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“This Thing Still Works, Right?” Interpreting a Stationary Steam Locomotive: A Case Study of the Stirling Single No. 1

Anni Shepherd

MA, PhD Student at the University of Turku

 <https://orcid.org/0000-0002-8208-3350>

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“This Thing Still Works, Right?” Interpreting a Stationary Steam Locomotive: A Case Study of the Stirling Single No. 1

Anni Shepherd¹

If engines have ghosts the beats from a Stirling Single's exhaust might still be heard on a clear night as it races northwards across what were once the fields of New Barnet.²

Introduction

It is both easy and common to wax lyrical about steam locomotives, particularly the ones that no longer function and are on display in museums across the globe. They are awe-inspiring machines in both scale and nature and represent feats of human ingenuity and engineering. When coupled with a nostalgic and often rose-tinted longing for days gone by, the perfect cocktail for adoration and disappointment is complete and a question forms on the lips of many a transport museum visitor: “Surely this still works?”

Many if not every guide working in a transport museum has had to disappoint visitors with various forms of “I’m afraid not” (sometimes coupled with a well-rehearsed apologetic frown or smile). In this paper I will argue that not all steam locomotives need to be operated in order to be appreciated and that their static status does not lessen their impact or value as steam locomotives.

As far back as the 1970s it has been argued that transport museums are an oxymoron.³ Can these objects be interpreted to the general public as static things when their movement was perhaps the very thing that defined them? The short answer is: of course they can. In this paper I will use the Stirling Single No. 1 as a case study to elaborate on how stationary steam locomotives have been and can be interpreted to the general public by examining the locomotive’s wider context from both the era when it was used as a working machine and its time in preservation up to the present day.

Stirling Single No. 1: An Object Biography

First, it is useful to discuss the reasons behind my selection of the Stirling Single as a case study by giving a short biography of the locomotive. All biographical information for the locomotive has been taken from the technical file for the locomotive as well as an unpublished staff training pack compiled by the author of this paper. The technical file can be accessed at the Search Engine research and archive facility at the National Railway

¹ Anni Shepherd is a current PhD Student at the University of Turku whose research focuses primarily on the cultural heritage of historic dress, but who has a years-long affinity with the world of historic railways and heritage rolling stock.

² *The Times Educational Supplement*, (2), 718, 1965.

³ Simmons 1970, 17–18.



Image 1. The Stirling Single No. 1 outside the National Railway Museum in 2008, coupled with an incorrect tender. A correct tender was finally coupled to the Stirling Single in 2014. Image credit: Science Museum Group Collections © The Board of Trustees of the Science Museum.

Museum (henceforth referred to as the NRM) in York.⁴ Research and archival staff were consulted to ensure the accuracy of the following information as the author was unable to visit the NRM in person due to the global coronavirus pandemic.

The Stirling Single No. 1 as it is known by its full name is a class G (sometimes also referred to as class A2 or simply the Stirling Single-class) 4-2-2 steam locomotive, the numbers referring to the number of wheels the locomotive has. It is the last remaining example of the class and the first G-class locomotive to be built. Designed by Sir Patrick Stirling, hence the colloquial name for the class being the “Stirling Singles”, all G-class locomotives were intended to pull express passenger trains including the “Flying Scotsman Express”, a precursor to the “Flying Scotsman” service. The locomotive was built for the Great Northern Railway Company (GNR) and its most distinguishable feature was and still is the single set of large driving wheels on either side of the locomotive, which measure 8'1 or 2,468 metres across from flange to flange. The other notable feature of the G-class locomotives was the use of exceptionally large outside cylinders.

Experimental in nature, the G-class locomotives were improved upon with every new batch which was built. The No. 1 was re-built in the 1880s and was heavily altered during this re-build when a longer main frame, longer boiler and larger firebox were added. Those

⁴ Stirling Single Technical File, unpublished, Search Engine Research and Archives (NRM)

changes to the locomotive are classified as irreversible, meaning that the locomotive cannot be and is not presented at the NRM in its original 1870 form. This fact is very relevant to the locomotive's life in preservation and will be discussed later.

