By
David Cooper
&
John Ayres

For and on behalf of the
The Babbacombe Cliff Railway CIC
THE HISTORY AND TECHNOLOGY

OF

THE BABBACOMBE CLIFF RAILWAY

By

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&

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The Babbacombe Cliff Railway CIC
## CONTENTS

<table>
<thead>
<tr>
<th>Section</th>
<th>Pages</th>
</tr>
</thead>
<tbody>
<tr>
<td>TECHNICAL DETAILS</td>
<td>5</td>
</tr>
<tr>
<td>CHRONOLOGY</td>
<td>6-7</td>
</tr>
<tr>
<td>SIR GEORGE NEWNES AND THE EARLY OFFER</td>
<td>8-9</td>
</tr>
<tr>
<td>GEORGE CROYDON MARKS</td>
<td>10-12</td>
</tr>
<tr>
<td>THE 1926 INSTALLATION</td>
<td>13-16</td>
</tr>
<tr>
<td>THE 1951 &amp; 55 REFURBISHMENTS</td>
<td>16</td>
</tr>
<tr>
<td>1955-1993</td>
<td>17</td>
</tr>
<tr>
<td>THE 1993 REFURBISHMENT</td>
<td>18</td>
</tr>
<tr>
<td>THE 2005/6 REFURBISHMENT</td>
<td>19-23</td>
</tr>
<tr>
<td>THE TALCA BELL</td>
<td>24</td>
</tr>
<tr>
<td>BIBLIOGRAPHY</td>
<td>25</td>
</tr>
<tr>
<td>THE AUTHORS</td>
<td>26-27</td>
</tr>
<tr>
<td>TECHNICAL DETAILS</td>
<td></td>
</tr>
<tr>
<td>-------------------</td>
<td></td>
</tr>
<tr>
<td>Track Length:</td>
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</tr>
<tr>
<td>Gauge:</td>
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</tr>
<tr>
<td>Rise:</td>
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</tr>
<tr>
<td>Speed:</td>
<td>500 feet per minute</td>
</tr>
<tr>
<td>Rated Load:</td>
<td>40 passengers per car</td>
</tr>
</tbody>
</table>

Cover picture: The track limit switches
1890
George Newnes & George Croydon Marks team up.

George Newnes offered to build a cliff railway at Babbacombe which was rejected.

1910
Sir George Newnes dies and is buried in Lynton

1922
George Croydon Marks consulted by Torquay Tramway Company about building a cliff railway at Babbacombe

1923
Torquay Tramway Company announce plans to build a cliff railway.
Babbacombe Cliff Light Railway Order issued by Parliament

1924
Building work starts in the December.

1926
Cliff railway opens on 1st April
Babbacombe Cliff Light Railway Statutory Rules & Orders Act issued by Parliament

1929
George Croydon Marks is given a peerage and becomes Baron Marks of Woolwich

1935
Torquay Corporation take over control of the lift from the Tramway Company on 13th March

1938
George Croydon Marks dies in Bournemouth
Closed down due to war time restrictions

Reopens on 29th June

Babbacombe Cliff Railway (Amendment) Order issued

Car frames & cars replaced

Modernisation programme – cliff railway closes. Track and cars replaced

Reopens

Friends of the Babbacombe Cliff Railway established.

Modernisation programme undertaken with complete replacement of track, motor, control panel, doors and cars. The under frames were retained however following an accident the west car under frame had to be replaced.

Revised railway order agreed by the Department of Transport Operation of the railway taken over by the Babbacombe Cliff Railway Community Interest Company

The Babbacombe Cliff Railway CIC continue to operate the railway and provide a vital community and tourist service.
Many people don’t realise that two of the most prolific builders of cableways were involved in the building of the Babbacombe Cliff Railway although one never got any further than a proposal that was rejected, the other was consulted by the then Torquay Corporation.

In 1890, Sir George Newnes MP offered to build a cliff lift to connect the Downs to Oddicombe Beach. He came up against fierce local objections and abandoned the idea. During the next forty years there were a number of attempts to resurrect the idea all of which were unsuccessful.

