

at the time at which it was written, it will possess great historical value, and its appearance in the 'Mémoires de l'Académie' will be welcomed by the geologists of every country. It is being edited by its author's devoted friend M. Emmanuel de Margerie, and Prof. Termier has contributed a genial and appreciative preface.

Geologists in this country will remember that in 1892 Bertrand paid a visit to the North-West of Scotland for the purpose of examining, under the guidance of the officers of the Geological Survey, the tectonic structure of that region, which afforded so many parallels to the phenomena observed by him in France, and that he published an interesting account of what he saw in Sutherland and Ross.<sup>1</sup> In the following year he prepared a paper on the connection of the Coal-Measure basins of the North of France and the North of England.<sup>2</sup> He was elected a Foreign Correspondent of this Society in 1893, and a Foreign Member in 1899.

The last years of this brilliant worker were years of sadness and gloom. The sudden tragic death of a daughter deeply affected him, and he gradually sank into a state of increasingly feeble health, from which at last death released him on February 13th, 1907.

Marcel Bertrand's gentle and kindly nature and the great charm of his manner made him a delightful companion and a valued friend. His enthusiasm for his subject and his remarkable power of lucid exposition gained for him the respect and regard of his colleagues on the Survey and of his devoted pupils in the School of Mines. His originality and breadth of view, his grasp of the problems with which he had to grapple, and the new light which he threw on the fascinating questions of mountain-building placed him in the forefront of the geologists of his day. We mourn in him the loss of one of the masters of tectonic geology, who has left the mark of his genius deeply impressed on the history of that department of our science.

Another distinguished geologist and devoted student of the Alps has been removed from our ranks by the death of JOHANN AUGUST EDMUND MOJSÍSOVICS, Edler von Mojsvár. Belonging to an old Hungarian family, he was born on October 18th, 1839, in Vienna, where his father was an eminent medical man. After passing

<sup>1</sup> 'Les Montagnes de l'Écosse' Revue Générale des Sciences Pures & Appliquées, Dec. 15th, 1892; and Geol. Mag. 1893, p. 118.

<sup>2</sup> Ann. des Mines, ser. 9, vol. iii (1893) p. 5 & vol. v (1894) p. 569. An abridged reprint of this essay appeared in the Trans. Fed. Inst. Mining Engin. vol. v (1892-93) p. 106.

through the Schottengymnasium in the Austrian capital, he studied jurisprudence, and took the degree of Doctor of Laws at the University of Graz in 1864. But he was not destined to follow the legal profession. While a student he showed a keen love of the mountains, and he succeeded in rousing a similar enthusiasm among a number of his associates at the University, with whom he formed a brotherhood of Alpine climbers. Out of this society, of which he was the inspiring soul, there eventually grew the 'Deutscher & Österreichischer Alpenverein,' which was founded in 1873. He took an active part in the earlier progress of this Verein, editing the publications and stimulating the work, so that he came to be acknowledged as one of the leading alpinists of his country. This close personal contact with the mountains ultimately shaped his whole future career. It led him to take note of the rock-features which appeal alike to the eye and to the imagination, and induced him to seek an explanation of the meaning of these features, and thus to add geological studies to his legal training. It may readily be believed that his bent towards our science could not but be encouraged and strengthened by the persuasive eloquence of Prof. Suess, under whom he studied and with whom he made excursions into the Eastern Alps. It is, at least, certain that geology proved to have more attraction for him than the law. Before long he had made such progress in geological pursuits that he was able to qualify himself for the position of Privatdozent in the Vienna University, which he obtained in 1871. In that capacity he continued for some years to lecture on stratigraphy, the geology of the Alps and the Austrian Empire, and conducted geological excursions.

Having now resolved to give up his life to the study of his beloved mountains, he offered himself, and on February 18th, 1865, was accepted, as a volunteer on the staff of the Austrian Geological Survey. He proved to be so efficient a worker that in the course of two or three years he was taken into the regular service of the establishment, and remained there for thirty-three years. By the end of December 1870 he had become a Bergrath and one of the chief geologists, and in the summer of 1879 he rose to the rank of Oberbergrath. In 1892, on the appointment of Stache to the directorate in succession to Stur, Mojsísovics was made Vice-Director. In 1900, the state of his health having compelled him to give up active field-work, he retired from official life, with the title of Hofrath in recognition of his long and distinguished services.

