



MEMORIAL TABLET ERECTED TO
PROFESSOR JAMES NICOL, F.R.S.E., F.G.S.,
IN THE UNIVERSITY OF ABERDEEN, 1ST JULY, 1920.

Designed and executed by Alice B. Woodward.

The Nicol Memorial.

(PLATE VI.)

A MURAL tablet, to the memory of Professor James Nicol, F.R.S.E., F.G.S., formerly of Aberdeen University, was unveiled by Dr. John Horne, F.R.S., in Marischal College, and entrusted to the Principal, Sir George Adam Smith, on July 1.

The memorial was presented by a number of well-known geologists who were his friends and admirers and desired to commemorate in some permanent form their high estimation for this distinguished teacher in the University during a quarter of a century, and also to record his original contributions to Scottish geology, the value and importance of some of which were not fully appreciated and confirmed until after his death.

The memorial (see Plate VI) is placed side by side with that of Professor Nicol's successor, Professor Henry Alleyne Nicholson,¹ in the same chair, and was designed and executed by the same artist, Alice B. Woodward, daughter of Dr. Henry Woodward, F.R.S., in the form of a bronze tablet in repoussé-work mounted on oak (measuring 4 feet by 3 feet), bearing the modelled profile medallion of Nicol with name and titles. Beneath the portrait in close raised letters, in twelve lines, is given an epitome of his career with dates, as follows:—

BORN AT MANSE OF TRAQUAIR
PEEBLESHIRE AUG. 1810, DIED IN
LONDON AP. 1879. PROFESSOR OF
GEOLOGY & MINERALOGY CORK
1849-53. OF CIVIL AND NATURAL
HISTORY ABERDEEN 1853-78.
HIS VIEWS ON THE SUCCESSION OF THE
ROCK GROUPS OF THE NORTH-WEST
HIGHLANDS, DISPUTED WHILE
HE LIVED, WERE CONFIRMED
BY THE OFFICERS OF THE
GEOLOGICAL SURVEY IN 1884.

Below is quoted a phrase used by the Professor himself—

“LEAVING TIME AND THE UNCHANGING
MOUNTAINS TO CONFIRM OR REFUTE.”

Above, the tablet bears the words—

BONUM CERTAMEN CERTAVI,

and in low relief is given a sketch of Na Tuadhan, a mountain north of Ben More Assynt, showing typical foldings.

On the border of the tablet are figures of Graptolites, *Monograptus vomerinus* Nich. and drawings of *Maclurea Peachii* Salter and two of the Trilobites, *Olenellus Lapworthi* and *Olenelloides armatus*, discovered in 1892-4 by the Geological Survey.²

¹ See Memorial Tablet to Professor H. A. Nicholson, F.R.S., *GEOL. MAG.*, 1903, pp. 451-2, Plate XXI.

² See Drs. B. N. Peach & J. Horne, “*Olenellus* Zone in the North-West Highlands of Scotland”: *Quart. Journ. Geol. Soc.*, vol. xlviii, 1892, pp. 227-41, with sections and plate v (Trilobites). *Id.*, addition to fauna of same, vol. l, 1894, pp. 661-75, pls. xxix-xxxii (Trilobites).

On behalf of the subscribers, Dr. John Horne, F.R.S., addressed the Principal, Sir George Adam Smith, as follows :—

SIR GEORGE,—We have met here to-day to do honour to Professor James Nicol, who for more than a quarter of a century was one of the teachers of Natural Science in this University, and whose contributions to Scottish geology were of the highest value. He was a remarkable example of the best traditions of Scottish University life, for, in addition to the prime duty of instructing students, he regarded the prosecution and encouragement of original research as an essential feature of the work to be done by a scientific department.

This memorial is intended to be a permanent record of the value of his contributions to the solution of the problem of the geological structure of the North-West Highlands. In the first half of last century that region was visited by Macculloch, Murchison and Sedgwick, Hay Cunningham and Hugh Miller, who had described the picturesque mountains of red sandstone, overlain by quartzites and limestones, in the west of the counties of Sutherland and Ross. They recorded that these unaltered strata rest upon a platform of crystalline gneiss and schist, and are succeeded eastwards by metamorphic rocks that stretch across the Great Glen to the eastern border of the Highlands.

