

teristics of any required system can be ascertained by inspection. An account is then given of the application of such systems to the new key-board, and particularly of a harmonium, which has been constructed, and contains at present the division of the octave into fifty-three equal intervals in a complete form. Rules for tuning are given. Finally, the application of the system of fifty-three to the violin is discussed.

Throughout the work of former labourers in the same field is reviewed; the obligations of the writer are due to Helmholtz, the late General T. Perronet Thompson, F.R.S., and others.

"On the Composition and Origin of the Waters of a Salt Spring in Huel Seton Mine, with a Chemical and Microscopical Examination of certain Rocks in its Vicinity." By J. Arthur Phillips.

After giving some tables, the author proceeds as follows:—A consideration of the various phenomena connected with the occurrence of this and other apparently similar springs, which have at different times been discovered in the district, would seem to lead to the inference that they all have some more or less direct communication with the sea, and that they are either the result of infiltration of sea-water through faults, or are true and independent sources which, before being tapped below the sea-level, had found their way to the ocean through faults or channels.

The following would appear, in the present state of our knowledge, a probable explanation of the origin of the Huel Seton spring. The cross-course is believed to extend through both granite and clay-slate to the sea. From the close contact of its surfaces, the presence of clay, and from other causes, this fault may be supposed not to be uniformly permeable by water, which can only follow a circuitous passage. In this way it penetrates to depths where reactions take place, which, although not entirely in accordance with the results of daily experience in our laboratories, can, after the investigations of M. Daubrée, M. de Sénarmont, and others, be readily understood. By the action of sea-water on silicates of calcium, silicates of sodium and chloride of calcium may be produced. The sulphate of sodium of the sea-water will be decomposed by this chloride of calcium, with the production of sulphate of calcium and chloride of sodium. The decomposition of clayey matter by common salt may produce chloride of aluminium and silicates of sodium, while the magnesium of the chloride of magnesium may be replaced by calcium; lastly, a portion of the potassium in the sea-water appears to have been replaced by the lithium of the granite.

Royal Geographical Society, Jan. 27.—Major-General Sir H. C. Rawlinson, K.C.B., president, in the chair.—"Journey from Bunder Abbas to Meshed, by Seistan," by Sir Frederick Goldsmid. The object of the author's journey was to carry into effect a settlement of the frontiers of Seistan, with which he had been entrusted. He left Bunder Abbas for the interior, with his party, on December 23, 1871, travelling in an E.N.E. direction first towards Bam. Beyond Bam and Azizabad, the country was fertile and well cultivated; this afterwards ceases, and near Fahraj the central desert begins. Beyond this, to the west, is another tract of mountainous country, bounding the fertile district of Seistan. The Hamun Lake was found dry, except pools of water at the mouths of the rivers, and the party crossed its southern part, where the bed was perfectly dry. Its limits are, however, well-marked by belts of reeds. The waters of the Helmund near and in the Delta had been led off by irrigation canals. The area of Seistan Proper was estimated at 947 square miles, and the population at 35,000. Majors St. John and Lovett, R.E., the surveyors attached to the party, had superintended the execution of a new wall-map of Persia, which was exhibited, and which gave quite a new character to the geography of many parts of Persia. The two great central areas of desert (1,500 to 3,000 feet above the sea-level) were clearly shown, and the snowy-ranges running in a north-west and south-east direction, nearly parallel to the Persian Gulf, well defined. One of these ranges rises to a height of more than 17,000 feet.—"On the Comparative Geography and Ethnology of Seistan," by the President. The country physically is dependent entirely on the River Helmund; and it is probable the earliest Aryan colonists drew off the whole of the water for irrigation, for in the earliest Geographical List, that contained in the "Vendidad," the country was called, not from the lake, but from the river. None of the sites of the cities and places named in ancient history could be identified with certainty. Seistan formed the most southerly province of the ancient Aryan country of Iran.

## DIARY

## THURSDAY, FEBRUARY 6.

- ROYAL SOCIETY, at 8.30.—On the Osteology of Hyopotamidæ: Dr. W. Kowalevsky.—Magnetic Survey of Belgium in 1871: G. J. Perry.  
ROYAL INSTITUTION, at 3.—Formation of Organic Substances: Dr. Armstrong.  
LINNEAN SOCIETY, at 8.—Notes on Aristolochiaceæ: Dr. Masters.  
CHEMICAL SOCIETY, at 8.—On Anthrapurpurin: W. H. Perkin.—On the Solidification of Nitrous Oxide: T. Wells.—On Isomerism in the Terpene Family: Dr. C. A. Wright.  
SOCIETY OF ANTIQUARIES, at 8.30.—On Donnington Castle: H. Goodwin.

## FRIDAY, FEBRUARY 7.

- ROYAL INSTITUTION, at 9.—Old Continents: Prof. Ramsay.  
GEOLOGISTS' ASSOCIATION, at 7.30.—Annual Meeting.—On the Diprionidæ of the Moffat Shale: Charles Lapworth.  
PHILOLOGICAL SOCIETY, at 8.15.  
ARCHÆOLOGICAL INSTITUTION, at 4.  
OLD CHANGE MICROSCOPICAL SOCIETY, at 5.30.—On the Internal Economy of Insects: T. Rymer Jones.

