SOCIETIES AND ACADEMIES.

LONDON.

Royal Society, January 20.—"The Homogeneity of Helium." By William Ramsay, Ph.D., LL.D., Sc.D., F.R.S., and Morris W. Travers, B.Sc.

About a year ago, a paper by Dr. Norman Collie and one of the authors (W. R.) was published, bearing the title "The Homogeneity of Helium and of Argon." In that paper (NATURE, 1896, p. 546) various reasons were adduced to show why an attempt to determine whether or no argon and helium are homogeneous was worth making. The results of the experiments at that time indicated that while it did not appear possible to separate argon into two portions of different densities, the case was different with helium. Samples were obtained after repeated diffusion which possessed respectively diffusion rates corresponding to the densities 2·133 and 1·874. It was there pointed out that these densities are not correct (although their ratio is probably not wrong), owing to the curious fact that the rate of diffusion of helium is too rapid for its density, *i.e.* it does not follow Graham's law of the inverse square root of the densities. These samples of gas also differed in refractivity, and the difference was approximately proportional to the difference in density.

Towards the end of the paper, the conjecture was hazarded that it was not beyond the bounds of possibility that the systematic diffusion of what we are accustomed to regard as a homogeneous gas, for example, nitrogen, might conceivably sift light molecules from heavy molecules. It is true that the fineness of the lines of the spectrum would offer an argument in favour of the uniformity of molecular weight; but still it is never advisable to assume any physical theory without submitting it to rigorous proof. And it was thought possible that the fractional diffusion to which helium had been subjected might have had the result of effecting such a separation; a separation, not of chemical species, but of molecular magnitude. The other and more ordinary explanation of the splitting of helium into fractions of different density is that helium must be regarded as a mixture of two gases, one lighter than the other.

Since the publication of the paper mentioned, Dr. A. Hagenbach has confirmed the possibility of separating helium into portions of two densities by diffusion; and the differences in density were practically the same as those observed in the laboratory of University College, London.

These experiments were made with somewhat over 200 c.c. of gas; but it was decided to make experiments of a similar kind, on a much larger quantity of helium.

An apparatus was therefore constructed, similar in principle to the one previously employed, but on a much larger scale.

The Fractional Diffusion of Air.

In order to test the working of the apparatus, a set of diffusions was carried out with air. After four rounds, comprising twenty-four diffusions, the light portion contained 17·37 per cent. of oxygen and the heavy portion 22·03. A fairly rapid separation was thus being effected considering the closeness of the densities of nitrogen and oxygen.

The Fractional Diffusion of Nitrogen.

A similar set of experiments was carried out with nitrogen, prepared by the action of solutions of ammonium chloride on sodium nitrite, in presence of copper sulphate. The gas was dried and passed over red-hot iron prepared by reduction of ferric oxide in order to remove any oxygen or to decompose any oxides of nitrogen which might be present. After thirty rounds, involving 180 operations, the "light" portion of the nitrogen, after purification by circulation over copper oxide, had not altered in density. It must therefore be concluded that nitrogen is homogeneous as regards the relative density of its individual molecules.

The Fractional Diffusion of Helium.

The first sample of helium employed was prepared from samarskite and clèveite. After seventeen rounds, involving 102 operations, the diffusion rates of the lighter and heavier portions were measured.

A fresh quantity of gas from clèveite was similarly treated.

The light gas from the first set of diffusions was then mixed with the light gas from the second set of diffusions and the mixture was re-diffused fifteen times, involving ninety operations. The density of the lightest portion of this helium was determined by weighing and found to be 1·988. The helium had, therefore, not been made sensibly lighter by re-diffusion. The mean of the two determinations may be taken as the true density of pure helium; it is 1·98. The refractivity of this sample measured against hydrogen and multiplied by the ratio between hydrogen and air, viz. 0·4564, gives 0·1238. This specimen of light helium of density 1·988 was placed in one of the refractivity tubes, and the lightest helium of the former preparation (density = 1·979) in the other. They had the same refractivity (1000 to 1004). The contents of No. 1, obtained from the mixture of light gases, had the density 2·030, showing that only a little heavier material had been withdrawn.

The lighter fractions of helium were then sealed up in glass reservoirs and stored. The heavier portions were placed in the diffusion apparatus and submitted to methodical diffusion.

