

# Transactions

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## JAMES FERGUSON, F.R.S.

James Ferguson, the astronomer, one of the most highly gifted men ever produced by the county of Banff, was born at Core of Mayen, Rothiemay, on April 25, 1710. The claim of being his birthplace has been made by the neighbouring parish of Keith, but it is proved both by oral testimony and documentary evidence that the astronomer first saw the light in Rothiemay. His father was John Ferguson [Fergusone, in his son's baptismal certificate] and his mother was Elspet Lobban, and one hundred years after his birth, with the help of an old map and landmarks students of his career were able to fix to within a few yards the spot where the humble cottage in which Ferguson was born was situated.

"What is poverty itself," asks Richter, "that a man should murmur under it? It is as the pain of piercing a maiden's ear, and you have precious jewels in the wound." That was Ferguson's experience. He was born in poverty. In the short and unpretentious sketch of his life which he has left us, he tells us that his parents "were poor, but religious and honest, lived in good repute with all who knew them, and died with good characters." Ferguson's father seems, indeed, to have been no ordinary man. He was self-taught, and he was his children's schoolmaster. When his twelve hours' day was finished in the fields or at such toil as hedging and ditching, he would pile the logs on the fire to supply the needed light and teach his boys what little arts of learning he himself had mastered, and by tuition of the kind, together with the assistance of a good-natured dame in the neighbourhood, young Ferguson was enabled to read and write with tolerable ease. Three winter months later at Keith school, under John Skinner, the worthy schoolmaster of the day, completed his early education and at the tender age of nine James was sent out to make his own living. He became a herd to a neighbouring farmer, James Glashan, who farmed at the place now known as Braehead. To the everlasting credit of his master, be it said, he

took the kindest interest in the boy, whose mechanical genius was already awakened, placed books and maps at his disposal, and gave him every encouragement possible. In wet and stormy days he would afford him the shelter of the barn or stable, give him writing materials, and let him draw diagrams, models and maps to his heart's content. Let James Glashan be given then a word of praise for what he did for the boy who was put in his care. His monument may be seen to this day. Upon a table-shaped stone in the churchyard of Keith there is the inscription that it was "erected in memory of James Glashan, late residenter in Keith, who was born the 11 day of Dec. 1686 years and died the 9 day of January 1771 years, in the 85th year of his age." It was of James Glashan that Ferguson said—"I shall always have a respect for the memory of this man." Ferguson as we have seen was employed as a servant upon his farm of Ardneedlie, later incorporated in Braehead, and he wrote of him that "My master gave me more time than I could reasonably expect, and often took the threshing flail out of my hands and worked himself, whilst I sat by him in the barn, busy with compasses, ruler and pen."

He did not know it, but young Ferguson was in process of making himself. With only the simplest tools at his command, the lad would carve and make different sorts of mechanical toys. One winter he set himself to make a clock, and we have the assurance that he made a success of it. When the marvels of astronomy first attracted him, all the passion of a vehement nature was concentrated on the study. He had no books to guide him, no friends to advise him, but for nights and nights together this herd laddie would lie in the open fields with a blanket round him mapping the stars, following their course by means of a stretched thread and beads strung upon it. The implements he employed were rough, but they were the best he had; the results of his investigations were perhaps meagre, but they served their purpose. They fired his imagination, filled his mind with wonder and admiration, and enabled him to take fullest advantage of

the good offices of encouraging friends who came forward at this juncture to help and stimulate him. A happy chance threw him into contact with Alexander Cantley, a man of humble circumstances but of rare natural ability, of whom Ferguson, after he had attained a position of eminence, wrote—

“He was the most extraordinary man I ever was acquainted with, or perhaps shall ever see, for he was a complete master of arithmetic, a good mathematician, a master of music on every known instrument except the harp. He was conversant with Latin, French and Greek. He let blood extremely well, and would even preside as a physician upon any urgent occasion. He was what is generally called self-taught. But I think he might with much greater propriety have been called God Almighty’s scholar.”

