

issuing from a small cleft near the pond; a sulphurous odour was also perceptible. The great eruption in 1812 was exclusively, or at least in greater part, an ash-eruption, as no lava stream was seen on the exterior of the mountain. A few insignificant beds of andesitic lava still occur interstratified in the tufa.

Someone told me that the island was rising slowly out of the sea on its western and sinking on its opposite side; this, however, was denied by others. If any change of importance has taken place on the western side during the last convulsion of Nature, it should not be difficult to ascertain the fact and determine the amount of change of level. I went in a boat along the coast from Château Belair to Kingstown and observed that where the coast consisted of tufa (not where it was formed of solid lava or coarse volcanic agglomerate) it displayed a kind of strandline or beach-shelf. It was a horizontal or slowly dipping platform about a yard broad. Fig. 2 shows the shelf along a promontory seen from some height, Fig. 3 represents a small island surrounded with its beach-shelf, while Fig. 4 gives a diagrammatic section of the shelf.

The sea at high water rises about one foot above the shelf and sinks at low water about 2 feet underneath it. At ebb-tide the outer slope is seen to be covered with seaweed (at X in the diagram), as far up as the sea rises the inner wall (at Y) is covered with a crust of calcareous matter consisting of serpulites and the remains of other sea animals. I cannot suppose that this peculiar beach was due solely to the action of the waves. Organic life has probably had something to do with it, the rate of recession of the cliff being comparatively rapid where the animals lived, while on the other hand the seaweed has been to a certain extent



FIG. 2.

FIG. 3.

FIG. 4.

protective. In any case this beach-shelf should be of good service in determining whether any sudden change of level has taken place during the latest eruptions.

Christiania.

HANS REUSCH.

A comparison of Dr. Reusch's observations with those which, it is hoped, will shortly be obtained, should be of value in showing the changes which have occurred.

The Paris Academy of Sciences has decided to send a special scientific expedition to the scenes of the eruptions. The expedition will sail on June 9.

In extension of the diary of recent volcanic events already published in these columns, we give a record of occurrences reported during the past week.

May 10, *Tacoma*.—Mount Redoubt, in Cook Inlet country, Washington State, has been pouring forth dense volumes of smoke for a week past, and a few nights ago became luminous. Volcanic ashes have been falling for several days, and the snow near the mountain is covered with ashes. The last eruption of Mount Redoubt was in 1867.

May 28.—A sharp shock of earthquake was felt in the Cape Peninsula at midnight.

May 28, *Fort de France*.—There was a tremendous explosion, followed by a cloud of black smoke, from Mont Pelée at 8.45 this morning.

May 29, *Fort de France*.—The eruptions of Mont Pelée have become more frequent, although less violent.

May 30, *Kingstown (St. Vincent)*.—There was a fresh eruption of the volcano La Soufrière this morning. It was accompanied by a thunderous noise and trembling of the earth, while volumes of vapour were emitted from the crater. The eruption lasted an hour.

May 30, *Fort de France*.—Cable communication with St. Thomas was again broken. A violent eruption of Mont Pelée took place at 2 p.m. It is reported that the craters on the north side of the mountain are pouring out torrents of mud.

May 31, *Fort de France*.—Detonations were heard from the

volcano this morning, and volumes of smoke were emitted. The Rivière Blanche is again a torrent of steaming hot mud.

May 31, *Kingston*.—During the past week Jamaica has been experiencing magnificent sunsets, the colours being extraordinarily rich and beautiful. The phenomenon is due to the volcanic dust in the atmosphere.

May 31, *Athens*.—For some days past earthquake shocks have been repeatedly felt in various parts of Greece.

DR. HENRI FILHOL.

DOCTOR HENRI FILHOL, professor of comparative anatomy at the Museum of Natural History, Paris, died on April 28 at the relatively early age of fifty-nine. A naturalist and palæontologist of the first rank, he will assuredly be lamented by a large circle of friends, not only in his native land, but also in this and other countries, his many and important contributions to our knowledge of both living and extinct animals being of world-wide interest.

