

Celebrating the Bicentenary of the World's Oldest Road Suspension Bridge

A View from the Bridge

for the Friends of the Union Chain Bridge

July 26th 2020



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Friends' Chairman Robert Hunter celebrates a great engineer and his greatest achievement

"The crowds on that summer's day witnessed the start of a revolution in bridge building"

"On Wednesday 26th July 1820

a remarkable event took place in a sparsely populated region of the United Kingdom which would have an immense impact on the lives of millions of people around the world right up to the present day. Precisely one year after the foundation stone was laid, the Union Chain Bridge was officially opened, crossing the River Tweed and the border between England and Scotland, five miles west of Berwick-upon-Tweed. Eye-witness accounts estimate a crowd of over two thousand people came to mark this occasion and witness history in the making,

What they came to see and celebrate was the start of a revolution in bridge engineering. Captain Samuel Brown's radical design was to be the first transport-bearing suspension bridge in Europe and, at its completion, the longest suspension bridge in the world. It would enable crossings previously considered impossible to be bridged, bringing communities together and developing economies. The use of his chains (originally designed for ships' anchors) suspended from a platform, completely transformed how bridges were built. They could be erected quickly, across wider spans than a masonry bridge, at a fraction of the cost. Captain Brown's estimate for building the Union Bridge was £5000; a masonry bridge would



have cost at least £20,000 and involved the erection of a number of stone piers in the water with the obvious headaches that would cause

The crowds who thronged the

river bank and sat in boats on that summer's day, rather like the crowds who watched the launching of space rockets from Cape Canaveral 150 years later, were in awe of the events before them but also had a certain amount of scepticism that this was possible. To win the trust of the spectators that the Bridge was safe, Captain Brown went across the Bridge in his carriage followed by twelve double-horse carts laden with stones to prove its strength. These were then followed by the Earl of Home, the Commissioners of Roads, preceded by the Bands of the Berwickshire and Northumberland militia playing the

National Anthem. This won the trust of the crowds, who then swarmed across the Bridge and so it has been in use ever since. A number of prominent engineers of the day such as Robert Stephenson and John Leslie were in attendance. A few years later,



a young, Isambard Kingdom Brunel would visit, such was the fame of the Bridge at that time.

Quite why this part of the Tweed was chosen for the siting of this revolutionary structure is still largely a mystery. The nearest bridge to the east was the remarkable 17th century bridge at Berwick and to the west, the Smeaton bridge at Coldstream which was completed in 1763. So a crossing at Horncliffe/Fishwick would save a round trip of 14 miles when the ford was unusable. It is likely that one of the principal drivers was to transport coal and lime from the Northumberland pits to Berwickshire to improve the farmland of the area.

In the world before Covid-19, we had planned celebrations to mark the Bicentenary and welcome esteemed bridge engineers from around the world to deliver a series of lectures at our Symposium. Sadly, events contrived that this was not to be, but we have published a small book bringing together those lectures as a lasting reminder, if one was needed, how significant this Bridge is to the history and development of suspension bridges around the world. A copy of the book is being sent to all Friends. I would like to take this opportunity to thank all who have contributed to the publication but in particular, one of our Patrons, Professor Roland Paxton in organising this fitting testimony and also for all his support over many years.”

The image of Capt Sir Samuel Brown – the only known portrait of the engineer – is reproduced with acknowledgement to Royal Pavilion and Museums, Brighton and Hove, and The Paxton Trust

Our Cancelled Bicentenary Events

Very sadly, the several Bicentenary events we, and the Project Team, had been organising for several months, were seriously affected by the Covid-19 restrictions. The Project Team’s update (opposite) sets out the way in which their own plans have been affected and how they intend to compensate for the abandonment of on-site celebrations.