Over fifty G-class locomotives were built, with the final batch of six completed in 1895 with a larger firebox and even larger cylinders than those built according to Stirling's original design. A major modification to the original Stirling Singles, including No. 1 and to most other steam locomotives built prior to the mid-1870s was the addition of brakes. In the winter of 1876 an accident known as the Abbots Ripton Disaster or Abbots Ripton Collision made national headlines. A catastrophic event, the disaster featured numerous trains colliding with each other due to signal failure. One of those trains was an express passenger service pulled by a Stirling Single bound for London.

After the events at Abbots Ripton, railway companies finally took heed and added brakes to their locomotives (though the change took time and certainly did not happen overnight). Originally the locomotives did not have brakes at all, and relied on the fireman applying the handbrake on the tender and the driver putting the locomotive in to reverse. Carriages were similarly precarious and did not feature continuous brakes as a rule until later. At the time of the Abbots Ripton accident, only brake vans or the guard's van were equipped with a hand brake.

In 1888 and 1895 the Stirling Singles featured heavily in the informal competitions between east and west coast railway companies competing for the fastest runs to Scotland (London to Edinburgh in 1888 and London to Aberdeen in 1895). These “Races to the North” were not officially sanctioned as such, because the companies involved did not want to be seen as risking public safety. In the early 1880s the average speed for an express train was 40 miles or 64,3 kilometres per hour, but by trying to beat each other, the races caused at least momentary increases in average speeds. For the sections of the races, which were operated by the GNR, Stirling Singles were used to pull the express services involved. After another significant railway accident at Preston 1896, speed limits were set in place on the main line routes and remained unchallenged until the 1930s.

It can easily be seen how the technological developments and alterations made to No. 1 mirror larger changes in society: speed was of the essence, but health and safety were also beginning to emerge.

The G-class locomotives were considered a successful design and the fact that they were improved upon over the span of three decades goes on to imply that the GNR and Patrick Stirling himself were committed to making them an excellent class of locomotive. With Henry Ivatt's succession as chief mechanical engineer for the GNR, a new class was introduced and focused on (the Ivatt Atlantics) and Stirling's Singles were no longer at the forefront of innovation. All others were scrapped over time and only No. 1 was kept as an example of the class.

Retired from active service in 1907, the Single was kept at King's Cross shed (known generally as “Top Shed”) as a showpiece and restored for exhibitions such as the Imperial International Exhibition in 1909. It later went on to have a noteworthy career in the heritage railway world, despite being operated only a handful of times for such a purpose. As it would happen, No. 1 was the first steam locomotive to pull an “Enthusiast's Special” or in other words the first heritage railway service in the UK. This event took place in 1938 and was a



Image 2. Stirling Single No. 1 pulling a heritage service in the 1980s. Image credit: Science Museum Group Collections © The Board of Trustees of the Science Museum.

part of an event commemorating the centenary year of the LNER⁵ and showcasing their improved Flying Scotsman train service. In the early 1980s the locomotive was once again restored to running condition for a limited run of heritage services for the Great Central Railway. Since those specials the locomotive has been preserved as a stationary exhibit as a part of the NRM's collections. In 2014 No. 1 was finally reunited with an appropriate tender and has since appeared aesthetically accurate to its working appearance in the 1890s. Due to its long and eventful history as well as the social and technological changes which took place during the locomotive's lifespan, the Stirling Single No. 1 is an excellent case study for this paper.

So why, particularly since it was used for heritage purposes at least a few times, doesn't the locomotive work anymore? Would it not be possible to simply fix it and loan it out to a heritage railway so people could admire the substantial driving wheels in motion again? In theory, yes, it probably would. In practice, it is a much more complicated process that I argue, there is no need for.

⁵ The GNR and numerous other small railway companies were amalgamated into four large railway companies in 1923 after the Railway Act of 1921 came into effect. The LNER of which the GNR became a part of had officially only existed for fifteen years by the time their centenary celebrations came around, but the company chose to count their years from the founding of one of the older companies amalgamated into it, presumably in order to project an image of continuity and stability.