Henri Filhol, son of Edouard Filhol, the famous chemist of Toulouse, was born in that town in the year 1843. Having studied for the medical profession, he early obtained his degree of doctor of medicine. His first contribution to science appears to have been in 1863, when he was about twenty years of age, for at that time was published, in conjunction with M. F. Garrigou, his paper on "L'Age de la Pierre dans les Cavernes de la Vallée de Tarascon (Ariège)" (*Comptes rendus*, lvii.). The French commission sent out for the study of the transit of Venus in 1875 included Dr. H. Filhol among its members; and the fact that in 1876 he received the Lalande-Guérineau prize of the Academy of Sciences is evidence of his confrères' appreciation of these early labours for science.

One of Dr. Filhol's most remarkable pieces of work was his "Recherches sur les Phosphorites du Quercy" (*Ann. Sci. Géol.* 1876, t. vii. pp. 220, pls. 10-36, and 1877, t. viii. pp. 1-273 and 297-340, pls. 1-26). In this are described the remarkable deposits of phosphate of lime, of Upper Eocene age, which occur as great pockets in Jurassic beds in the departments of the Lot, of the Tarn and Garonne, and of the Aveyron; then follows, as the subtitle of the work says, an account of the fossils met with in these deposits and especially the Mammalia. Numerous new forms are brought to light, and others critically revised, in this memoir of more than 500 pages and 52 plates.

Another work of similar character is the "Étude des Mammifères Fossiles de Saint-Gérard le Puy (Allier)" (*Ann. Sci. Géol.* 1879, t. x., and 1880, t. xi.), which occupies some 338 pages and 51 plates, and was the result of studying numerous collections of fossils, made during many years, from these Lower Miocene deposits. Here again numerous forms are described, many being regarded as new to science. A third work is entitled "Étude des Mammifères Fossiles de Ronzon" (*Ann. Sci. Géol.* 1881, t. xii. pp. 270, pls. 6-31). The locality is near the village of Puy, and the calcareous marl which has yielded this great assemblage of fossil vertebrata is believed to be of Miocene age. Many mammalian remains from the locality had already been collected and described by M. Aymard (1856); but not only are these critically revised in the light of new material, but again new forms are made known. A fourth piece of work of the same kind is the "Études sur les Mammifères Fossiles de Sansan" (*Ann. Sci. Géol.* 1891, t. xxi. pp. 314, pls. 46). M. E. Lartet had begun the study of the remains from this Miocene deposit, but died suddenly, leaving the work uncompleted. Dr. Filhol, taking up the study of the extensive material preserved in the Paris Museum, and with the help of additional specimens collected by himself under the auspices of the same museum, produced this important memoir.

These four volumes of painstaking work, including more than 1400 pages and 174 plates, would alone have constituted a most important contribution to natural knowledge, reflecting high honour upon the author; but this is only a part of the work which he accomplished. He had a lively interest in deep-sea exploration, and, as a member of the commission, took a prominent part in the dredgings of the *Talisman* expedition in the year 1883. The results of this and of the *Travailleur* work were made known in his "La Vie au fond des Mers" in 1885. Another work published about this time is the "Faune des Crustacés de la Nouvelle-Zélande," and his "Zoologie Descriptive" was issued in the same year. In 1893 he published, in conjunction with M. Grandidier, "Observations relatives aux ossements d'Hippopotames trouvés dans le Marais d'Ambolisatra à Madagascar" (*Ann. Sci. Nat. Zoologie*, 1893, ser. vii. vol. xvi., pp. 151-190, pls. 7-15). In this memoir are described the remains of the remarkable pigmy hippopotamus found by M. Grandidier, from which place also Dr. Forsyth Major obtained the material recently described by him in the *Geological Magazine*.

Besides the examples of Dr. Filhol's labours above alluded to, he made many other contributions to zoology and palæontology. Under his name will be found, in the Royal Society's catalogue, upwards of fifty papers published before the year 1883, and about as many more have been published since that date. This noble record has been appreciated by his fellow workers throughout the world, and has not been without hearty recognition in his own country; for besides the Lalande-Guéryneau prize in 1876, already mentioned, he was awarded the gold medal of the Scientific Congress of the Sorbonne in 1879, the chief prize for physical and natural science of the Academy of Sciences; he was the recipient of the Petit-d'Hormoy prize in 1883, and received the decoration of the Legion of Honour in 1886.

Dr. H. Filhol at one time held the chair of zoology of the Faculty of Sciences of Toulouse, his native town; in 1885 he became subdirector, and subsequently director, of the laboratory of anatomical zoology at the Museum of Natural History, Paris; more recently he was appointed to the professorship of comparative anatomy at the same national institution, and continued to hold that post until the time of his death.

