

The Reverend Henry Duncan (1774–1846) and the Discovery of the First Fossil Footprints

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The Reverend Henry Duncan (1774–1846), clergyman, philosopher, writer, politician, archeologist, poet, educator, social reformer, and the founder of savings banks, was indeed a “Man for All Seasons.” In 1824, while Minister of the Church of Scotland at Ruthwell, Dumfriesshire, Scotland, he was presented with a slab of red sandstone from the Corncockle Muir quarry in Annandale, exhibiting a set of footprints. Although Duncan felt from the start that he was dealing with the tracks of an animal, he wrote to the Reverend William Buckland, Reader in Mineralogy and Geology at the University of Oxford, to solicit his opinion on the origin of these curious markings. Buckland was at first skeptical but, after receiving casts of the markings from Duncan, he became convinced that they did in fact represent footprints, urging Duncan to study and publish on what he considered to be a very important paleontological find.

On January 7, 1828 Duncan described the Corncockle Muir footprints to the Royal Society of Edinburgh and quoted Buckland’s findings. Duncan’s paper was not published by the Society until 1831, but it aroused considerable interest and was reported in several newspapers. This represents the first scientific report of a fossil track.

Keywords Permian, reptile tracks, Henry Duncan, William Buckland

INTRODUCTION

In 1974 W. A. S. Sarjeant published a seminal study regarding the history of research in British vertebrate ichnology. This paper constituted one of the first modern treatments on the subject and laid the foundation for all subsequent contributions. He noted that the first published account of vertebrate footprints was from rocks now known to belong to the Permian of Dumfriesshire in Scotland. These specimens were from the quarry at Corncockle Muir in Annandale and were collected by a Mr. Carruthers of Dormant and passed on by him to the Reverend

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Henry Duncan (1776–1846), Minister of Ruthwell (Fig. 1A). Duncan wrote to the Reverend William Buckland (Fig. 1B), Reader in Mineralogy and Geology at the University of Oxford on June 11, 1827, to solicit his opinion on the origin of these curious markings. The Reverend William Buckland possessed one of the most innovative minds ever to grace the science of geology, but he was also one of its most eccentric characters. His science can best be described as eclectic and encompassing, and among other things included the study of dinosaur footprints, the first work in experimental ichnology, the first study of coprolites, the first mention of preserved rain prints, and the first study to utilize modern analogues to interpret ancient structures by injecting plaster of Paris into shark and ray intestines. He pioneered the study of cave paleontology, was an early leading advocate of economic geology, was one of the first to embrace the glacial theory, and was one of the first to recognize the significance of functional morphology (Rupke, 1983). Buckland was at first skeptical but, after receiving casts of the markings from Duncan, he was at once convinced that



FIG. 1. A. The Reverend Henry Duncan (1774–1846), Minister of Ruthwell. B. The Reverend William Buckland (1784–1856) Dean of Westminster and Reader in Geology and Mineralogy, Oxford University.

they did in fact represent footprints (Duncan, 1848). Buckland then urged Duncan to study and publish on what he considered to be a very important paleontological find; he wrote:

"I look upon your discovery as one of the most curious and most important that has been ever made in geology; and as it is a discovery that will for ever connect your name with the progress of this science, I am very anxious that the entire evidence relating to it should be worked out and recorded by yourself" (Buckland quoted in Duncan, 1848, p. 183).

Duncan worked diligently on the footprints and read a paper to the Royal Society of Edinburgh on January 7, 1828, but the paper was not published until 1831 (Duncan, 1831). Sarjeant (1974) reported that a summary paper by an anonymous reporter was published in the February 10, 1828 edition of the *London and Paris Observer*. He went on to stress that *"Most unfortunately, the only known copy of this newspaper, which was lodged in the British Museum Library, was destroyed by a fire following war time bombing and, unless some copy comes to light in the future, the contents of this earliest of all published accounts of fossil vertebrate footprints can never be ascertained"* (Sarjeant, 1974, p. 269). Details of the history of the Dumfriesshire footprints can be found in Delair (1966), Sarjeant (1974), Delair and Sarjeant (1985) and Sarjeant (1997).

