

Go Forth and Discover

An interactive game to develop awareness and knowledge of The Forth Bridge, its place in Scotland's history and the life of the people who created it.

Curricular Focus: Curriculum for Excellence Social Studies



— THE — FORTH BRIDGES®





Go Forth and Discover

Curricular Focus and Level : Social Studies, First Level

Experiences and Outcomes:

- By exploring places, investigating artefacts and locating them in time, I have developed an awareness of the ways in which we remember and preserve Scotland's history. SOC 1-02a
- I can use evidence to recreate the story of a place or individual of local historical interest. SOC 1-03a
- I can compare aspects of people's daily lives in the past with my own by using historical evidence or the experience of recreating a historical setting. SOC1-04a
- I can describe and recreate the characteristics of my local environment by exploring the features of the landscape. SOC 1-07a

Benchmarks:

- Draws a short timeline and can locate two or more events on the line in the correct order.
- Uses information learned from sources to relate the story of a local place or individual of historic interest through media such as drawings models or writing.
- Draws comparisons between modern life and life from a time in the past.

Resources:

Resources included in the pack:

- Go Forth and Discover PC Game <https://glowscotland.sharepoint.com/sites/PLC/technologies/SitePages/Home.aspx>
- Go Forth and Discover Resource Pack A : Character Cards
- Go Forth and Discover Resource Pack B : Clothes Cards
- Go Forth and Discover Resource Pack C : Photo Pack
- Go Forth Resources via the Glow National Technologies Community
- Go Forth and Discover Glow Form Quiz - Master Copy Link <https://bit.ly/2JJWHNa>

Suggested Support Resources:

- Forth Bridges Website <https://www.theforthbridges.org>
- Men Of The Forth Bridge, 1930, British Pathé Film Clip <https://bit.ly/2LQ8kyO>
- Painting The Forth Bridge, 1922, British Pathé Film Clip <https://bit.ly/2JMlsmS>
- Teachers may also wish to access the Go Forth and Create or Go Forth and Design Learning Packs which focus on engineering and creative computing skills.
- Unesco World Heritage - Forth Road Bridge <https://whc.unesco.org/en/list/1485/>



Go Forth and Discover

Duration of activities:

- 1hr x The Go Forth and Discover PC Game
- 4hr x Research and Social Studies Quiz available online via Glow link above.

Overview of Learning

The Go Forth and Discover learning resource has been designed to develop knowledge and understanding of the history of the Forth Bridge and its place within Scotland's history. The resources can be used in isolation or as part of a wider interdisciplinary learning focus where the games based learning serves as a tool to support the Social Studies Curriculum for Excellence for primary 4 pupils onwards.

As a Unesco World Heritage site, the Forth Bridge is of international importance. This resource will ensure that Scottish children and young people gain understanding of the historical aspects of the bridge, the life and skills of the workforce, who were as young as 13 year old, and support them in creating a timeline in the development of this national icon.

This games based learning activity covers a range of experiences and outcomes at first level with extensions into and second level within Social Studies and can provide the core learning, teaching and research opportunities which learners may use to complete the game or as part of their wider class based project. Each of the mini challenges can be played individually as a plenary for research being carried out or the game can be played in its entirety over 45 minutes.

Players will learn about and control the life of 'David' the 13 year old lead character as he leaves school to start employment on the new Forth Bridge during its construction between 1883 and 1890. They will complete challenges throughout the game which reflect the various roles and skills required of the workers, (known as Briggers) whilst building their knowledge of historical artefacts, clothing, tools and completing challenge questions.

Throughout the game, the learner will also see the Forth Bridge develop over time throughout the use of images provided by National Records of Scotland, Forth Bridges Forum, University of Aberdeen Archives and Canmore, the National Record of the Scottish Environment.

In addition, a version of the quiz has been created for teachers to be able to assess their pupils understanding through the use of a Glow 365 Quiz.



Go Forth and Discover

Pupil Objectives

- I can identify key landmarks in Scotland.
- I can create a timeline of events.
- I can access a range of trustworthy resources in develop an understanding of a local place or historical event.
- I can identify similarities and differences between my life and the life of those in the past.
- I can demonstrate an understanding of the key figures and their roles in the building of the Forth Bridge.

Introduction

Practitioners can initiate the lesson through discussing key landmarks across Scotland and why they are important. Focusing on the Forth Bridge, learners could carry out an internet image search to see how many landmarks are used in a range of places e.g. on bank notes, on buses, in television adverts, with particular focus on the Forth Bridge to facilitate a discussion around why is the Forth Bridge so important.

Main Activity

Learners investigate the 'Roll On, Roll Off Ferry' to discuss transport difficulties which existed before the Forth Bridge was created and what impact that had on the local area and nation population and transportation of goods during the Victorian era.

Discuss the differences between life for young people in modern society compared to that of the life of the young workers on the Forth Bridge. Explain that the learners will be required to research and learn about the Forth Bridge as a national icon of Scotland in order to complete the Go Forth and Discover PC game. This research can take place through online research, reference books, archive collections, online film footage or working with partner organisations and their education specialists or resources (for details please see 'Where next' section of this document).

The learners can consolidate their learning through the use of the game, a tool to support them in the learning which has taken place throughout their research or work within their interdisciplinary project or as a tool for research. The game is made up of ten small challenges to establish a full understanding of the life of a young person during the Victorian era, specifically 1883 - 1890. At any point during the game the user can use the escape button to return to the main menu.



Go Forth and Discover

The individual challenges are:

- Introduction and scene setting

Information provides the learner with context for area, jobs for men and women as well as information on the differences between society then and now so that they can use it as a tool for research.

- Challenge 1 Go Forth and Run, Rivet, Run

Highlighting the journey of a young worker to reach the bridge and collect rivets as they travel as the more rivets they used at work, the more a worker was paid.

