

Hie-kwang-ki, 'mark of combining light.' Besides this palace in Leo and Virgo, there is another, Tien-shi-yuen, 'inclosure of the heavenly market.' It is not far to the north-east of Scorpio. It is the serpent in our astronomy. Within the brilliant circle of the serpent is a star called 'court of the western heaven.' There is also a bright star,  $\alpha$  Herculis, which is called 'emperor's throne.' The twenty-two stars in the Serpent are named after the States into which China was formerly divided."

### UNIVERSITY AND EDUCATIONAL INTELLIGENCE.

CAMBRIDGE.—Among the numerous lectures on physics and chemistry this term, we note those of Prof. Liveing, on spectroscopic chemistry; Prof. Dewar, on physical chemistry; Mr. Pattison Muir, on chemical affinity; Mr. Robinson, on agricultural chemistry; Mr. Heycock, on chemical philosophy; Prof. Thomson, on electricity and magnetism, and on the kinetic theory of gases; Mr. Shaw, on thermodynamics and radiation; and Mr. Wilberforce, on dynamo electric machines (continuous current generators and motors). Prof. Stuart lectures on theory of structures.

Prof. Foster continues his elementary course of physiology; Dr. Lea his chemical physiology; and Mr. Langley his advanced histology and physiology.

In zoology, Prof. Newton lectures on the geographical distribution of Vertebrates. Mr. Sedgwick and Mr. Darwin conduct the large class of elementary biology. Mr. Gadow's course is on the morphology of the Amniota (recent and extinct). Mr. Sedgwick, Mr. Harmer, and Mr. Weldon continue their classes on the Invertebrata.

Mr. Darwin lectures on the physiology of plants (advanced), Mr. Gardiner has a general elementary course, Mr. Vaizey lectures on the morphology and classification of Cryptogams, and Dr. Hicks on elementary botany.

The lectures on geology are divided thus: Prof. Hughes, geology of a district to be visited at Easter; Mr. Marr, principles, and geology and scenery; Mr. Harker, petrology; Mr. Roberts, palæontology; Mr. Seward, palæobotany.

The principal mathematical lectures are the following: Prof. Stokes, semi-convergent series involving powers of a complex variable; Prof. Cayley, analytical geometry; Prof. Adams, lunar theory; Mr. Pendlebury, projective geometry; Mr. Glazebrook, hydrodynamics (waves and sound); Mr. Hobson, spherical and cylindrical harmonics; Mr. Larmor, geometrical optics and electro-magnetism; Mr. Forsyth, modern algebra (binary forms); Dr. Ferrers, elliptic functions; Dr. Besant, analysis; Mr. H. M. Taylor, higher plane curves; Mr. Webb, dynamics (elasticity and viscosity); Mr. Stearn, hydrodynamics (multiply-connected velocity-potentials and vortices); Mr. Herman, hydrodynamics (viscous and gravitating fluids).

An examination will be held at Gonville and Caius College on March 15 for one Shuttleworth Scholarship, value £60 per annum for three years. Candidates must be medical students of the University of not less than eight terms standing. In the case of candidates not already scholars of the College, the examiners may recommend at the same time for a foundation scholarship. Further particulars may be obtained from the tutors.

### SCIENTIFIC SERIALS.

*American Journal of Science*, January.—The history of a doctrine, by S. P. Langley. This is the address delivered last year to the American Association for the Advancement of Science, here published complete with the notes that have not hitherto appeared. Its object is to show the steady progress of scientific truth, as illustrated by the history of the undulatory and corpuscular theories of light from the time of Descartes, Boyle, and other precursors of Newton down to the present day, when the identity of radiant light and heat as forms of motion, or as different effects of radiant energy, has been finally established.—Description of the new mineral beryllonite, by Edward S. Dana and Horace L. Wells. This is a new phosphate of sodium and beryllium discovered in 1886 by Mr. Sumner Andrews near Stoneham, Maine, the same district that has already yielded fine specimens of phenacite, herderite, and other rare minerals. It occurs mostly as a crystal in a fragmentary state, of small size

