OSCILLATIONS OF FRENCH GLACIERS.[1]

THIS part of the valuable publication issued by the French Government, is chiefly devoted to the glaciers of Savoy, because, though those of the Pyrenees have been studied with the same thoroughness, they have not attracted so much notice in the past, and thus less information was obtainable. In Savoy also the history of the glaciers of the Mont Blanc range is far more complete than in the Maurienne, because, fewer than seventy years ago, these districts were but rarely visited by travellers. Careful search in the archives and libraries of Annecy, Geneva, and Chamonix has discovered more than could have been anticipated about the history of the Mont Blanc glaciers, and that of the Glacier du Bois has been traced back with fair completeness for more than three centuries.

The earliest maps, restricted to northern Savoy, are dated 1555 and 1562, but these are practically worthless, and the first on which the glaciers are indicated is as late as 1742. They are, however, mentioned in some detail in documents written in 1580 and 1605, during which time a notable advance of the ice evidently did serious damage to property in the valley of Chamonix. After this the information is for a time less complete, but it rapidly improves with the coming of travellers, and from about 1780 illustrations provide another source. Several of them are reproduced in this publication, and though often rude, they form valuable records of the extent of the ice at particular dates. The glaciers of which information has been obtained—not in all cases equally complete—are six in number, and their oscillations show a general, though not an exact correspondence. Including the glaciers of the Maurienne, their advances and retreats indicate a certain periodicity. From 1605 to 1894 (inclusive) there have been seven of the former, the longest interval being forty-four years and the shortest thirty-one years, giving an average of forty years in 284 years; of these, the advances about 1610, 1716, and 1822 were exceptionally great, and these maxima are 106 years apart. Numerical correspondences are also noted between two other groups of oscillations, with the result that the figures suggest general periodicities of about thirty-six years, and special of three times that amount.

The mean temperature and rainfall, of which records are given, must produce effects on these movements, and it is remarkable that the former, between 1773 and 1860, rose steadily by 0·871° C. and has since then declined by 0·698° C. The remainder of the volume is devoted to glaciers in the Pyrenees, but we must be content to mention these, as the information is more imperfect, and only to direct attention to another part (Annexe du Tome v.) of the same publication, which contains a valuable series of maps of the hydrography of the river-basins of the Bréda, the Arc, and the Durance. T. G. B.

[1] Ministère de l'Agriculture: Direction Générale des Eaux et Forêts. 2e Partie, Faux et Améliorations Agricoles. Service des Grandes Forces Hydrauliques (Régions des Alpes et du Sud-ouest). Études Glaciologiques Savoie-Pyrénées. Tome iii., 1912.

A NATURE-RESERVE IN SPITSBERGEN.

THE question of the government of the Arctic isles of Spitsbergen is occupying an international commission, and meanwhile Prof. H. Conwentz opportunely directs attention to the need for the demarcation of a Polar natural history reserve. In the second part of vol. iv. of his *Beiträge zur Naturdenkmalpflege*, he brings together the views of a number of scientific men who have visited Spitsbergen, and points out the wanton destruction of reindeer, polar bears, and other animals, that is encouraged by many of the pleasure-expeditions to the north. The establishment of a recognised government would enable such "sport" to be rigorously held in check. As Prof. Penck reminds us in his contribution, a traveller may land in summer on Spitsbergen, may see the antlers of reindeer and their tracks in the soil, and yet may never come across a single individual. The accessibility of Spitsbergen makes it especially attractive to the geologist and the naturalist, and the scale of its scenery provides an admirable illustration of our own islands during the waning of the Quaternary ice-age.

A complete nature-reserve is now proposed for the region north-west of the Ice-fjord, leaving the coal-mining area of Advent Bay and the whale-fisheries of Green Harbour in a larger area over which partial control may be effected. Anyone who has seen the fog roll like a curtain from the ice-flecked water, and the great panorama of peaks and glaciers appear as a first vision of the Arctic world, will assuredly give sincere support to those who would limit the private exploitation of Spitsbergen. Prof. Sapper has the foresight to propose the prohibition of hotels in proximity to glaciers of special beauty. He directs attention to such geographical features as the polygonal soils and the hillsides grooved by arid erosion, and to the marring effect that factories might have upon landscapes of such exceptional interest. We may add that the driving of a road across the boulder-clay of the von Post Glacier would deprive geologists of one of the most valuable "modern instances." The conditions along the vales from which the ice has shrunk away are those amid which our palæolithic ancestors founded man's dominion in European lands. If scientific workers seek to preserve Spitsbergen from the fate that has overtaken Switzerland, it is in no selfish spirit but in the desire to retain for all an intellectual heritage. GRENVILLE A. J. COLE.

DR. ADOLF LIEBEN.

DR. LIEBEN, whose death occurred on June 6 at the age of seventy-eight, was born on December 3, 1836, at Vienna, and was the son of a merchant in that city. Until the age of twelve his education was entrusted to the care of Moritz Hartmann, who was later to make a name as a poet. Later young Lieben began to interest himself in chemistry, and attended lectures at the university under Redtenbacher and Schrötter. In 1855 he entered the University of Heidelberg, and worked in Bunsen's laboratory, where he met

many students—Beilstein, Baeyer, Landolt, L. Meyer, and Roscoe—who were destined later to become distinguished in the science of chemistry.

