

have gone over requires re-examination, and that six years would be too short to enable one person to divide and correlate correctly, and arrive at satisfactory conclusions as to modes of accumulation. In connexion with this subject, I may express my belief that in order to prevent any geologist assigning too much to the depositing power of ice in an extensively glaciated region like the Lake District, it is important that he should be acquainted with the drifts of the adjacent plains, and of neighbouring or distant hilly districts in which traces of glaciation are exceptional or altogether absent. It is likewise important that he should not be ignorant of the *versatility* of the sea as a depositing agent.

The question asked by Mr. Wollaston relative to the absence of Skiddaw slate and granite from Dunmail Raise, applies with nearly equal force to the theory of transportation by great streams of land-ice. In its bearing on ice-laden marine currents, I think it can be satisfactorily answered. Currents impinging on an island (such as Skiddaw must once have been) do not necessarily flow through all the gaps or passes within sight of the island; and a current may have been prevented from flowing southwards from Skiddaw by an east or west current traversing Keswick and Threlkeld vale. We know that a current laden with boulders from Wasdale Crag flowed over Stainmoor pass,<sup>1</sup> but no trace of such a current has been found in the Lune valley pass, south of Tebay railway-station. Granite-laden currents must have flowed south and south-west from the Eskdale Fells, but there are no indications of such currents having flowed in any other directions.

MILLOM, 8th December, 1870.

D. MACKINTOSH.

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## OBITUARY.

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### PROFESSOR BISCHOF, FOR. MEMB. GEOL. SOC., LOND.

Amongst the losses which science has sustained during the past year, it is our melancholy duty to record the death of Professor Bischof, of the University of Bonn, in Rhenish Prussia, who died in that city on the 29th of November, in his seventy-ninth year. As a tribute of respect to a man of science, of so thoroughly cosmopolitan reputation, and whose labours have nowhere been more appreciated than in England, we lay before our readers the following short sketch of his scientific career.

Carl Gustav Bischof was born on the 18th of January, 1792, at Wörd, in the suburbs of Nürnberg, in Bavaria, where his father, subsequently Rector of the Latin School of Fürth, then resided. In the year 1810 he entered the University of Erlangen, with the special

<sup>1</sup> Professor Harkness, in the last number of the Quart. Journ. Geol. Soc., submerges the Lake District to a greater height than 700 feet above the level of Dunmail Raise, and brings up false-bedded marine drift to 1,100 feet above the present sea-level, or 100 feet higher than I have ventured to assert.

intention of devoting himself to mathematics and practical astronomy; but in a short time he became so impressed by the chemical lectures of Professor Hildebrandt, that he entirely changed his course of studies, which resulted in his qualifying himself as a lecturer on chemistry and physics; and upon the decease of Hildebrandt, in 1816, he succeeded to his position, and also undertook the continuation and conclusion of his "*Lehrbuch der Chemie*," published at Erlangen in 1816.

About this period his attention appears to have been more specially directed to Geology, and, in conjunction with his friend Professor Goldfuss, he brought forward, in the "*Physicalische Statistischen Beschreibung des Fichtelgebirgs*," (2 vols., Nürnberg, 1817), the results of the geological and physiographical exploration of this mountainous district.

In the year 1819 his "*Lehrbuch der Stöchiometrie*" appeared, and also, in conjunction with Von Esenbeck and Rothe, a memoir on "*Die Entwicklung der Pflanzensubstanz*;" and in the spring of the same year he removed to Bonn to act as Professor of Chemistry and Technology in the newly-founded University, in which, in 1822, he was appointed Professor of Chemistry, a position he retained for little less than half a century.

A treatise on chemistry, "*Lehrbuch der reinen Chemie*," was commenced by him in 1824, but only the first volume ever was published, he having given up the study of pure chemistry, in order to devote his entire energy and time to chemical and physical geology, in which branches of science he afterwards became so distinguished. His first production in this line was his work, brought out in 1826, "*On the Volcanic Mineral Springs of Germany and France*," as well as a memoir on the mineral spring of Roisdorf, which appeared in the course of the same year; and was followed, some ten years later, by "*Die Wärmelehre des Innern unseres Erdkörpers*," (Leipzig, 1837), a work which gave rise to his "*Physical, Chemical, and Geological Researches on the Internal Heat of the Globe*," published in London, in 1841.

During the interval from 1837 to 1840 he had been ordered by the Government to inquire into the nature of the inflammable gases of coal-mines, and the safety-lamps employed in their exploration; and the results of these investigations will be found in several communications to "*Karsten und von Dechen's Archiv für Mineralogie*" and the *Edinburgh New Philosophical Journal*, as also in a memoir on "*Des Moyens de soustraire l'Exploitation des Mines de houille aux dangers d'Explosion*," (Brussels, 1840), to which the premium offered by the Academy of Brussels was awarded.

In the following years numerous memoirs were contributed by Professor Bischof to the different scientific Journals, amongst which may be mentioned "*The Glaciers in their Relations to the Elevation of the Alps*," 1843; "*The Formation of Quartz and Metallic Veins*," 1844, etc.; and in 1847 he commenced the publication of the first

edition of his greatest work, the “*Lehrbuch der Chemischen und Physicalischen Geologie*,” (2 vols., Bonn, 1847–1854), which was finished in 1854, in which year an English translation (so much augmented as in reality to be a second edition) was published by the Cavendish Society, under the personal superintendence of the author, which work, for the first time, supplied a notable deficiency in our scientific literature. In 1866 an entirely re-written new German edition of this work, in three volumes, was completed; and up to the last days of the worthy Professor’s life, he was occupied in completing a supplement to this edition, which will bring it up to date, and is expected to appear immediately.

Space does not admit of our even giving the titles of the numerous scientific papers and minor communications, or alluding to the popular lectures and letters on scientific subjects, which appeared in print between the years 1842 and 1849. The posthumous fame of Professor Bischof will rest, however, mainly upon his most important work on Chemical and Physical Geology, which embodies a vast amount of data for future generalization. Even those men of science who may not be inclined to adopt the late Professor’s views in their entirety, cannot but admire the wonderful perseverance and sagacity which he brought to bear upon his chosen field of investigation, and admit that he must be regarded as the founder of the study of chemical geology, a branch of science which every day is asserting its claims to more distinct recognition.

Professor Bischof had, what is rarely accorded to scientific men, the happiness of seeing his labours universally appreciated during his lifetime. Prussia gave him the decoration of the Red Eagle, whilst from Russia he received the Order of St. Ann; in England he was awarded the gold Wollaston medal by the Geological Society, and in 1861 was elected a honorary member of that body, whilst most of the principal scientific institutions of Europe enrolled him amongst their members. Up to the very last Professor Bischof preserved his mental faculties quite unimpaired by either age or infirmity; and whilst, in his public capacity, he was esteemed by all, it must also be added, that in private life he was one of the most amiable of men, as all who knew him can testify. D. F.

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**DEATH OF THE PRESIDENT OF THE ROYAL MICROSCOPICAL SOCIETY.—**With deep regret we announce the death of the Rev. Joseph Bancroft Reade, F.R.S., F.R.A.S., President of the Royal Microscopical Society. He was a Scholar of Caius College, Cambridge; and obtained his B.A. degree in 1825, when he took high honours in the Mathematical Tripos. He was curate of Rigworth, Leicestershire, till 1829, and was successively curate and afternoon lecturer at the parish church, Halifax, till 1832, and incumbent of Harrow Weald till 1834. In 1839 he was presented by the Royal Astronomical Society to the vicarage of Stone, near Aylesbury, and in 1859 to the