He had been elected a Foreign Correspondent of the Geological Society as far back as 1884, and became a Foreign Member in 1893.

In the spring of 1871 he happily married Miss Charlotte Voelker, daughter of a banker in London, who survives him. His retirement from the Survey did not mean a cessation of work on his part. It probably lengthened his life by several years, and enabled him to continue the literary tasks on which he had been engaged, and to take the same effective part which he had done for many years in the earthquake-investigations of the Vienna Academy. In summer he escaped from the distractions of the Austrian capital to his country-home at Mallnitz, one of the loveliest spots on the southern slopes of the Hohe Tauern. While he was staying there in the autumn of last year, a cancerous growth developed itself in his tongue and throat. The malignant disease made rapid progress, in spite of all that medical skill and wifely devotion could do to arrest it. He bore with heroic patience the tortures which he suffered, until they were ended by his death on October 2nd, 1907.

The special department of geology to which Mojsisovics gave up his energies was the study of the Trias of the Eastern Alps. The Salzkammergut had claimed his early affection, and it was there that the idea shaped itself in his mind to devote himself to the investigation of its rocks. Perhaps the autumn-excursions in that delightful region which he took with Prof. Suess as far back as 1866 may have, in some measure, determined his resolution. Certainly it was the rocks of the Salzkammergut that first fascinated him, and to which he constantly returned all through his life. He there realised that, in spite of the admirable work already done by Franz von Hauer, Dionys Stur, Ferdinand von Richthofen, and others, a wide field remained to be explored which might demand the labour of a lifetime.

One of the most fortunate circumstances in the career of our lamented associate was that circumstances allowed him to concentrate his energies on this one subject and this one region. With the exception of the year 1879, when, with Tietze and Bittner, he was sent to make a geological reconnaissance of the provinces of Bosnia and Herzegovina, which Austria had shortly before undertaken to occupy, he continued to work at the Trias of the Eastern Alps. Again and again, year after year, he climbed the rugged slopes of these mountains, striving to make sure of the order and to trace the distribution and variations of the strata, and collecting

from them the abundant fossils with which he enriched the museum in Vienna. He was at once a stratigrapher and a palæontologist. His constant aim was not only to place the successive formations in their true chronological order, to follow their lithological changes from district to district, and to connect these details with the ancient geographical conditions of the Alpine region, but above all to ascertain the facies of each fossiliferous group of strata so as to obtain a palæontological basis for their stratigraphical subdivisions, and at the same time such evidence of the progressive evolution of the organic forms as might be preserved among the deposits. Oppel and Quenstedt had shown how a system of zonal classification by means of fossils could be worked out among the Jurassic formations; and Mojsisovics sought to apply a similar principle to the enormously developed and abundantly fossiliferous Trias of the Salzkammergut and surrounding districts. When he began this work no one had divined that the structure of the Alps is so largely determined by horizontal displacements as it has since been ascertained to be, that in an apparently continuous and unbroken series of flat stratified formations the sequence may be deceptive, and that the oldest parts of the section may really lie at the top. It is possible that he may here and there have been misled by this delusive structure. We know that at various times he changed his views as to the true stratigraphical position of some members of the Trias.

Mojsisovics was the author of many papers on his favourite subject, the larger portion of which appeared in the various publications of the Austrian Geological Survey. They began in 1862 with a contribution on the age of the Hierlatz-Schichten, and hardly a year elapsed from that time up to the end of his life without some contributions from his pen. In these numerous writings the story of his progress in the exploration and description of the Alpine Trias is revealed. But probably his most generally appreciated and best-known memoir is that which he published in 1879 as an independent work, with the title of 'Die Dolomitriffe von Südtirol & Venetien.' This volume, with its large geological map and its discussion of the geological and biological problems of the Alpine Trias, marks a notable epoch in the literature of Alpine geology, and has had much influence on the subsequent progress of the subject of which it treats.