The *London and Paris Observer* article was recently uncovered and published by Pemberton et al. (1996). The contents of the article appear to be a report not of Duncan's lecture to the Royal Society of Edinburgh but of a report of a talk given by James Grierson to the Literary and Antiquarian Society of Perth on November 22, 1827 (not 1828 as reported in Sarjeant, 1974). The Reverend James Grierson, M.D., was a member of the Wernerian Society of Edinburgh and was known to have been the historian of St. Andrews. Grierson accompanied Duncan on an expedition to the Corncockle Muir Quarry, to try to obtain additional specimens to send to Professor Buckland. This expedition must have taken place after Duncan's second letter to Buckland (July 2, 1827) and before his third letter (September 10, 1827). In the September 10, 1827 letter Duncan writes:

"I am happy to hear from you that the plaster casts have arrived, at last and that you are convinced that the impressions on the sand stone are actual footmarks, a conclusion which I am sure no one can avoid who has seen them in the quarry. Since receiving your welcome letter I made a visit to the quarry along with a party of friends. I brought away some other specimens, none of them, however, so perfect as those the casts of which I sent you." (Duncan to Buckland Letter of September 10, 1827, Oxford University Museum Archives).

The report published by Grierson (1828) details the circumstances of this trip and he clearly states *"Having spent a few days in that neighbourhood with Dr. Duncan of Ruthwell, who is in possession of the finest specimens that have yet been procured, and who was anxious to obtain some others for Professor Buckland of Oxford, with whom he had been corresponding*

on the subject, I went with him to the quarry to see the original deposit, [sic.] and, if possible, to procure a small slab for myself." (Grierson, 1828, p. 130). Although the *London and Paris Observer* article was considered to be the first scientific report of vertebrate footprints (Sarjeant, 1974) it is not. The Grierson (1828) article in the *Edinburgh Journal of Science* was published sometime in January 1828, just prior to the *London and Paris Observer* article. The *London and Paris Observer* report was reprinted in the journal *Arcana* (Anonymous, 1828b) and the *New Monthly Magazine* (Anonymous, 1829a). It was subsequently translated into French and published in the *Bulletin des Sciences naturelles et de Géologie de Paris* (Anonymous, 1829b). Additional early reports of the Corncockle Muir footprints appear in the *London Journal of Arts and Science* (Anonymous, 1828c), the *Gentlemen Magazine* (Anonymous, 1828d), the *Annales des Science Naturelles de Paris* (Buckland, 1828), and the *Magazine of Natural History* (K.N. 1829).

Unfortunately the Grierson article, one of the earliest reports of the Dumfries footprints, does not mention Henry Duncan by name. The only people identified are James Grierson and William Buckland. This may be why Buckland is commonly identified as the original finder of the footprints. To their credit, Buckland (1828, 1836) and Grierson (1828) always credited Duncan as the person who identified and interpreted the curious markings that Grierson so dramatically called the *"Foot-steps before the flood."*

THE REVEREND HENRY DUNCAN (1774–1846)

The Reverend Henry Duncan (Fig. 1A) clergyman, philosopher, writer, politician, archeologist, poet, artist, educator, ichnologist, social reformer, and the founder of savings banks, has to be considered a true "Renaissance Man." Duncan was born on October 8, 1774, at Lochrutton, Kirkcudbrightshire, a village that lies a few miles to the west of the town of Dumfries, Scotland. His father, George Duncan, was the minister of the parish and he could trace his descent on both sides to a long line of clerical ancestry. Details on the life of Henry Duncan are summarized from Duncan (1848), Blaikie (1888), Hall (1910), and Dinwiddie (1974).

