

on an axis, straight, curved, or tortuous, by Mr. G. H. Knibbs. In this paper the author showed that certain theorems developed in two previous papers might be extended greatly in generality, and were applicable to *quanta* determinations in *n*-dimensional space.—Rock-holes used by the aborigines for warming water, by Mr. R. H. Mathews. The author showed that the natives were in the habit of immersing heated stones in small quantities of water for the purpose of warming it for drinking, and in some cases to assist in cooking their food.—Some aboriginal tribes of Western Australia, by Mr. R. H. Mathews. Mr. Mathews also contributed an article on some aboriginal tribes of Western Australia, describing their divisions into intermarrying sections; lists of totems, comprising animals, plants and other natural objects, attached to each of the sections, were also given. The laws regulating marriage and descent were explained, together with a brief outline of the structure of the language. Mention was made of their legends, knowledge of the cardinal points, and customs of genital mutilation, the whole concluding with a comprehensive vocabulary.—Projects for water conservation, irrigation and drainage in New South Wales, by Mr. H. G. McKinney.

ST. LOUIS.

Academy of Science, January 6.—Mr. Henry W. Eliot, president, in the chair.—On behalf of herself and a considerable number of other persons, Mrs. William Bouton presented to the Academy a collection of 633 butterflies mounted on Denton tablets, on condition that the collection should be made accessible to the public. The following papers were presented by title:—New species of plants from Missouri, by Messrs. K. K. Mackenzie and B. F. Bush.—Revision of the North American species of *Triodia*, by Mr. B. F. Bush.—Prof. A. S. Chessin exhibited a gyroscope and explained how an accurately constructed and rapidly rotated gyroscope might be made to indicate the position of the meridian plane, the direction of the polar axis of the earth and the latitude of the place of observation, thus serving the purpose of the mariner's compass, but more accurately, because of the fact that the compass indicates the magnetic pole and not the true pole. The following formulæ pertaining to the subject were furnished:—

$$T = \pi \sqrt{\frac{A + C_1 + A_2}{C \omega \Omega \cos \lambda}} \quad T^1 = \pi \sqrt{\frac{A + C_1 + A_2}{C \omega \Omega}}$$

where *T* and *T*¹ are the durations of a complete oscillation of the gyroscope when its axis is made to remain in the horizontal and the meridian planes respectively; ω and Ω the angular velocities of rotation of the earth and the gyroscope respectively; *A*, *A*₁, *A*₂ and *C*, *C*₁, *C*₂ the equatorial and the axial moments of inertia of the gyroscope and the two rings on which it is mounted. From these formulæ the latitude (λ) of the place of observation is derived, namely:—

$$\cos \lambda = \frac{T^{12}}{T^2}$$

—Prof. F. E. Nipher made a further statement concerning his results in the attempt to produce ether waves by the explosion of dynamite. He had obtained some results which seemed to show that magnetic effects could be thus produced.

DIARY OF SOCIETIES.

THURSDAY, FEBRUARY 6.

ROYAL SOCIETY, at 4.30.—The Stratifications of Hydrogen: Sir William Crookes, F.R.S.—The Density and Coefficient of Cubical Expansion of Ice: Dr. J. H. Vincent.—On the Increase of Electrical Resistivity caused by alloying Iron with various Elements, and the Specific Heat of those Elements: Prof. W. F. Barrett, F.R.S.—Continuous Electrical Calorimetry: Prof. H. L. Callendar, F.R.S.
SOCIETY OF ARTS, at 4.30.—The Coal Resources of India: Prof. W. R. Dunstan, F.R.S.
LINNEAN SOCIETY, at 8.—On a Method of Investigating the Gravitational Sensitiveness of the Root-tip: F. Darwin, F.R.S.—An Extinct Family of Ferns: Dr. D. H. Scott, F.R.S.
CHEMICAL SOCIETY, at 8.—An Investigation into the Composition of Brittle Platinum: W. N. Hartley.—Conversion of *l*-Hydroxycamphene into β -Halogen Derivatives of Camphor: M. O. Forster.—Tetrazoline, Part II.: S. Ruhemann and H. E. Stapleton.—(1) The Solubilities of the Calcium Salts of the Acetic Acid Series; (2) The Equilibrium between a Solid and its Saturated Solution at various Temperatures: J. S. Lumsden.—The Influence of Temperature on Association in Benzene Solution, and the Value of the Molecular Rise of Boiling Point for Benzene at Different Temperatures: W. R. Innes.—The Magnetic

Rotation of Ring Compounds: Camphor, Limonene, Carvene, Pinene, and some of their Derivatives: W. H. Perkin, sen., F.R.S.—Polymerisation Products from Diazoacetic Ester: O. Silberrad.
RÖNTGEN SOCIETY, at 8.30.—A System of Radiography: E. W. H. Shenton.

