

## OBITUARY NOTICES.

John Horne, LL.D., F.R.S.  
(1848–1928.)

THE death of John Horne—the *doyen* of Scottish geologists—has soon followed that of his distinguished colleague and friend, Benjamin Neeve Peach. There has been nothing happier and more fruitful in the history of scientific work than the close association and interdependence of Peach and Horne. This collaboration lasted for half a century and resulted in a great increase to our knowledge of the geology of Scotland. Indeed, in a sense it may be said to have continued up to the day of Horne's death, for Peach had left his materials and views in his partner's hands, and Horne was engaged to the very end in preparing for the press a book embodying the final results of their joint investigations and deliberations.

Peach and Horne have been well called “the Castor and Pollux of the Geological Survey.” They were twin stars so closely associated that the mention of one inevitably invokes the other, and their names are household words for geologists all the world over. Indeed, as far as their scientific work is concerned, it may be said that the one was incomplete without the other. Peach, a brilliant genius, with his vivid imagination and impetuous nature, needed the restraining influence of the eminently cautious and careful Lowland Scot. Horne was safe and solid, and frequently kept the other star from erratic courses. Their gifts and qualities were so different and so strongly contrasted that the one type acted as a foil to the other. They were in a true sense complementary, forming an ideal association.

Peach displayed rare original power in interpreting evidence in the field. He had a wonderful gift of visualising in three dimensions the most complicated tectonic features. He appeared to do this by a flash of intuition. This led to some of his greatest triumphs, but at the same time it was not without its dangers. Horne was methodical, painstaking, and judicious, fully armed with an artillery of facts with which to put to the test Peach's interpretation of the phenomena under discussion. To Peach any literary labour proved irksome and arduous, and

he had the greatest difficulty in expressing his thoughts in speech or in writing. It has been said that he would rather walk a mile than write a letter. Horne, on the other hand, was remarkably lucid both as a speaker and a writer. The only way in which Peach could adequately express his views was by the use of the drawing pencil. He was a skilful artist, and his geological sections and palæontological drawings are the works of a master. The result of much of Peach's observations as a field geologist would never have seen the light of day were it not for Horne's persistent and successful efforts to give expression to them in language and to secure illustrations from Peach in the form of drawings. There was something delightfully childlike in both these great geologists which endeared them to all who came in contact with them. They were generous and helpful to others, and particularly encouraging to younger workers. The names of Peach and Horne have an assured place in the annals of geological science.

But Horne possessed qualities peculiar to himself which were recognised and utilised in administrative work on the Geological Survey and in the services of the various scientific societies of this city. He has left a great record of public service as well as of scientific achievement.

John Horne was born at the village of Campsie in Stirlingshire on the 1st of January 1848. He received his education at the High School, Glasgow, and in the University of that city. He became attracted to geology, and at the early age of nineteen he entered the Geological Survey and remained in it at the Scottish office until 1911, when he retired on a pension. After his official retirement he continued to do work for the Survey until the date of his death. Peach was senior to him on the Survey by five years, and Horne's training in the field and early routine work were carried out under the direction of Peach. This was the beginning of their memorable partnership. For many years the results of the work carried out in the course of the Survey were only allowed to appear in the official maps and publications, and so it became the custom for members of the staff to devote much of their holidays to unofficial work, the results of which could be published independently. In 1873 Horne spent his leave in the Isle of Man examining the Carboniferous rocks and glacial deposits of that area, and in the following year the results of his researches appeared in a paper contributed to the *Trans. Edin. Geol. Soc.* His observations on the filling up of the Irish Sea by land-ice attracted the attention of Alfred Russel Wallace. With his colleague, R. L. Jack, he next paid a

