

sharp and decisive. These beds of stratified sand and gravel reach a level of 320 feet at the "Roman camp" above Upper Sherringham, giving the minimum amount of the submergence at this epoch and in this part of East Anglia.

EDWARD HULL.

OBITUARY.

REV. PROFESSOR HAUGHTON, D.C.L., F.R.S., F.G.S.

BORN 1823.

DIED OCTOBER, 1897.

At the close of the month of October last there passed away, in his 75th year, one of Ireland's most eminent sons, whose name stands at the head of this notice, and who must have been well known to many readers of the *GEOLOGICAL MAGAZINE*. The late Dr. Haughton came of a Carlow family, and at an early age entered Dublin University, of which he afterwards became so distinguished an ornament. Graduating in 1844, he took the senior mathematical moderatorship and gold medal, and in the same year obtained his Fellowship at the first trial; a performance almost unique in the history of the University. Those only who know what a tremendous test of mathematical and classical knowledge the examination for a Fellowship in Trinity College really is, can fully realize the greatness of this mental achievement.

The writer well remembers the first time he saw Haughton. The examinations for "littlego" were about to commence, and we were all seated at our desks waiting for the distribution of the papers, when a side door opened, and Jellett (afterwards Provost) and Haughton entered together. Both were in the prime of youth and vigour, both had reached the goal of Fellowship; and the writer was struck by the extreme beauty of countenance exhibited by the former, and the quick glance and decisive step of the latter, indicative of the restless activity of the mind within.

Most men in attaining a similar position elect to devote their time and talents to the cultivation of one branch of "natural knowledge" or research. It was otherwise with Haughton. His avidity for investigation in many directions was insatiable, and there were few subjects which he did not study in turn. His mind had essentially a mathematical bent, but he had also a strong leaning in the direction of physical and biological subjects. Hence he studied chemistry, geology, physical geology, and biology, with never-tiring devotion, and thus qualified himself for the great work he had kept in view—the development of the range of subjects to be taught in the University curriculum. Two years after obtaining the Fellowship he entered Holy Orders, and in 1847 was appointed Assistant Divinity Lecturer. But Divinity was not Haughton's strong point. The University School of Medicine was the object upon which he had determined to concentrate his energies, in order to its development and greater usefulness. With this object in view he studied medicine and surgery, taking the degrees of M.B. and M.D. in 1862. Thus fully equipped by this course of study, he proceeded to

reorganize the Medical School, and being liberally supported by the Provost and Board with funds, additions were made to its buildings and equipments. A new chemical laboratory (now under the direction of Professor Emerson Reynolds) was built, and a spacious anatomical museum was erected and well furnished with typical specimens for the use of students. Thus provided with all appliances, and with the objects of practical study afforded by the Dublin Hospitals, it is not surprising that the Dublin University Medical School ranks second to none amongst the institutions of this kind in the British Islands.

Nor did Dr. Haughton neglect original investigation into many curious problems of natural history. As Secretary to the Zoological Gardens in the Phoenix Park, Haughton had many opportunities for studying the habits of the inmates; and one of the most remarkable of his experiments was that by which he endeavoured to determine the relative strength of the lion and tiger. The writer cannot find an account of this experiment in "The Principles of Animal Mechanics," and has to depend on his memory alone. As far as he recollects, the trial was tested by the number of men hauling at a rope required to pull the fore-paw of each animal through the cage against its will. The experiment was decided in favour of the tiger, so that "the king of beasts" was dethroned from his position of eminence. A more important series of experiments was that on the muscular strength carried out by measurements of the cross-section of the muscles of various animals, resulting in the general proposition that "the work done by the contraction of a muscle is proportional to its length and area of cross-section conjointly."¹ These experiments, like most of those undertaken by Haughton, were worked out by accurate mathematical formulæ.

To geologists, the investigations which were of greatest interest, were contained in his papers on the Irish granites, in which he was able to show by chemical analyses that in each granitic region (and of these there are four) there are representatives of the soda and potash varieties.² At the time these papers were published, microscopic analysis had not come into use; and although more recent observers, with the aid of thin sections under the microscope, have examined these rocks, it has not been shown that Haughton's conclusions can be shaken. Another interesting set of observations were those carried out by Dr. Haughton and the writer on the Vesuvian lava-streams from specimens ranging throughout a period of 237 years (from 1631 to 1868), which resulted in showing that both in chemical composition and mineral structure no important change had taken place throughout this period.³

Besides his numerous contributions to the transactions of learned societies, Haughton, in concert with his friend and colleague, the late Rev. J. Galbraith, brought out a series of textbooks, designed

¹ "Principles of Animal Mechanics," p. 443.

² Q J G.S., vol. xii, pp. 171, 188; and vol. xiv, p. 300.

³ Trans. Roy. Irish Acad., vol. xxvi (1876).

chiefly for students, which had a wide circulation, and were known as "Galbraith and Haughton's Manuals." These dealt with the following subjects: "Euclid," "Plane Trigonometry," "Mathematical Tables," "Mechanics," "Optics," "Hydrostatics," "Tides," "Astronomy," "Steam-Engine," "Algebra," and "Arithmetic." The publication of these Manuals gave rise to the following parody, taken from David's lament over Saul and Jonathan: "Galbraith and Haughton were beautiful in their lives; and in their Manuals they were not divided!" In 1865, however, Haughton published a Manual of Geology, by himself; Longmans and Co., 8vo, pp. 360 (see *GEOL. MAG.*, Vol. II, 1865, p. 449).

Other works were the "Principles of Animal Mechanics," a book of extreme interest and originality, published in 1873, and "Six Lectures on Physical Geography" (1880). Meanwhile, well-merited honours were falling thick and fast on Haughton. In 1853 he was elected a F.G.S., and F.R.S. five years later (1858). He filled the offices of President of the Royal Irish Academy and of the Royal Geological Society of Ireland. Oxford conferred upon him the honorary degree of D.C.L. in 1868, and Cambridge followed suit a few years later, in 1880, while Edinburgh added her LL.D. in 1884; and that he was the life and soul of many Dublin societies and institutions, need scarcely be said.

Of Haughton's personal character little need here be stated. He was a general favourite with those who knew him; and when he rose to speak in public his trenchant manner of dealing with his subject, combined with an overflowing fund of humour, sometimes spiced with sarcasm, at once rivetted attention. In advocating or opposing a cause he was absolutely fearless of persons or of outside opinion, and undoubtedly he exercised great influence in the government of Trinity College. Those who, like the writer, were sometimes in his company at the dinners of the Dublin Geological Club, are not likely to forget the unfailing flow of wit and anecdote which kept the company in a state alternating between delight, amusement, and, it must be added, sometimes horror! In literature the *Noctes Ambrosianæ* of Professor Wilson afford the only parallel. E. H.

PROF. CONSTANTIN BARON VON ETTINGSHAUSEN.

BORN 1826. DIED FEBRUARY 1, 1897.

THE BARON CONSTANTIN VON ETTINGSHAUSEN, who was born at Vienna in 1826, and died at Graz on the 1st February of this year, shares with Heer and Saporta the merit of having, more than any other workers, advanced our knowledge of the Fossil Flora of the Tertiary period. This was the chief, although not the exclusive field of his astounding activity, which extended over a period of forty-seven years, from 1849 to 1896.

He graduated as a Doctor of Medicine in Vienna, beginning his scientific work almost immediately afterwards. After having been for a few years an Assistant in the Geologische Reichsanstalt, he became Professor at the Medical and Surgical Military Academy at