

ström 5269'4) in the second, and is good in the fourth and even fifth spectrum.

Flat grating, 2×3 inches, 1200 lines to one millimetre. Shows very many more lines in the B and A groups than were ever before seen.

Flat grating, $2 \times 3\frac{1}{4}$ inches, 14,438 lines to the inch. This has most wonderful brilliancy in one of the first spectra, so that I have seen the Z line, wave-length 8420 (see Abney's map of the ultra-red region), and determined its wave-length roughly, and have seen much further below the A line than the B line is above the A line. The same may be said of the violet end of the spectrum. But such gratings are only obtained by accident.

Concave grating, 2×3 inches, 7 feet radius of curvature, 4818 lines to the inch. The coincidences of the spectra can be observed to the tenth or twelfth spectrum.

Concave grating, 2×3 inches, 14,438 lines to the inch, radius of curvature 8 feet. Divides the 1474 line in the first spectrum, the E line in the second, and is good in the third or fourth.

Concave grating, $3 \times 5\frac{1}{2}$ inches, 17 feet-radius of curvature, 28,876 lines to the inch, and thus nearly 160,000 lines in all. This shows more in the first spectrum than was ever seen before. Divides 1474 and E very widely, and shows the stronger component of Ångström 5275 double. Second spectrum not tried.

Concave grating, $4 \times 5\frac{3}{4}$ inches, 3610 lines to the inch, radius of curvature 5 feet 4 inches. This grating was made for Prof. Langley's experiments on the ultra-red portion of the spectrum, and was thus made very bright in the first spectrum. The definition seems to be very fine, notwithstanding the short focus, and divides the 1474 line with ease. But it is difficult to rule so concave a grating, as the diamond marks differently on the different parts of the plate.

These give illustrations of the results accomplished, but of course many other experiments have been made. I have not yet been able to decide whether the definition of the concave grating fully comes up to that of a flat grating, but it evidently does so very nearly.

UNIVERSITY AND EDUCATIONAL INTELLIGENCE

CAMBRIDGE.—The following awards have been made at St. John's College for proficiency in natural science:—Foundation Scholarships to Bateson, Goodman; Exhibitions to Edmunds, Love, T. Roberts (already scholars), and to Acton, Andrews, Clementson. T. Roberts also received a Wright's Prize, with augmentation of scholarship to 100*l.* for the year. In the Open Exhibition Examination at Easter, H. Stroud (Owens College) was awarded a Foundation Scholarship of 100, and Fuller (Perse School, Cambridge), 50*l.* for three years.

In the long list of lectures on Natural Science for the ensuing academic year, lately published, we note as new courses or features of special interest, Mr. Shaw's lectures on some Applications of the Higher Mathematics to Physics (Michelmas Term); Dr. Roberts's lectures on Physiography (Michaelmas Term); Prof. Hughes's Course of Dynamical Geology (Lent Term); Dr. Vines's complete course of advanced Botanical Study, extending through the year; Prof. Newton's lectures on the Evidence of Evolution in the Animal Kingdom, in the Michaelmas Term, and on the Geographical Distribution of Animals, in the Easter Term; and Prof. Balfour's announcement of his lectures and practical work, as Professor of Animal Morphology.

The annual report of the Botanic Gardens Syndicate details work done in improving the Gardens, and amongst valuable additions to the collection, the Tonga plant, recently introduced from the Fiji Islands. A special collection of medical plants has been formed, which already contains the most important hardy plants, and some of considerable rarity. About 8000 labels have been written during the year.

With regard to the recent Mathematical Tripos (in which Messrs. Welsh of Jesus College, and Turner of Trinity College, were respectively Senior and Second Wranglers), although the twenty-nine Wranglers may enter for a further advanced examination in January next, they are by no means compelled to do so. The examination, so far as it has already proceeded, includes very many of the subjects of the old Mathematical Tripos, and we anticipate that unless the colleges decline to elect to Fellowships Wranglers who do not proceed to the higher

examination, many will rest content with the test already undergone. The recent talk about the "abolition of the Senior Wrangler" has not a very valid basis.