visit to the Carpathians and investigated the glacial phenomena of the valleys of the Theiss and Pruth, and their conclusions were published by the Geological Society of London in 1877. In 1876 he began with Peach a prolonged study of the glacial phenomena and of the Old Red Sandstone rocks of North-Eastern Scotland, including the Orkney and the Shetland Islands. This resulted in a series of valuable papers which appeared in the *Quart. Journ. Geol. Soc.* (London) and in the *Proc. Roy. Phys. Soc.* (Edin.). They demonstrated the overriding of the Shetlands by the Scandinavian ice, the coalescence of Scandinavian and Scottish ice-sheets on the floor of the North Sea and the consequent deflection of the Scottish ice north-westwards over the Orkneys and the Caithness plain. The Old Red Sandstone sediments and the associated igneous rocks of the area were fully described. Their work in this region received recognition in the award of the Balance of the Proceeds of the Wollaston Fund by the Geological Society of London to Peach in 1887 and to Horne in 1888. In handing over the Balance for transmission to Horne, the President of the Society at the time (Professor Judd) said, "Seeing that in their researches Messrs Peach and Horne have been so constantly united, it is felt that in the recognition of their services they should not be divided."

There followed the period during which the two friends were largely engaged in those brilliant researches on the geology of the North-West Highlands, the results of which brought them fame and made this area a classic region for pilgrimage by geologists from all parts of the world. The story of the unravelling of the complicated geological history of the North-West Highlands has been told by many, and amongst others by Peach and Horne themselves in the obituary notice of Sir Archibald Geikie contributed by them to this Society.

For many years there had been keen controversy as to the order of succession of the rock formations and the tectonics of this area. The Murchisonian view that the fossiliferous Durness Limestone passes up conformably into the Eastern Schists was strongly supported by Archibald Geikie. Nicol, on the other hand, had contended that the apparent sequence is misleading, and that the line of junction is really a dislocation along which "a comparatively very small amount of inversion and extrusion of older crystalline masses will suffice to explain any of the Scottish sections." Nicol's contention was disregarded partly on account of the great authority attaching to Murchison and Geikie and partly owing to Nicol's reluctance to admit the widespread superposition of the Eastern Schists upon the fossiliferous beds, which was insisted

upon by his opponents and confirmed by other observers. In 1878 the controversy was reopened, and in this and subsequent years Hicks, Bonney, Callaway, and others brought forward much new evidence bearing on the question. Charles Lapworth visited the Durness region in the early 'eighties and mapped a part of it. Horne has acknowledged that Lapworth grasped the true solution of the geological structure of that region, but owing to illness only a partial account of his work was published.

To settle the controversy, Peach and Horne were sent in 1883 to map the Durness-Eireboll region. The results of their work in the field led to the abandonment of the Murchisonian view of conformity and to the vindication of Nicol's contention regarding the structural break between the Durness Limestone and the overlying Eastern Schists. Though ignorant of the final results of Charles Lapworth's work, they came to similar conclusions regarding many of the tectonic features of the area, and it seems certain that they were the first to realise that thrusting had occurred of the order of ten miles or more. With the consent of the Director of the Survey (Sir Archibald Geikie), a brief account of the researches carried out by Peach and Horne appeared in *Nature* in 1884. In this and subsequent work in the North-West Highlands, Peach and Horne brought forward evidence of remarkable tectonic features in the form of overfolds, reversed faults, and gigantic thrusts, resulting in the transport for long distances, under the influence of tangential pressures, of stupendous rock masses, so as to bring these masses to rest often on younger formations. With their colleagues on the Survey they proceeded to trace these structures south-westwards along the western sides of Sutherland and Ross and on as far as South-Eastern Skye. This tract of disturbed ground or "belt of complication" was found to be limited on the eastern side by the most easterly of the great thrust planes—the Moine Thrust—overlain by the Eastern Schists. The important discovery of the *Olenellus* fauna in the so-called "Fucoid Beds" was largely due to Horne himself, who put Macconnochie, a member of their staff, to search for fossils in these beds. This find enabled them to fix the age of the belt of quartzites and limestones as Cambrian. Hitherto they had been regarded as Lower Silurian (or Ordovician, as the system is now called). It may be mentioned that many still think that the upper part of the limestone is best retained in the Ordovician. These fossiliferous sediments were already known to lie unconformably on sandstones and arkoses which were termed Torridonian as soon as their pre-Cambrian age was realised. The Torridonian sediments embrace a

