upon a number of phenomena, such as the formation of minerals, the apparent volatilisation of solids, &c., and has been the fruitful source of countless novel discoveries.

The number of different subjects touched upon by Deville during his long career of investigation, has been so great that we are forced to simply allude in conclusion to several notable researches, such as that on boron in company with Wöhler (1857), preparation of silicium, and its compounds with copper (1863), a new calorimeter, and the changes attendant upon the mixture of liquids (1870), the examination of a large variety of minerals and natural products, &c.

In reviewing the lifework of Sainte-Claire Deville, we are struck constantly by the predominance of one quality —that of simplicity; a quality so eminently characteristic of the man in his social relations, as well as in his scientific labours, that perhaps no phrase could describe him better than that of the French Bunsen. Like his great fellow-worker across the Rhine, he has been able to find abundant material for the exercise of his genius in attacking the still unsolved problems of inorganic chemistry; like him also he has held himself aloof in a great measure from the polemics prevalent in the modern school of chemists; the same charming simplicity characterises his apparatus, his methods, the few fundamental principles he has enunciated. As a professor Deville was deeply beloved by his students, to whom he was in turn greatly devoted; responding readily to all demands on his time and thought, and making use of his vast influence to further the interests of those who evinced special merit. His proverbial tenderness towards trembling candidates in the public examinations rendered him eminently popular in student circles.

"Voyons, Monsieur, de quoi est composée l'eau? . . . d'O?"

"Xygène," repondait l'élève.

"Et encore? . . . d'hy . . . ?"

"Drogène," ajoutait le candidat.

"C'est cela, Monsieur, merci!"

Sainte-Claire Deville was elected a member of the French Academy in 1861. A year before he had been elected a honorary member of the Chemical Society of London. He was the recipient of numerous other marks of recognition from foreign societies and governments. A few years since he received the commission of preparing the normal international metre measure, a task which brought upon him much labour. While holding aloof from politics, Deville was highly regarded in the business world, and was a director in the Parisian Gas Company and the Eastern Railway of France. His family relations were singularly happy. He leaves behind him a group of five sons. In addition to the treatise on aluminium already alluded to, Deville was the author, in company with Débray, of an exhaustive work in two volumes on the "Métallurgie du Platine" (1863).

T. H. N.

CONVERSAZIONE AT KING'S COLLEGE

On Saturday, July 2, a brilliant and successful *conversazione*, given by the Council and the Academical Staff of King's College, brought to a conclusion the celebration of the fiftieth anniversary of the opening of the College. In the afternoon H.R.H. the Prince of Wales, accompanied by H.R.H. the Princess of Wales, distributed the College prizes to successful students, and the College rooms were converted into tastefully decorated drawing-rooms and picture galleries, in which were exhibited many very choice pictures and works of art.

The library was furnished with microscopes which had been lent by members of the Microscopic Society. The large entrance hall and the front of the College were brilliantly lighted by three Crompton electric lights, which burnt with remarkable steadiness throughout the evening. In the scientific department, the museum of King George III. contains an unrivalled collection of mechanical and physical apparatus, and is especially rich in apparatus of historic interest. The nucleus of the collection was presented to the College by Her Majesty the Queen in 1843, when the museum was opened by Prince Albert, who then witnessed some of the experiments of Sir Charles Wheatstone on the electric telegraph. Important additions have been made to the collection of apparatus by the Professors of Natural Philosophy, and at his death Sir Charles Wheatstone's valuable collection was bequeathed to the museum. Among the interesting features in the museum are: calculating machines of Cavendish and others, Appoldie centrifugal pump, Newcomen's model of his steam-engine, original forms of Daniell's battery, Siberian loadstone used for his induction spark by Faraday, original Wheatstone's bridge, early forms of stereoscope, early forms of electrical machines, polar clocks and shadow clocks, De Kempelen's talking machine.