After fifteen rounds (ninety operations) the heaviest fraction had density 2·275, the lightest 2·08. The refractivity of the heaviest gas was next determined and found to be 0·1327. This gas examined in a Plücker's tube showed brilliantly pure helium lines, but along with these the reds and green groups of argon. Calculating from the density of this gas it should contain 1·63 per cent. of argon according to the equation $1 \cdot 961x + 20y = 2 \cdot 275$. Calculating from the refractivity the percentage of argon should be 1·05, from the equation $1 \cdot 245x + 0 \cdot 9596y = 13 \cdot 33$. A mixture of 99 per cent. of the purest helium and 1 per cent. of argon was made, and it showed the argon spectrum with about the same or with somewhat less intensity than the heaviest gas. Finally, the heavy gas was diffused to the last dregs, so that only about 0·5 c.c. remained undiffused; and this small residue, transferred to a Plücker tube, showed the argon spectrum with only a trace of the spectrum of helium. The yellow line and the bright green line were visible, but feeble. This spectrum was compared with that of a mixture of argon with a trace of helium, and nearly the same appearance was to be seen. With the jar in parallel and a spark gap interposed the blue spectrum of argon was equally distinct in both tubes; and, more important still, *there was no trace of any unknown line.* It appears, therefore, that helium contains no unknown gas, nor is it possible to separate it by diffusion into any two kinds of gas; all that can be said is that most minerals which evolve helium on heating also evolve argon in small quantity. This accounts for the difference in density observed in different samples of helium; and in one instance, viz. malacone, the amount of argon evolved on heating the mineral, though small, was much in excess of the helium, so far as could be judged by the spectrum.

We are disappointed in the result of this long research, because we had thought it not improbable that an element of density 10 and atomic weight 20 might prove to be the cause of the fact that different samples of helium possess different densities, according to the mineral from which they are extracted, and also of the separation of helium into portions of different densities by diffusion. We still regard it as by no means improbable that further research will lead to the discovery of the "missing" element.

Addendum.—Since this paper was written, Profs. Runge and Paschen, in a communication to the British Association in August of last year, have withdrawn their contention that helium is a mixture, or, perhaps more correctly stated, they now ascribe to helium the same complexity as that of oxygen, the spectrum of which may also be arranged in two series, each consisting of three sets of lines. As oxygen has not yet proved to be complex, the surmise that helium is complex therefore falls to the ground.

Chemical Society, January 20.—Prof. Dewar, President, in the chair.—A ballot for the election of Foreign Members was held and Profs. S. Arrhenius, P. Curtius, A. P. N. Franchimont, W. Körner, W. Markownikoff, N. A. Menschutkin, H. Moissan, W. Ostwald, F. M. Raoult, I. Remsen, W. Spring, L. J. Troost, P. Waage and J. D. van der Waals were subsequently declared duly elected.—The following papers were read:—The preparation of pure iodine, by B. Lean and W. H. Whatmough. Pure iodine is conveniently prepared by heating cuprous iodide in a stream of dry air at 220–240°; it melts at 112·5–114°.—Derivatives of bromtolylhydrazine, by J. T. Hewitt and F. G. Pope.—Researches on the terpenes. (1) On the oxidation of fenchene, by J. A. Gardner and G. B. Cockburn. On oxidising fenchene with dilute nitric acid, cis-camphopyric acid and its anhydride are formed. Turpentine hydrochloride, when oxidised with nitric acid, yields camphoric and camphopyric acids.—The action of alkalis on amides, by J. B. Cohen and C. E. Brittain. The authors have succeeded in preparing a series of compounds, which probably have the constitution NNaR.C.Me(OH)$_2$, by the action of caustic alkalis on amides.—The formation of monomethylaniline from dimethylaniline, by J. B. Cohen and H. T. Calvert. Phenylnitrocarbinol acts violently upon dimethylaniline with formation of nitrosomethylaniline, benzylic alcohol and benzaldehyde and evolution of nitrogen.—Note on the aluminium-mercury couple, by J. B. Cohen and H. T. Calvert. A small quantity of chlorine is retained by aluminium, probably as oxychloride, when it is amalgamated with mercuric chloride.—Action of chloroform and alkaline hydroxides on the nitrobenzoic acids, by W. J. Elliott.

