

Physical Society, April 18.—Dr. Gladstone, F.R.S., in the chair.—Dr. W. H. Stone read a paper On Wind Pressures in the human chest during performance on wind instruments. The author's object was to ascertain (1) what was the extreme height of a column of water which could be supported by the muscular act of expiration transmitted by the lips: this was found to be about 6 ft.; and (2) what was the actual pressure corresponding to the full production of a note on each of the principal wind instruments. It was found that with the majority of wind instruments the pressure required for the high notes is considerably greater than that required for the low notes, each instrument having a pressure-ratio of its own. The clarinet is an exception to the rule.—Mr. Tribe illustrated by experiments the action of hydrogen upon finely divided metals, such as are produced by precipitation.

EDINBURGH

Royal Physical Society, April 22.—R. Scot Skirving, president, in the chair.—Recent Modes of determining the Impurity of Milk, by J. Falconer King, City Analyst. The only sure way to determine the quality of milk is to make a proper and careful chemical analysis of it.—Additional Note on the Suspension of Clay in Water, by Wm. Durham. Finely-powdered silica was found to behave in a manner generally similar to clay. Experiments seem to show that each solution has a specific capacity of sustaining clay, and also that this capacity varies in a specific manner according to the strength of the solution.—Note on the Formation of Boulder Clay, by D. J. Brown. Mr. Brown advocated that the usually accepted theory of the land origin of boulder clay would not explain the nature of this remarkable deposit, and considered that it was formed at the line of junction of the Arctic glacier with the sea.—On Fused Stones, showing Columnar Structure from a Pictish Tower, by the Rev. Jas. M. Joass, Golspie. These stones, in their columnar structure, illustrate, though on a small scale, an important geological phenomenon. The instance usually cited in illustration of the development of columnar structure in a melted mass is that of grain-tin, which forms rude columns on cooling. The author ventures to think that these fused stones afford a new and rather better illustration of the geological phenomenon, more closely analogous to the case of lavas, inasmuch as we have, in fact, a fused silicate, an artificial lava, forming columns the same in character as those of the Giant's Causeway, Samson's Ribs, or the pillars of Fingal's far-famed cave.

PARIS

Academy of Sciences, April 20.—M. Bertrand in the chair.—The following communications were read:—Letter relating to a calculation, by Pouillet, on the cooling of the sun's mass, by M. Faye. The author showed that Pouillet's calculation tacitly implied that the sun's mass was not susceptible of contraction, and again restated his belief that solar radiation is not maintained by external causes, but is to be looked for in the formation of the sun itself, and in the enormity of its mass.—Observations concerning a communication, by M. Crocé Spinelli, on the lines of aqueous vapour in the solar spectrum, a letter from P. Secchi to the perpetual secretary. The author stated, that although the elements of water would be dissociated at the high temperature of the sun, their combination might take place in the ascending currents accompanying spots and eruptions owing to the lowering of temperature in these currents produced by expansion.—Tenth memoir on the formation of various crystalline substances in capillary spaces, by M. Becquerel.—New researches on the cyanogen series, by M. Berthelot. A continuation of this author's valuable researches in thermo-chemistry.—Heat of formation of the Cyanogen compounds, by M. Berthelot.—On Phylloxera and the American vines at Roquemare (Gard), a note by M. J. E. Planchon.—Collimating level and its employment for foggy horizons, by M. G. M. Goulier.—On Orometric dials, specially applicable to pocket barometers, by the same author.—On partial differential equations which can be integrated without arbitrary functions, by M. de Pistoye.—On the "singular points" of algebraical plane curves, by Mr. Halphen.—On the rôle of salts in the action of potable waters on lead, by M. Fordos. The author recommended, as the results of his experiments, the filtration of all water issuing from leaden conduits.—Mode of preservation of the wood employed in large manufactures and in railways, by M. Hubert. The preservative is hydrated ferric oxide.—On the absorption of oxygen and the emission of carbonic acid by leaves kept in darkness, by MM. P. P. Dehérain and H. Moissan. The