- Challenge 2 Go Forth and Dress for the Day

This activity allows the player to learn about the different clothes of the time by rotating different clothing choices and selecting . This section can be used as a research tool, cards are available for each item in Resource Pack B to further develop the lesson in class or for display.

- Challenge 3 Go Forth and Climb the Ladder

Highlighting the journey of a young worker, the perilous layout of the working environment and to support learners to develop a sense of scale for the Forth Bridge. Players can use the F1 key to zoom out to see where they are on their journey up through the Forth Bridge and arrow keys can be used to navigate their way across and up the structure to reach the target bothy at the top of the bridge.

- Challenge 4 Go Forth and Search

Reinforcing the responsibilities of David, the 13 year old lead character, and the tools that workers would have used in the 1880s through a search game. This challenge can be linked with local museums or historical organisations who may have collections of these tools. Several non historical items are also included in the challenge to allow learners to make comparisons between new and old.

- Challenge 5 Go Forth and Be Riveting

Highlighting the three process of the riveting required to construct the Forth Bridge, heating, catching and hammering. It also demonstrates the dangers of these jobs which we often filled with the younger members of the games. It also raises awareness of the engineering process as well as the differences between the Victorian era and modern life construction process.



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- [Challenge 6 Go Forth, It's Puzzling](#)

Due to the size of the bridge, not all riveting was done by hand. Riveting machines were invented to rivet the tubes. This challenge allows players to apply their knowledge and problem solving skills to complete a puzzle taken from a vintage glass plate photograph of a rivet machine.

- [Challenge 7 Go Forth and Test Yourself](#)

Rivet teams had to work together, to provide learners with an opportunity to answer questions based on what they have been learning throughout the game or through classwork based research. Practitioners can also ask the questions through the use of Glow Forms via the link in the resources section of this plan.

- [Challenge 8 Go Forth and Paint](#)

Painting the Forth Bridge is almost as famous as the bridge itself. This challenge is designed to inform learners about the process required to paint the bridge using a range of materials. It is also a way for the learners to see the completed bridge and get a sense of scale. Links can be made to the science surrounding different materials through this challenge.

- [Animated overview of Forth Bridge based on laser scanning](#)

Using laser scans of the Forth Bridge recorded by the Centre for Digital Documentation, learners will have the opportunity to see a fly through of the complete bridge model in modern time. This will allow them to see how all the work they have undertaken in the challenges and the progression of the bridge building process through the archived images come to life in this accurate model of industry standard. This video is also available to watch, pause and use to develop understanding of engineering concepts or in conjunction with the Go Forth and Design resources.

The film used in this game can also be accessed separately to support understanding of the bridge's layout, function, location and scale and stills of the film could be used to form part of the learners personal research / presentation or as a class display.

Should you wish to access any individual challenge, view the film or jump between challenges rather than play through them sequentially you can return to the start page by pressing Escape (Esc) at any time.



Go Forth and Discover

Plenary

At the end of the game;

- Discuss with the learners - what were the key facts that they discovered?
- Discuss with the learners - How was life similar or different for children and young people in the past during the time of the Forth Bridge's construction?

Assessment Opportunities

- Reviewing and discussion of learners understanding of why the Forth Bridge was built and create a timeline of the build including the different roles which David played throughout this process.
- As learners to create a sketch note or online visual, in Sway, Slides , etc., of their journey as 'David the rivet catcher' and share it with their class.
- Following their use of the game and research, recreate or act out a section using green screen apps to share learning and demonstrate where they have accessed accurate information.
- Classes create 'Rivet Tally Boards' to identify who was the most successful worker on the Forth Bridge, this is in line with the payment process of the time where the workers were paid per rivet at the discretion of the Rivet Gang Leader.
- The quiz contained within the game can be copied into a practitioner's Glow account and they can use it to assess learner using only the questions from the game or with the addition of any other games which would allow for assessment of learning which has taken place through other events or research. The Glow Form is available via the link in the resources section of the plan.
- The completed game and accurate information recorded in research factfiles, wall displays based around a Make, Say, Write, Do theme will demonstrate that the learners successfully interpreted accurate information throughout this focused activity.

Curriculum Links

Literacy

- I am learning to use my notes and other types of writing to help me understand information and ideas, explore problems, generate and develop ideas or create new text. LIT 1-25a
- I can convey information, describe events or processes, share my opinions or persuade my reader in different ways. LIT 1-28a / LIT 1-29a
- As I listen or watch, I can identify and discuss the purpose, key words and main ideas of the text, and use this information for a specific purpose. LIT 1-04a



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Technologies

- I can design and construct models and explain my solutions. TCH 1-09a
 - I can recognise a variety of materials and suggest an appropriate material for a specific use. TCH 1-10a
 - I explore and discover engineering disciplines and can create solutions.
 - TCH 1-12a
-
- I can explore and experiment with digital technologies and can use what I learn to support and enhance my learning in different contexts. TCH 1-01a
 - Using digital technologies responsibly I can access, retrieve and use information to support, enrich or extend learning in different contexts. TCH 1-02a

Extension and Further Resources

To further extend learning around the Forth Bridge, you may wish to investigate and use some of the other materials from the Go Forth Bridges Project including:

Go Forth and Design

Resources to support the design and engineering aspects of the Forth Bridges

Go Forth and Create

Resources to support computing science through the use of materials developed from scanning of the Forth Bridges.

Additionally, schools can access the Go Forth, See and Here 360° Audio and Video files available from The Forth Bridges Forum <https://www.theforthbridges.org>. These can be used with VR headsets such as Google Cardboard, etc to further develop learners understanding and awareness of the design, scale and function of the three Forth Bridges prior to or instead of visiting them, ensuring all learners can share in an experience.