Geological Society, January 19.—Dr. Henry Hicks, F.R.S., President, in the chair.—On some gravels of the Bagshot district, by Horace W. Monckton. The author referred to his papers on gravels south of the Thames, published in the *Quart. Journ. Geol. Soc.* for 1892 (p. 29) and 1893 (p. 308), and gave some additional details. He suggested that the occurrence of stones which had been very little rolled or waterworn in gravels at certain localities, afforded evidence of the presence of ice in the water by which those gravels were deposited; and that the position of some sarsens which he described was due to the same agency. He gave details and exhibited photographs of a number of sarsens which he had seen *in situ*. In the discussion which followed the reading of the paper, the hypothesis advanced by the author was criticised unfavourably by several speakers, but others supported it.—On the occurrence of chloritoid in Kincardineshire, by George Barrow. The rock containing the chloritoid was first found *in situ* at the entrance to the little gully at the head of Friar Glen Burn, near Drumtochty Castle. It has since been observed at many places along a belt of country extending from the coast north of Stonehaven nearly as far as the North Esk. The rock is easily recognised by the presence of numerous white spots, which are always present and are larger than the chloritoid. The chloritoid and the spots vary in size, being largest when the rock is most crystalline (a schist), and smallest when it is least crystalline (a slate). The mineral appears as minute glistening scales in the schist, but in the slate it can be recognised only with the aid of the microscope. The optical characters were described, and shown to be identical with those of the mineral from the Ile de Groix, and with those of the ottrelite from Ottré and Serpont. An account of the methods adopted to obtain a pure sample was given. Several analyses were made, and it was proved that as the purification increased, the analyses approximated more and more closely to the analysis of the mineral from the Isle de Groix. The final result was as follows:—SiO_2 26·00, Al_2O_3 40·05, FeO 19 50, Fe_2O_3 5·05, MgO 2·88, loss on ignition 6·00; total, 99·48.—The annual general meeting of the Society will be held on Friday, February 18, at 3 p.m.

Linnean Society, January 20.—Dr. St. George Mivart, F.R.S., Vice-President, in the chair.—Mr. J. E. Harting exhibited a series of photographs of the grey seal (*Halichœrus grypus*) at various ages, taken from life by Mr. Henry Evans, of Jura, on the Haskeir Rock, Outer Hebrides, to which place the animal resorts every autumn for breeding purposes. Some of the photographs showed the young thickly clothed with white hair, which is retained for several weeks after birth, but is gradually shed before the animal enters the water. Details of measurement and weight were given, and occasion was taken to review the status of the grey seal as a British species, and to indicate its known breeding stations in the British Islands.—Mr. W. J. H. McCorquodale exhibited a skull of a hartebeeste which was one among some fifty skulls of various ruminants he had recently received, all having their horns infested by the larvæ of *Tinea vastella*, upon the chrysalids of which he offered some remarks. The collection was from Nigeria, and was made by his brother the late Lieut. R. H. McCorquodale, 3rd Dragoon Guards, while doing duty as a special service officer in W. Africa. He further recorded the capture by his brother, in 1896, of a giraffe from the regions of the Benue River, north of Calabar, remarking that the specimen was the only one known from this region of Africa, and that its skull was now deposited in our national collection.—Mr. W. E. de Winton, who was present as a visitor, made some remarks on the geographical distribution of the giraffe in Africa, and traced the limits of the range of the northern and southern species as far as had been ascertained.—Dr. W. G. Ridewood read a paper on the larval hyobranchial skeleton of the anurous batrachians, in which were recorded observations made on twenty-one species belonging to nineteen genera.—Mr. R. H. Burne read a paper on the *porus genitalis* of the *Myxinidæ*, in which he concluded that the urogenital sinus present in the lampreys is in the *Myxinidæ* unrepresented, and that the ureters and genital pore open into an integumentary cloaca.

PARIS.