The Friends’ arrangements included two high-profile events, both of which have been cancelled because of Covid-19. For several months, one of our Patrons, Prof Roland Paxton, had been assembling a panel of distinguished speakers from the UK and internationally to “publicly celebrate, advance knowledge and inform the future role of Capt Samuel Brown’s innovative masterpiece” at a Symposium to have been held in Horncliffe on the 26th July. Speakers from the USA, Japan, and Norway as well as the UK – including our Trustee, Stephen K Jones and our first Chair, Heather Thompson of the Honey Farm- would have presented talks on a variety of Bridge-related topics but, fortunately, they had all submitted synopses of their planned talks and we have published them in a Bicentenary book which Robert Hunter mentions above and **which we are distributing to all Friends with this Newsletter as a remembrance of a Bicentenary blighted by the pandemic. Further copies of the book are available for a limited period at £5 each plus £1.50 postage, from the Friends See also the article on the ICE/ASCE/JSCE plaque, on page 4.**



The other major event planned to mark the bicentenary was a celebration concert organised within the Music at Paxton Festival on our behalf by Angus Smith, Artistic Director and Liz McDonald, General Manager. The fact

that the last day of the Festival was the actual date of the Bicentenary seemed too good to let pass by and when we discussed this happy coincidence with Angus and Liz they responded enthusiastically with a wonderful programme of



early 19th century Scottish music to be played by *Concerto Caledonia*, concluding the evening and the bicentenary with a ceilidh in the Paxton marquee. What could have been a more appropriate conclusion; what venue could have been more

fitting than Paxton House, overlooking the Bridge and frequented by Samuel Brown and William Molle, the Chairman of the Bridge Trustees? What could possibly go wrong? Well, the rest is, or will shortly become, we hope, history. But we are most grateful to *Music at Paxton* for all they had planned to do for us and we very much hope that we will be able to organise the planned concert in 2021. **Watch out for further details.**

PROJECT TEAM REPORT



The Union Chain Bridge Project Team, which has continued to meet regularly by remote means during the Covid-19 restrictions, includes representatives of Northumberland County Council, Scottish Borders Council, Museums Northumberland,

the Conservation Architects (Spence & Dower), the Project Managers (Turner & Townsend) and the Friends’ Chairman, Robert Hunter

Restoration project Covid-19 delays.....



Although we hope that the Contract for the restoration of the Bridge will have been signed by the time this Newsletter is circulated, the “procurement process” for letting the Contract was delayed because of the impact of Covid-19. The Project Team have been working with the preferred contractor to agree a works programme to take into account the Covid-19 working restrictions and the precautions that will need to be in place on the site. They remain hopeful that works will start on site during this summer. Meanwhile, the Project Team has been preparing the education and community engagement activity programme and adjusting it in the light of Covid-19 restrictions so that this part of the Project can start once it is safe to do so.

...and Bicentenary Virtual Celebrations



For the Bicentenary, the Project Team’s celebrations, which would have run alongside the Friends’ own Symposium and Concert, have been forced to move from on-site events to a virtual celebration. A range of online activities and resources is being developed to bring communities together and to increase interest in the Bridge, the restoration scheme and the Bicentenary.

Meet the Activity Plan Project Team



The Project Activity Plan Project Team is now in place, based at Berwick Museum and Art Gallery. :



Matthew Storey, Audience Development Manager

Matt is Audience Development Manager at Museums Northumberland, responsible for overseeing the delivery of the heritage, interpretation, and STEM (Science, Technology, Engineering and Maths) content of the Bridge project. An experienced museum professional, Matt was previously Head of Transformation for Middlesbrough Museums Service and has also held roles at Sunderland City Council, Bede's World, Jarrow and National Glass Centre, Sunderland. He is a Trustee at Bailiffgate Museum and Gallery in Alnwick.



Rebecca Cooper, Learning and Engagement Officer (STEM)

Rebecca is responsible for the delivery of the Bridge STEM Learning Programme for first, primary and middle schools in north Northumberland and the Scottish Borders. Rebecca has a background working in tourism and science communication in north Northumberland and the Scottish Borders. Previous roles have included working at Kielder Observatory, Berwick Film and Media Arts Festival, English Heritage, and the Flodden 1513 Eco-museum.



Carol Whinnom, Learning and Outreach Officer

As Learning and Outreach Officer for the Bridge project, Carol is responsible for the day-to-day delivery of components of the Activity Plan ensuring that the project outcomes and outputs detailed in the Activity Plan are achieved. Carol has over 25 years' experience in education, from teaching music in primary schools to being Head of Expressive Arts faculties in secondary schools, via Pupil Referral Units, initial teacher-training for the Open University and running community activities.

