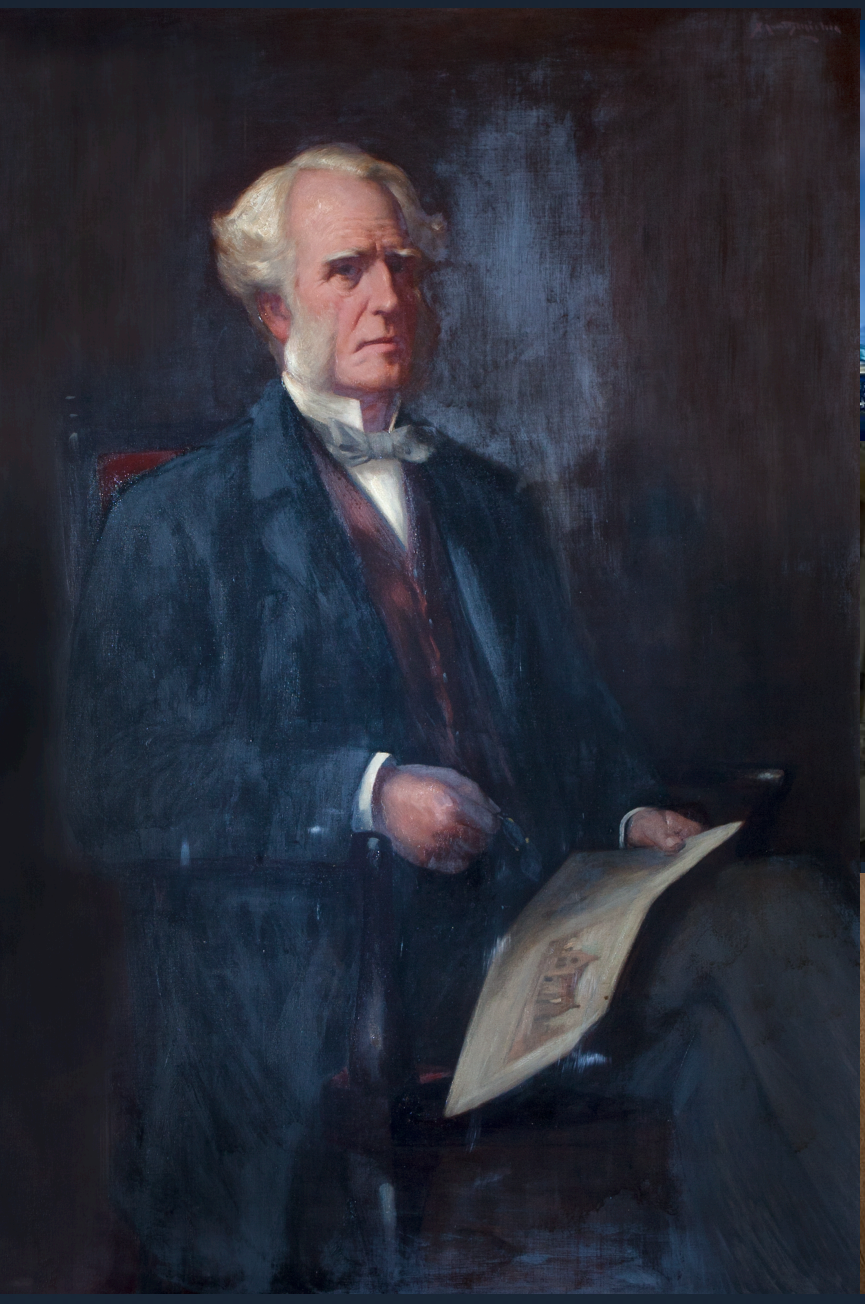
A vision of sustainable energy becoming reality: 136 years, 1 month and 6 days later.