The discovery of fossils in the Durness limestones in the north of Sutherland (in 1854) by Mr. Charles Peach raised questions of vital geological importance connected with the structure of that region and the age of the crystalline schists associated with these limestones.

Nicol's field work in the North-West Highlands began in 1855, not long after his appointment to the Professorship in this University. His first examination of the ground was carried out in association with his friend Sir Roderick Murchison, but all his subsequent work was done by himself, for they differed as to the interpretation of the structure.

Adopting the determination of the fossils made by J. W. Salter, the palæontologist of the Geological Survey, Murchison referred the quartzites and limestones to the Silurian system. He further contended that as the fossiliferous limestones passed normally below the crystalline schists to the east, therefore these schists themselves must belong to the same system. Hence, with one bold sweep of the brush, Murchison coloured as Silurian the extensive region stretching from near Durness to Stonehaven, and from Fraserburgh to the Mull of Kintyre. This interpretation involved a radical change in the geological map of Scotland.

Nicol's interpretation was fundamentally different. With untiring energy he continued his work in the field for several years and issued a series of papers containing the results of his researches. From time to time he modified his views, abandoning positions which he found to be untenable, and stating the evidence for changing

his opinions. In the development of his researches he showed sterling honesty of purpose.

His work in the field may be summed up in two propositions. First, he showed that the red sandstone formation, which he named the "Torridon Sandstone", was separated from the overlying quartzites and fossiliferous limestones by a great unconformity, implying a gap in the geological record. This important structural feature was traced by Nicol for a distance of one hundred miles from the north of Sutherland to Loch Kishorn. Second, he contended that no conformable upward succession from the fossiliferous limestone to the overlying schists is to be found. To quote his own words: "The line of junction, where this conformable succession is said to occur, is clearly a line of fracture, everywhere indicated by proofs of fracture, contortion of the strata, and powerful igneous action."

Such widely different interpretations gave rise to keen controversy. The progress of geology, like that of other sciences, is bound up with controversy. The brethren of the hammer fight keenly; indeed, the *odium geologicum* rivals at times the *odium theologicum*.

Murchison's order of succession, which was supported by Sir Andrew Ramsay, Professor Harkness, and Sir Archibald Geikie, met with general acceptance because it furnished such a simple solution of the problem.

In 1878 the controversy was reopened and Murchison's position was shown to be untenable by several investigators, of whom the most prominent was the late Professor Lapworth,¹ followed by Dr. Callaway,² Professor Bonney,³ Dr. Hicks, and others.

In 1883 the Geological Survey began the detailed mapping of that region. The results of their work completely confirmed Nicol's main conclusions.⁴ We now know that the structure of that mountain chain is intensely complicated, far more complicated than Nicol imagined. Under extreme lateral pressure the rocks have behaved like brittle rigid bodies; they have snapped

¹ Professor Charles Lapworth, "The Secret of the Highlands": *GEOL. MAG.*, 1883, pp. 120-8, 193-9, 337-44. "On the Stratigraphy and Metamorphism of the Rocks of the Durness-Eireboll District": read at the Ordinary Meeting of the Geologists' Association, July 4, 1884, by Professor C. Lapworth; printed as read, with a few words added in brackets for clearness of description, by J. J. H. Teall, *GEOL. MAG.*, 1885, pp. 103-6. Professor C. Lapworth, "The Close of the Highland Controversy": *GEOL. MAG.*, 1885, pp. 97-103.

² Dr. Callaway, *Quart. Journ. Geol. Soc.*, May, 1881; *GEOL. MAG.*, 1883, p. 139. *Id.*, "Torridon Sandstone and Ordovician Rocks of the Northern Highlands": *Q.J.G.S.*, vol. xxxviii, 1882, pp. 114-17. *Id.*, "Age of the Gneissic Rocks of the Northern Highlands": *Q.J.G.S.*, vol. xxxix, 1883, pp. 355-414.

