

repellent action on the other, and driving it with disastrous consequences across the island of Cuba. But Mr. E. Hayden, of the United States Meteorological Bureau, rejects this explanation, and traces the disturbance to the influence that zones of high pressure appear to exercise on low pressures and especially on cyclones. M. Faye seems inclined to accept this view, if it could be shown that the action of high-pressure zones is felt in the higher atmospheric regions far above the crests of the loftiest mountain ranges.—On the value of a finite continuous and purely periodical fraction, by Prof. Sylvester. The positive root of the equation

$$[t]x^2 - ([t] - [t'])x - [t'] = 0$$

gives the value of the purely periodical infinite fraction ( $t^{\infty}$ ), where  $t$  is a type—that is, a succession—of any elements whatever. By means of a formula given in a previous communication the author here offers an easy solution for the problem: To find the value of the analogous periodical but finite continuous fraction ( $t_n$ ).—Researches on the elasticity of solids, by M. E. H. Amagat. The method applied by the author to crystal, as described in a former note (*Comptes rendus*, October 15, 1888), is here employed for other substances, such as glass, steel, copper, brass, and lead, which are also treated by the Wertheim process. The tabulated results, obtained at a mean temperature of  $12^{\circ}$  C., seem to show that for metals the value of Poisson's coefficient  $\mu$  increases with the coefficient of compressibility, and for the other substances with the facility with which they undergo permanent deformation. The value of  $\mu$ , theoretically equal to 0.50 for fluids, would appear to increase in the scale of bodies, passing through all the intermediate states (pasty, viscous, &c., and consequently for the same body passing through these various states), and approaching 0.25 according as the bodies become more and more refractory to permanent deformations—that is, more perfectly elastic. Glass approaches nearest to this theoretic condition, the next in order being steel, copper, and lead, while caoutchouc occupies the opposite extremity of the scale. Hence the perfect solid, for which the value of  $\mu$  would be 0.25, should realize the double condition of being at once perfectly elastic and perfectly isotropic.—On the solubility of saccharose in distilled water, by M. Léon Périer. After the disastrous vintages of 1888 in the Gironde district, various growers attempted to substitute for the ordinary wines a drink prepared from grape-cake and sugar refermented. M. Périer here describes the results of the examination he has made of numerous specimens of these liquids submitted to his inspection.—Erosions due to wind action, by M. Contejean. During a recent visit to Corinth the author observed a remarkable instance of this phenomenon on the neighbouring plateau, where an old amphitheatre some fifteen metres from the edge of the escarpment communicates with the beach through a cavern with wide opening at both ends, and above which the limestone rock forms a natural bridge. The walls of this cavern, which is formed in the sandstone stratum at the foot of the cliff, are extremely rugged and irregularly corroded, nowhere showing traces of human workmanship. The tunnel could not possibly have been excavated either by the rains or the running waters, and its existence can be explained only by the action of the sands playing on a point of least resistance under the influence of the fierce northern gales prevalent in this region.—On the rectification of alcohol, by M. E. Sorel. In continuation of his previous communication on this subject (*Comptes rendus*, May 27, 1889), the author here shows how the theoretical data may be verified, and indicates the practical conclusions that may be drawn from them.—Some documents were submitted to the Academy by le Père D-nza, on the recent earthquakes in the north-west of France, slight vibrations of which were also felt in Genoa, Sinigaglia, Sienna, and other parts of Italy. At the Observatory of Moncalieri the seismic instruments showed some indications of the underground disturbances.

## BERLIN.

Physiological Society, May 31.—Prof. du Bois-Reymond, President, in the chair.—Dr. Nitze described and demonstrated his apparatus for observing and examining the interior of the urinary bladder. The apparatus, called a cystoscope, consists of a small incandescent electrical lamp, a prism, and a small ocular and objective, the whole arranged in the form of a catheter. Before making an observation the bladder is washed out with water, the instrument is then introduced, and the terminals of the electric lamp are connected with a battery. While intended in the first instance to facilitate the ocular inspection of pathological