THE eighth annual meeting of the Yorkshire College was held at Leeds on Saturday, Sir Edward Baines in the chair. Prof. Marshall, the principal, made a satisfactory report, and a resolution of the council was confirmed to proceed with the completion of the new college buildings. On the proposition of the Mayor of Leeds (Alderman Tatham) it was resolved that, in memory of the late Lord F. Cavendish, M.P., the late president of the college, who for twelve years had been one of its foremost promoters, a fund be established for the endowment of a Cavendish Professorship of Physics or for such other purpose as the council should deem best.

SCIENTIFIC SERIALS

Notes from the Leyden Museum, vol. iv. No. 2, April, 1882, contain: On American Diptera, by F. M. van der Wulf.—On new species of Lycidæ, Lampyridæ, and Telephoridæ, and on a new Sumatran species of Callimerus, by Rev. H. S. Gorham.—On new species of Pedilidæ and Anthicidæ, and on a new African species of Hister, by S. de Marscul.—On the Holothurians in the Leyden Museum, by Dr. H. Ludwig.—On some British Indian reptiles and amphibia, by Dr. A. Hubrecht.—On the Pselophidæ and Scydænidæ of the Sunda Islands by Dr. L. W. Schauffuss.—Description of a new species of Apogonia, by Dr. D. Sharp.—On a new species of Pantolamprus from Liberia, by Dr. E. Candèze.

Bulletin de la Soc. Imp. des Naturalistes de Moscou, tome lvi. No. 3, 1882, contains; V. Kiprijanoff, on fish remains in the Siwerischen Osteoliths (2 plates).—Dr. Max Schmidt, on *Bolborhynchus monachus*.—Prof. K. Lindeman, on *Coleophora tritici*, a new injurious Russian insect.—Dr. J. v. Bedriaga.—On the Amphibia and Reptiles of Greenland.—F. v. Thumen, contributions to the fungal-flora of Siberia.—N. Vischniakoff, on the *Ammonites distractus* of Quensted.—Prof. Bredichen, report on the tails of comets 1881 *b* and *c*.—Dr. E. Kern, on a new milk ferment from the Caucasus (2 plates).—Th. A. Sludski, on two inequalities taking place in the movement of the solar system (in Russian).—A. Becker, journey to Southern Daguestan.—M. Menzbier, comparative review of the ornithological fauna of Moscow and Toula.—A. Regel, Correspondence.

Zeitschrift für wissenschaftliche Zoologie, vol. xxxvi., part 4, 1882, contains J. Brock, on the anatomy and systematic position of the Cephalopoda (with plates 34 to 37).—O. Katz, contribution to a knowledge of the tegumentary system of the pouch and its several accompanying organs in the marsupials (with plates 38-40).—R. Rössler, contribution to the anatomy of the Phalangidæ (with plates 41 and 42).

Archives des Sciences Physiques et Naturelles, May 15.—Study on the chemical composition of albuminoid substances (continued), by A. Danilewsky.—Mean diurnal heights of Lake Leman, at Secheron, from 1874 to 1881, by P. Plantamour.—The rheolyser, by E. Hartmann.—Darwin considered as regards the causes of his success and the importance of his works, by Alph. de Candolle.

Sitzungsberichte und Abhandlungen der naturwissenschaftlichen Gesellschaft Isis in Dresden, July to December, 1881.—On some lime-spar crystals, by A. Pungold.—Flora of Dresden and its environs, by C. F. Schulze.—On the oldest traces of fossil plants in Saxony, by H. B. Geinitz.—On the progress of Geological researches in North America, by the same.—On the occurrence of Cenomanian petrefactions at Dohne, by J. v. Deichmüller. On the occurrence of the Riesengebirge races of *Pinus Montana*, Müll., in the Saxon-Bohemian Oberlausitz, by O. Drude.

SOCIETIES AND ACADEMIES

LONDON

Royal Society, June 15.—"On an Arrangement of the Electric Arc for the Study of the Radiation of Vapours, together with the Preliminary Results." By Professors Living and Dewar.

By the arrangement described, the authors are able to make observations as the temperature rises and as it falls, and so to trace the influence of temperature in many cases in which the extent of that influence was before doubtful. The temperature