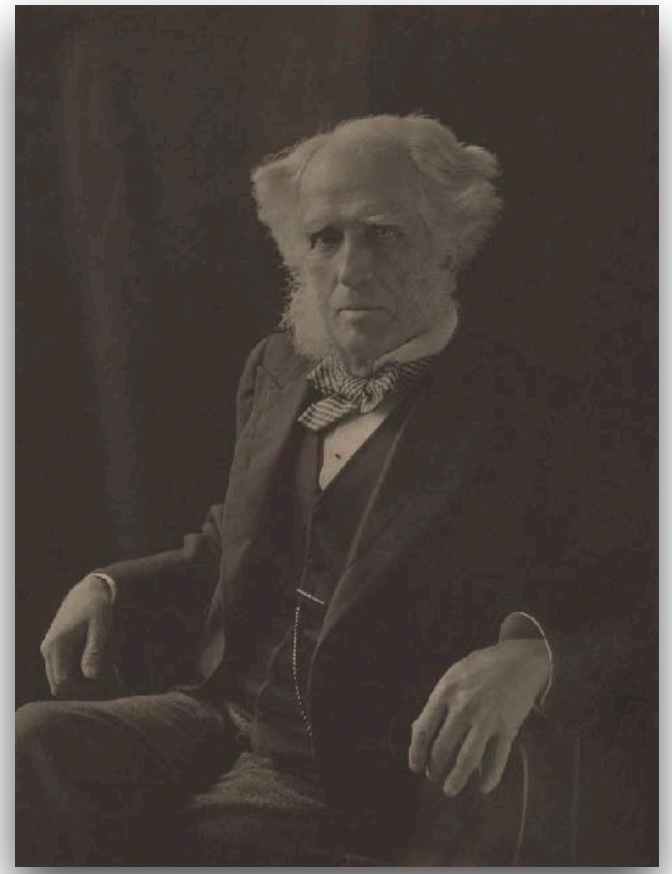
The Warksburn Old Church Project



First Of A Kind conversion of a former church into a smart energy home, to 21st Century Passivhaus standards.

Nearly one and a half centuries after the Victorian visionary who funded it first described the renewable generation & storage of electricity.

Part 1: Somebody important said something important, at an important event, quite a long time ago



On 8th November 1887, in the year of Queen Victoria's Diamond Jubilee, an eminent engineer, George Barclay Bruce, was formally installed as the President of the Institution of Civil Engineers (ICE) in London.

At the height of Britain's imperial and industrial dominance, this made him probably the most influential engineer on Earth. That's him, looking every bit the 'Eminent Victorian' in the photograph. *Image © National Portrait Gallery, London, used with permission under licence.*

As befits the figurehead of his profession in the 'heroic age' of engineering, Bruce had a direct connection to the high priests of the Industrial Revolution. George Stephenson had sent his son Robert to be educated at Newcastle's Percy Street Academy, which was run by Barclay Bruce's father. Working with his own father, Robert Stephenson built arguably the single most important machine in history, the 'Rocket' locomotive which truly ignited the Industrial Revolution on the world's first intercity railway from Liverpool to Manchester.

Having known him since childhood, Robert Stephenson later appointed Barclay Bruce as Engineer in Charge of one of the iconic projects of the era of coal and steam: the Royal Border Bridge at Berwick; the vital link between England and Scotland on the East Coast Main Line from London to Edinburgh.

George Barclay Bruce went on to build railways on five continents, cementing an engineering reputation which culminated in him giving the Presidential Address to the ICE, from what he calls "the highest seat a civil engineer can occupy". It is no surprise that the speech acknowledges his "revered Master, Robert Stephenson." However, given that the vast majority of his engineering career had been building the coal-fired railways of the Great Age of Carbon, the words Barclay Bruce speaks from the Presidential Chair of the ICE on 8th November 1887 are truly astonishing and genuinely visionary. Speaking of the (then) "unknown perhaps unknowable thing, electricity" he says:

"Electricity is to us now light, heat, and power. Our streets and beacons shine with it, it signs and speaks for us around the world, across the desert, and beneath the ocean ; and when we shall have learnt the way of storing up in a more efficient and financially successful manner, the unemployed forces of nature such as the winds and streams and tides which can be so readily converted into electrical energy at trifling cost, then will it become a factor in the world's life compared with which the present is as nothing." *[ICE Minutes of Proceedings, Session 1887-88 - Part 1, Sect. 1]*

These words make George Barclay Bruce the first senior engineer on the planet to articulate the concept of the renewable generation and storage of electricity. A man truly ahead of his time: a visionary, foreseeing the key technologies of Net Zero well *before* 'peak coal' had even been imagined.