³ Professor T. G. Bonney, "Lithological Character of Scottish Rocks" (Dr. Hicks' Collection): *Quart. Journ. Geol. Soc.*, vol. xxxix, 1883, pp. 159-66; (and Dr. Callaway's Collection), vol. xxxix, pp. 414-20.

⁴ Drs. B. N. Peach & J. Horne: "Preliminary Report on the Geology of the Durness-Eireboll District": *Nature*, November, 1884, vol. xxxi, p. 19.

and have been driven westwards in successive slices, so that crystalline gneiss and schist are made to rest upon fossiliferous strata of Cambrian age. But Nicol's main contention was proved beyond doubt that there is no conformable sequence in the North-West Highlands from the quartzites and limestones into the overlying schists. In grappling with the structure of this old mountain chain there can be no question that Nicol displayed the qualities of a great stratigraphist.¹

Since the publication of the results of the Geological Survey work, that region has been visited by many of the leading geologists in Europe and North America, who have been profoundly impressed with the light which it throws on the building of an old mountain chain by folding and terrestrial displacements.

It is a source of genuine pleasure to me to present this memorial on behalf of the subscribers to you, Mr. Principal, for the preliminary report on the geology of the Durness-Eireboll district, published in *Nature* in 1884 by my old friend and colleague Dr. Peach and myself, led to the final abandonment of the Murchisonian hypothesis.

In the custody of yourself and your successors it will recall the labours of one whose name is inseparably linked with the solution of one of the great problems in British geology.

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The following is a brief abstract of Professor Nicol's life, taken from his obituary by Professor Lapworth (*Quart. Journ. Geol. Soc.*, 1880, *Proc.*, pp. 33-6), and may serve to show the leading features in his career and explain the silence which marked the latter years of his strenuous life.

More than a century ago James Nicol was born at Manse of Traquair, Peeblesshire, in 1810. His father, the Rev. James Nicol, was well known for his poetical writings. After his father's death in 1819, young Nicol lived with his family in Inverleithen, where his early education was completed by the Rev. Mr. Pate. His rambles amid the bold and picturesque scenery of the district led him early to study its geology. The absence of fossils and of clear sections in these old rocks directed Nicol's attention more especially to their mineralogical aspect, still further encouraged by his subsequent attendance on the classes of Professor Jameson. He entered the University of Edinburgh in 1825, where, after passing the Arts and Divinity courses, he went to Germany and studied at the Universities of Berlin and Bonn. On the conclusion of his University training he returned to Scotland, and devoted himself to the geology of the valley of the Tweed, and in 1841 he was awarded prizes by the Highland Society for his essay on the Geology of

¹ *Quart. Journ. Geol. Soc.*, vol. xii, 1857, pp. 17-39, with sections; and C. Lapworth, "Theory of Professor Nicol": *GEOL. MAG.*, 1888, p. 123.

Peeblesshire,¹ and subsequently for one on the Geology of Roxburghshire.

During the ensuing years he made extensive geological journeys throughout Scotland, more especially in its southern portions. The results of these investigations were published in the form of *A Guide to the Geology of Scotland*, illustrated by plates and a small geological map of Scotland.

In 1847 James Nicol was appointed Assistant Secretary to the Geological Society of London, and for two years he edited the "Quarterly Journal" of the Society. Here he gained the friendship of many of that illustrious group of British geologists which then assembled at its meetings. In this congenial atmosphere Nicol's mineralogical studies were prosecuted with increased ardour; and in 1849 he published his well-known textbook of mineralogy.

First among his geological friends stood Sir R. Murchison, and through his influence, and that of Sir H. De la Beche and Sir Charles Lyell, Nicol was appointed in 1849 to the post of Professor of Geology and Mineralogy in Queen's College, Cork. But in 1853 he relinquished the post for the more lucrative position of Professor of Natural History in the University of Aberdeen, which he retained till his death in 1879.