## SATURDAY, FEBRUARY 8.

- ROYAL INSTITUTION, at 3.—Comparative Politics: Dr. E. A. Freeman.  
ROYAL BOTANIC SOCIETY, at 3.45.

## MONDAY, FEBRUARY 10.

- ROYAL GEOGRAPHICAL SOCIETY, at 8.30.  
LONDON INSTITUTION, at 4.—Physical Geography: Prof. Duncan.

## TUESDAY, FEBRUARY 11.

- PHOTOGRAPHIC SOCIETY, at 8.—Annual Meeting.—The Achromatisation of an Object Glass: Prof. G. Stokes.

## WEDNESDAY, FEBRUARY 12.

- LONDON INSTITUTION, at 7.—Fresco and Siliceous Painting: Prof. Barff.  
SOCIETY OF ARTS, at 8.  
ARCHÆOLOGICAL ASSOCIATION, at 8.

## THURSDAY, FEBRUARY 13.

- ROYAL SOCIETY, at 8.30.  
SOCIETY OF ANTIQUARIES, at 8.30.  
MATHEMATICAL SOCIETY, at 8.—On Systems of Linear Congruences: Prof. H. J. S. Smith.

## BOOKS RECEIVED

ENGLISH.—On a Hæmatozoon inhabiting Human Blood: T. R. Lewis, Calcutta.—A Report of Microscopical and Physiological Researches into the Nature of the Agent or Agents producing Cholera: T. R. Lewis and D. D. Cunningham.—The Useful Plants of India: Col. H. Drury. Second Edit. (W. H. Allen & Co.)—A Handbook of Hygiene: George Wilson (J. A. Churchill).—Chambers' Arithmetical Exercises: J. S. Mackay (W. & R. Chambers).—Standard Algebra (W. & R. Chambers).—Chambers' Elementary Physical Geography: J. Donald (W. & R. Chambers).—Chambers' Scientific Reader (W. & R. Chambers).—Chambers' Electricity: R. M. Ferguson (W. & R. Chambers).—Recollections of Canada: Lieut. Carlisle, R.A., and Lieut.-Col. Martindale, Quebec (Chapman & Hall, London).

FOREIGN.—Die Kalkschwämme: eine Monographie. 3 vols, Ernest Hæckel (Williams & Norgate).—Gespinnst Fässern, &c.: Dr. R. Schlesinger (Williams & Norgate).

## PAMPHLETS RECEIVED

ENGLISH.—Potential Functions and their Applications in Physical Science: Prof. J. E. Davies.—Symon's Monthly Meteorological Magazine, No. 74, Vol. vii January.—Quarterly Journal of Education, No. 5, January (Groombridge).—Messenger of Mathematics, No. 21, January (Macmillan & Co).

FOREIGN.—Correspondenzblatt des Naturforcher: Riga—Sulla Corona Sollare: Prof. L. Respighi.

## CONTENTS

	PAGE
SEDGWICK By Prof. PHILLIPS, F.R.S . . . . .	257
PALMIERI'S VESUVIUS. By DAVID FORBES, F.R.S. (With Illustration.) . . . . .	259
OUR BOOK SHELF . . . . .	261
LETTERS TO THE EDITOR:—	
Dr. Bastian's Experiments.—Dr. J. BURDON SANDERSON, F.R.S.	261
Eyes and no Eyes . . . . .	261
Meteor at St. Thomas.—Hon. RAWSON RAWSON . . . . .	262
Brilliant Meteor.—G. ST. CLAIR, F.G.S. . . . .	262
The Antinomies of Kant.—Dr. C. M. INGLEBY . . . . .	262
The Source of the Solar Heat.—MAXWELL HALL . . . . .	262
The Twinkling of the Stars.—THOS. HAWKSLEY . . . . .	262
Meteorological Cycles . . . . .	262
ON THE OLD AND NEW LABORATORIES AT THE ROYAL INSTITUTION, II. By W. SPOTTISWOODE, Treas. R.S. . . . .	263
THE GROWTH AND MIGRATIONS OF HELMINTHS. By M. CORNU . . . . .	265
A PRIVATE CIRCUMNAVIGATING EXPEDITION . . . . .	266
FOSSIL CRYPTOGRAMS. By Prof. McNAB . . . . .	267
NOTES . . . . .	267
ON THE COAL QUESTION. By Sir W. ARMSTRONG, C.B. . . . .	270
RADIANT HEAT. By Capt. J. ERICSSON (With Illustration.) . . . . .	273
SCIENTIFIC SERIALS . . . . .	274
SOCIETIES AND ACADEMIES . . . . .	275
BOOKS AND PAMPHLETS RECEIVED . . . . .	276
DIARY . . . . .	276