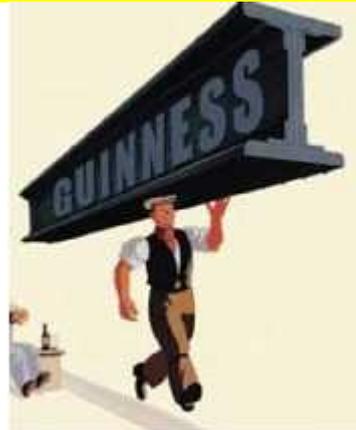
Union Suspension Bridge – Notes by Professor John R Hume

Professor John R Hume, Scotland's "father of industrial archaeology" and formerly Chief Inspector of Historic Buildings with Historic Scotland, has very kindly donated to the Friends a number of copies of his illustrated booklet on the Bridge which he has produced in celebration of the Bicentenary. It is entitled *Union Suspension Bridge, Hutton, Scottish Borders and Northumberland, Notes by John R Hume* and, while stocks last, is available from the Friends on receipt of an A5 SAE. We are very grateful to Prof Hume for his generosity in producing this little gem of a volume based on his pioneering work of the 1970s.

Union Bridge and Menai Bridge – two bridges of world significance

John W Burrows, a friend of the Friends, has very kindly supplied us with a number of copies of his detailed article on the importance of the Union and Menai bridges, based on a larger research paper he has prepared for publication. While stocks last, we'd be happy to send a copy to Friends on receipt of an A5 SAE. We are most grateful to John Burrows for this gift and for his interest in promoting the Bridge.

We're in the Guinness World Records!

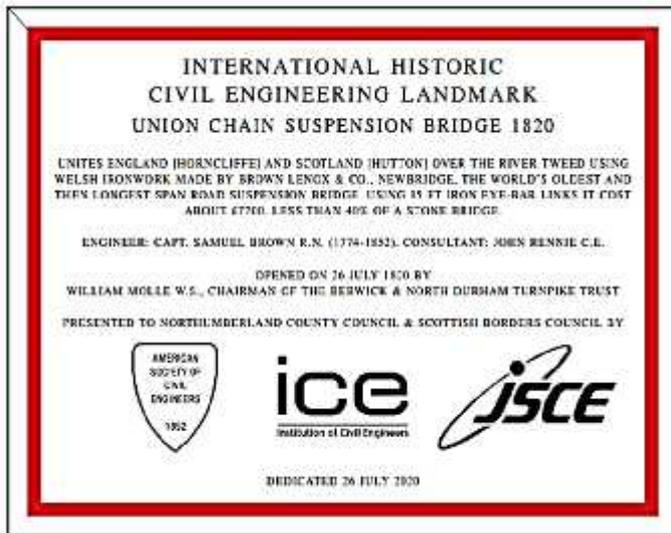


In March this year, Christopher Baglee, the Restoration Project Conservation Architect, made a personal application to Guinness World Records for official recognition of the Bridge's claim to be the "world's oldest road suspension bridge still carrying vehicular traffic". On May 28th the

Guinness adjudicators approved the application and requested primary and secondary evidence to substantiate the claim, which Chris was able to gather from his own extensive archive, and from wider UK and international sources. The assembled evidence was submitted in early June and the Friends met the cost of a "fast-track" decision in advance of the Bicentenary. The good news came through on the 23rd June. **Guinness World Records officially recognise the Bridge as a World Record Holder.** Because of Covid-19, they cannot present the Certificate as normal but it is expected to be sent before the Bicentenary. An advance copy of the Certificate is shown below. Many thanks to Chris Baglee for taking this initiative for us.



Civil Engineering Landmark Plaque ICE, ASCE and JSCE Joint Award



One of the most regrettable casualties of the abandoned celebrations on the 26th July was the planned presentation to the Chairman of Northumberland County Council and the Convener of Scottish Borders Council of a prestigious plaque by the presidents of the American and Japanese Societies of Civil Engineers and the UK Institution of Civil Engineers, designating the Bridge an **International Historic Civil Engineering Landmark**, the result of much groundwork by Patron, Prof Roland Paxton and extensive deliberation by those national bodies. In receiving this accolade, Union Bridge is in the august company of previous recipients, the Forth, Menai and Craigellachie bridges.

The plaque, the final pre-casting proof of which is shown above, has been cast in the USA and will be placed in the close vicinity of the Bridge after the restoration works have been completed.