Well, as it turned out, 136 years, 1 month and 6 days after George Barclay Bruce's presidential address to the ICE, on 14th December 2023, we had the privilege of being able to transform his vision of a sustainable energy future into a powered reality.

And, in an extraordinary twist of history, we were able to achieve this in a building which Barclay Bruce had himself funded, even longer ago, in 1875.

Part 2: Sir George decides to build a church

For Eminent Victorians of a clean living and God-fearing persuasion, bankrolling religious activity was a thing. George Barclay Bruce was that way inclined. After he returned from a stint in India where he shocked the Empire establishment by insisting on actually *paying* the Indian workers building his railway, and did the God thing for several decades, both before and after he was knighted by Queen Victoria in 1888, as his year in the ICE Chair came to an end.

Sir George's particular interest was funding the unification of the Presbyterian churches in England, which later became the United Reform Church (URC).

When this eventually occurred in 1875, he built a church in Wark-on-Tyne, near Hadrians Wall in rural Northumberland, to celebrate the momentous event.

Close examination of the portrait which hangs in the URC theological college, shows George to be holding an architect's sketch for this very church in his left hand. *Detail on this page and Portrait of Sir George Barclay Bruce on cover sheet used by kind permission of the Archivist, Westminster College, Cambridge.*

While he was at it, George also funded the construction of a house immediately next door for the Minister serving the church. An inscription near the church door records these events as shown below.

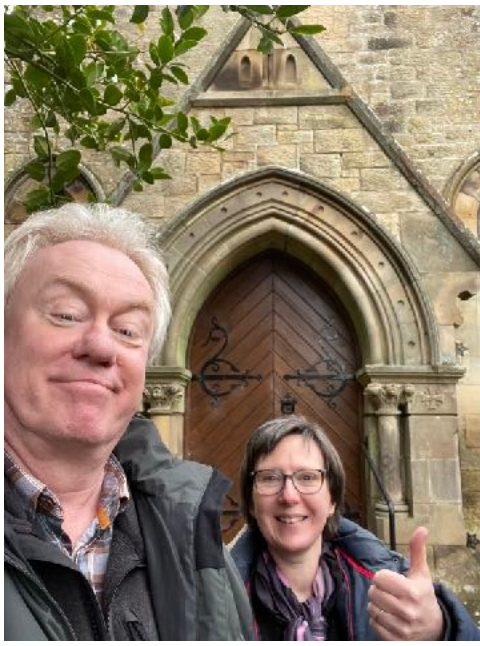
Memorial Stone
Laid by
Mrs George Barclay Bruce
29 May 1875
The Church and Adjoining Manse Being
The Gift of her Esteemed Husband

Although, with classic Victorian sexism, the stone refers only to 'Mrs George', her Esteemed Husband did at least have the foresight to tell his architect to include two large gable end windows.

These were later retrofitted with stained glass memorials to Helen Norah (his wife) and Annie Louisa (their daughter), both of whom died before Sir George himself expired, aged 87, in August 1908.

Part 3: Converting the church and bringing Sir George's sustainable energy vision to life

On 31 December 2019, the United Reform Church in Wark closed, the upkeep and heating of a cold, draughty, and increasingly leaky Victorian building having become unsustainable for the aging and dwindling congregation.



That's where we come in. We're Anne and Alan James and we bought the church, which happens to be located in our front garden. Since 2002, we have lived in the former Manse, now Warksburn House, immediately next door. So we already had a connection to George Barclay Bruce, but we didn't know it when we first moved in to the house which he had funded in 1875.

