with the sea-water, which was constantly renewed by the tide. So rapid and complete is this process of interchange, that the amount of river-water actually present diluting the water of the Clyde sea area is much less than the amount which passes through it every year, and is not equal to half of the average rainfall. In an average year 1·25 cubic miles of water, 97·5 per cent. of which is pure sea-water, and 2·5 per cent. fresh-water, enters the area at every tide; and a slightly greater amount is withdrawn, the whole being freshened a little so as to contain 2·7 per cent. of its volume of fresh-water. The great saltness of the deep water of the sea lochs, on which their importance as fishing-grounds depends, appears to be due to two causes. One of these is the thorough mixture of the tidal water from bottom to surface as it pours across the shallow bars at the mouths of the lochs. The saltest surface water was always found at flood-tide, off Otter Spit in Loch Fyne, where the salt water welled up from beneath in consequence of the rapid shoaling of the channel. Another cause of thorough mixture is the influence of the wind, which seems to set up a complete vertical circulation. Thus if wind is blowing strongly down Loch Fyne, the freshened surface water is driven out of the loch, and very salt water rises at the head of the loch to take its place. In a down-loch wind the surface water is almost always saltest at the head of the loch, and diminishes in salinity towards the open sea. The paper concludes with a summary of the chemical composition of the water.

PARIS.

Academy of Sciences, June 8.—M. Duchartre in the chair.—On the currents which give rise to cyclones, by M. H. Faye. The views held by Dr. Hann and Prof. Ferrel concerning cyclones and anticyclones are compared. The author believes that cyclones, but not anticyclones, are dynamical phenomena, with which local circumstances of temperature have nothing to do, and he shows that they depend on the general movements of the atmosphere due to Polar cold and equatorial heat. On this point, therefore, M. Faye agrees with Dr. Hann.—Note on the presence of the *Kophobelemnon* in the waters of Banyuls, by M. H. de Lacaze-Duthiers.—The mastodon of Cherichira, by M. Albert Gaudry.—A new chemical balance for rapid weighings, by M. Victor Serrin.—Partial eclipse of the sun on June 6, observed at Nice, by M. Perrotin. With a power of 280, the time of first contact was observed to be 5h. 54m. 26s.; and of second contact, 6h. 53m. 26s. Nice mean time.—Observations of the new asteroid discovered at Nice Observatory on May 16, by M. Charlois. The observations are for May 16 and 25.—Observations of Brooks's comet (1890 II.), made with the great equatorial of Bordeaux Observatory, by MM. G. Rayet and L. Picart. Twenty-three observations for position were made between February 3 and April 29. The comet has been followed from March 27, 1890, to April 29, 1891.—On the theory of shooting-stars, by M. Callandreau. The author develops the equation of condition to be fulfilled by radiant-points belonging to the same family of meteors. According to Mr. Denning's observations, the Perseid radiant-point moves towards the east during the period of activity, a fact indicated as probable by Leverrier in 1871. This is in conformity with the equation of condition, which shows that if the latitude of a radiant-point varies slightly the longitude increases.—On two systems of differential equations, of which the hyperelliptic functions of the first order form the integrals, by M. F. Caspary.—Determination of the mechanical equivalent of heat, by M. Constantin Miculesco. The method adopted was similar in principle to that used by Joule. Thirty-one experiments made with this apparatus gave very accordant results, and the mean of them all give 426·7 as the mechanical equivalent of a calorie in kilogram-metres.—Dielectric properties of mica at high temperatures, by M. E. Bouty. The principal result of the research is that the dielectric constant is almost invariable for rapid alternations.—Application of the principle of the transmission of pressures to widely separated telephone transmitters, by M. P. Germain.—Action of ammonia on some compounds formed with halogen salts of mercury, by M. Raoul Varet. The author has studied the action of ammonia on compounds formed with mercury iodide and metallic cyanides, with the idea of determining the *rôle* of certain compounds of ammonia in double decompositions.—On a new method of preparing silicon chloro-iodides, by M. A. Besson.—On three cases of free development observed in Bryozoas ectoproctæ, by M. Henri Prouho.—On the locusts of Algeria, by M. Charles Brongniart.—On the morphological nature of the phenomena of fecundation, by M. Léon Guignard. It results from the observations that the phenomenon of fecundation consists not only in the copulation of two nuclei of different sexual origin, but also in the fusion of two protoplasms, also of different origin, and represented essentially by the directing spheres of the male and the female cell.—On the inclosures of nephelinic syenites found in the middle of phonolites from Höhgau and in some other beds; conclusions to be drawn from them, by M. A. Lacroix.—Observations of the parallelism of Upper Cretaceous strata of the Western Pyrenees (Lower Pyrenees and Landes), by M. Jean Seunes.—The sympathetic nerve of accommodation for the observation of distant objects, by MM. J. P. Morat and Maurice Doyon.—Researches on the existence of parasitic organisms in diseases of the crystalline lens of the eye of man, and on the possible *rôle* of these organisms in the pathology of certain ocular affections, by MM. Gallippe and L. Moreau.—On the employment of carbon bisulphide dissolved in water for the destruction of Phylloxera, by M. A. Rommier.

BOOKS, PAMPHLETS, and SERIALS RECEIVED.

Glimpses of Nature: Dr. A. Wilson (Chatto).—Revelation of the Trinity: S. B. G. McKinney (Stock).—Oysters and all about Them, 2 vols.: J. R. Philpots (Richardson).—Die Veränderlichkeit der Temperatur in Österreich: J. Hann (Wien).—Monograph of the British Cicadæ, vol. ii. Part 6: G. B. Buckton (Macmillan).—A Guide-book to Books: edited by E. B. Sargant and B. Whishaw (Frowde).—Our Country's Flowers: W. J. Gordon (Day).—Primo Resoconto dei Risultati della Inchiesta Ornitologica in Italia; Parte Terza ed Ultima Notizie d'Indole Generale: E. H. Giglioli (Firenze).—Chambers's Encyclopædia, vol. vii. (Chambers).—Hand-book of the London Geological Field Glass: H. G. Seeley (Philip).—Teaching in Three Continents: W. C. Grasby (Cassell).—Bulletins de la Société d'Anthropologie de Paris, 4e fasc. (Paris, Masson).—Journal of the Chemical Society, June (Gurney and Jackson).—Quarterly Journal of Microscopical Science, vol. xxxii. Part 3 (Churchill).

CONTENTS.