It is probable, however, that our departed friend will take higher rank as a palæontologist than as a stratigraphical geologist. Here again he concentrated his efforts on one limited domain, of

which he made himself the acknowledged master. The remarkable and abundant assemblage of cephalopods in the Trias of the Eastern Alps furnished him with an attractive and ample field for the exercise of his singularly acute eye for delicacies of form and structure. His researches among these organisms brought him Triassic material from all quarters for comparison and determination. Thus from the Geological Survey of India he received the large assemblage of cephalopods collected from the Upper Triassic groups of the Himalayas, which he named and described. From the Arctic Regions, from Spain and the Mediterranean basin, from Astrakhan, from Japan, from New Caledonia, and other regions, Triassic cephalopods found their way to him, and enabled him to form those suggestive pictures which he presented of the distribution of land and sea and the zoological provinces of Triassic time over the globe.

Mojsisovics took an active interest in earthquake-research, and for many years was the leading member of the Seismological Commission of the Vienna Academy, by which a network of stations was planted over Austria for the purpose of registering earthquake-disturbances. He was a frequent attendant at the meetings of the International Geological Congress, where he was welcomed by geologists from all regions of the globe, and where his assistance was always readily given towards the preparation of the great International Geological Map of Europe. His helpfulness to science will long outlive him, for he has by his will left to the Vienna Academy the greater part of his estate of more than a million of crowns, to be applied, after the decease of his widow, for the furtherance of scientific studies.<sup>1</sup>

Dr. JOHANN FRIEDRICH CARL KLEIN had for the last forty years been an accomplished and constant contributor to the literature of descriptive mineralogy. He had also studied the crystallography of various artificial compounds. His 'Mineralogische Mittheilungen' have long been a conspicuous feature in the 'Neues Jahrbuch.' His eminence in his own subject was recognized by his being appointed Professor of Mineralogy in the University of Berlin, and by his being

<sup>1</sup> In preparing this sketch of my lamented friend I have been much indebted to two necrologies of him—one by Prof. Diener of the Vienna University ('Beiträge zur Paläontologie & Geologie Österreich-Ungarns & des Orients' vol. xx, 1907, p. 272), and one by Dr. Tietze, Director of the K.-k. Geologische Reichsanstalt (Verhandl. Geol. Reichsanst. 1907, No. 14).

created a Geheimer Bergrath. He was elected a Foreign Correspondent of this Society in 1903.

In Sir RICHARD STRACHEY, G.C.S.I., who was born in 1817, the Society has lost almost its oldest and certainly one of its most distinguished Fellows. His connection with geology dates back to a time before most of us were born, and he has been a Fellow of the Society since 1851. He belonged to a family which for some generations has been closely associated with administrative work in India, and it was there that he also laid the foundations of the great scientific reputation which he ultimately attained. Trained as a military engineer, he in 1836 entered the Bombay Engineers in the Service of the East India Company, and was soon engaged in the construction of irrigation-canals. These peaceful operations, however, were occasionally interrupted by outbreaks of war, and the engineer-officers were called off into active service against the insurgent tribes. In this way Strachey took part in the first Sikh war, had his horse shot under him at the battle of Aliwal, and was present at the action of Sobraon. Promoted to a brevet-majority for his services in the field, he returned to irrigation and other engineering works. Eventually, however, he was compelled by frequent attacks of fever to betake himself to the hill-station of Naini Tal, where he had opportunities of devoting himself to scientific investigation, especially in regard to botany, geology, and physical geography. It was during this time that he made his expeditions across the passes into Tibet, and ascertained the existence of the Kumaon glaciers. He then likewise made important discoveries in regard to the presence of Palæozoic, Mesozoic, and Kainozoic formations along the line of these passes. His observations were communicated to this Society in 1851, in a paper on the 'Geology of Part of the Himalaya Mountains & Tibet,'<sup>1</sup> with a sketch-map and sections of the country that he had traversed. Three years later he sent in a paper on the 'Physical Geology of the Himalaya,' of which an abstract was published in the tenth volume of the 'Quarterly Journal' (1854) p. 249.

These scientific expeditions restored his health and strength, so that he was able to resume for a short time irrigation-work in Bundelkhand. But he was soon called to enter on the administrative duties which proved to be the main feature of his career and to become of such lasting benefit to India. His first appointment was

<sup>1</sup> Quart. Journ. Geol. Soc. vol. vii, p. 292.