Oddly, there's another level of connection too, Alan has also spent much of his career in railways and other forms of ground transportation, including 300 km/h high speed trains, 500 km/h maglev and 1,000 km/h hyperloop, all of which George himself would probably have found quite exciting.

Long story short, we've shaped Warksburn House over the years to suit our needs. Alan's office is above the old meeting room once used by the congretation. Anne James Ceramics operates from the solar-powered studio we've built in the back garden.

It is with our solar installation that the truly uncanny aspect of our connection to George Barclay Bruce begins. Over time, we just happen to have turned the old Manse into one of the most sustainably-powered homes in the UK. But we didn't know the Barclay Bruce history whilst we were doing it; didn't know that the man who had 'seen it all coming' had actually paid to build the house we were converting to renewable generation.

And we still didn't have the full detail, even when we published *How to Electrify Your Life, Save Loads of Money and Save the Planet* [electrifylife.co.uk], which shares our energy data and the "how to do green stuff" knowledge we've picked up along the way.

But when we bought the church in March 2021, we unearthed the memorial stone and started doing in-depth research. That's when we discovered that the person who had originally paid for the construction of our home, and of the church we had just bought to save from dereliction, had foreseen the Age of Renewables as long ago as 1887. He had spoken of "the unemployed forces of nature" being turned into electricity "at trifling cost".

We had spotted that too. The very large south-facing roof Sir George had so thoughtfully provided for us gets a huge amount of sunshine, even in the depths of winter. So a large solar array was a great starting point for our plan to make Warksburn Old Church one of the most energy efficient buildings in the world.

Switch on: 14 December 2023

On 14 December 2023, the Warksburn Old Church solar array, generating energy from “the unemployed forces of nature” was connected to the inverters which convert its DC generation into AC power usable in the building. That was precisely 136 years, one month and six days after George Barclay Bruce first expressed the concept of renewable generation, on 08 November 1887.

And, fully 148 years, six months and fifteen days since Helen Barclay Bruce laid the memorial stone at the front door, the solar array sent power to the batteries in the plant room we have built in the basement, where the coal which fired the carbon-intensive original church heating was once stored. Down in the cellar, we’re realising Sir George’s vision of “storing up [electrical energy] in a more efficient and financially successful manner.” We’re delighted to acknowledge the great work by Steve Duckworth Electrical in installing the solar array, the Tesla Powerwall batteries, and the associated control equipment.

Opening Autumn 2024 as a luxury holiday rental property.
Experience low energy living at Warksburn Old Church

Simply producing and storing energy is not, of course, enough. To truly make a difference in the epoch-defining battle for Net Zero, it is essential that we all massively reduce the overall energy which our buildings consume in the first place. That’s explains the mountains of insulation in picture above.

That’s why Anne and I are “turning it up to eleven” with the GreenTech at Warksburn Old Church. With the help of a great team, led on site by David Reed, our truly perfectionist builder (of whom Sir George would undoubtedly have approved!) we are converting the church into a three bedroom holiday let, using the extremely demanding Passivhaus retrofit *EnerPHit* standards for super-insulation, airtightness, and drastic reduction of primary energy consumption. When completed, we understand that our project will be the first Church-to-Domestic Passivhaus conversion in the UK, possibly the world.

At Warksburn Old Church, we have the privilege of be able to bring George Barclay Bruce’s vision of sustainable energy to life, in a building which he himself funded nearly one and half centuries ago.

Once the build is complete, it would be our pleasure to welcome you as a guest to Warksburn Old Church from Autumn 2024, when it starts its new life as a luxury holiday rental, designed and equipped to the highest standards. If you’d like to experience of the world’s most sustainable ultra-low energy homes, in Northumberland’s historic and beautiful Hadrians Wall country, just drop us an email.

Enquiries & reservations: info@warksburnoldchurch.com

Follow project progress at: instagram.com/warksburn_old_church/