Henry Duncan received his early education, along with his brothers, from a domestic tutor, and later attended Dumfries Academy for more formal training. At the age of 14, Henry Duncan was sent to St. Andrews University to study languages for two years. Subsequently, he was sent to Liverpool to join his two brothers to work as a clerk in the eminent banking firm Heywood's, under the tutelage of his relative Dr. Currie (the biographer of Robert Burns). However, Duncan was not suited for business and he left Liverpool in 1797 to study for the clergy, first at the University of Glasgow and later at the University of Edinburgh. In 1798 at age 24, he was ordained a Minister in the Church of Scotland, and since no position was available he spent time as a tutor in the Highlands. In 1799 he was offered three pulpits: Ireland, Lochmaben, and Ruthwell. Al-



FIG. 2. The Savings Bank Museum in Ruthwell.

though Ruthwell was the poorest post of the three, the lure of his home area took him there. As a minister in Ruthwell, his main concern was trying to help the poor.

Duncan was married twice. His first wife was Agnes Craig, who bore him two sons (George and Wallace) and a daughter (Barbara). They were married in 1804 and she passed away in 1832 during the great influenza epidemic. His second wife, Mary Lundie, was the widow of his good friend the Rev. Robert Lundie of Kelso and the mother of his second son Wallace's wife. They were married in 1836, and Mary Duncan proved to be an invaluable partner at a critical period of Duncan's life.

Henry Duncan is perhaps best known as the originator of the concept of savings banks. On the May 10, 1810, he opened his first ledger in the Society Room at Ruthwell, persuading the villagers to bank the little spare cash they had (Fig. 2). Owing to his great concern for the poor, he started his bank to promote financial independence for the common man. His bank proved a great success, and after a year he had deposits worth 151 pounds, a high amount considering the poverty of Ruthwell. The Bank paid 5% if the money was paid in regularly and left in for 3 years, but this was reduced to 4% if money was withdrawn. At least 4 shillings per annum had to be deposited in order to earn the interest, and though any amount could be paid in, interest was only paid on whole pounds. The cottage where the bank started is now a museum and can be visited year round at no charge (Fig. 2). During this time, Duncan traveled to London to lobby for the introduction of formal legislation in order to protect depositors. He was gratified when the legislation was passed and this led to the formal recognition of his banking system. Through the medium of his own newspaper, and by letter writing across the country, he publicized the details and success of the scheme, which was swiftly taken up elsewhere. Within five years, savings banks based on his model were operating throughout the United Kingdom. Eventually the concept was introduced on a global scale, and Henry Duncan is now recognized as the "Father of Savings Banks."

Other than his bank, Henry Duncan is also known for restoring the Ruthwell Cross, starting in 1818 when he discovered it

in pieces in the courtyard of the Ruthwell Church. The cross is 18 feet tall and dates from around the 7th century (Fig. 3). It had been broken as an idolatrous monument during the post-Reformation in 1642. Henry discovered parts of it buried and distributed around the church, and upon realizing what it was had it restored over a 20-year period despite the order for its destruction not having been rescinded. He spared no expense or time in finding all of the cross's fragments; in fact some had been incorporated into graves around the church. The restoration of the cross was finally completed in 1823. The cross is ornate with a sermon on the Life of Christ depicted in a series of carvings. During Duncan's lifetime the cross was located in the courtyard of the Manse, but later it was found to be suffering the ravages of Scottish weather, and a later minister, the Rev. James McFarlane, erected it in a specially built apse in the church, where it is currently housed.

Henry Duncan was a man of many interests and abilities. His interest in geology led to discovery of the first quadruped footprints to be found in Britain, and he presented a learned paper on the subject to the Royal Society of Edinburgh. His garden became a showplace in the district, as did the model farm he developed at the rear of the Manse. He was a talented