great continental series of deposits lying on the denuded surface of an old land area consisting of the fundamental gneiss. A preliminary account of the results of the Survey of the North-West, carried out by Peach and Horne, assisted by Gunn, Clough, Hinxman, Cadell, and others, was given in the *Quart. Journ. Geol. Soc.* in 1888. In subsequent years, further statements regarding the progress of the mapping were issued in the "Annual Reports" and "Summaries of Progress" of the Geological Survey. The mapping of this belt was completed in 1897, but the final memoir on the "Geological Structure of the North-West Highlands" did not appear until 1907. This memoir is a monumental work and is now regarded as a classic in geological literature. It contains a detailed account of the researches of Peach and Horne and other members of the Survey staff. Horne himself contributed the masterly introductory chapters to the volume.

Peach and Horne were justly proud of the leading part which they had played in these researches, and while all due acknowledgment should be made to earlier workers, especially to Nicol and Lapworth, it is generally recognised that the complete solution of the complicated tectonics of the North-West Highlands is mainly due to the labours of these two officers of the Survey and their colleagues.

Horne's share in this work brought him the award of the Neill Prize of the Royal Society of Edinburgh in 1892, and of the Murchison Medal of the Geological Society of London in 1899. He was elected a Fellow of the Royal Society of London in 1900, and he was President of the Geological Section of the British Association at the Glasgow meeting in 1901.

During these years Horne also did work in the north-east of Scotland, and in 1896, in collaboration with Greenly, he contributed an important paper to the *Quart. Journ. Geol. Soc.* entitled "On Foliated Granites and their Relations to the Crystalline Schists in Eastern Sutherland." But next in importance to the work on the North-West Highlands was the part which he took in the revision of the geology of the Southern Uplands, carried out with Peach and others. This was a colossal task extending over many years, and it resulted in the appearance of another memoir of first-class importance entitled *The Silurian Rocks of Britain: Vol. I.—Scotland*. In this work the classic researches of Lapworth were followed up and amplified, and much new light shed on the geology of this wide region. The presence of radiolarian cherts associated with lavas of Lower Silurian age and the wide extent of these lavas may be particularly mentioned. This massive

memoir was issued in 1899, and one of its features is the clear summary given in the earlier chapters by Horne.

Of Horne's many other contributions to geological knowledge it will suffice to mention a few. He played a large part in the preparation of a number of Scottish Survey Memoirs, and was mainly responsible for the memoir on the *Geology of the Lower Findhorn and Lower Strath Nairn* published in 1923.

In conjunction with Peach an important monograph on the Canonbie Coalfield was contributed to the *Trans. Roy. Soc. Edin.* in 1903. A valuable chapter by Peach and Horne on "The Scottish Lakes in Relation to the Geological Features of the Country" appeared in Murray and Pullar's work entitled *Bathymetrical Survey of the Fresh Water Lochs of Scotland* published in 1910. In 1917 the results of investigations carried out by Peach and Horne on certain bone-caves near Inchnadampf were communicated to the Royal Society of Edinburgh. This drew the attention of archæologists to the importance of these caves, and thus led in subsequent years to further explorations which threw fresh light on interglacial epochs and the presence of palæolithic man in Northern Scotland.

Problems connected with the Archæan gneiss continued to occupy their minds. In 1911 they undertook a journey to the Outer Hebrides to compare the types of rocks displayed there with those with which they were familiar in Sutherland and Ross. They made traverses across Lewis and excursions by water along the eastern and western seaboard—a hazardous undertaking. Nothing could quell the ardour of these grand old geologists. On one occasion, owing to contrary winds, they were forced to spend twenty-four hours in a small open boat on the turbulent seas of the Minch. Peach, as might be expected, thoroughly enjoyed the rough experience, but Horne was troubled and anxious not on his own account but because he feared the effects of the long exposure on his colleague who was advanced in years. The results of their observations were communicated to the British Association meeting at Dundee the following year.

The long-continued researches of Peach and Horne on the geology of Scotland were recognised by the Geological Society of London in 1921 by the award to them in duplicate of the Wollaston Medal, the highest honour in the power of the Society to confer.