An AR App, Go Forth and Explore, is also available for download from the Google Play (<https://play.google.com/store/apps/details?id=com.simvis.frblbm>) and Apple App stores (<https://itunes.apple.com/gb/developer/centre-for-digital-documentation-visualisation-llp/id1234262814?mt=8>). This location based image app will allow learners to see back through time to when the bridges were being built when standing in specific locations around the Forth Bridge and Forth Road Bridge.



Go Forth and Discover

Practitioners may wish to develop links with partner organisations and third parties, several of whom have supported in the creation of these resources, to further research specific workers, the engineering of the bridge, the science behind the materials used, etc.

National Records of Scotland



National Records of Scotland collects, preserves and produces information about Scotland's people and history and makes it available to inform current and future generations. We provide a flexible service with workshops and online resources designed to support a wide range of Scottish curriculum areas to help pupils connect with Scotland's history, heritage and culture from Robert the Bruce to the results of the 2011 Census.

We are delighted to see records from our collections used in a creative and innovative way in the Forth Bridges game. We very much look forward to introducing young learners to this exciting new topic. For more information about the services we provide you can visit the [Services for Schools](#) section of our website or contact our learning team at education@nrscotland.gov.uk

The Briggers



The Briggers is a Forth Bridge research group based in South Queensferry beside the bridge. Initially they were responsible for identifying the names of the 73 men and boys who died constructing the Forth Bridge. Their research continues into the history of the bridge and the people who made and maintain it.

The Briggers give Forth Bridge talks to adults and school children and consultancy to bridge related projects. They also hold a significant archive of images and Forth Bridge related material. Their book, "The Briggers", written by Edinburgh author and historian, Elspeth Wills and based on their research, tells the story of the Forth Bridge.

Briggers contact: mail@briggers.com

Briggers website: www.briggers.com

Historic Environmental Scotland



Historic Environment Scotland (HES) is the lead public body for Scotland's historic environment and a charity dedicated to conserving and presenting Scotland's places now and in the future. We care for over 300 prehistoric sites, castles, abbeys and industrial buildings spanning 5,000 years of Scotland's history and culture. We are Scotland's largest operator of paid tourist attractions.

The HES Learning & Inclusion Team support access to our historic sites and deliver programmes which use these special places in creative ways to support learning and wellbeing for diverse audiences.

From Edinburgh Castle to the Antonine Wall our sites are a rich national resource for learning. As well as telling Scotland's story these special places can provide inspiring and meaningful experiences, safe environments in which to learn and routes to our national culture. They provide excellent settings for exploration, discovery and inspiring creativity.

We can support schools and learning groups through:

- free Education Visits with a learning or wellbeing remit
- travel grants to support visits from Scottish schools
- advice and support to enable visits for groups with additional support Needs
- access to archives and digital resources containing millions of photographs, drawings and plans relating to national and local culture and heritage
- support from our Learning Officers who work in partnership to deliver activities and projects to support learning, creativity and wellbeing linked to our sites and collections

To find out more visit our website www.historicenvironment.scot/hes/learn



SCDI's Young Engineers and Science Clubs Scotland

SCDI's Young Engineers and Science Clubs Scotland (YESC) programme supports learners aged 3-18 and their teachers with a range of innovative STEM projects, developed with our industry partners. Our interdisciplinary projects, accompanied by resource kits and teacher CPD courses, support teachers to tackle challenging STEM concepts through engaging activities; while our annual STEM challenge gives Clubs a practical challenge to explore a topical theme.

In 2016, our 'Go Forth!' challenge with Morrison Construction tasked teams to use a kit of lollipop sticks, cable ties and string build a suspension or cable stayed bridge to commemorate the Queensferry Crossing.

Find out more or come along to our national Celebration of STEM event at the end of term: <http://www.yescotland.co.uk/>

DYW

The Developing Young Workforce (DYW) career pathways which can be linked to the Go Forth projects include Engineers, Civil Engineers, Historians, Archivists, Digital Documentation Teams, Games Companies, etc. many of whom have links with the STEM Ambassadors program who offer a free service to schools and teachers. <https://www.stem.org.uk/stem-ambassadors>

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Resource Pack A : Forth Bridge Character Cards



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Documentation and
Visualisation



United Nations
Educational, Scientific and
Cultural Organization



The Forth Bridge
inscribed on the World
Heritage List in 2015

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ENVIRONMENT
SCOTLAND

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EACHDRAIDHEIL
ALBA



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David
Rivet Catcher, Forth Bridge



Mr Hay
Rivet Gang Leader, Forth Bridge

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Resource Pack B : Clothes Cards



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Rivet Worker's Woollen Jacket