and seldom well formed, but remarkable for the number of planes they present, eight or more distinct planes being frequently presented in each zone on a single crystal. Twins are common, leading to many curious variations of form. The crystals are colourless, or slightly yellowish, and transparent, with specific gravity 2.845, and hardness 5.5.—The iron ores of the Penokee-Gogebic series of Michigan and Wisconsin, by C. R. Van Hise. The author's recent explorations of this region confirm Prof. Irving's conclusion that the original rock of the iron-bearing formation is a cherty iron carbonate from which the various phases of rock and the ore found in it have been produced by a complex series of alterations. The iron ore is a soft, red, somewhat hydrated hæmatite, more or less manganiferous, and mostly very friable.—A quartz-keratophyre from Pigeon Point and Irving's augite-syenites, by W. S. Bayley. The remarkable bright red rock of Pigeon Point, Minnesota, is here studied in its various phases, with the general result that the sections described by Irving as augite-syenites are partly identical with the typical red rock itself, and partly the same in all essentials as the formations which have been called its intermediate varieties. The space between the fresh olivine-gabbro and the typical quartz-keratophyre is occupied by a series of rocks exhibiting a gradual transition between the heavy dark basic rock and the light red keratophyre.—On the occurrence of hanksite in California, by Henry G. Hanks. This anhydrous sulphate of soda has hitherto been found in limited quantities amongst the various borax fields of California. But the author's researches tend to show that it exists in great abundance, and that it plays an important part in the metamorphoses that produce gay-lussite, thionolite, and perhaps borax.—Further papers on Mount Loa are contributed by James D. Dana and the Rev. E. P. Baker, bringing its history down to July 1888.—H. L. Wells and S. L. Penheld contribute notes on the new mineral sperryllite.

*American Journal of Mathematics*, vol. xi. No. 2 (Baltimore, January 1889).—The number opens with an instalment of a memoir entitled "Remarque au sujet du théorème d'Euclide sur l'infinité du nombre des nombres premiers," by J. Perott (pp. 99-138). A footnote supplies bibliographical information as to previous memoirs on the same subject.—Next, Prof. Cayley writes on "The Theory of Groups" (pp. 139-57), a subject he has pretty largely written upon before, and to which his attention has been recalled by the section, in Mr. Kempe's Philosophical Transactions memoir "On the Theory of Mathematical Form," entitled "Groups containing from One to Twelve Units." The paper is largely illustrated by what the author styles "colour groups."—Mr. A. E. H. Love discusses "Vortex Motion in certain Triangles" (pp. 158-71), by a method explained by Dr. Routh in a paper in vol. xii. of the London Mathematical Society's Proceedings.—Another hydrodynamical paper follows, by Mr. Basset, "On the Steady Motion of an Annular Mass of Rotating Liquid" (pp. 172-81), wherein he follows up previous work in the line of Poincaré's and Prof. G. H. Darwin's recent investigations of the figures of equilibrium of rotating masses of liquid. The case considered is for an approximately circular cross-section and for rotation under the influence of its own attraction about an axis through its centre of inertia, which is perpendicular to the plane of its central line.—A paper, by Sophus Lie, "Die begriffe Gruppe und invariante" (pp. 182-86), is reprinted from the *Berichte der k. Sächs. Gesellschaft der Wissenschaften*, August 1887.—A short note, by E. Picard, "Sur les formes quadratiques binaires a indéterminées conjuguées et les fonctions fuchsianes" (pp. 187-94), closes the number. The method employed is that used by Poincaré in his memoir on fuchsian functions (*Journal de Jordan*, 1887).

### SOCIETIES AND ACADEMIES.

#### LONDON.

Royal Meteorological Society, January 16.—Dr. W. Marcet, F.R.S., President, in the chair.—The Report of the Council showed that a large amount of work had been done during the past year, and that considerable progress had been made in the investigation of one of the most interesting and hitherto neglected branches of meteorology, viz. thunderstorms. Forty-nine new Fellows were elected last year, the total number on the books now being 525.—After the Report had been