In spite of his predilection for mineralogy, it is beyond question that Nicol will be remembered less for his mineralogical works than for his numerous and valuable memoirs upon the stratigraphy of Scotland. His papers upon the Geology of the Southern Uplands of Scotland are of especial interest and value. In 1848 he published a memoir "On the Rocks of the Valley of the Tweed" (Quart. Journ. Geol. Soc., iv, p. 195), demonstrating their fossiliferous character, and a general view of the entire succession among the transition rocks of South Scotland, and applying to them for the first time the title of "Silurian". In 1849 he communicated a memoir "On the Silurian Rocks of the South-East of Scotland" (Quart. Journ. Geol. Soc., vol. vi, p. 53), in which for the first time Graptolites were figured from these ancient deposits. In 1850 he accompanied his friend Sir R. Murchison in a tour through the Southern Uplands, and aided him in his detailed investigation of the geology of the fossiliferous Girvan area. In 1852 he communicated a complete résumé of the results of his extended researches into the geological structure of the Southern Uplands, illustrating it by the first complete transverse section through the Silurian rocks from the Pentlands to the Cheviots. A reduced copy of this section illustrated all the subsequent editions of Murchison's *Siluria*, and stood substantially unmodified in the official publications on South Scottish geology, until the true order of succession, based on the graptolites, was established by the late Professor Lapworth.

During his residence in the University of Aberdeen Nicol

¹ In the first of these publications the presence of fossils in the Lower Palæozoic rocks of the Inverleithen district was first made known.

transferred the sphere of his geological investigations to the metamorphic rocks of the Highlands, which in 1844 he had suggested were probably of the same geological age as those of the Southern Uplands. In 1855 he published his paper "On the Sections of Metamorphic and Devonian Rocks of the Eastern Extremity of the Grampians" (Quart. Journ. Geol. Soc., vol. xi, p. 544).

The same year he visited the well-known Torridon and Durness area in the North-West Highlands in company with Sir R. Murchison, in order to verify Mr. Peach's discovery of fossils in the metamorphic limestone of that region. On his return he communicated an independent memoir to the Geological Society (Quart. Journ. Geol. Soc., vol. xiii, p. 17), in which he claims to have published for the first time their order of succession, viz. : (a) Lower Gneiss ; (b) Conglomerate and Red Sandstone ; (c) Quartzite ; (d) Limestone, overlain by (e) an Upper Gneiss. Arguing mainly from the petrographical character of these rocks, he threw out the suggestion that the Torridon Sandstone might be of Devonian age, and that the overlying limestone and gneiss might be of the age of the Lower Carboniferous. After Mr. Salter's demonstration that the fossils of the Durness Limestone were not Carboniferous, but belonging to the deepest zone of Murchison's Silurian, Nicol again visited the North-West Highlands. In a memoir giving the chief results of this expedition (Quart. Journ. Geol. Soc., xvii, p. 85) he retraced his former admission of an Upper Gneiss, superior to the Durness Limestone ; and claimed to have proved that the line of demarcation between the Durness series and the eastern gneiss of Central Sutherlandshire is actually a line of fault, the Torridon and Durness strata always overlying or abutting against, but never dipping under, the eastern gneiss. These opinions led to a keen controversy between himself and his old friend Sir R. Murchison ; but after the publication of two additional memoirs on the subject in 1862 and 1863, in which he defended his view that the central gneiss of the Highlands is of the same general geological age as the Lewisian gneiss of the Outer Hebrides, and that the only metamorphic strata that can safely be called "Silurian" are the less altered rocks upon the outer borders of the Highlands, he ceased to contribute papers to the Society upon the subject. A little work, *On the Geology and Scenery of the North of Scotland*, contains his last published words upon the subject.

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"The Close of the Highland Controversy," written by Professor Lapworth (see *GEOL. MAG.*, 1885, pp. 97-106), and the admirable but brief address by Dr. John Horne (*ante*, pp. 388-90), furnish a suitable note to Professor Nicol's life and researches, most of the friends and contemporary actors in which have now, like himself, "ceased from their labours." But the value of their conclusions have left a permanent impress for good on the modern school of geological thought and science which can never be forgotten.—H.W.