Newnes was a man of distinction; born on 13\textsuperscript{th} March 1851, in Bakewell, Derbyshire he was the youngest of 6 children. The son of a congregational minister he was expected to follow his father into the ministry and he was educated in a boarding school where he received preparation for this. He had his own ideas and on leaving school he joined a London firm of accountants as a trainee and later took over their Manchester office. In 1881 he launched the journal “Tit Bits” which was to supply his future funding for other such projects. It was the success of this magazine that brought him back to London. In 1885 he was elected as Liberal MP for Newmarket. The
popularity of his publications enabled him to spend the winter in places such as Torquay. In 1887 he was persuaded by Thomas Hewitt, a business man from Lynton to change his plans and he wintered in Lynton and fell in love with this north Devon town. Here he funded the installation of the water balance funicular lift which still exists today. In 1890, the same year as proposing the cliff lift at Babbacombe, he teamed up with George Croydon Marks, later Baron Marks of Woolwich, who was to be the consultant on the eventual installation at Babbacombe. In 1895 he lost his Newmarket seat and was given a Baronetcy. In 1897 he started the now renowned journal “Country Life”. In 1900 he was elected MP for the Swansea Town seat although some reports say this was 1906.

He died in 1910 and was buried in Lynton. He never got to see the realisation of his proposal of a cliff lift at Babbacombe although he had his hand in on many cliff railways around the UK including Bridgnorth and Lynton & Lynmouth, Saltburn, Aberystwyth and the now closed Bristol Clifton Lift.
George Croydon Marks was born on 6th June 1858, the eldest of eight children of which only four survived infancy. He followed his father into the Arsenal at Woolwich where he undertook an apprenticeship. At school he had impressed his teachers with his academic ability and it was suggested that he attempt the Whitworth scholarship which he passed and attended Kings College in London achieving a Degree.

At a reasonably young age he became the manager of the hydraulic and lift department of the Birmingham based Tangye Brothers, a company associated with cableways and was placed in charge of the installation of the cableway at Saltburn. It was here that he met Dugald Clerk, inventor of the two stroke combustion engine, who was to become his business partner. In 1880 he set up in private practice in Birmingham and married Margaret Maynard a year later.

In 1882 (but some reports say 1887) at the age of 29, he set up in private practice as a consulting engineer and was soon joined by Dugald Clerk in the London based patent agency Marks Clerk which still trades today and has offices all round the world.

George’s mother was originally from Lynton and had maintained contact with her relatives.
there so once the idea of the Lynton railway became a reality George was brought in to carry out its design. In Lynton he met with George Newnes and each had a profound impact in each other’s lives.

Following the opening of the Lynton and Lymouth cableway Newnes and Marks worked together on a number of other installations; Saltburn, in 1892 Bridgnorth, 1893 Bristol Clifton and in 1895 Aberystwyth.

In 1906 he was elected Liberal MP for Launceston & North Cornwall

In 1910 he opened a New York office with Thomas Edison.

In 1911 he was knighted followed by a CBE in 1918. After being elected into the House of Parliament he crossed the floor of the house to join the labour party under the leadership of Ramsay McDonald.

His involvement in Babbacombe was significant albeit without his former partner, Newnes, who had passed away by this time. In 1922 Marks was consulted by Torquay Corporation with respect to the design and construction of the cliff railway at Babbacombe. It was eventually built by Waygood Otis for the National Electric Construction Company at a cost of over £15,000.
In 1929 he was elevated to the peerage and became Baron Marks of Woolwich which was one of the first two Labour peerages.

During his life he was a Director of two record companies, Columbia and EMI, and could be described as the Richard Branson of his time. He passed away in Bournemouth on 24th September 1938 whereupon the peerage became extinct.

His involvement with Babbacombe was to be the last major involvement he had with cliff railways having been such a formidable character in their history during his life.
**THE 1926 INSTALLATION**

In 1923 the Torquay Tramway Company announced the intention to install a lift to Oddicombe Beach and Waygood Otis were appointed to undertake the installation.

Work started in December 1924 and the Babbacombe Cliff Railway was completed in 1926. On April 1st 1926 the Mayor of Torquay, Alderman John Taylor, made the first trip and was presented with a ticket number A000 which was framed in silver by Mr H Thomas, the lessee of Oddicombe Beach, who presented it to the Mayor. The line cost £15,648 to construct.

B W Stedham, Director of the Torquay Tramway Company proudly announced that the whole installation had been created solely by British labour and materials.

The line was worked by the tramway company until 13th March 1935 when the Company’s assets including the cableway were taken over by Torquay Corporation for the sum of £18,000. Early returns showed that 192,000 people used the lift that year! The tramway company had closed down its operation in the January of 1934.