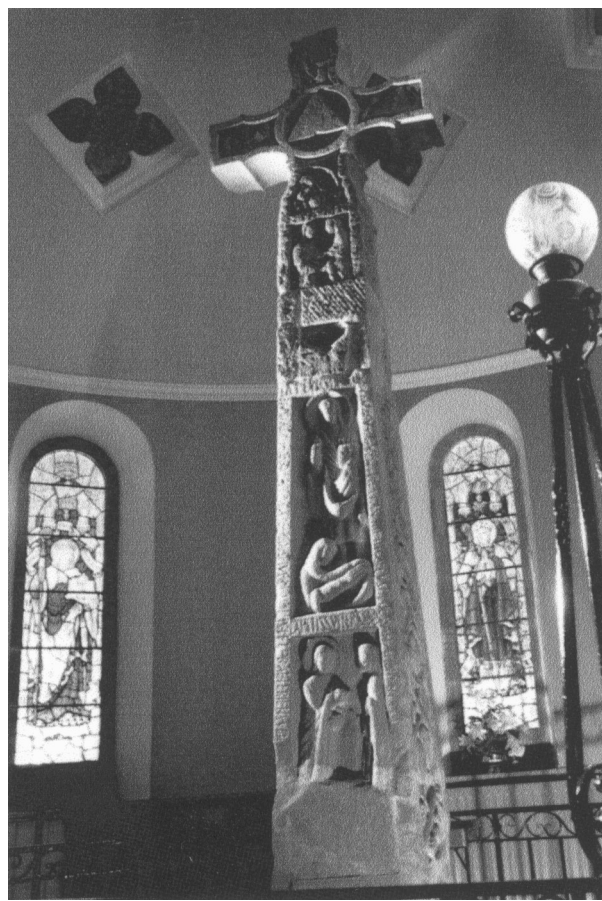


FIG. 3. The Ruthwell Cross discovered and restored by Henry Duncan starting in 1819.



FIG. 4. A. The memorial to Henry Duncan in the churchyard at Ruthwell, Dumfries. B. Closeup of the dedication on the Duncan Memorial.

artist whose drawings skillfully captured the Ruthwell of his time. Duncan was a fine writer who founded two excellent local newspapers (one was the *Dumfries and Galloway Courier*), not for narrow parochial reporting but rather to broaden the knowledge of his people by bringing world events to his remote corner of Scotland. He wrote a popular series of essays under the common title *The Cottage Fireside* and produced a highly acclaimed work in four volumes *The Sacred Philosophy of the Seasons*. As a poet, Duncan composed what is considered the best poem ever written on the sport of curling. Henry Duncan worked hard against unfair treatment of people wherever and whenever he saw it, and in 1823 the University of St. Andrew's awarded him the honorary degree of Doctor of Divinity.

As a clergyman, Duncan was a respected leader in the church and was appointed Moderator of the General Assembly of the Church of Scotland for 1839–1840. This coincides with a critical period in the history of the church, brought about by the increasing control that the government sought to impose upon the church. Such a situation was unacceptable to Duncan, who believed that the church worked through divine guidance and that interference by the state interrupted that divine authority. This growing problem erupted when the Law of Patronage conflicted with the right of a congregation to choose its own minister. It was an issue on which the church was deeply divided, and led to the Disruption in 1843 when those who could not accept government interference left the church. Duncan then walked out of a stormy General Assembly and into the new Free Church of Scotland. This meant that he also had to leave Ruthwell and his Manse, since it remained in the established church. These events imposed a radical change in his life, although he stayed on in the district at a cottage in Clarencefield. Regardless of a greatly depleted congregation, he built a new Free Church and Manse at Mount Kedar.

Duncan was invited to take a prayer meeting at Cockpool near Ruthwell in February 1846 when he was 71 years old. Ten

minutes into his sermon, he collapsed with a stroke, and was taken to his sister's home at nearby Comlongon. He died on February 12, 1846, and his son (Duncan, 1848) tells of a funeral attended by an immense number of people from many churches and all walks of life. An impressive memorial has been erected in the garden of the church to commemorate Ruthwell's most famous son (Fig. 4).