Rivet Worker's Moleskin Trousers



Rivet Worker's Hobnail Boots



Rivet Worker's Flat Cap



Surveyor's Tweed Jacket



Surveyor's Tweed Trousers



Surveyor's Boots with Gaiters



Surveyor's Deerstalker Hat



Prince of Wales' Frock Coat



Prince of Wales' Suit Trousers



Prince of Wales' Leather Shoes



Prince of Wales' Top Hat



Diving Suit



Diving Weights



Diving Boots



Diving Helmet



Protective Boiler Suit



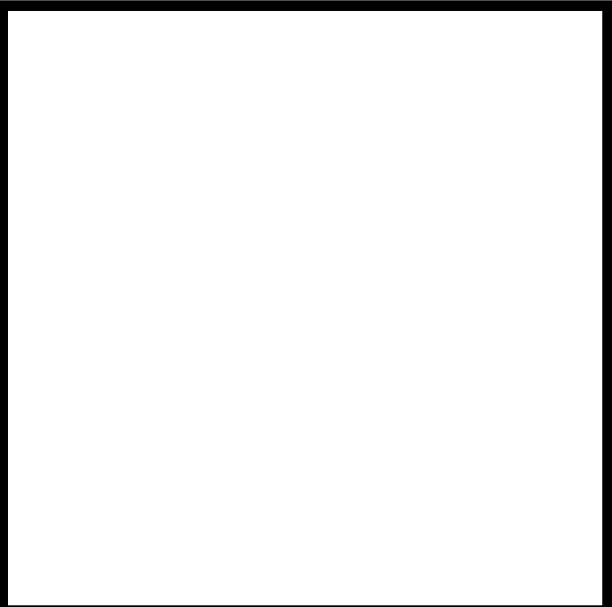
Protective Safety Harness



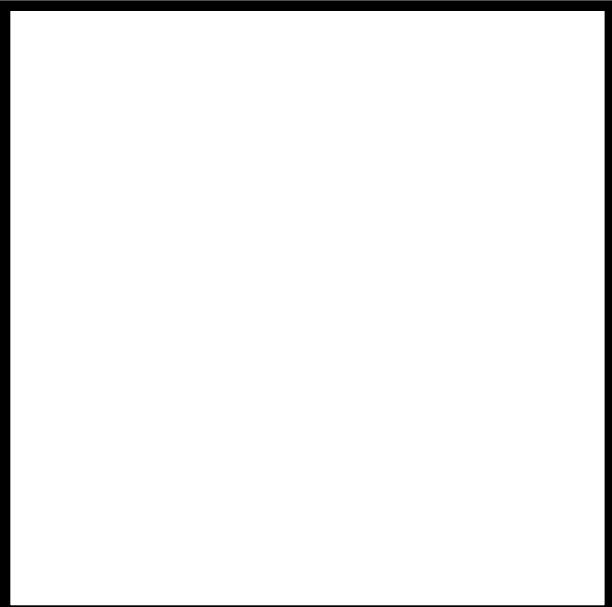
Protective Steel Toecap Boots



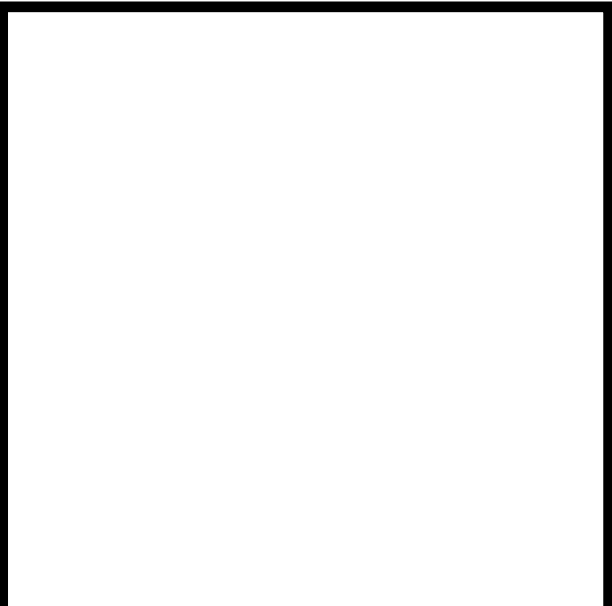
Protective Hard Hat



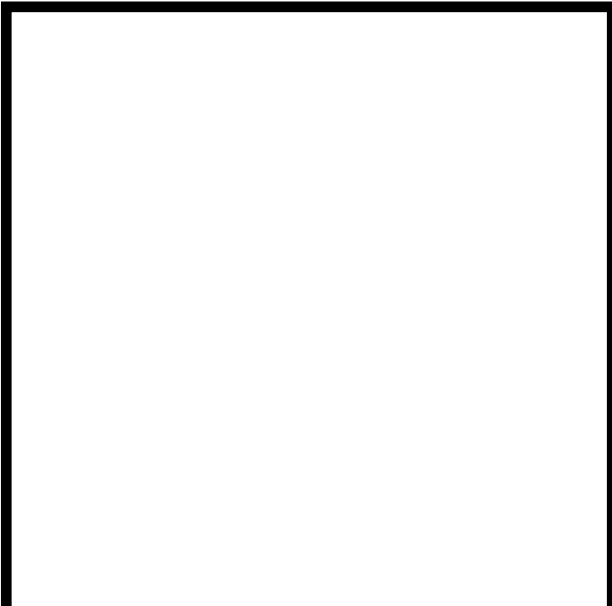
My Boots



My Coat



My Trousers



My Hat

Clothes are expensive, especially items like this wool jackets. This is old and would have been passed down from someone who no longer needs it.

Jackets like this are worn by workers for example painters, riveters or machine workers. The thick woollen fabric offers some protection from the weather but can become very heavy and wet in the rain.

Workers must provide their own clothing and it often gets damaged.

Rivet Worker's Woollen Jacket

Moleskin trousers are worn by workers on the Forth Bridge as the fabric is thicker than cotton trousers.

Workers clothing is often second hand and younger workers frequently 'grow into' they're clothing.

Rivet Worker's Moleskin Trousers

Workers are not provided with anything to protect their feet from the hot rivets, sharp metals or uneven surfaces. They wear a shoe or boot made of leather that would not slip or slide on the wooden planks.

They may wear hobnail boots, also known as 'tackety boots', which have short nails or tacks inserted into the heel and sole. These nails give the worker more friction when walking on the ground or on the wooden platforms but these make working on the structure difficult if they are walking on the metal bridge ties and tubes.

Rivet Worker's Hobnail Boots

Hats are an important part of life and fashion in Victorian Britain. The size and style of your hat says a lot about your class and job. Workers on the Forth Bridge wear different hats depending on the job that they have. Flat Caps are worn by the Rivet Gang workers and are the most frequently seen hat worn by working class men. Made of wool, they offer little protection from anything falling from higher levels of the bridge. There is no way of securing the hat onto the head so they are often blown off. By the end of the bridge building more than 8000 caps will be collected from the water.