The track gauge is 5 ft 10 inches, over a foot wider than the standard railway gauge. Brunel believed that the best gauge for a railway was
7 ft and the Great Western Railway was originally built at this gauge later changing to the standard 4ft 8½ in adopted throughout the rest of the country. Whilst the wider gauge would have been better for speed and stability the smaller gauge had a historical standing. The ruts in the basalt on roman roads can be measured at 4 ft 8½ in as a result of the distance between wheels caused by the width of the yoke which was attached to donkeys etc and subsequent modes of transport were built to this gauge. The history of our standard railway gauge can therefore be accredited to the width of two donkeys’ rear ends! One wonders whether by selecting 5 ft 10 in for Babbacombe whether George Marks was trying to emulate Brunel of which he has already been described as a disciple! Perhaps Marks didn’t actually have a say in the gauge? That is a matter for history to reveal at a later date!
The first sub level of the machine room houses the control panel and the hoist rope diverters. The steel wire cables are arranged in a double wrap arrangement which means that they pass round the traction sheave twice. This is required so that adequate traction can be afforded between the cables and the sheave itself to be able to move the two lift cars. As a result of the way the cables pay off the traction sheave offset rope diverters are installed. To the uninitiated these look like they are leaning over and have been incorrectly fitted but to an appreciative eye these are a fantastic piece of engineering!

There are also another set of steel wire cables attached to the bottom end of each of the lift cars which travel over a set of diverter sheaves located under the bottom station. These cables are known as compensating cables and are there to maintain a balance between the two lift cars during travel. If you can image a lift car at the bottom without the compensating cables there would be the weight of the lift car, its load and four 718 ft hoist cables to overcome with assistance being given only by the weight of the upper car and its load going down. In this situation the power demanded of the motor would vary during the ride and by fitting the compensating cables there is a continuous loop of cable which means that the only differential in weight between the two cars during travel is the number of people in them!
When the cars were replaced the original seven window design was replaced with five windows. Ramps were also added to secure the car doors during travel and to assist people with wheelchairs and pushchairs to negotiate the gap between the car and the landing when at a station.

In 1941 the line was closed due to wartime restrictions and the beach was sealed off. The cars were chained to the rails around half way down the track and the bridge over the road at the bottom removed.

THE 1951 & 1955 MODERNISATION

The line did not reopen until 29th June 1951 at a further cost of some £10,000 after being refurbished by J & E Hall.

The design was as originally installed with the cars, weighing 3 ½ tons each, being rated at 14 persons and driven by a variable speed 45 hp direct current motor. The power was supplied by a three phase mains system. Four 2 ½ inch steel wire cables were fitted with a breaking strain of 18 tons.
The bridge was reconstructed with the design and supervision being carried out by Oscar Faber the renowned father of reinforced concrete.

In 1955 the railway, which was reported as showing signs of its age, was again modernised by J&E Hall of Dartford and it is known from photographs from around the time that both the chassis and the car were replaced.

At this time the cars were uprated to 14 persons seated plus 26 persons standing and the hoist motor was replaced with an 85 hp direct current type.

New cables were fitted increasing the breaking strain to 21.6 tons.

1955-1993

There is little information about changes and improvements made between 1955 & 1993. It is hoped that further research will enable more information to be included in future editions.
THE 1993 REFURBISHMENT

In 1993 the lift was subjected to a further refurbishment which included the replacement of the track and the cars. Again the hoist motor was replaced this time with a 75 hp direct current type but now driven by a 68 kw generator set located in the bottom level of the top station.

The system of using a generator is known as a Ward Leonard system. This is a system used to control motors prior to the development of high power electronic systems in the sister alternating current design. The system works by using an alternating current supply to run a motor which is mechanically linked to a direct current generator which then supplies the power for the main direct current motor itself. The Ward Leonard system is now considered highly inefficient but in its day was the best available system for accurate control of a DC motor.

Track replacement 2005/06
THE 2005/6 MODERNISATION

After a major breakdown in 2003 the council sought advice as to what was required to modernise the railway and a report was prepared by David Cooper of LECS (UK) Ltd which suggested that a sum in excess of £500,000 would be required. The railway continued to run for the remainder of the 2003 season and that of 2004 but became very unreliable and the rumours of closure were getting louder.

In March of 2005 a Friends group was formed with the aim of resisting closure and the intention to organise events around the railway to encourage its use. Later that year the Council decide to apply the funds received from the sale of the St. Marychurch Town Hall to the refurbishment of the cliff railway. At the end of the 2005 operating season the railway was handed over to the project team for a two year refurbishment programme.

David Cooper was appointed as the consultant to Torbay Council and following a tendering process LSL Ltd of Welham Green, Herts, were awarded the contract to refurbish the cliff railway.

The brief was that the lift had to be back in service for 1st April 2006 – the 80th anniversary of the original opening hence the two year programme.
In the first year the track was replaced and new cars manufactured by Embankment Engineering. The following year saw the replacement of the control panel with a variable frequency type replacing the previous variable voltage type.