To Ferguson’s grief, Mr Cantley left Achoy-naney and went into the service of the Earl of Fife. Young Ferguson then went to a miller, who “liket a dram,” and he left after a year’s stay. He next went into the service of a doctor by whom, he says, he was badly treated, and he returned home in ill-health, and employed his leisure in making clocks. By day he worked at manual labour, snatching at what spare moments he could to turn out mechanical contrivances of various kinds; at night he turned to astronomy, or studied mechanics, hydrostatics, and electricity. It was in the odd moments of busy days and nights that at this time he made a wooden clock, acknowledged by all who saw it to be a work of genius. The bell on which the hammer struck the hours was the neck of a broken bottle, and it is on record that the time-piece worked with perfect regularity. Mechanics and ingenious men straggled in from many parts to see the wonder. One of the visitors showed him a watch, the first he had ever seen. He asked to be allowed to examine it, and, in a month’s time, he made a duplicate, with wooden wheels and a whalebone spring. He sought to keep the wolf from the door by clock-cleaning—he cleaned a clock for one shilling, oiled it for one penny. Some of the clocks he had made he took to Sir James Dunbar of Durn, Portsoy, and here was the turning point

in his life. Sir James set him to clean clocks about the district, by which he made some little amount of money. The lady of Dipple came on a visit to Durn, and asked him whether he could draw patterns for needlework on aprons and gowns. He did several for her, and he was sent for by other ladies for the same purpose. He afterwards went and stayed with William Baird of Auchmedden. Here he painted more pictures. He next moved to Edinburgh, where he was offered one year's, afterwards extended to two years', free lodging from Lady Dipple and Mr Baird, who thought he had a genius for painting. He painted in Edinburgh for two years, where he indulged an inclination to study anatomy, surgery, and physic. At the end of the second year he came home, thinking himself qualified for a doctor, but he found that his medical theories and study were of little use in practice, while very few paid him for the medicines they received. He went to Inverness where his thoughts turned to the stars again; in 1739 he returned to Edinburgh, and in the same year he married Isabel Wilson, a native of Grange.

In 1743 Ferguson went to London, where he remained for the remaining 33 years of his brilliant career. His fame had gone before him, and once the door was opened, his genius smoothed the path of progress. Before this he had made an orrery which showed the sun's motion round its axis and the motions of the earth on its inclined axis. In 1744 he submitted to the President of the Royal Society a contrivance for showing the path of the moon. In 1747 he published a dissertation on the phenomena of the harvest moon, with the description of a new orrery. In the following year he began to read lectures on the eclipse of the sun on 14th July of that year, and followed this up with other works. It was not until 1760, when he was 50 years of age, that he could dispense with the manual work which had kept the wolf so long from the door. About that time his circumstances became easier. In 1762 the King gave him a pension of £250 a year, and in the following year he was elected F.R.S. He lectured a good deal throughout England, and his works of science held a first

place in learned societies in this and other countries. They were for long standard textbooks. He died on 16th November 1776, and was buried in old Marylebone churchyard. The obituary notice of the "Times" refers not only to his genius, but to his engaging simplicity of manner, and his uncommon share of humility. It also set forth that his whole deportment was consistent with what he professed to be—a sincere believer in the Christian faith. The London "Morning Post" and the Edinburgh "Caledonian Mercury" styled him "an Israelite in whom there was no guile." The inscription on his tombstone is—"Here is interred the body of James Ferguson, F.R.S., who, blessed with a fine natural genius, but unwearied application (without a master), attained the sciences. Astronomy and mechanics he taught with singular success and reputation. He was modest, sober, humble, and religious, and his works will immortalise his memory when this small monument is no more. He died, 16th November 1776, aged sixty-six." Ferguson, it may be added in a word, had one brother and four sisters. The brother was John Ferguson, who remained in Rothiemay, was an elder of the kirk there, and died in 1796. Of the sisters, one of them, Janet, was with her brother in London when he died. A Life of the Astronomer was written by Dr Ebenezer Henderson, Edinburgh. It was published in 1867, and a second edition was issued three years later. His own principal literary works are Astronomy explained upon Sir Isaac Newton's Principles (1756; 13th edition revised by Sir David Brewster, 2 vols. 1811), and Lectures on Mechanics, Hydrostatics, Pneumatics, and Optics (1760; also edited by Brewster, 1805).