Academy of Sciences, January 31.—M. Wolf in the chair.—Note accompanying the presentation of the notice on the scientific work of H. Fizeau, by M. A. Cornu.—On the approximate development of the disturbance function, by M. H. Poincaré.—On the meteorological observatories of the Atlantic Ocean, by S.A.S. Albert, Prince of Monaco. Two centres of observation, at San Miguel and Flores, have been established in the Azores, and the results are regularly telegraphed to certain continental observatories. The observations from these two stations gives some fifty hours' warning to European ports of approaching depressions.—Remarks by M. Mascart on the preceding paper.—M. Cremona was elected a Correspondent in the Section of Geometry in the place of the late M. Brioschi.—Martial function of the liver in the Vertebrates and Invertebrates, by M. Dastre. The hepatic organ whenever present is always distinguished from the other tissues by the increased amount of iron it contains. Thus in the Crustacea the liver is rich in iron, containing four times as much as muscle, the blood and ovary containing practically none. In Molluscs (cephalopods) the hepato-pancreas contains, weight for weight, twenty-five times as much iron as any of the other tissues; in Lamellibranchs the ratio is about five to one, and the same for Gasteropods. The presence of this iron is independent of the metal in the blood, thus where copper is present in the blood as hæmocyanine, iron only is present in the hepatic tissue.—Observations of the periodical comet of Arrest, made at the Observatory of Rio de Janeiro with the 25 c.m. equatorial, by M. L. Cruls.—On some photographs of nebulæ obtained at the Observatory of Meudon, by M. A. Rabourdin.—Remarks on the preceding communication, and on the correct method of getting comparable images of the nebulæ, by M. J. Janssen. A telescope was specially designed for this work, of 1 metre aperture and 3 metres focal length. Owing to its very short focal distance this instrument is very valuable for observing and photographing very faintly luminous objects, especially nebulæ.—On the development of analytical functions for real values of the variables, by M. Painlevé.—On the systems of partial differential equations, analogous to systems of equations of the first order, by M. Jules Beudon.—On the relations between the infinitesimal elements of two homographic or correlative figures, by M. A. Demoulin.—On surfaces applicable to a surface of revolution, by M. A. Pellet.—On the decomposition of Θ-functions into factors, by M. G. Humbert.—On the most general monographic method resulting from the relative position of two superposed planes, by M. Maurice d'Ocagne.—On the permanent changes of form and breaking of metals, by M. G. A. Faurie. Test pieces of metals, submitted to longitudinal stress under certain conditions, develop nodal points at equal distances apart. These effects are not produced by bending or torsion.—On the flexion of thick bars, by M. Ribière.—Experimental study of the lustre of projectors of light, by MM. A. Blondel and J. Rey.—Study of some radiations by interferential spectroscopy, by MM. A. Perot and Ch. Fabry. By means of the interference apparatus described in previous papers, it is now shown that the green thallium ray is composed of one bright ray and of two others, more faint, situated towards the red. The bright green ray of mercury is also triple, two of these three lines being separated by only $\frac{1}{100}$th of the interval between the sodium lines. Some of the cadmium lines were also split up.—On the measurement of high temperatures by the interference method, by M. Daniel Berthelot. The method is based upon the fact that if the density of a gas is diminished to the same extent on the one hand by a rise of temperature, or on the other by a diminution of pressure, the index of refraction has the same value in both cases. The constant temperature required in these experiments was obtained by means of an electric furnace, composed of two spirals of platinum wire, jacketed with asbestos, by which any temperature up to 1000° C. could be steadily maintained.—On the composition of air at different places, and on the density of gases, by M. A. Leduc. After discussing the errors inherent to the methods of Dumas and Regnault, figures are given for the composition by weight of air taken at various places and under varying conditions of wind. The author notes that in comparing the densities of various gases with oxygen the figures obtained by himself and Lord Rayleigh agree very exactly, but that compared with air there is a constant difference of about ·0001, and hence concludes that the air of London contains 0·1 per cent. less oxygen than that of Paris.—New researches relating to the influence of the X-rays upon the explosive distance of the electric spark, by M. S. Guggenheimer.—On the Hertz resonator, by M. Albert Turpain. —On the decomposition of sulphite and hyposulphite of strontium by heat, and the production of phosphorescent strontium sulphide, by N. J. R. Mourelo.—Contribution to the study of oxydase in grapes. Its utility in the preparation of wine, by MM. A. Bouffard and L. Semichon. By the application of oxydase, white wines may be prepared from red grapes. —Phyllocyanic acid and the phyllocyanates, by M. A. Guillemare.—On the destructive action of a blood serum upon the red corpuscles of another species of animal. Inmunisation against this action, by MM. L. Camus and E. Gley.—Tyrosin, a chemical vaccine against snake poison, by M. C. Phisalix. This is the first known case where the cell sap of a plant confers immunising properties against snake poison.—The neurology of the encephalon in fishes, by M. Catois.—On the morphological limits of the rings of the integument, by M. Charles Janet.—On the fresh-water fauna of the Canary Isles, by M. Jules Richard. Among the species observed the following were the most remarkable: *D. similis*, var. *Alluadi*, and *Canthocamptus palustris*.—On the area of dispersion of the malacological fauna at great depths in the Atlantic, by M. Arnould Locard. —On the germination of the spores of the truffle, and the production of teleutospores, by M. A. de Gramont de Lesparre. The stages of germination are shown in nine diagrams.—On the age of the quaternary gravels of Villefranche (Rhône), by M. Gaillard.—On a new method for determining the position of foreign bodies by radiography, by M. H. Morize.