I will divide the arguments for displaying No. 1 as a stationary object to two main categories:

1. Conservation and preservation in a museum context
2. Learning, engagement and accessibility

Conservation and preservation

Oliver Betts discussed in his 2019 article, that a turn towards movement can be noted in attitudes towards old transport vehicles.⁶ This is not a bad thing in itself and it is in many ways wonderful, that heritage railways in the UK remain popular and that steam specials on the main line attract plenty of attention when operated. Stationary locomotives and their functioning heritage counterparts can and do complement each other beautifully and for myself as a former front of house staff member at the NRM, it was useful to be able to direct museum visitors to heritage railways across the country should they wish to see operational steam locomotives on a larger scale than what the museum’s steam rides could offer. It was also a good opportunity to explain that the NRM and SMG as a whole own plenty of functioning rolling stock, but that stock was out working and not usually kept on site at the museum. According to Betts, the future of transport museums lies in their cooperation with academic researchers.⁷ A similar case can be made for the benefits, which museums like the NRM achieve from working together with heritage railways.

A good example of cooperation between the NRM and a heritage railway enterprise is that since 2015 the museum has been the location of the substantial overhaul of one of the most famous and popular steam locomotives operated on the North Yorkshire Moors Railways, the Sir Nigel Gresley.⁸ The overhaul has been conducted by the Sir Nigel Gresley Locomotive Trust in the open workshop space of the museum, allowing visitors to see what a massive undertaking such an operation is and to marvel at the engineering involved.⁹ Heritage railways help preserve not only the locomotives themselves but the specialist skills required in maintaining them, as noted even in the preservation standards guide written for the Collections Trust,¹⁰ an independent UK charity, which among other things advises and assists museums in collections care and interpretations.¹¹

In the case of many machines now in museum collections, lack of movement can be considered just as risky to the object as restoration to working order. The benefits of operating historic machines has to be weighed against the risks of such a course of action, and the outcome of such risk assessments will always vary depending on the type of object in question and the owning organisation’s intentions with it. These issues along with many others are discussed in the railway and engineering specific preservation guidelines

⁶ Betts 2019, 141–152.

⁷ Ibid.

⁸ Sir Nigel Gresley Locomotive Trust 2016, <https://sirnigelgresley.org.uk/>

⁹ Ibid.

¹⁰ Bell, 2009

¹¹ The Collections Trust, <https://collectionstrust.org.uk/what-we-do/>

published by the Collections Trust on behalf of the Association of British Transport and Engineering Museums (ABTEM) in 2018.¹²

The NRM is seen by some as an institutional antithesis to movement and comments calling for certain locomotives to be restored to steam are frequent on the museum’s social media accounts.¹³ What these comments ignore is that the Science Museum Group (SMG) of which the NRM is a part of, is actually the largest owner of operational heritage rolling stock in the UK.¹⁴ The SMG’s conservation policy also has a dedicated section on operating objects and the principles applied to them. It states, among other things, that “As leaders in science and technology communication and learning, the SMG remains committed to operating historic objects, recognising that the high levels of interest and the educational value in “working objects” make a meaningful connection between the museum’s visitors and the collections.”¹⁵ This clearly demonstrates that SMG and the NRM are not institutions, which oppose the idea of some of the carefully selected objects in their collection being kept in working order. The rail operations policy outlines these ideas further, but with an important note: “Vehicles selected for long-term exhibition at SMG sites will not be considered for loan or operation.”¹⁶ No. 1, at least for now, falls into this category.

It would be remiss to discuss any subject matter relating to the NRM and operational locomotives without mentioning Flying Scotsman, one of the most famous steam locomotives in the world.¹⁷ Anyone with even a passing interest in heritage railways has heard of it partly due to its glamorous history, world-record breaking adventures, colourful owners and well-publicised tours in the USA and Australia. Flying Scotsman is currently the only steam locomotive of the national collection, which is operated on mainline railways. It has a long and varied history, which I will summarise very shortly.