Rivet Worker's Flat Cap

Smart tweed or checked woollen jackets are often worn by the surveyors who are working on the bridge in a more specialist, professional role than the rivets or painters.

This highly respected job means that the surveyors work on site with the other workers but also work with the wealthy upper classes who planned and designed the Forth Bridge.

Surveyor's Tweed Jacket

Tweed or wool trousers are worn by the surveyors and engineers who wear suits to work on the Forth Bridge.

They are well paid and dress smartly to show they hold a position of importance.

Surveyor's Tweed Trousers

It is hard to clean clothes if they get muddy and dirty in Victorian Britain. Traditional leather shoes and ankle boots do not stop mud and dirt splashing the expensive wool and tweed trousers of the surveyors and engineers so they wear gaiters to protect their clothes.

Gaiters are made of leather which wraps around the leg between the ankle and the knee. To make sure the gaiter does not slide up the leg, a band slides under the sole of the foot and then it is buttoned up the side of the leg.

Surveyor's Boots with Gaiters

Each style of hat worn by a worker on the Forth Bridge indicated a different role. This hat is worn by the surveyors who are taking measurements and ensuring that the Forth Bridge plans are being followed.

These hats are also known as 'fore and aft' hats as they have a small peak at the front and back. They also have two flaps which can cover the ears but are usually tied up on top.

Surveyor's Deerstalker Hat

Frock coats are worn by people of importance and wealth.

Upper class Victorian gentlemen always wear a suit. These coats are worn over the top of the suit and they are often referred to as overcoats. They are usually black, brown or dark green.

Prince of Wales' Frock Coat

These formal wool trousers are part of a smart, formal three-piece suit made up of trousers, a waistcoat and a jacket. This type of clothing is expensive and not very suitable for hard work or labour.

Prince of Wales' Suit Trousers

Short leather shoes like these are hand crafted and made of expensive leather.

Victorian gentlemen wear spats as a sign that they are wealthy and fashionable. Spats give protection to the feet and ankles of the person wearing them from dirt. They are usually made from leather or fabric and are fastened with buttons.

Prince of Wales' Leather Shoes

Hats are an important part of life and fashion in Victorian Britain. The size and style of your hat tells others about your class and job.

Top hats are worn by the wealthy and are often made of silk or beaver skin which is water repellent.

Prince of Wales' Top Hat

A diving suit, also known as diving dress, is worn by the workers who are sinking the caissons of the bridge. These caissons will help to build the foundations for the cantilevers.

The suit is made from a rubber sheet lined on the inside and outside by a cotton layer of fabric to help make them more comfortable to wear but it does not keep the diver warm against the cold sea or river water. The divers have a leather belt tied around their waist once their helmet is on so that they can store tools in it. They wear rubber mittens to keep their hands warm.

Diving Suit

These diving weights attach to the front and back of the diving helmet using ropes. They hang down over the chest and back and are usually labelled.

The weights are made of lead and are very heavy. They help stop the diver from floating to the surface of the water.

Diving Weights

These diving boots are made of leather with a thick, rigid wooden sole underneath. The wood is covered in lead and brass making them very heavy.

The boots are fastened onto the foot with buckles and ropes and are tied around the ankles to make sure they do not come off.

These boots are coated in brass to stop the divers sparking any fires with their soles as they work.

Diving Boots

This diving helmet is made of copper which is covered in tin. It has a breathing tube between the surface into the back of the helmet. Two men connect the tube to an air pump on the platform surrounding the caisson which pumps fresh air down the tube to allow the diver to breathe whilst they are underwater.

The helmet is lifted onto the shoulders of the diver and screwed onto a neck plate before the diver is lowered into the water. These helmets can weigh between 15-20kg, that is the same as carrying a 4-year-old or 4 adult cats around on your head.

Diving Helmet

This piece of Personal Protective Equipment is known as a Boiler Suit or Coverall.

It is designed to give the wearer freedom to move whilst protecting their body and clothing from any damage. These coveralls come in a range of materials depending on the task being carried out whilst wearing them. All suits are smooth with as few loose parts or pockets as possible to ensure workers do not get caught on any equipment.

Protective Boiler Suit

Modern harnesses are used to secure workers when working at height and are made of nylon webbing.

A harness is worn by a worker to stop them falling from a high building or landmark.

When the Forth Bridge was built, harnesses didn't exist. Some workers were injured as they had no protective clothing to keep themselves safe on the high and uneven platforms.

Protective Safety Harness

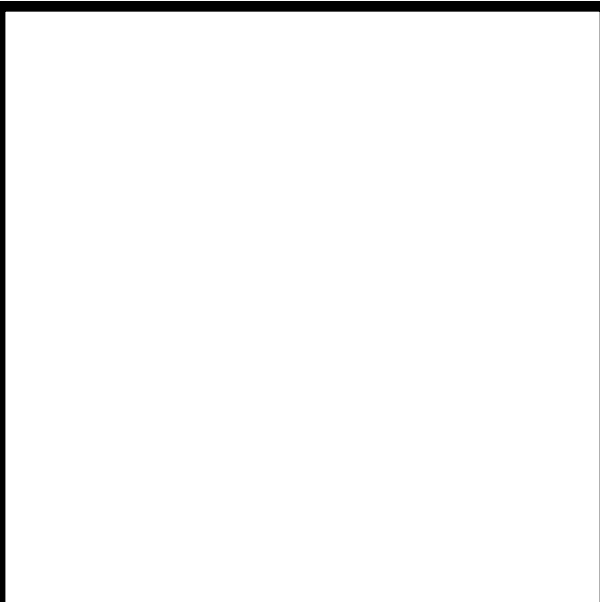
These modern, waterproof boots are made from leather or rubber with reinforced steel toecaps and thick soles to protect the wearer from slipping or being injured by falling items. They will also protect the wearer if they step on anything sharp.