The first task was to strip out the old equipment and one of the 1993 lift cars can be seen opposite being lifted out. It was decided that when the cars were replaced the original five window design would be retained rather than the seven window type which had been seen on the railway at one point. Ramps were also added to allow mobility impaired passengers to be able to use the railway.

The new cars were designed to give a maximum life expectancy given the exposure to rain and salt water sea spray. One of the new lift cars can be seen here.
At the same time that the cars were being manufactured off site the site team battled against the elements on the side of a steep hill to replace the sleepers and track.

Unfortunately, on 15\textsuperscript{th} March 2006, during the reinstallation of the chassis on the west track the chassis broke away and collided with the bottom station.

This meant that the cliff railway couldn’t be run on its 80\textsuperscript{th} Birthday on 1\textsuperscript{st} April 2006 as a replacement chassis had to be constructed by Embankment Engineering. Nevertheless the celebrations went ahead and a reconstruction of the 1926 photograph can be seen on page 12. The second phase of the project was to replace the control equipment. The DC VV ward Leonard system was stripped out and a AC VF control system manufactured by
Kollmorgen in Cologne, Germany, was installed.

The replacement system utilises the alternating current supply and varying the frequency to vary the speed of the cars. To achieve this a new motor was grafted onto the existing gearbox which was retained and overhauled.

A model of the cliff railway can be found in the nearby Babbacombe Model Village.

The Council wanted to relinquish the responsibility of operating the railway but the original Order that approved the construction of the railway prevented the granting of a lease to anyone other than the Torquay Tramway Company that was now non-existent. It was not until February 2009 that this matter was settled by the issue of a revised Order by the Department of Transport and in August 2009 the Operation of the railway was transferred to the Babbacombe Cliff Railway Community Interest Company (CIC), a not for profit organisation, who have been granted a 40 year lease.

The takeover has seen the extension of the running season and a determined effort to market the railway as both a tourist attraction and superb example of industrial architecture. Thanks to support from the Heritage Lottery Fund the CIC has established a Visitor Centre
adjacent to the cafe on the Beach which details the history of the railway and contains exhibits of a number of artefacts related to the railway.
THE “TALCA” BELL

At the end of the working day a bell is sounded at the lower station to advise intending passengers that the last lift is about to leave. The bell has an interesting history and local rumour has it that it was rescued from a Scandinavian vessel! Research into the validity of this rumour has not been substantiated but extensive research has turned up two ships that bore the name “TALCA”

The first was built in 1900 by Robert Napier & Sons at Glasgow, was over 1000 tonnes with a length of 209 ft 11 in and a beam of 35 ft 1 in. She served on the Pacific coastal services in South America but came to an untimely end on 12th July 1901 when she was wrecked off Puchoco Point in Chile.

The second was a liberty ship built for WW2. Originally launched as the Orville P Taylor in the 1940’s her name was changed to “TALCA” in 1947 by the Pacific Steam Navigation Co and registered under a British flag in Liverpool. She had a succession of names both before and after “TALCA” and only carried the name between 1947 and 1953. She was finally scrapped in 1967 in Whampoa, China.

Were either of these ships the provider of the bell at the cliff railway? Hopefully one day the bell will give up its secret as to where she came from!
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www.torbay.gov.uk

www.babbacombecliffrailway.co.uk

www.friendsofbabbacombecliffrailway.org.uk
David Cooper of UK based lift consultants LECS (UK) Ltd was the Project Director of the 2005 modernisation having been appointed by Torbay Council.

He has acted as a consultant on a number of inclined lifts both in the UK and overseas including Hastings East Hill, Hastings West Hill, Babbacombe, Scarborough Central, Scarborough South Cliff, Scarborough St Nicholas, Lynton & Lynmouth, RNLI Lizard, RNLI Padstow, Southend, Angels Flight (Los Angeles) and the Urbis Centre in Manchester.

He is now the Technical Director of the Babbacombe Cliff Railway CIC.
JOHN AYRES

Trained as a Civil Engineer with a number of Local Authorities qualifying in 1970.

Joined Chichester College of Arts, Science and Technology in 1973 as a Lecturer teaching various subjects on a number of courses from Craft and Technician Level to Degree.

Moved to Torquay in 2000 and was a founder member and Chairman of the Friends of the Babbacombe Cliff Railway from its inception until 2008.

John became a Director of the Community Interest Company when it was incorporated in 2008 and then Chairman of that organisation later that year. He participated in the negotiations with Torbay Council to establish a Lease and the takeover of the railway by the Company.