DIARY OF SOCIETIES.

THURSDAY, FEBRUARY 10.

ROYAL SOCIETY, at 4.30.—Contributions to the Theory of Alternating Currents: W. G. Rhodes.—The Development and Morphology of the Vascular System in Mammals. I. The Posterior End of the Aorta and the Iliac Arteries: Prof. A. H. Young and Dr. A. Robinson.—Further Observations upon the Comparative Chemistry of the Suprarenal Capsules: B. Moore and Swale Vincent.—The Effects of Extirpation of the Suprarenal Bodies of the Eel (*Anguilla anguilla*): Swale Vincent.

MATHEMATICAL SOCIETY, at 8.—The Transformations which leave the Length of Arcs on any Surface Unaltered: J. E. Campbell.—On Aurifeuillians: Lieut.-Colonel Cunningham, R.E.

INSTITUTION OF MECHANICAL ENGINEERS, at 7.30.—Report of the Council.—Discussion upon Mr. Philip Dawson's Paper on Mechanical Features of Electric Traction.

FRIDAY, FEBRUARY 11.

ROYAL INSTITUTION, at 9.—The Metals used by the Great Nations of Antiquity: Dr. J. H. Gladstone, F.R.S.

ROYAL ASTRONOMICAL SOCIETY, at 3.—Annual General Meeting.

PHYSICAL SOCIETY, at 5.—Annual General Meeting.—Address by the President.—Also Paper: On Electromagnetic Induction in Plane, Cylindrical, and Spherical Current Sheets, and its Representation by Moving Trails of Images: Prof. G. H. Bryan, F.R.S.

INSTITUTION OF CIVIL ENGINEERS, at 8.—The Protection of Power Transmissions from Lightning: John T. Morris.

INSTITUTION OF MECHANICAL ENGINEERS, at 7.30.—First Report to the Gas-Engine Research Committee: Description of Apparatus and Methods, and Preliminary Results: Prof. Frederic W. Burstall.—Steam Laundry Machinery: Sidney Tebbutt.

MALACOLOGICAL SOCIETY, at 8.—Descriptions of Two New Species of *Clausilia* from the Province of Che-Kiang, China: E. R. Sykes.—List of the Species of *Cataulus* found in Ceylon, with Descriptions of some New Land Shells from that Island: E. R. Sykes.—Notes on the Genus *Coxiella*: E. A. Smith.—Note on *Cypræa caput-anguis*, Philippi. with the Description of a New Variety of *C. caput-serpentis*: Mrs. A. F. Kenyon.

MONDAY, FEBRUARY 14.

SOCIETY OF ARTS, at 8.—The Principles of Design in Form: Hugh Stannus.

ROYAL GEOGRAPHICAL SOCIETY, at 8.30.—A Recent Journey in Western Australia: Hon. David W. Carnegie.

IMPERIAL INSTITUTE, at 8.30.—Sierra Leone: Lieut. J. P. Mackesy, R.E.

TUESDAY. FEBRUARY 15.

ROYAL INSTITUTION, at 3.—The Simplest Living Things: Prof. E. Ray Lankester, F.R.S.

ZOOLOGICAL SOCIETY, at 8.30.—On the Osteology of the Steganopodes: W. P. Pycraft.—On the Skeleton of the Regenerated Limbs of the Midwife-Toad (*Alytes obstetricans*): Dr. W. G. Ridewood.—Description of a New Sea-Snake from Borneo: G. A. Boulenger, F.R.S.