THE FOOTPRINTS

The Corncockle Muir footprints (Fig. 5C), originally incorporated into the wall of the Ruthwell Parish Manse (Fig. 6), eventually ended up in the collections of the Dumfries Museum (Figs. 5A and B), Oxford University (Fig. 5D), and the National Museum of Scotland (Fig. 5C). For details on the whereabouts of these specimens, see McCracken (1964), Delair (1966), Delair (1967), Bunyan (1983), and McKeever (1994a). The footprints were originally named *Testudo duncani* by Richard Owen in 1842; the generic name is a testament to his belief that turtles made the tracks and the specific name honors their discoverer Henry Duncan. They were renamed *Chelichnus duncani* by Jardine in 1850, who also assigned some of the Corncockle Muir footprints to the ichnogenus *Herpetichnus*. In 1853 Sir William Jardine (Fig. 7A) published a book that is probably the largest (about 2 ft. 6 in. x 1 ft. 6 in.), thinnest (17 pages), most lavishly illustrated (13 plates, all double-spread, all hand-colored), rarest, and most expensive in the entire field of ichnology, the *Ichnology of Annandale, or Illustrations of Footmarks impressed on the New Red Sandstone of Corncockle Muir*. In this volume, Jardine figured all of the specimens including *C. duncani* (Fig. 7B) and *Herpetichnus bucklandi* (Fig. 7C) in plates that were actual size, and hand colored. Buckland also figured the casts that Duncan sent to him in his Bridgewater Treatise volume (Buckland, 1836). It is now known that trackways from Corncockle Muir quarry include specimens