Professor Paxton writes:

“My Interest in promoting the bridge’s preservation quickened in 2013 when it was put on English Heritage’s *Heritage at Risk Register*. On 25 July 2014, in my lecture at the inaugural meeting of *The Friends of Union Chain Bridge* at Paxton House, I undertook to seek international recognition for the Bridge from the American (ASCE) and Japanese Societies of Civil Engineers via a nomination from the Institution of Civil Engineers. This was approved by ASCE on 7 November 2018. Since 1979 about fifty International Historic Civil Engineering Landmarks have been designated, “ illustrating the creativity and innovative spirit of civil engineers. Almost always performed under challenging conditions, each of these engineering feats represents the achievement of what was considered an impossible dream”. These include the Eiffel Tower, Thames Tunnel and bridges at Sydney Harbour, Victoria Falls (R. Zambesi), Menai, Brooklyn, Golden Gate, and the Forth Bridge. **So, Union Bridge is in great company!**”

National Transport Trust Red Wheel

We recently received notification of another Award – a Red Wheel Award, from the National Transport Trust, the only UK body that promotes transport in all its forms – rail, road, air and water. Its Transport Heritage Programme commemorates Britain’s rich and globally important legacy in the development of transport so we were delighted to learn that the Bridge had been selected as the recipient of a National Transport Trust Heritage Plaque in recognition of the Bridge’s unique contribution to the UK’s road engineering heritage. A specially cast red wheel – one of only 100 located around the UK – will be placed in the vicinity of the Bridge when the works have been completed



The Bridge’s other World and European Records

Following Guinness World Records’ recognition that the Union Bridge is the World’s oldest suspension bridge still carrying vehicular traffic, Christopher Baglee, Conservation Architect for the Bridge, has produced this schedule of the other internationally significant records and facts that it currently holds or will hold* plus previous records held and lost.

World Records

- 1) **July 1820**, the World’s longest clear span deck **until January 1826** when Telford’s Menai Suspension Bridge opened.
- 2) **July 1820**, the World’s first bridge to use the new eye-bar chain system of suspension, invented and patented by its designer, Captain Samuel Brown, RN in 1817.
- 3) **June 2020**, the World’s oldest suspension bridge still carrying vehicular traffic. (Guinness World Records)
- 4) **June 2020**, the Scottish Pylon is the World’s oldest masonry road suspension bridge pylon.
- 5) **December 2021**, it will become the World’s oldest road suspension bridge with the deck totally supported by its original iron chains, once the 1903 wire suspension system has been removed*.

(This UK record is currently held by Whorlton Bridge, River Tees, 1830, designed by John Green, although the suspension chain design patent was held by Captain Samuel Brown, with ironwork supplied under licence from Brown, Lenox & Co., by Walker & Yates of Gospel Oak.)

European Records

- 1) **July 1820**, Europe’s first iron suspension bridge to carry vehicular traffic.

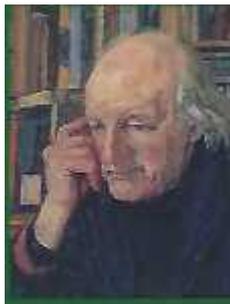
*** Subject to confirmation after completion**

Christopher Baglee would be pleased to hear from Friends who can provide any further World ‘firsts’ relating to the UCB. You can email him at chris@baglee.com or pass your information to Edward Cawthorn, Friends’ Secretary

The Grand Opening

by the late Gordon Miller, Patron of the Friends

Samuel Brown's great day was on Wednesday July 26th 1820, when at 12 noon, his Chain Bridge of Suspension was formally opened, exactly one year after the foundation stone was laid. *The Times* characteristically reported the forthcoming event on July 20th, sandwiched between Crown Court cases of High Treason and malicious wounding. So much for the romantic and remarkable achievement; the announcement simply stated;



"The first Chain Bridge in Great Britain – the river is 437 feet from bank to bank, and the bridge across it is without any central support, to the astonishment of the beholder. Its appearance is at once extraordinary and magnificent; and if found to answer the purpose, as it is confidently expected to do, its application to the other rivers must be productive of great benefit to the country at large...We mention the work as the first of the kind in this or any other country, and the magnitude of the length and access will render it worthy of being recorded as unexampled...."