Flying Scotsman was built in 1923 by the London North Eastern Railway Company. It was intended for express passenger traffic and is mainly known for hauling The Flying Scotsman train service between London and Edinburgh. In 1963 the locomotive was purchased by Alan Pegler and after an eventful career as a heritage locomotive, the Scotsman was purchased by the NRM in 2004.¹⁸ Restoring it was a mammoth undertaking with multiple surprise setbacks and an estimated cost of millions. The locomotive returned to railway service in 2016, but not without controversy as explained by Andrew McLean, head curator of the NRM in his article “Flying Scotsman: Modernity, Nostalgia and Britain’s ‘Cult of the Past’”.¹⁹

Scotsman in its current state is a “strange hybrid” and a “compromise”²⁰ which inevitably every steam locomotive restored to steam must be. Their parts have been replaced many

¹² ABTEM 2018, 1–93.

¹³ NRM Facebook page, <https://www.facebook.com/NationalRailwayMuseum> (AN: particularly posts about specific locomotives, such as the locomotive Gladstone on August 1st 2020, often attract multiple comments on wishing for a stationary locomotive to steam again or stating it is a shame it doesn’t. For ethical reasons no direct quotes from social media posts will be used in this article.)

¹⁴ SMG 2019, 1.

¹⁵ SMG 2018, 2.

¹⁶ SMG 2019, 2.

¹⁷ McLean 2020, 4.

¹⁸ Science Museum Group Collection Database, <https://collection.sciencemuseumgroup.org.uk>

¹⁹ McLean 2020, 21–22.

²⁰ Ibid.

times over during their original careers as well as in heritage service and in order to be safely operated in modern day conditions particularly on main line railways, they must be fitted with safety equipment wholly unoriginal to them. Add to the mix that locomotives with long working lives have also had several different liveries over the years, the colour scheme chosen in any restoration process will always look wrong to some.

No. 1 is a prime example of a one of a kind locomotive: it is the only surviving example of its class and a good example of a single driving-wheel type Victorian steam locomotive. As with any object in a museum collection the conservation and preservation of the locomotive are of great importance. Though not in its original 1870 state, the changes that have been made to the locomotive during its operational career are a part of its story and add further layers to its historical significance. One could say that it falls in with the ABTEM suggestion of a museum object being “so iconic that the preservation of their fabric should not be compromised.”²¹

The lengthening of the boiler and frame as mentioned in the previous section cannot be un-done so the locomotive could never appear or function exactly as it did when it was first made. Should No. 1 be re-fitted for heritage use it would most likely need several replacement parts and as is generally the case with heritage locomotives, it is likely that over the years the make-up of the locomotive would be significantly altered. Returning any locomotive to steam is a costly and complicated process, which will never satisfy everyone so it is no wonder that it is not approached lightly by the NRM and SMG as a whole.

The reasons behind why some of the NRM’s collection is in working order and some is not is outlined in their operational rail vehicle strategy, which can be read in full online, as can the SMG conservation policy. The intention of this piece is not to evaluate the NRM’s policies or to ponder on their motivations. To further clarify the museum’s position on returning locomotives to steam I include the following statement:

The operation of collection items is not a primary function of the National Railway Museum and has never been. Such restorations as the museum has undertaken have tended to be under controlled parameters very different to locomotives under private ownership or operating on preserved railway lines. Nevertheless, operating passenger and demonstration trains on SMG sites is good for the visitor, providing movement, enjoyable experiences and an effective means of interpreting railways.²²

Learning, engagement and accessibility

Stationary steam locomotives make for fantastic learning tools in a museum environment. As previously discussed, No. 1 has several historically important and noteworthy contextual connections. It can be interpreted in various ways to shed light on the history of science and engineering, as well as elements of social and cultural history. No. 1 is also a fascinating example of various scientific principles and concepts, for example adhesion: the use of a single pair of large driving wheels came from Stirling’s interpretation of those wheels

²¹ ABTEM 2018, 18.

²² SMG 2019, 4.

providing better adhesion than smaller coupled driving wheels. Workshops around whether or not the design of the locomotive was successful or about the forces behind what made it work are only some of the things No. 1 could inspire as a learning tool.