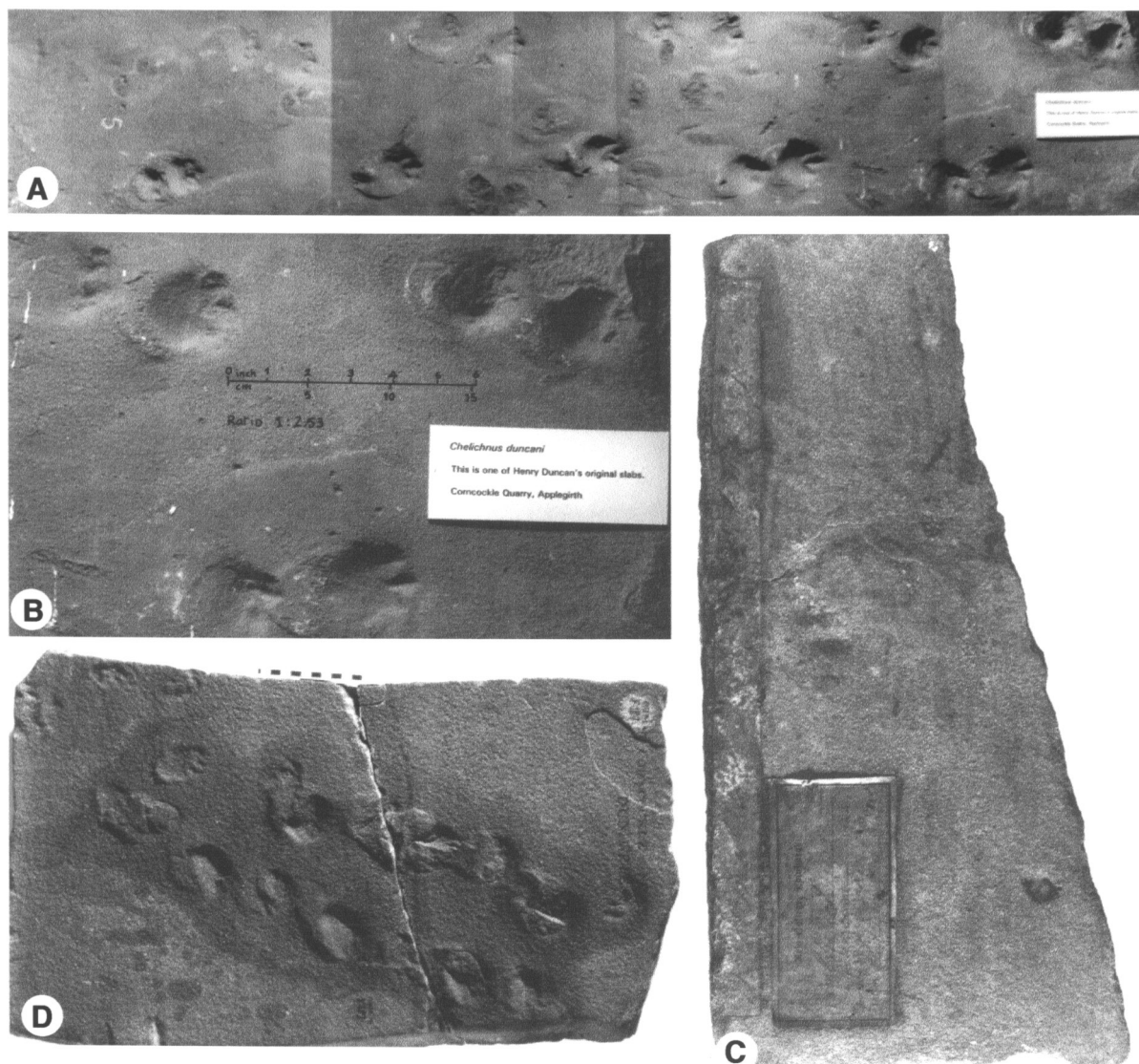


FIG. 5. Some of the original specimens described by Henry Duncan from Corncockle Muir quarry. **A.** One of Duncan's original slabs of *Chelichnus duncani*, Dumfries Burgh Museum Specimen 5. **B.** Close up of *C. duncani* from the slab depicted in A. **C.** *Chelichnus duncani*, part of original slab that was incorporated into the wall of the Ruthwell Manse by Duncan, National Museum of Scotland Specimen 1966.40.103. **D.** Specimen of *C. duncani* sent to Buckland from Duncan, Specimen F 187, Oxford University Museum.



FIG. 6. The Duncan Manse in Ruthwell where the footprint slab depicted in Fig. 5D was incorporated into the garden wall.

that represent the ichnogenus *Chelichnus* Jardine (*C. duncani*, *C. gigas*, *C. titan*, *C. ambiguous*, *C. pricei*, *C. plagiostopus*, and *C. locharbriggsensis*), *Herpetichnus* Jardine (*H. sauroplesius*, *H. bucklandi*, and *H. robustus*), *Batrachnus lyelli* (Harkness), *Actibates triassae* Jardine, *Cardiodactylum permicum* Delair, and *Prochirotherium truckelli* Delair (see Jardine, 1850, 1853; Delair, 1966, 1967; and McKeever, 1994a and 1994b).

SUMMARY

The Reverend Henry Duncan was a remarkable man, and among his many accomplishments he is considered the founder of vertebrate ichnology. His pioneer work on documenting and describing trackways from the Permian of Scotland represents the first scientific study of vertebrate tracks. The final word belongs to the eccentric William Buckland, who summed up

