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## From sketchbook to structure from motion: Recording prehistoric carvings in Ireland

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## ABSTRACT

This paper traces the development of techniques of recording carvings on megalithic tombs and on open-air rock-art in Ireland from 1699 to the present day. Analysis shows that after the initial pioneering phase, recording methodologies tended to develop in accelerated bursts, interspersed with lulls in activity. In all, four phases of activity can be identified; in each there were a critical number of researchers who interacted with each other, driving forward advances in various forms of recording methods. Part 2 of the paper describes the application of new methods of digital recording, notably Structure from Motion photogrammetry. It shows how the resulting data have been used to create new ways of experiencing Irish prehistoric art in virtual environments, either as entire monuments in the landscape or within a “virtual museum”, using the open-source Blender 3D animation and game engine software.

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Part 1—Elizabeth Shee Twohig

## 1. Introduction

In Ireland prehistoric carvings are found on megalithic tombs (almost exclusively of the passage tomb type), on rock outcrops and on monuments such as standing stones. Traditionally the carvings have been divided between passage tomb art on the one hand and rock-art/cup and ring art on the other hand, particularly following Eoin MacWhite's seminal paper (MacWhite, 1946). However, as so often happens, over time this division has been found to be somewhat simplistic, and a large number of carvings cannot be fitted comfortably into this traditional two-fold categorisation. Models are now emerging which indicate a more complex situation, resulting in suggestions of a third category called ‘anomalous or debatable sites’ (O'Sullivan, 2009, Table 1) or ‘other’ art (Shee Twohig et al, 2010, 25), however, a firm chronology for the open-air art is, as yet, elusive. Thus there are still many challenges to our understanding of these types of carvings in Ireland, in addition to the bigger questions of how the art was produced and its significance for those who created it and those who experienced it.

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The development of recording methods in Ireland shows pioneering work in 1699–1700, followed by three main phases of innovation, which seem to occur when a critical mass of recorders were working at the same time; major progress was made by the recorders comparing notes and adopting and adapting each other's methodologies.

In summary these phases are:

1. Pioneer phase: 1699–1700
2. Consolidation: 1840s–1910s
3. Systematic classification: 1950s–1990s
4. Digital revolution: 1990s to present

In this paper the earlier phases are discussed by EST and phase 4 by KW.

## 2. Pioneer phase: 1699–1700

In Ireland the earliest records of carvings were made by Edward Lhwyd (1659–1709) (or Lhuyd or Lloyd), Keeper of the Ashmolean Museum in Oxford, a polymath who became interested in antiquarian matters after an earlier career classifying natural history and working in linguistics (Ashmolean Museum, 2014). He was on an antiquarian tour of Ireland at the time of the discovery of the passage tomb at Newgrange, Co. Meath in 1699. Some letters he wrote describing the discovery have survived, and also a drawing made by his draftsman,



Fig. 1. Drawing of Newgrange, Co. Meath c. 1699–1700 by Will Jones for Edward Lhwyd. TCD MS 888/2/90, The Board of Trinity College Dublin.

Will Jones (Herity, 1967; C. O’Kelly, 1982, 24–27; McGuinness, 1996; Smyth, 2009, Fig. 1.11). The drawing (Fig. 1) is of particular interest as it presents an elevation of the interior of the passage tomb, demonstrating the relative positions of the carved stones. Another sketch made for Lhwyd shows a carved stone from Site L passage tomb, adjacent to Newgrange (O’Kelly et al., 1978, 328–329, Fig. 25).

In the eighteenth and early nineteenth centuries, illustrations of the carvings at Newgrange principally comprised poorly executed sketches. Some bear little resemblance to the actual carvings and were made with a particular agenda in mind, for example those published by General Vallancey who interpreted the carvings as ‘Druidic Inscriptions’, which he believed represented the ‘Supreme Being’ (Vallancey, 1786).