Protective Steel Toecap Boots

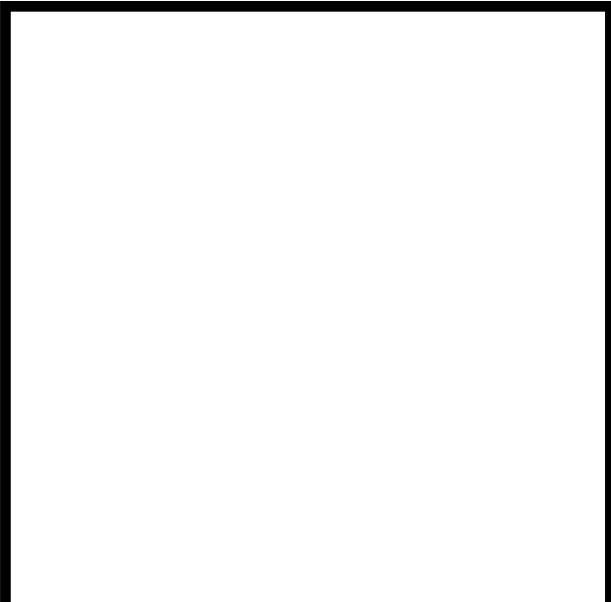
Modern hard hats are first introduced in 1919, 29 years after the Forth Bridge was opened. When first created they are made from steel or canvas which is hardened by steaming it then adding glue and black paint.

Workers on the bridge do not have protective headwear but hats are worn to show what job people had. If you work on a modern construction site, Personal Protective Equipment (PPE) hats or helmets are made of strong plastic and must be worn.

Protective Hard Hat



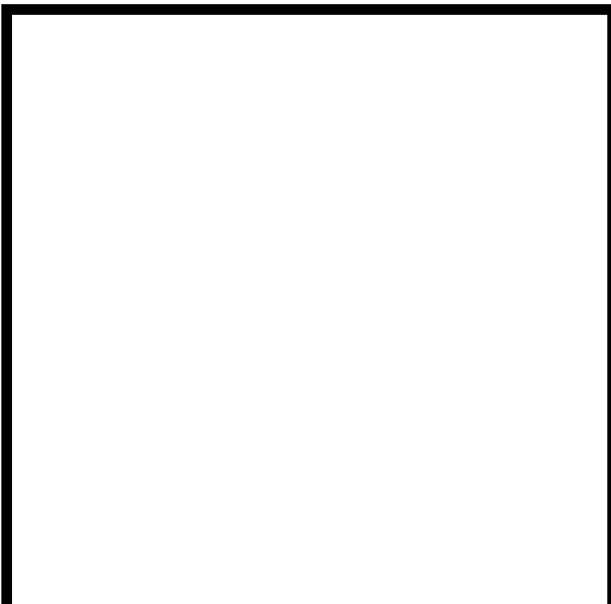
My Boots



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Resource Pack C : Photographs



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The Forth Bridge
inscribed on the World
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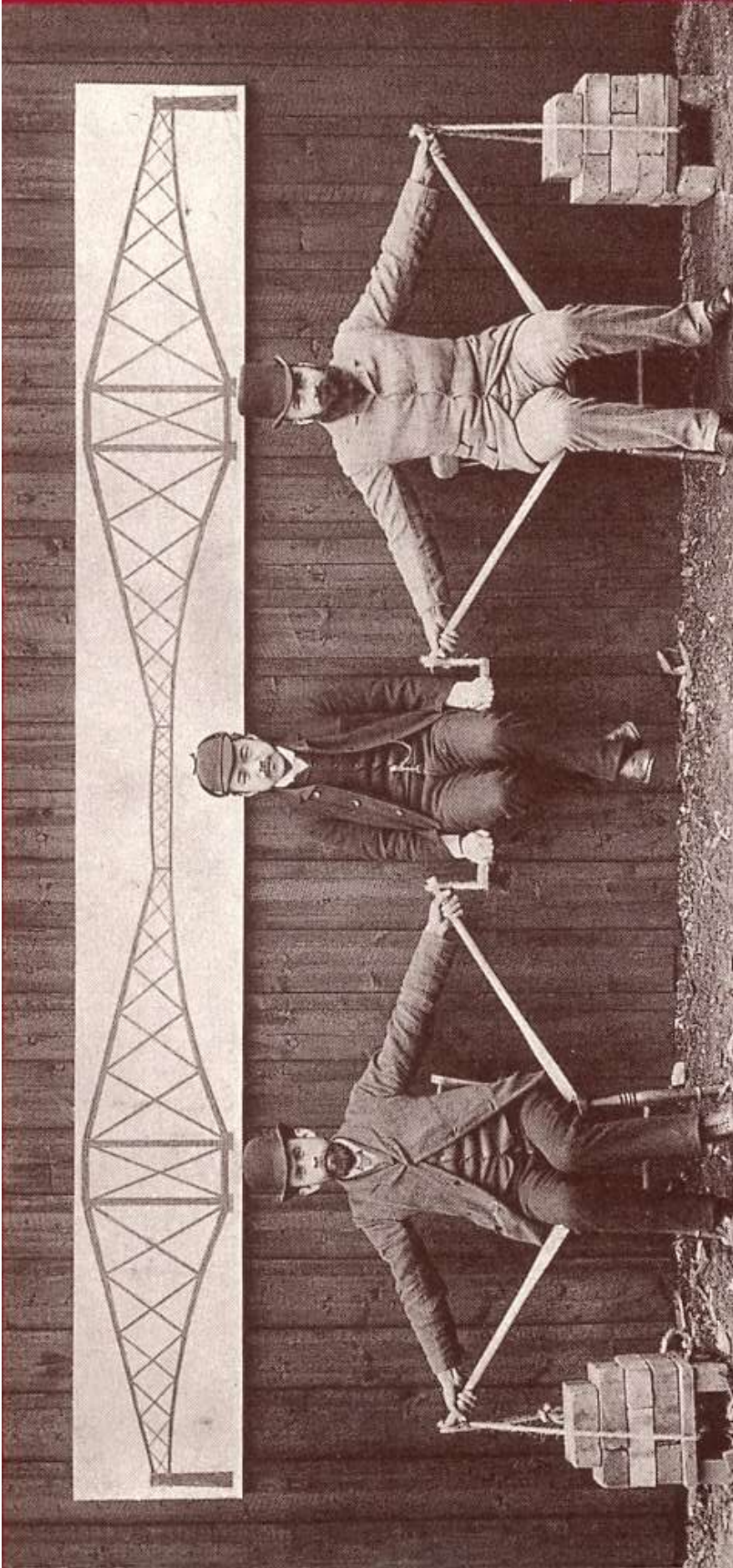