conditions of the bladder, this instrument also makes it possible to observe various physiological functions, such as the periodic extrusion of small quantities of urine from the mouths of the ureters, and the peristaltic movements of the ureters themselves. The applicability of the method was demonstrated on two patients.—Starting with the observed fact that canaries fed with cayenne pepper acquire a ruddy plumage, Dr. Sauermann has based upon it a scientific investigation of canaries, fowls, pigeons, and other birds. From these he has obtained the following results. Feeding with pepper only produces an effect when given to young birds before they moult; the colour of the feathers of older birds cannot be affected. Moisture facilitates the change of colour to a ruddy hue, which is again discharged under the influence of sunnigh and cold. A portion of the constituents of cayenne pepper is quite inactive, as for instance piperin and several extractives: similarly the red colouring-matter alone of the pepper has no effect on the colour of the feathers. It is rather the triolein, which occurs in the pepper in large quantities, together with the characteristic pigment, which brings about the change of colour by holding the red pigment of the pepper in solution. Glycerin may be used instead of triolein to bring about the same result. The same statement holds good with regard to the feeding of birds with aniline colours. The red pigment of the pepper is also stored up in the egg-yolk as well as in the feathers. The first appearance of the pigment in the yolk may be observed as a coloured ring four days after the commencement of feeding with the pigment dissolved in fat; after a further two days' feeding the whole yolk is coloured. Dr. Sauermann is still engaged in carrying on his researches.

## BOOKS, PAMPHLETS, and SERIALS RECEIVED.

The Flora of Switzerland for the Use of Tourists and Field Botanists: A. Gremli; translated by S. W. Paitson (Nutt).—Commercial Organic Analysis, vol. iii. Part 1, 2nd edition: A. H. Allen (Churchill).—Morocco: H. M. P. De la Martinière (Whittaker).—Woolwich Mathematical Papers for the Years 1880-88, edited by E. J. Brooksmith (Macmillan).—Physiological Diagrams for Use in Schools; also Index: G. Davies (W. and A. K. Johnston).—Days with Industrials: A. H. Japp (Trübner).—New Verse in Old Vesture; J. C. Grant (E. W. Allen).—Catalogue of the Fossil Reptilia and Amphibia in the British Museum (Natural History), Part 2: R. Lydekker (London).—Climatology of New Jersey (Trenton, N.J.).—Bulletin of the United States National Museum, No. 33: T. Egleston (Washington).

## CONTENTS.

	PAGE
Evolution Ethics . . . . .	169
The Zoological Results of the <i>Challenger</i> Expedition . . . . .	171
Greek Geometry from Thales to Euclid . . . . .	172
Our Book Shelf:—	
Günther: "Die Meteorologie, ihren neuesten Standpunkte gemäss" . . . . .	173
Worsley-Benison: "Haunts of Nature" . . . . .	173
Letters to the Editor:—	
The Structure and Distribution of Coral Reefs.—Dr. H. B. Guppy . . . . .	173
The Fireball of May 29, 1889.—W. F. Denning . . . . .	174
Meteor.—F. T. Mott . . . . .	174
Stationary Dust-Whirl.—J. Lovel . . . . .	174
Bunsen's Photometer.—D. M. Lewis . . . . .	174
The Tuticorin Pearl Fishery. By Edgar Thurston . . . . .	174
Californian Forestry . . . . .	176
The Extinct Starling of Reunion ( <i>Fregilupus varius</i> ). By R. Bowdler Sharpe . . . . .	177
A Mansion House Meeting in Aid of the Pasteur Institute . . . . .	177
Notes . . . . .	178
Our Astronomical Column:—	
Two Remarkable Conjunctions . . . . .	180
The General Relations of the Phenomena of Variable Stars . . . . .	181
Astronomical Phenomena for the Week 1889 . . . . .	181
June 23-29 . . . . .	181
Geographical Notes . . . . .	181
Aluminium. By Sir Henry Roscoe, M.P., F.R.S. . . . .	182
The Palæontology of Sturgeons. By A. Smith Woodward . . . . .	186
Nitrate of Soda, and the Nitrate Country. I. ( <i>Illustrated</i> ). By Hon. Ralph Abercromby . . . . .	186
University and Educational Intelligence . . . . .	189
Scientific Serials . . . . .	189
Societies and Academies . . . . .	190
Books, Pamphlets, and Serials Received . . . . .	192