Almost the last visit of Peach and Horne to the scene of their greatest triumphs, the North-West Highlands, was in 1912, on the occasion of the meeting of the British Association in Dundee. They



conducted a large party of geologists to the Assynt region where the most interesting tectonic features are admirably displayed. Amongst the members of the party were such distinguished geologists from overseas as Charles Barrois, Teitze, Lugeon, Haug, Reusch, and Leith. Peach and Horne were like schoolboys playing on their happy hunting-ground. Those of us who were present will recall one amusing incident. During our rambles Horne, with his usual modesty, insisted that Peach, as senior, should take upon himself the duty of speaking in explanation of the phenomena presented to our eyes. This was a great mistake. Horne could have done this so much better himself, for he excelled in terse and clear exposition. Speaking in public was not Peach's forte, and in his efforts to make things intelligible he was like a fish floundering out of its proper element. It was comical to watch the look of perplexity which crept over the faces of the foreign geologists as they listened to Peach's vain efforts to express himself in language. Matters seemed to be getting into a hopeless tangle, when it occurred to one bright member of the party to hand to Peach pencil and drawing-paper. Then affairs took on quite a different aspect. With the skill of a born artist and the insight of a genius for field observations he was able by a few graphic sketches to make clear and transparent, structures which are so extremely complex as to be difficult to understand.

During the passage of years other honours were bestowed on Horne. The Universities of Aberdeen, St Andrews, and Edinburgh in turn conferred on him the honorary degree of LL.D. He became an honorary member of the Physical and Natural History Society of Geneva, a corresponding member of the Geological Society of Belgium, and a foreign honorary member of the American Academy of Arts and Sciences.

Horne's work as an administrator in connection with the Survey and his services to the learned societies of Edinburgh are not likely to be forgotten. In 1901 he became Assistant Director of the Geological Survey in charge of the work in Scotland. Though junior to Peach on the staff, he was selected by Sir Archibald Geikie for this work with the full concurrence of his senior, on account of his capacity for administration. He remained at this post until 1911 and conducted his official duties with marked success. Relations between him and the staff of the office were always of the happiest nature, and on his retirement he had won the esteem and affectionate regard of all its members. He knew how to handle men and how to make allowances for the idiosyncrasies of individuals. He won their confidence and

consequently drew from them the best they were capable of giving. After his retirement he continued to take a deep and practical interest in the Survey work, and he became the adviser and helper of every geologist in Scotland and of many in other parts of the British Isles. Foreign geologists from every quarter of the world visited him at his house, and there was nothing that he loved better than a chat and a discussion on geological problems.

He rendered faithful and long-continued services to the Edinburgh Geological Society, the Edinburgh Royal Physical Society, the Royal Scottish Geographical Society, and our own Royal Society. In addition, many provincial scientific and field societies, particularly the Inverness Scientific Society, owe much to his encouragement and aid. On more than one occasion he was President of the Edinburgh Geological Society. He acted for many years as Chairman of Council of the Royal Scottish Geographical Society, and was afterwards Vice-President. He was an ordinary member of the Council of the Royal Society of Edinburgh for three periods, twice Vice-President, and finally, on the death of Professor James Geikie in 1915, he was elevated to the Presidential Chair, an honour which gave him great gratification. Amongst his many services to this Society was his conspicuous success in obtaining funds to aid in the publication of the *Proceedings* and the *Transactions*.

Much time during his later years was spent in the congenial task of preparing, in collaboration with Peach, a book on the geology of Scotland which was to embody not only the results of their own life-work, but also of the researches of all other workers, and to form a connected story. This was interrupted by the death of Peach and was still unfinished at the close of Horne's life. Time was lost owing to the fact that Peach and Horne held somewhat divergent views as to the tectonics and the age of the rocks of the Central and South-Eastern Highlands. These matters are still unsolved problems and had for long engaged the thoughts of Peach and Horne and of other workers. The evidence is very conflicting. Peach's fertile mind led him to envisage many possible interpretations, and his changes of view were so frequent as to puzzle and embarrass his colleague. Horne was loath to differ from Peach and very unwilling to place on record interpretations put forward by his partner to which he could not assent. To listen to their friendly discussions was both an education and an entertainment; but these discussions proved so protracted and led to such delay that unfortunately the work was never completed.