HISTORIC
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SCOTLAND

ÀRAINNEACHD
EACHDRAIDHEIL
ALBA



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Ref: Forth Bridge Watanabe Image Courtesy of The Forth Bridges Forum



Crown copyright, National Records of Scotland, BR/FOR/4/34/318, Queensferry north east cantilever bedplate, 9 Jul 1886



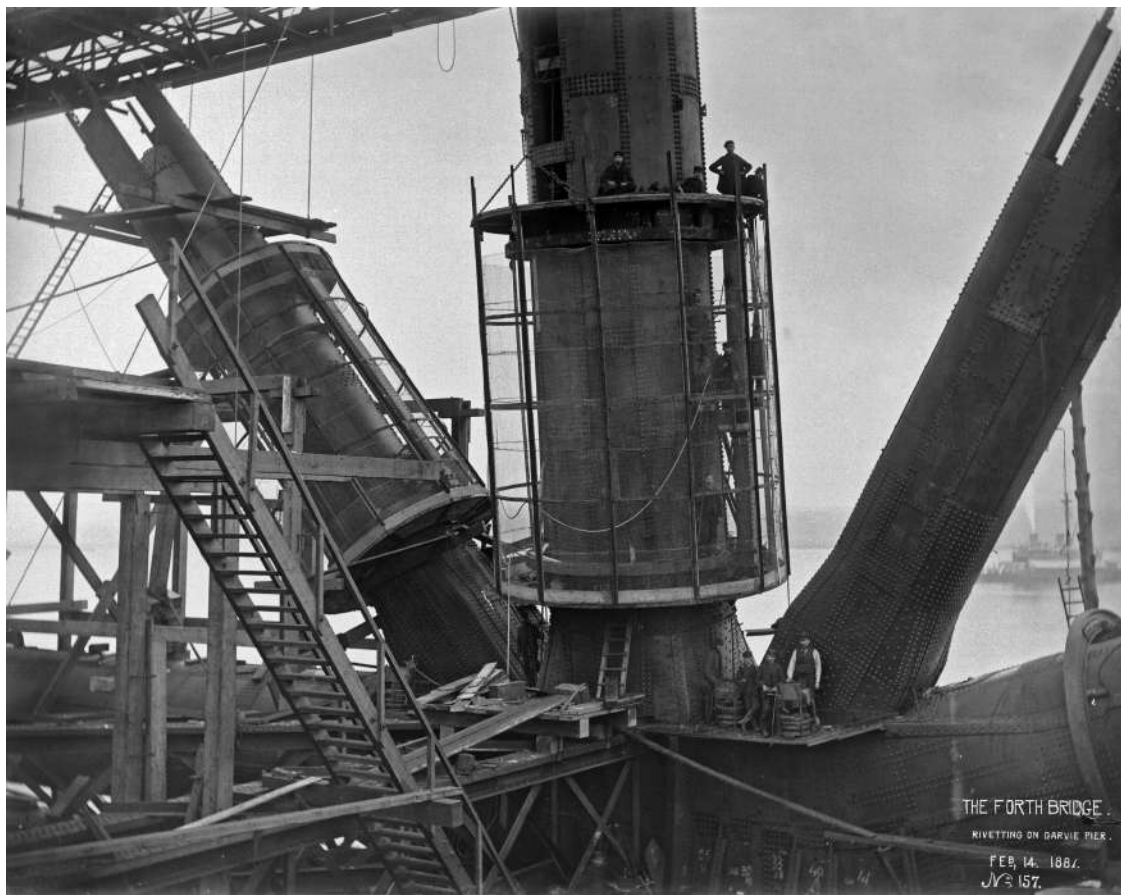
Crown copyright, National Records of Scotland, BR/FOR/4/34/176, Queensferry north west caisson, 15 Dec 1885