Examples of other late eighteenth century published illustrations of carved stones are rare; they include Thomas Wright’s 1758 illustration of a carved stone from a probable passage tomb at Killen, Co Louth (see Shee Twohig, 1981, 224). In 1789 a drawing of a carved stone from north Donegal was published in Gough’s edition of *Camden’s Britannia* (Camden, 1789, 645, Plate XLVII). The carving had been noted in 1773 ‘... on a druidical altar from Lynsfort on Inis Oen’ and was first reported in Walker’s 1774 *Proposals for a Description of Ireland*.

### 3. Consolidation: 1840s–1910s

Notable advances were made in recording methods in Ireland from just before the mid nineteenth century, and records of stone

carvings benefitted from the exchange of ideas between researchers, some of whom now began to present photographs and scaled drawings made from full-size rubbings or tracings. Various casting methods were also developed.

The 1830s saw the beginning of the emergence of archaeology as opposed to antiquarianism; in Ireland this was pioneered by the work of members of the Ordnance Survey of Ireland where, as Waddell (2005, 103), has noted ‘The systematic recording... and the scholarly work of its topographical department mark the beginnings of Irish archaeology as a discipline’. Some of those working in the topographical department were involved in recording carved stones. The senior antiquarian/archaeologist, George Petrie (1790–1866) was a polymath, like many others of the time and taught art to a number of younger people who went on to develop methods of recording carvings, notably George V. Du Noyer (1817–1869) and Margaret Stokes (1832–1900). Du Noyer and another of Petrie’s pupils, W.F. Wakeman (1822–1900) worked in the Ordnance Survey with Petrie in the later 1830s. Both Du Noyer and Wakeman taught art for a period at St Columba’s College near Navan, Co. Meath, beside the River Boyne, and did a great deal of fieldwork in the area. In 1845 a careful plan and sectional elevation of the passage tomb at Newgrange by Du Noyer was published (Wilkinson, 1845, Plate 6) while Wakeman published numerous illustrations of Newgrange and Dowth (Wakeman, 1848), and later some of rock-art (for example in Wakeman, 1874–75); his illustrations of the better known sites were frequently used by others such as Wilde (1847), though some were soon noted to be inadequate (see below).

The first instance of the making of full-scale copies of prehistoric carvings appears to date to 1851 when Bishop Charles Graves and the Earl of Dunraven report making ‘heel-ball rubbings’ of rock-art in County Kerry (Graves, 1867, 422). Their text was later reproduced by J. Graves in a paper which presented an early example of a photograph of rock-art, on a standing stone at Muff, Co Donegal (J. Graves 1877, facing p. 293); this was captioned ‘Dallastint, engraved and printed by Duncan C. Dallas, King’s Cross, London’.

Photography began to be introduced to record Irish antiquities in the 1850s, for example by W.D. Hemphill in south Tipperary (Mullaney-Dignam, 2014), but apart from the example cited above, it does not seem to have been used to any extent for recording carvings until the end of the century. The history of photography in Irish archaeology is, however, in need of extensive research.

Samuel Ferguson (1810–1886) also contributed to the development of recording techniques in this phase, and unusually, he worked on megalithic art outside Ireland. He described making tracings and rubbings at Mané Lud in Brittany during 1863, from which he prepared scale drawings which were shown at a meeting of the Royal Irish Academy and he also reported on the results of René Galles’s excavations there (Ferguson, 1863a,b). Ferguson went on to develop methods of recording by means of a ‘paper squeeze’—a cast made by building up layers of wet paper such as blotting paper; some of these casts have been retained in the collections of the Royal Irish Academy. Wakeman (1874–75, 471) described what he called Ferguson’s pioneering process

... which insures absolute truthfulness in pictorial illustration. The legends [on a megalithic tomb at Castledearg, Co. Tyrone] were carefully cast, and from the impressions thus procured, sun drawings were made; from these, by the art of a skilful engraver, perfect representations were multiplied. Thus we have, as it were, the original before us.

In 1880 Ferguson described to the Royal Irish Academy his ingenious method of using photography to record stones carved with Ogham inscriptions on two sides of an angle (Fig. 2). Paper casts were taken of the stone, the casts were then flattened out

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