After taking his doctorate in 1856, he left Heidelberg, and studied for a time in Paris. On the recommendation of Dumas he entered the alkali works of Kuhlmann in Lille; but industrial chemistry had no attractions for him, and in 1859 he was back again in Vienna in Schrötter's laboratory, where he remained until 1861. In 1862 he made a second visit to Paris, where he met Cannizzaro, who offered him a post in the laboratory at Palermo, where he ultimately became professor. In 1867 he was elected to the chair of chemistry at Turin, and remained there until 1871, when he was appointed to a professorship at Prague. In 1875, on the death of Rochleder, he was called to fill one of the two recently created chairs at the new University Institute at Vienna, where he remained for thirty years, actively engaged in teaching and research, until his failing health obliged him to retire. He is described as a lucid lecturer and brilliant experimenter, and his lectures were largely attended by students, many of whom later became secondary-school teachers or obtained important positions in various chemical industries.

The esteem in which Lieben was held by them and by his colleagues is shown by the celebrations which attended his fiftieth jubilee and seventieth anniversary in 1906, and by the numerous honours and distinctions which were conferred upon him in his later years. His researches cover a wide field, and include important investigations in inorganic and physical chemistry; but his principal contributions lie in the domain of organic chemistry. He was among the earliest investigators to adopt Kekulé's new structural formulæ.

One of his first researches was carried out in Wurtz's laboratory in Paris (1856–1859) on the action of chlorine on acetaldehyde, alcohol, and ether, which led to the discovery of the chloroacetals and dichloro-ethers; but his most productive period was during the time he held the chairs at Turin and Vienna, where he became associated with Rossi and later with Zeisel and with Haitinger. In Turin he began his investigations on the synthesis of the alcohols by the method of Piria and Limpricht by heating the calcium salts of the fatty acids with calcium formate, and thus obtaining aldehydes which on reduction yielded the alcohols. In this way he prepared a series of alcohols from methyl alcohol to hexyl alcohol. This was followed by a study of the aldol and crotonic aldehyde condensation, which he applied to a variety of aldehydes, and obtained by reduction new glycols and alcohols. It was at this time that he discovered the iodoform reaction for ethyl alcohol which goes by his name. But one of his most interesting contributions which he carried out with Haitinger during 1883–85 is on the structure of chelidonic acid (a constituent of the yellow juice of the greater celandine), which was recognised as a pyrone derivative, and was converted into a hydroxypyridine carboxylic acid by the action of ammonia.

Lieben also interested himself in what is now termed biochemistry. By the aid of the iodoform reaction he was able to detect small quantities of alcohol in urine, and also gave some attention to the reduction products of carbon dioxide under the influence of light in an attempt to elucidate the process of plant assimilation. J. B. C.

THE REV. OSMOND FISHER.

FULL of years, but with interests unabated and working until within a few days of the end, the veteran geologist, Osmond Fisher, passed away on July 12, at the age of ninety-six.

He was born on November 17, 1817, at Osmington, in Dorset, of which place his father, the Rev. (afterwards the Ven.) John Fisher, was vicar. Educated at Eton under Dr. Keate and at King's College, London, he proceeded in 1836 to Jesus College, Cambridge, from which he graduated as eighteenth wrangler in 1841, the year in which Stokes was senior. He was ordained deacon in 1844, and priest the following year. After a short period of clerical work at Writhlington, near Radstock, and Dorchester, he returned to Cambridge in 1853 as tutor of Jesus College, but left after four years' work on his presentation to the college living of Elmstead, near Colchester. In this year, also, he married Maria Louisa, daughter of Mr. Hastings N. Middleton, of Ilsington House, near Dorchester. In 1867 he was presented to another college living, that of Harlton, near Cambridge, and here he resided until his retirement in 1906. The last eight years of his life were spent in the home of his eldest son, the rector of Graveley, near Huntingdon. He lies buried in the quiet Harlton churchyard, within sight of his forty years' home.

From his childhood, Mr. Fisher was a geologist. Fossils collected from the Coral Rag before he was fifteen are now in the Sedgwick Museum. His contributions to pure geology relate to beds of Cretaceous or more recent date. Among them may be mentioned his papers on the Bracklesham beds, the phosphatic deposits of the Cambridge Greensand, and the mammaliferous deposits of Barrington, as well as those on the "trail" and the denudations of Norfolk.

It is, however, as a physical geologist that Mr. Fisher is most widely known. His originality in this branch of geology is shown by the facts that in 1841 the contraction theory of mountain-formation occurred to him, and that in 1855 he attributed the Visp earthquake of that year to the growth of a fault. That he was by no means a slave to his own theories is equally manifest, for by 1873 he had abandoned the contraction theory, believing the cause invoked to be incapable of producing the known inequalities of the earth's surface. With the contraction theory went also his belief in the practical solidity of the earth's interior, and from this time dates his championship of the hypothesis of a liquid substratum between the solid crust and core of the earth, and of the well-known theory of mountain-building with which his name will always be connected. It