NOTES.

THE German Emperor has, with the consent of the British Government, appointed Sir Joseph Dalton Hooker, G.C.S.I., C.B., late Director of the Royal Botanic Gardens at Kew, a foreign Knight of the Order *Pour le Mérite* for Science and Arts. It has been officially decided that the regulations regarding foreign decorations do not apply to this order.

LORD RAYLEIGH has been elected a corresponding member of the section of natural sciences of the Imperial Academy of Sciences of Vienna.

MR. J. B. SCRIVENOR has been appointed geologist on the Geological Survey, and Mr. D. A. MacAlister has been appointed temporarily to investigate metalliferous mines.

WE learn that Lord Salisbury has asked the President of the Board of Trade to receive a deputation from the Institution of Electrical Engineers on the subject of the present unfavourable condition of the law relating to electric lighting and traction (see *NATURE*, vol. lxi. p. 35). The deputation is to wait on Mr. Gerald Balfour to-day (Thursday). In view of the backwardness of this country in electrical engineering and of the large degree in which this backwardness is due to restrictive legislation, it is to be hoped that the Government may be induced to introduce more rational laws without delay.

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THE Berlin correspondent of the *Times* writes that experiments were carried out last year at the General Telegraph Office in Berlin with a new system of octoplex typographic telegraphy. It is claimed that this system will enable twenty operators to send 18,000 words an hour through a single wire. The despatching instrument is of the typewriter form, and to telegraph any letter it is only necessary to depress a single key. The receiving instrument prints the message on a sheet of paper (not on a tape), and this can be immediately detached and forwarded to its proper destination. An installation to enable communication between Hamburg and Frankfurt by this system is being put up, and will shortly come into use. Further particulars and developments will be awaited with interest. The invention is due to the late Prof. H. A. Rowland, of Baltimore.

It is reported that Mr. Thomas A. Edison has been experimenting with a view to the invention of a storage battery to enable automobiles to run 100 miles without recharging. As soon as a 5000 miles endurance test, which is about to be started, is completed, he will begin the manufacture of storage batteries for the use of automobiles, launches and street cars. It is understood that Mr. Edison's invention will also greatly diminish the weight of automobiles.

THE fifty-first annual meeting of the American Association for the Advancement of Science will be held at Pittsburgh from June 28 to July 3. At the first general session the retiring president, Dr. C. S. Minot, will introduce the president-elect, Prof. Asaph Hall. The presidents of sections will deliver their addresses on Monday, June 30, and Dr. Minot will give his address, as retiring president, on the following day, at the Carnegie Museum. The programme of the work of the sections has not yet been published.

THE forty-seventh annual exhibition of the Royal Photographic Society will be held from September 29 to November 4. There will be five sections, namely, (1) selected pictorial photographs; (2) general professional work; (3) photographic apparatus and materials; (4) photo-mechanical processes of reproduction; (5) scientific photography and photography in its technical applications. The judges of sections four and five will be Sir William Abney, K.C.B., F.R.S., Mr. Chapman Jones and Mr. E. Sanger Shepherd.

THE *Bulletin* of the Belgian Academy contains an obituary notice by M. C. Le Paige of M. François Deruyts, who died in February last. M. Deruyts was an ardent student of pure geometry. On leaving the University he published a remarkable dissertation on the theory of involution and unicursal homography, and this formed the nucleus for a series of investigations dealing with the geometry of hyperspaces and the determination of the singular elements in an involution of any order. From general theorems, numerous elegant applications to special curves and surfaces were deduced. M. Deruyts also possessed an intimate knowledge of analysis and mechanics.

AN International Shipbuilding Congress in connection with the Düsseldorf Exhibition was opened on Monday by the Crown Prince of Germany. More than 550 delegates are in attendance. Of foreign countries Great Britain is most numerously represented. The Institution of Naval Architects is represented by the Earl of Glasgow (president), Lord Brassey, Messrs. Elgar, Thornycroft, Yarrow, and others. The Crown Prince, in declaring the Congress open, expressed the regret of his father, the Emperor, that his Majesty was unable to be present, and hoped that the deliberations of the Congress would be fruitful in good results.

THE Board of Agriculture has given notice that the Colorado beetle has again made its appearance at Tilbury. Potato growers are, therefore, requested to examine their plants and