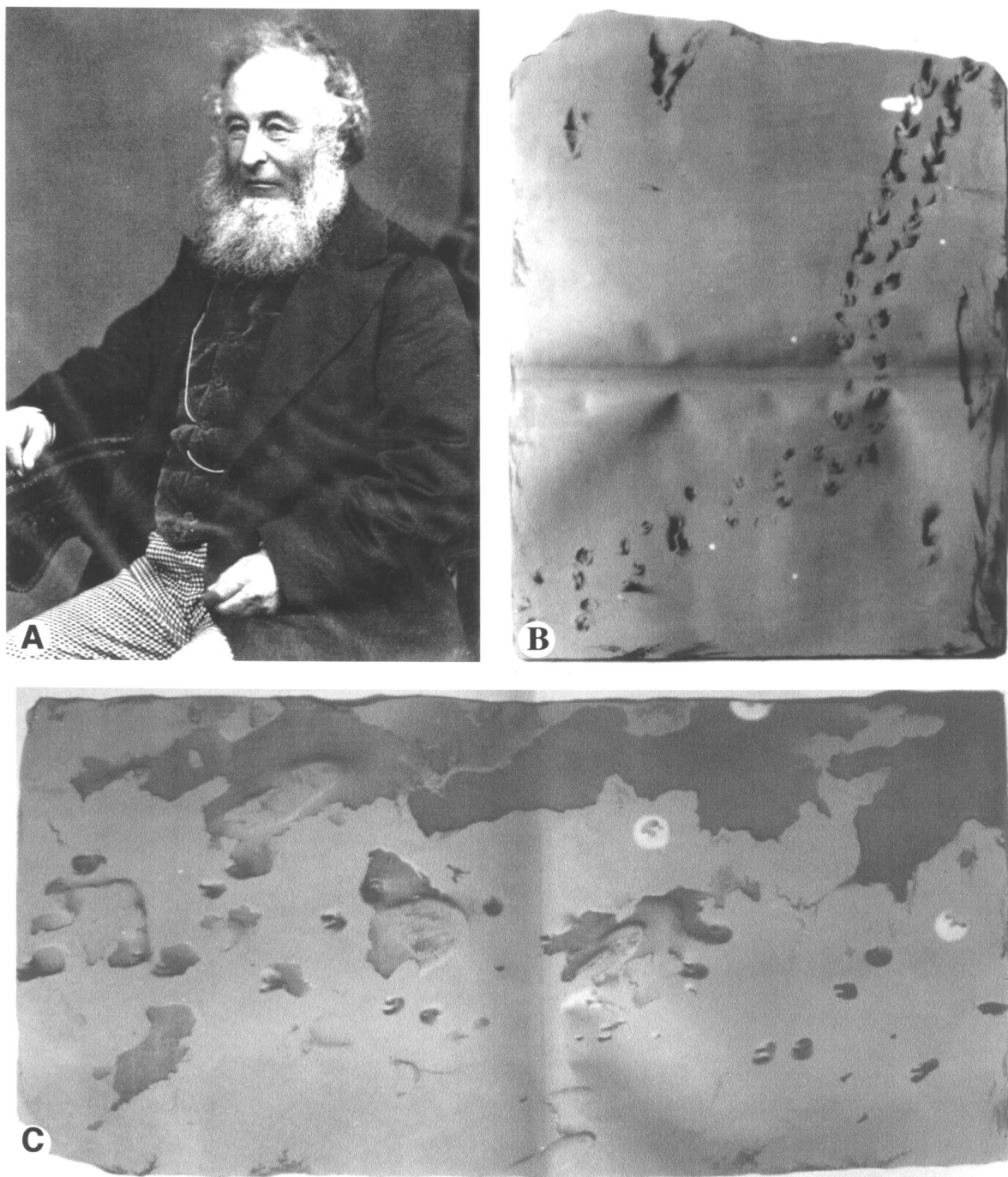


FIG. 7. A. Sir William Jardine. B. *Chelichnus duncani* figured as Plate 2 in the *Ichnology of Annandale* by Jardine (1853). C. *Herpetichnus bucklandi* figured as Plate 4 in the *Ichnology of Annandale* by Jardine (1853).

the discovery in his Bridgewater Treatise volume by remarking:

“The Historian or the Antiquary may have traversed the fields of ancient or of modern battles; and may have pursued the line of march of triumphant Conquerors, whose armies trampled down the most mighty kingdoms of the world. The winds and storms have utterly obliterated the ephemeral impressions of their course. Not a track remains of a single foot, or a single hoof, of all the countless millions of men and beasts whose progress spread desolation over the earth. But the Reptiles that crawled upon the half finished surface of our infant planet, have left memorials of their passage, enduring and indelible. No history has recorded their creation or destruction; their very bones are found no more among the fossil relics of a former world. Centuries and thousands of years, may have rolled away, between the time in which these footsteps were impressed by Tortoises upon the sands of their native Scotland, and the hour when they are again laid bare, and exposed to our curious and admiring eyes. Yet we behold them, stamped upon the rock, distinct as the track of the passing animal upon the recent snow; as if to show that thousands of years are but as nothing amidst Eternity—and, as it were, in mockery of the fleeting perishable course of the mightiest Potentates among mankind.” (Buckland 1836, pp. 262–263).

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