authors have proved that leaves kept in the dark give off a quantity of CO₂ increasing with the temperature, that the quantity of CO₂ given off is comparable to that given off by cold-blooded animals, that the leaves absorb more oxygen than they give off CO₂, and that they continue to evolve CO₂ in an atmosphere deprived of oxygen.—Facts concerning the vibration of the air in sonorous pipes, by M. E. Gripon.—On a new thermo-electric pile, by M. C. C. Clamond.—On a volume regulator for gas currents, by M. H. Giroud.—On tetra-iodide of carbon, by M. G. Gustavson. This substance has been obtained by the action of tetrachloride of carbon upon dialuminic hexiodide, according to the equation 3Cl₄ + 2Al₂I₆ = 3Cl₄ + 2Al₂Cl₆; the two substances being dissolved in carbon disulphide. It was described as a red crystalline substance decomposed by heating in the air into CO₂ and free iodine.—New researches on black phosphorus, by M. Blondlot.—Action of pure hydrogen on silver nitrate, by M. H. Pellet. The author stated that a neutral or slightly acid solution of the salt is not reduced in the cold by pure hydrogen, and that an alkaline solution is reduced in the cold to an extent proportional to its alkalinity, elevation of temperature increasing the reducing action.—Researches on soluble phosphates used in agriculture, by M. A. Millot.—On the direct determination of the degree of intensity of explosive mixtures; application of the method to gunpowders, by M. Chabrier.—Action of bromine on dibromsuccinic acid; tribromsuccinic acid, by M. E. Bourgoin. The following substances are obtained by the action of bromine and water on the acid: tribromsuccinic and dibromsuccinic acids and dibrominated ethylene dibromide.—On the alcohols contained in the acid liquors of starch manufactories and in the products of the butyric fermentation of glucose, by M. G. Bouchardat. These are ethylic, normal propylic, and butylic alcohols.—On the determination of alcohol in water, wines and saccharin liquors, by M. Salleron.—General method for the transformation of alcohols into nitric ethers, by M. P. Champion. The reagent employed is nitro-sulphuric acid.—On phenyl-allyl, by M. B. Radziszewski.—On pyrogallol in presence of iron salts, by M. E. Jacquemin.—On the colouring matter of wine, by M. E. Duclaux.—On the volatile acids of wine, by the same author.—Movements excited in the stamens of *Mahonia* and *Berberis*; anatomical conditions of this movement, by M. E. Heckel.—On the direction of the wind in the high and low (atmospheric) regions during the storm of April 13, 1874, by M. Chapelas.—During the meeting a commission was appointed to prepare a list of candidates for the vacancy of foreign associate caused by the death of M. De la Rive.

BOOKS RECEIVED

ENGLISH.—Handbook of Practical Telegraphy. 6th edit.: R. S. Culley (Longmans).—Mental Physiology: W. B. Carpenter (H. S. King & Co.).—The Design and Construction of Harbours: Thos. Stevenson (A. & C. Black).—Our Inheritance in the Great Pyramid: C. Piazza Smyth (Isbister & Co.).—Longevity: John Gardner (H. S. King & Co.).—The New Chemistry: Josiah P. Cooke (H. S. King & Co.).—Hydrostatics and Pneumatics: Lardner and Loewy (Lockwood).—Geology of Suffolk: J. R. Taylor (White).—The Universe and the Coming Transits: R. A. Proctor (Longmans).—Haydn's Dictionary of Dates. 14th edit.: B. Vincent (Moxon).

CONTENTS

	PAGE
THE FRENCH ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE . . .	497
NORTH AMERICAN BIRDS	498
OUR BOOK SHELF	498
LETTERS TO THE EDITOR:—	
Herbert Spencer and <i>à priori</i> Axioms.—ROBERT B. HAYWARD; A	
SENIOR WRANGLER; QUARTERLY REVIEWER	499
Lakes with two Outfalls.—GEORGE GREENWOOD; HUGH MILLER	500
Trees "Pierced" by other Trees	501
PROF. TAIT ON "CRAM"	501
THE SOIREE OF THE ROYAL SOCIETY	502
THE LECTURES AT THE ZOOLOGICAL SOCIETY'S GARDENS, II.	503
THE FLUCTUATIONS OF THE AMERICAN LAKES AND THE DEVELOPMENT OF SUN-SPOTS. By G. M. DAWSON, Geologist to the B. N. A. Boundary Commission. (With Diagram)	504
POLARISATION OF LIGHT, VIII. By W. SPOTTISWOODE, Treas. R. S. (With Illustrations)	507
FLOWERS OF THE PRIMROSE DESTROYED BY BIRDS	509
JOHN PHILLIPS	510
NOTES	511
ON THE REFRACTION OF SOUND. By Prof. OSBORNE REYNOLDS	513
SCIENTIFIC SERIALS	514
SOCIETIES AND ACADEMIES	514