It was also William Molle's* great day, for he had laid the foundation stone, and thereby became closely associated with Samuel Brown and the project. He revelled in every moment, and as agent to William Foreman Home Esq, of Paxton House, he addressed a letter of explanation about the event:



"My Dear Sir

The Union Bridge is to be opened by Capt. Brown on Wednesday the 26th at 12 o'clock when Capt. Brown will put a greater weight upon it than in all probability it will ever have to sustain.

I am happy to acquaint you that Capt. Brown and I have prevailed on Professor John Leslie of the Natural Philosophy in this University, and one of the greatest mathematicians in the Island, and Messrs Stevenson and Jardine, two eminent Engineers, to come out and inspect the Bridge on that day. They seem to consider it as a matter of great curiosity in the Arts, and an object of national importance; as I shall have the honour of introducing them to you on Wednesday they are to come out in a Post chaise, at Capt. Brown's expense.

Mrs Molle and I alongst with one of the young people propose to do ourselves the honour of taking a Family Dinner with you and Mrs Smith on that day, if it be convenient – Mrs Molle will call on Mrs Smith about 11, in order to go alongst with her to the Bridge, if it

*be agreeable. I shall be at Netherbyres** tomorrow Evening alongst with Capt. Brown, who is my fellow traveller.*

I beg to offer my best regards to you and Mrs Smith and all

My dear Sir

Yours sincerely

William Molle

12 Northumberland Street, Edinburgh. 20 July 1820"

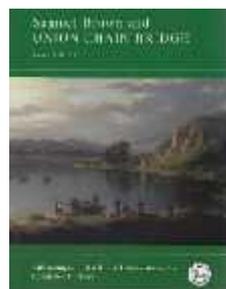
[* William Molle WS, of Edinburgh, was the Chairman of the North Durham and Berwick Turnpike Trustees who had commissioned Capt Brown to design and construct the Bridge.

** Netherbyres was Wm Molle's house in Eyemouth, inherited from an uncle; he later sold it to Samuel Brown.]

The awe and splendour of the occasion can be imagined, for nothing like this frail structure stretched across the river as a filmy substance could really have been believed. Arched iron bridges were barely forty years old, which in general scale and form resembled their stone counterparts and for Border people, Union Bridge was tantalisingly supernatural. Hordes of people gathered on both banks of the river, and upon it in boats, gay and colourful with bands, tents and bunting, and a bright sky to enhance the wonder.

Although Samuel Brown was full of confidence, the magnitude of the moment must surely have caused a twitch of mind to drift over innumerable points. It was a test of courage, apart from skill, for imagination had little technology as reinforcement, but Brown abounded in determination and a will to experiment.

Public recognition had at long last come to Samuel Brown as his ambitions became a reality. His earlier years in proving the value of chains for the Royal Navy were successful, and he founded the Isle of Dogs manufacturing works, where in 1813 he constructed an experimental suspension footbridge using plate and bolt-connected wrought iron bars. In July 1817 Brown was granted letters patent for the design and manufacture of "iron bridges of suspension" and now, with the acclaimed Union Bridge, his professional standing was established.



[The late Gordon Miller was a Patron of the Friends and, with our Trustee, Stephen K Jones, wrote *Samuel Brown and Union Chain Bridge*, published by the Friends, from which the account of the Grand Opening is an extract. The book-306 pages with 138 illustrations – is available from Grieves Bookshop, Berwick-upon-Tweed and Chain Bridge Honey Farm at £17.50; or from the

Friends + £3.50 postage]

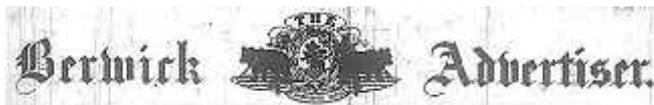
A request to Friends using Paypal for membership fees

In the midst of the Celebrations and Awards, a more mundane request to those Friends who use Paypal to pay their annual membership subscriptions. Each membership payment made by Paypal is subject to a significant administration fee deducted by Paypal from the membership payment – typically 2.9% + 30p. or 34p on a standard annual membership payment of £5. To avoid this deduction and to ensure that the entire membership fee arrives in the Friends' account, we respectfully suggest that Friends consider paying their membership fee by Standing Order or online bank transfer. We'll gladly send a SO mandate on request; bank details for online transfer are 20-29-23 Account No 93654354 "The Friends of the Union Chain Bridge". **Please let us know if you change your payment arrangements. Thank you!**