From its foundation in 1868 the Physical Laboratory, now called the Wheatstone Laboratory, has been under the direction of Prof. W. Grylls Adams. Among the interesting apparatus exhibited in this department were the Wheatstone Collection of electrical apparatus for exhibition in Paris, dynamo-electric machines, diffraction spectra, an optical bench, showing interference of light, measuring polariscopes, with universal motions for the exact measurement of crystals, and vacuum tubes in great variety, including a very beautiful coronet. The great event of the evening in the Physical Department was the exhibition for the first time in England of the Faure's secondary battery or reservoir of electricity. Two boxes of this battery, which had been previously charged from a dynamo-electric machine, and had then been brought to the College, were capable of heating and keeping heated to bright redness a platinum wire 2 metres long and 1 millimetre in diameter. Six boxes were found to be sufficient to cause Swan electric lamps to glow brilliantly. Twelve of these boxes supplied a pedestal of Lane-Fox lamps, supplied by the British Electric Light Company, and during the evening the Physical Lecture Theatre was brilliantly illuminated by twenty Swan lamps of the latest type with the current from twelve other boxes of Faure's secondary battery. It was shown that by means of these boxes of electricity the lighting of private houses by electricity was already an accomplished fact.

THE COMET

We have received the following communications:—

At about 11h. 0m. G.M.T. on June 29 a transit of the "following" nuclear jet of the great comet over a star of 8m. was observed by Mr. N. F. Green, of 39, Circus Road, St. John's Wood, and by me, with a 12½-inch reflector belonging to Mr. Green. Definition was very good and tranquil. As the star became involved in the jet it gradually increased in size, and when seen through the brightest part of the jet traversed resembled an ill-defined planetary disk about 3″ in diameter. At this moment the comet seemed to have two nuclei similar in aspect and brightness.

The effect of the cometary matter on the star's image resembled that of ground glass, not that of fog; the image of the star, being dilated into a patch of nearly uniform brightness, instead of presenting a sharp central point with a surrounding halo. Cirro-stratus, passing into rain-cloud, produces on the appearance of the sun an effect the counterpart of that produced by the cometary emitted matter on the star. There was not sufficient light for the use of the spectroscope, the star, afterwards identified as B.D. + 65°, 519, being fainter than 8m.

The transit of the jet occupied about 3m., and the star slowly resumed its ordinary appearance and dimensions, the image *contracting* as the centre of the jet left the star behind. A transit of this kind has not frequently been observed, at least under such favourable conditions as to brightness and definition of the objects, and it is to be hoped that others may have been as fortunate as Mr. Green and the undersigned.

If the point which obeys the Newtonian law be a solid body, the observation just recorded seems to show that its true outline would probably be rendered unrecognisable, and its aspect totally altered by the (refractive?) power of the coma and jets. CHARLES E. BURTON

38, Barclay Road, S.W., July 1

The following is an extended list of places obtained with the transit-circle when the comet passed *sub Polo*:—

	Date.	Greenwich Mean Time of observation.	Observed R.A.	Observed North Polar distance (uncorrected for parallax)
		h. m. s.	h m. s	° ′ ″
(*a*)[1]	June 23	11 30 54·4	5 34 55·2	44 53 20·6
(*b*)	,, 24	11 30 42·6	5 38 39·9	40 35 33·7
(*c*)	,, 25	11 30 58·3	5 42 52·2	36 38 27·4
(*d*)	,, 27	11 33 2·8	5 52 50·2	29 46 5·8
(*e*)	,, 28	—	—	26 49 45·0
(*f*)	,, 29	11 37 39·3	6 5 20·5	24 11 37·9
(*g*)	,, 30	11 41 3·9	6 12 42·2	21 50 26·3
(*h*)	July 1	11 45 19·9	6 20 55·5	19 44 41·3
(*i*)	,, 2	11 50 31·9	6 30 4·9	17 52 59·6

Remarks.—(*a*) The nucleus distinct but nebulous. Tail bright, and estimated 15° in length. Observation good.

(*b*) Observation difficult, owing to cloud.

(*c*) Nucleus better defined than on June 23, but not so bright. Length of tail estimated at 15°. Observation good.

(*d*) Observation fair, very cloudy. Tail 12°-15° long.

(*e*) Observed through short break in clouds. Tail 10° in length.

(*f*) Observation very good. Tail 10°.

(*g*) Observation very good. Nucleus smaller and fainter than on preceding nights. Tail 10°.

(*h*) Observation very good. Tail 9°.

(*i*) Very faint, observed through haze. Tail 8°.

Radcliffe Observatory, Oxford E. J. STONE

My chief object in writing to-day is to explain a word in my letter of June 28 (p. 200) that is quite open to misinterpretation. In examining the head of Comet *b* 1881 with a small direct-vision spectroscope and a narrow slit, I saw, on June 27, three bright lines or bands on a faint continuous spectrum. Two of the lines were strong and

[1] The observed R.A. and G.M.T. for June 23, reported in last week's NATURE (p. 200), should be *decreased* one minute, as above.