The theory and practice behind participatory engagement in museums has been written about at length by for example Nina Simon in her comprehensive work *The Participatory Museum*, which was published in 2010.²³ In my opinion and experience talking to people about the Stirling Single and on occasion even providing footplate or cab access to it created excellent conditions for a type of participatory interaction in a museum setting.

A front of house member of staff being able to explain, discuss and answer questions about the locomotive in an informative but ultimately friendly and approachable way is one of the best methods of interpreting a stationary locomotive in instances of both formal (e.g. school or other educational groups) and informal (drop-in visitors who engage with the collection in a less structured manner) education. More informal than a guided tour or talk about a set topic, footplate or cab access offers visitors the chance to talk to a staff member and ask any questions that they like, or to simply have a quiet look around if that's what they prefer. By sharing their memories and stories with front of house staff, the visiting public contributes to the knowledge the museum has about a locomotive or railways as a subject matter. In a best case scenario, visitors' stories, memories and experiences become a part of the interpretation of a locomotive in the museum.

Some visitors to the NRM have never heard of No. 1 before, but to others it is familiar and a firm favourite and remains a popular locomotive in the NRM's collection with at least two rather distinct groups. One group is of course the railway enthusiasts: collectors of models, builders of miniature locomotives and those with a keen interest in Victorian era railways and their development. In 2018 Locomotion Models, a company jointly owned by Durham County Council and SMG and operated from the Locomotion railway museum in Shildon²⁴ produced a scale model of the locomotive, which proved very popular with collectors and is as of October 2020 out of stock.

The second group of visitors, who are partial to No. 1, is perhaps a little more surprising and to put it bluntly, a little younger too.

Since the first episode of season seven of the ever-popular and global phenomenon “Thomas and Friends” aired in October 2003, thousands of children and their parents have been introduced to No. 1 under the guise of Emily. Described as “a beautiful emerald green engine with shiny paintwork and gleaming brass fittings” Emily can “be a little bossy and think she knows best, but is always ready to help a friend.”²⁵ Emily usually speaks in a Scottish accent, which one can only presume is a nod to Sir Patrick Stirling who was born in Kilmarnock as well as perhaps the Single's involvement in pulling the “Scotch express” trains.

Fans of the theatre may recognise No. 1 as one of the stars of the 2010 production of *The Railway Children*. Popular as a book, play and movie in the UK, *The Railway Children* is set in 1905 and tells the story of a family who move from London to a house near a railway line and whose father disappears under mysterious circumstances. Arguably the most famous scene of the story occurs when one of the children of the family, Bobbie,

²³ Simon 2010.

²⁴ Locomotion Models, <http://www.locomotionmodels.com>

²⁵ Thomas and Friends, <https://play.thomasandfriends.com/>

stops a moving train by waving a red petticoat in front of it and signals the train to stop. In 2010 the play was staged at the NRM as well as Waterloo International Station and No. 1 was used as the locomotive in the story.

Practically all reviews and of the 2010 play mentioned the locomotive as a notable feature of the production²⁶ and prompted Mike Kenny, responsible for adapting the 2010 version, to state:

*The Stirling Single is very beautiful and I truly came to love it, but it's the biggest diva I have ever worked with. When the train arrives, you see, no one looks at anything else.... For months and months we talked about that train. I began to feel I was writing not a play but an elaborate warm-up act. Still, when push comes to shunt, she knows how to make an entrance. It was worth it.*²⁷

Steam locomotives are immensely evocative objects. As discussed by Sherry Turkle, Professor of Social Studies of Science and Technology in the Program in Science, Technology and Society at MIT, and the founding director of the MIT Initiative on Technology and Self: “objects bring together thought and feeling” and “In particular, objects of science are objects of passion.”²⁸ No. 1 fits this description, because of its familiarity to at least the aforementioned groups of visitors. During my time as a member of the front of house team, I witnessed both adults and children experiencing strong emotional reactions to the locomotive.