FRIDAY, FEBRUARY 7.

ROYAL INSTITUTION, at 9.—The New Mammal from Central Africa and other Giraffe-like Animals: Prof. E. Ray Lankester, F.R.S.
GEOLOGISTS' ASSOCIATION, at 7.30.—Annual General Meeting.—Address on a Dozen Years of London Geology (Eocene, Chalk, and Underground): W. Whitaker, F.R.S., President.

MONDAY, FEBRUARY 10.

SOCIETY OF ARTS, at 8.—Personal Jewellery from Prehistoric Times: Cyril Davenport.
IMPERIAL INSTITUTE, at 8.30.—The Coloured Races in Australia: Hon. Sir Horace Tozer, K.C.M.G.
ROYAL GEOGRAPHICAL SOCIETY, at 8.30.—The Ancient Kingdom of Kongo; Rev. Thomas Lewis.

TUESDAY, FEBRUARY 11.

ROYAL INSTITUTION, at 3.—The Cell: its Means of Offence and Defence: Dr. A. Macfadyen.
INSTITUTION OF CIVIL ENGINEERS, at 8.—The Port of Dundee: G. C. Buchanan.

WEDNESDAY, FEBRUARY 12.

SANITARY INSTITUTE, at 8.—Discussion on the Prevention of Small-Pox in the Metropolis: Opened by A. Wynter Blyth.

THURSDAY, FEBRUARY 13.

ROYAL SOCIETY, at 4.30.
INSTITUTION OF ELECTRICAL ENGINEERS, at 8.—Researches on the Electrical Conductivity and Magnetic Properties of upwards of 100 different Alloys of Iron: Prof. W. F. Barrett, F.R.S., and W. Brown.—On some Conclusions deduced from the preceding Paper: Prof. W. F. Barrett, F.R.S.
MATHEMATICAL SOCIETY, at 5.30.—On the Density of Linear Sets of Points: W. H. Young.—On Plane Cubics: Prof. A. C. Dixon.

FRIDAY, FEBRUARY 14.

ROYAL INSTITUTION, at 9.—Magic Squares and other Problems on a Chess Board: Major P. A. MacMahon, F.R.S.
PHYSICAL SOCIETY, at 5.—Annual General Meeting.—Address by the President, Prof. S. P. Thompson, F.R.S.—Mr. T. H. Littlewood will exhibit an Atwood's Machine.
ROYAL ASTRONOMICAL SOCIETY, at 3.—Annual General Meeting.
MALACOLOGICAL SOCIETY, at 8.
INSTITUTION OF CIVIL ENGINEERS, at 8.—Some Public Health Aspects of the Question of Sewage Disposal: C. Johnston.

SATURDAY, FEBRUARY 15.

ROYAL INSTITUTION, at 3.—Some Electrical Developments: Lord Rayleigh, F.R.S.

CONTENTS.

PAGE

Religion as a Scientific Study. By E. Sidney Hartland	313
Chemistry for Colleges	314
Hydraulics	315
Our Book Shelf:—	
Gegenbaur: "Erlebtes und Erstrebt."—H. G.	316
Selous: "Beautiful Birds."—F. E. B.	316
Siebert: "Lehrbuch der Chemie und Mineralogie"	317
"Knowledge"	317
Hudson: "A Geography of Wales"	317
Letters to the Editor:—	
Fall of Mud or Dust.—Sir Edw. Fry, F.R.S.	317
Change of Pitch of Sound with Distance.—R. Freeman	317
A Lunar Romance. (<i>Illustrated</i> .) F. C. Constable; The Reviewer	318
Cherry Leaf Disease.—Alfred O. Walker	318
Extremes of Climate in the British Empire.—Dr. Hugh Robert Mill	318
Elementary School Mathematics.—John S. Yeo	318
Electrification of Glass.—F. Hodson	319
The Dangerous Side of India. (<i>Illustrated</i> .)	319
Report of the Indian Plague Commission. By Dr. E. Klein, F.R.S.	320
A. W. Bennett. By S. A. S.	321
Notes	321
Our Astronomical Column:—	
Early Observations of Algol Stars	325
United States Naval Observatory Report	326
The Discovery of the Future By H. G. Wells	326
The West Indian Agricultural Conference, 1902. By Prof. J. P. d'Albuquerque	331
The Leonid Shower of 1901. By W. F. Denning	332
University and Educational Intelligence	333
Societies and Academies	333
Diary of Societies	336