The public museum at Banff is rich in relics of Ferguson, acquired by purchase from his biographer. They include some of the instruments he used, MS. of some of his works, and copies of first editions of some of his publications. Ferguson's watch is here, also his telescope, the latter described as "Telescope made and used by Ferguson during his younger years. This instrument continued to be much valued by the astronomer up to his dying day." In the museum are also astronomical

data which are the work of Ferguson. One of the papers is described—"Equation table, all done with the pen, and adapted to the second year after Leap Year, showing to the nearest full minute how much the sun is faster or slower than the clock." Another has the description—"This article shows the days of all the mean new and full moons and eclipses of the sun and moon for 12,000 years"; and another to which is attached a note to the effect that it was Ferguson's last work, having been executed by him shortly before he died, is described as "a table of the equation of time, showing how much the clock should be faster or slower than the sun every day in the year. By James Ferguson, F.R.S. A.D. 1776." There is a copy, too, of Ferguson's first astronomical rotula, published at Edinburgh in 1741. It is said that "this rotula, among other ingenious and most interesting matter, shows the first day of every month for ever." There is also in the museum a faded photograph of the astronomer. It was gifted to the institution in 1879, by Mr John Mackie, Buckie, who could claim Ferguson as "a maternal ancestor of mine." The purchase of these and other relics took place in 1865, and the fact was noted as an item of news in the "Banffshire Journal." The notice met the eye of Mr Mortimer Clark, W.S., Toronto, Canada, who sent a letter to the office of the "Banffshire Journal" mentioning that, observing the efforts made to collect memorials of Ferguson, he begged to convey information as to where certain valuable MSS., which had belonged to Ferguson, were to be found. He stated that in the cellar of Messrs Scott Moncrieff and Dalgety's office in Edinburgh, there would be found the commonplace book of Ferguson; and in a book-case in the same office would be found a work of his on astronomy in MS. These books, Mr Clark mentioned, he had seen and frequently examined during his leisure hours, when in Edinburgh. A search was made in the office in Edinburgh and these articles were duly discovered, and although an effort was made to add them to the collection in the chief museum of Ferguson's native county, they were deposited, in course, in the University Library, Edinburgh.

In August 1907, largely through the efforts of the late Mr James Geddes, M.A., school-master of Rothiemay there was erected at Milltown of Rothiemay a memorial to Ferguson and his early patrons, in the form of a "standing stone," over 10 feet high, showing the signs of the zodiac, and with the name of the astronomer and the dates of his birth and death, also the legend that "This stone also commemorates his early patrons and friends in Keith, James Glashan, Ardneedly; the Rev. John Gilchrist; John Skinner, school-master; Thomas Grant of Achoynany, and Alex. Cantley, butler, Achoynany." The memorial was unveiled by Dr Joseph Ogilvie, himself also a distinguished native of Rothiemay, who recalled how "a son of this soil, a native of this parish, though born and bred in comparative poverty, had, from the impulse of genius, courage enough, perseverance and ability enough, to go out into the world, and work his way upwards till his name became one of the best known among scientific men in London." He noted how during Ferguson's period of service with James Glashan, "when the day's work is done and the darkness of night has come on, we find the boy lying on the hillside wrapped in a blanket, with a candle near him, and a string of beads stretched at arm's length between him and the stars. The beads were shifted along the string till each hid a star, and then the string was placed on a sheet of paper, and by the light of the candle, the stars were marked off in their relative positions—perhaps the most curious celestial map ever made in such an observatory and with such apparatus." When he went to London, and was winning the abounding reputation he came to enjoy, he was several times commanded to appear before the King at Kew in order to show and explain his various inventions. From this time to his death, Dr Ogilvie continued, "Ferguson was busily engaged in making all manner of machines—clocks, orreries, sundials, tide-forecasting contrivances, new pumps and mills; in lecturing on astronomy and various branches of natural philosophy in London, Bath, Bristol, Liverpool, New-

castle, and elsewhere throughout England; in observing transits and eclipses, of which he sent reports to the Royal Society; in computing and compiling astronomical and other tables; and in issuing publications almost numerous enough to form a small library. To Ferguson belongs the credit not so much of advancing the science of astronomy as of popularising it. Ferguson was not a mathematician, and the higher flights of theoretical astronomy were beyond his reach; he was not a maker of telescopes like Herschel, and, as he was not attached to any observatory, the part of the purely practical astronomer was closed to him; but the exposition of astronomy in a style to suit the average understanding was a task worth undertaking, and it was by him worthily undertaken and successfully accomplished."