Interpreting No. 1 is therefore not just limited to what its role was in decades gone by, but also in what it means to the present day visitor. For some children it is a friend, familiar from several adventures on the island of Sodor (the fictional home of Thomas the Tank Engine and his many friends) and for certain adults it brings back memories, which may not even be associated with the locomotive itself, but are of a broader railway- related nature. Others may simply appreciate the locomotive for aesthetic reasons, perhaps because of the large driving wheels in particular or on an even more general level, because they rather like the locomotive’s colour. Every reason for why someone may find No. 1 fascinating is equally valid and every instance of engagement with the locomotive is equally important and noteworthy.

No. 1 also has a strong regional connection as a distinctly “northern” locomotive and having been built in Doncaster, once the location of one of the UK’s largest railway workshops, it is an example of the region’s industrial heritage. This connection is an evocative one for anyone whose family has links to Doncaster and particularly those who have a connection to the city’s railway heritage. Many of NRM’s visitors would speak of friends or family who used to work at railway stations, railway works or the trains themselves and considering the amount of railways still left in the UK today (let alone the amount of railway infrastructure still in place prior to the 1960s), it would be difficult to find a family without railway links in their past. These familial connections are among the most evocative and can spark very emotional responses from visitors regardless of age or gender.

²⁶ See for example Billington, *The Guardian* 14.7.2010. or Purves, *Times*, 14.07. 2010.

²⁷ Kenny, *The Independent* 05.07.2010.

²⁸ Turkle 2013, 158–159.

The fact that No. 1 is a stationary exhibit means that it is easy for all groups of visitors to find and accessibility is naturally a key part of interpreting the locomotive for the public. Usually located at the NRM in York or their second museum Locomotion at Shildon, the locomotive does sometimes change locations, but generally speaking it is on public display in a free entry museum and can be seen by thousands of visitors daily. In the 2018/2019 financial year, the NRM welcomed 782 000 visitors, 37 000 of those being in formal education groups.²⁹ There is little doubt that when No. 1 is at the NRM in its stationary state, the potential for people to see and engage with it is higher than it would be almost anywhere else.

Conclusion

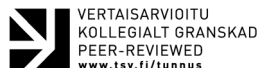
In this paper I have discussed the interpretation of steam locomotives as stationary objects from the point of view of one case study example, the Stirling Single No. 1. Most of the points made in this article can however be applied to a number of stationary exhibits in various transport museums. In the end, when one considers the financial reasons, conservation guidelines and museum policies currently in place, there is no reasonable argument to be made in favour of restoring every heritage locomotive to working order.

Steam locomotives do not need to function forever. Even as stationary exhibits they are imposing and impressive machines, which can tell stories and inspire engagement, excitement and interest in museum visitors. They can spark memories of childhood, of familial connections or of holidays gone by and also hold within them information about the development of engineering and of scientific innovation. The cultural and societal impact of railways in Great Britain as well as across the world can not be overstated and each preserved old locomotive helps to tell these stories and histories to new generations. There will always be an audience interested in these machines whether they are in working order or not.

Stationary locomotives are not a cause for sadness and dismay, but delight: in most cases they had long working lives and living “in retirement” in a location where they can be seen and learned from can surely only be a good thing. It is not a case of stationary versus operational, but of there being a balance and a symbiotic relationship between these ideas and between the organisations which facilitate them. Transport museums are not an oxymoron, they are valuable institutions using the best means at their disposal to allow both researchers and the general public to interact with their exhibits in a meaningful way.

The author is a former Explainer (guide, workshop presenter, interpreter and vehicle access facilitator) of the National Railway Museum in York, UK who worked for over four years as a member of the Learning and Public Programmes department. The views in this article do not represent the views of the National Railway Museum and are the author’s own. Due to the current global pandemic the author was not able to access all of the source material for this paper in person and is grateful for the assistance of Library and Archive Services Supervisor Peter Thorpe at the museum’s archive & research library, Search Engine. Further information about the Stirling Single No. 1 can be obtained from the author or directly from Search Engine at the NRM in York.

²⁹ SMG 2019, *Annual Review*, 58.



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<https://collection.sciencemuseumgroup.org.uk/objects/co8352583/great-No.rthern-railway-locomotive-stirling-single-steam-locomotive> and published under the Creative Commons Attribution-NonCommercial-ShareAlike 4.0 Licence.