INSTITUTION OF CIVIL ENGINEERS, at 8.—The Stability of Channels through Sandy Estuaries: P. M. Crosthwaite.

ROYAL STATISTICAL SOCIETY, at 5.—Democratic Statistics of the United Kingdom: their Want of Correlation and other Defects: Edwin Cannan.

ROYAL PHOTOGRAPHIC SOCIETY, at 8.—Process Reproduction from an Editor's Point of View: Wallace L. Crowdy.

ROYAL VICTORIA HALL, at 8.30.—Brains: Hugh de Haviland.

WEDNESDAY, FEBRUARY 16.

ROYAL METEOROLOGICAL SOCIETY, at 7.30.—Report on the Phenological Observations for 1897: Edward Mawley.—Monthly and Annual Rainfall in the British Empire, 1877 to 1896: John Hopkinson.

ROYAL MICROSCOPICAL SOCIETY, at 8.—Essay on Micro-crystallography, with Lantern Illustrations: T. C. White.—Exhibition of Miscellaneous Lantern Slides: J. E. Barnard.

ENTOMOLOGICAL SOCIETY, at 8.—On the Genus *Erebia*: H. J. Elwes and Dr. T. A. Chapman.

THURSDAY FEBRUARY 17.

ROYAL SOCIETY, at 4.30.—*Probable Papers*: On the Depletion of the Endosperm of the *Hordeum vulgare* during Germination: H. T. Brown, F.R.S., and F. Escombe.—On the Connection between the Electrical Properties and the Chemical Composition of Different Kinds of Glass: Prof. A. Gray, F.R.S., and Prof. J. J. Dobbie.—Contributions to the Mathematical Theory of Evolution. On the Inheritance of the Cephalic Index: Cicely Fawcett and Prof. K. Pearson, F.R.S.

ROYAL INSTITUTION, at 3.—Some Italian Pictures at the National Gallery: Dr. Jean Paul Richter.

SOCIETY OF ARTS (Imperial Institute), at 4.30.—The Plague in Bombay: Dr. Herbert Mills Birdwood.

LINNEAN SOCIETY, at 8.—On the Genus Arenaria: F. N. Williams.—On the Brain in the Edentata, including Chlamydophorus: Dr. Elliot Smith.

CHEMICAL SOCIETY, at 8.—Some Lecture Experiments: J. Tudor Cundall. —Observations on the Influence of the Silent Discharge of Electricity on Atmospheric Air: W. A. Shenstone and W. T. Evans.

FRIDAY, FEBRUARY 18.

ROYAL INSTITUTION, at 9.—A Yorkshire Moor: Prof. L. C. Miall, F.R.S.

EPIDEMIOLOGICAL SOCIETY, at 8.30.—The Relationship of Variations of the Ground-Water Level to the Incidence and Seasonal Distribution of Malarial Fevers in India: Surgeon-Captain Leonard Rogers.

SATURDAY, FEBRUARY 19.

ROYAL INSTITUTION, at 3.—The Structure of Instrumental Music (with Musical Illustrations): William H. Hadow.

BOOKS, PAMPHLETS, and SERIALS RECEIVED.

BOOKS.—Religio Medici: Sir T. Browne, edited by Dr. D. L. Roberts (Smith, Elder).—Chambers's Algebra for Schools: W. Thomson (Chambers). —A Flower-Hunter in Queensland and New Zealand: Mrs. Rowan (Murray).—Elementary Botany; P. Groom (Bell).—Quarterly Current Charts for the Pacific Ocean (Meteorological Office).—Elementary Physics: J. G. Kerr (Blackie).

PAMPHLETS.—Remarkable Comets: W. T. Lynn, 6th edition (Stanford). Quantitative Exercises for Beginners in Chemistry: A. H. Mitchell, 2 parts (Reading, National Publishing Association).—A Catalogue of Recent Cephalopoda, Supplement 1887-96: W. E. Hoyle (Edinburgh).—Mythos und Naturwissenschaft, &c.: G. W. A. Kahlbaum (Leipzig, Barth).—Eleventh Annual Report of the Liverpool Marine Biology Committee, &c. (Liverpool).

SERIALS.—Chambers's Journal, February (Chambers).—Natural Science, February (Dent).—Fortnightly Review, February (Chapman).—Scribner's Magazine, February (S. Low).—Journal of Botany, February (West).

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