The Berwick Advertiser records the Grand Opening

Union Bridge of Suspension over the Tweed, near Berwick.
CAPTAIN SAMUEL BROWN, R. N. begs leave to acquaint the Gentlemen of the Berwick Turnpike Trust, and the Noblemen and Gentlemen on both sides of the Tweed, that the above Bridge will be Opened for the use of the Public on **WEDNESDAY** the 28th instant at 12 o'Clock. The Road is not yet complete, but a number of loaded Carts and other Carriages will be employed for the occasion, to pass over and return in presence of several respectable Gentlemen who will favor him with their Company.
Berwick, 17th July, 1820.

Berwick Advertiser July 22nd 1820



July 29th 1820

THE OPENING of this curious and elegant structure, the first of its kind in The Island, took place on Wednesday. At an early hour of the day various groups were observed hastening to witness the interesting aspect. The River itself was covered with different parties in boats, its northern banks exhibited lines of carriage, horsemen and pedestrians, booths, and other places of refreshment, while the precipitous declivity on the south occupied by numerous groups picturesquely scattered on its surface, presented the most delightful effect. A little after noon Capt. Brown, the inventor, crossed and recrossed the bridge in a tandem, followed by a number of loaded carts, amidst the loud cheers of the multitudes assembled, while the bands of the Berwick Militia, and the Northumberland local Militia, played "God save the King"; soon afterwards the Trustees of the Berwick roads, and a large party of gentlemen with the Earl of Home at their head, preceded by the bands playing the King's Anthem, crossed from the northern to the southern end of the bridge, and returned, giving three cheers at each side of the Tweed. The ceremony here ended, and the strength and fitness of the beautiful structure being thus ascertained, the barriers were removed, and the public permitted to pass.



"....a number of loaded carts amidst the loud cheers of the multitudes assembled"

All the rank, beauty and fashion of the Borders were assembled on this occasion. A numerous company (eighty four) amongst whom we observed Lord Home, and many other persons of distinction, dined in a huge tent, which had

been erected near the bridge, many loyal and suitable toasts were given, to which the bands played appropriate tunes, and the evening was spent with much conviviality and good humour.

Amongst the gentlemen present we observed Professor Leslie of Edinburgh and several other gentlemen of science, who admired very much this curious specimen of the arts, so nicely adjusted in all its parts, while at the same time, they considered it in a national point of view of much importance. This bridge is only to cost £5,000; a stone bridge at the same place would have cost upwards of £20,000, and it possesses this superiority over a stone bridge that from having no pillars or support in the middle of the water, it will not be liable to be swept away by the floods of the river. It is obvious therefore that bridges of this nature will become general throughout the Island, and it is hardly necessary to remark how much they must facilitate the internal trade and commerce of the country. To this quarter the advantages of the present bridge are incalculable; in particular it will save to an extensive district of country seven or eight miles in going for their cost and time, and will render these articles accessible to them at all times of the year, and in all states of the river.

The extreme length of the suspending chains from the point of junction, on each side of the Tweed is 590 feet, from the stone abutments or towers 432. The platform, or roadway, is 360. The height of the bridge above the surface of the river is 27 feet. The weight of the chains, platform, etc, is about 160 tons, but the bridge is calculated to support 360 tons, a greater weight than ever, in any probability, it can be subjected to. Although twelve months have elapsed since the work commenced, we can state on good authority that the workmen have not been employed one half of that time; and with pleasure we add that during its progress, and on Wednesday when the crowd was excessive, and anxious to see so great a novelty, no serious accident occurred. In the centre of the bridge* on each side is the following inscription:

"VIS UNITA FORTIOR"



**The iconic intertwined Rose and Thistle crests with the Vis Unita Fortior ("United Strength is Stronger") maxim originally formed part of the railings in the centre of the Bridge but were relocated to their present positions high on the English and Scottish towers at an unknown date – the Project Conservation Architect, Chris Baglee suggests 1871 when major repair works were undertaken. They will be restored during the restoration but will remain on the towers. See "A Fascinating Discovery" in our December 2018 Newsletter.*

The opinions and views expressed by contributors to this Newsletter do not necessarily reflect those of the Trustees. The Newsletter is published by

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