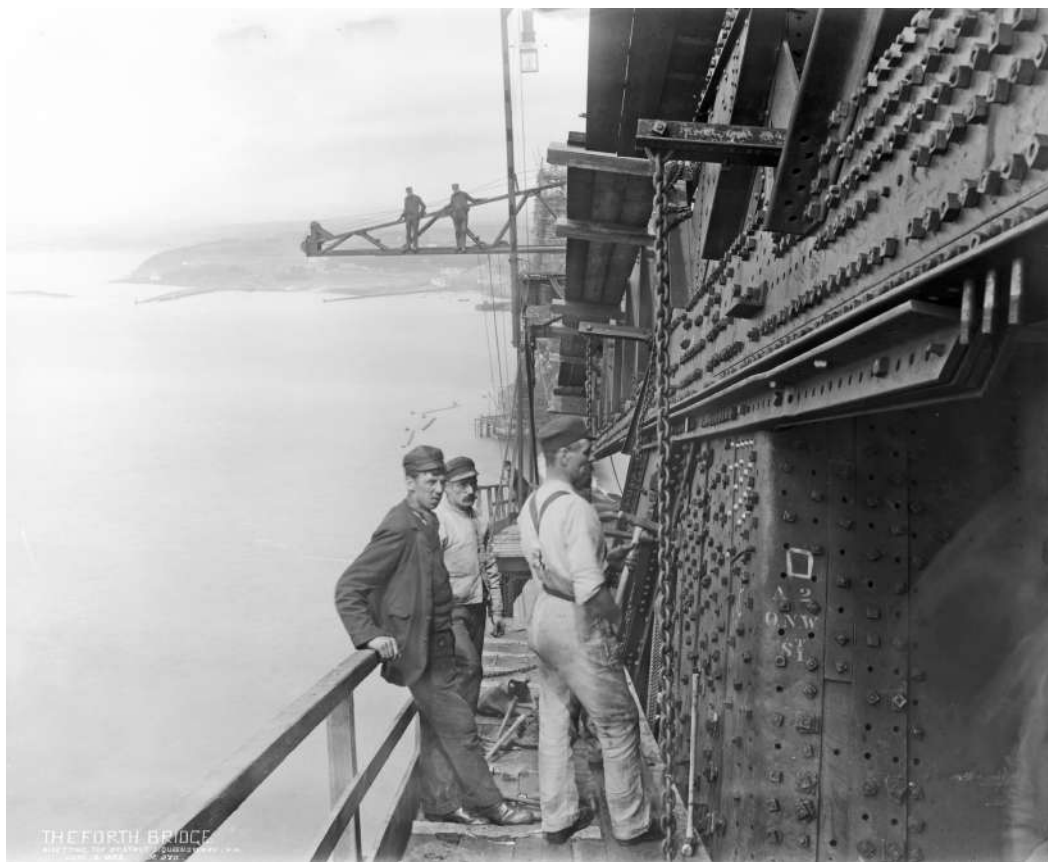
Crown copyright, National Records of Scotland, BR/FOR/4/34/123, Compressed struts, one labelled iron, one labelled steel (possibly for testing the metal), in front of two workers' sheds, 12 May 1885



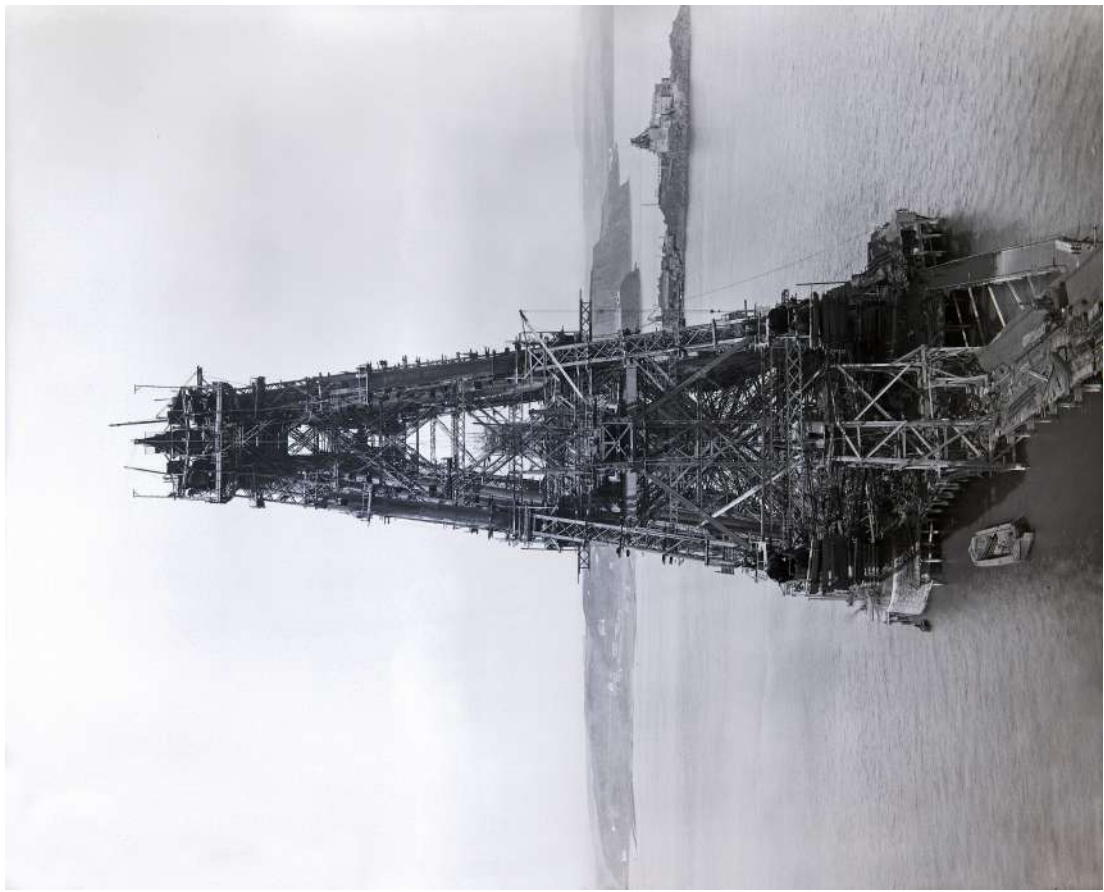
Crown copyright, National Records of Scotland, BR/FOR/4/34/116, Riveters posed with a pneumatic riveting machine on the drill roads, 12 Mar 1887



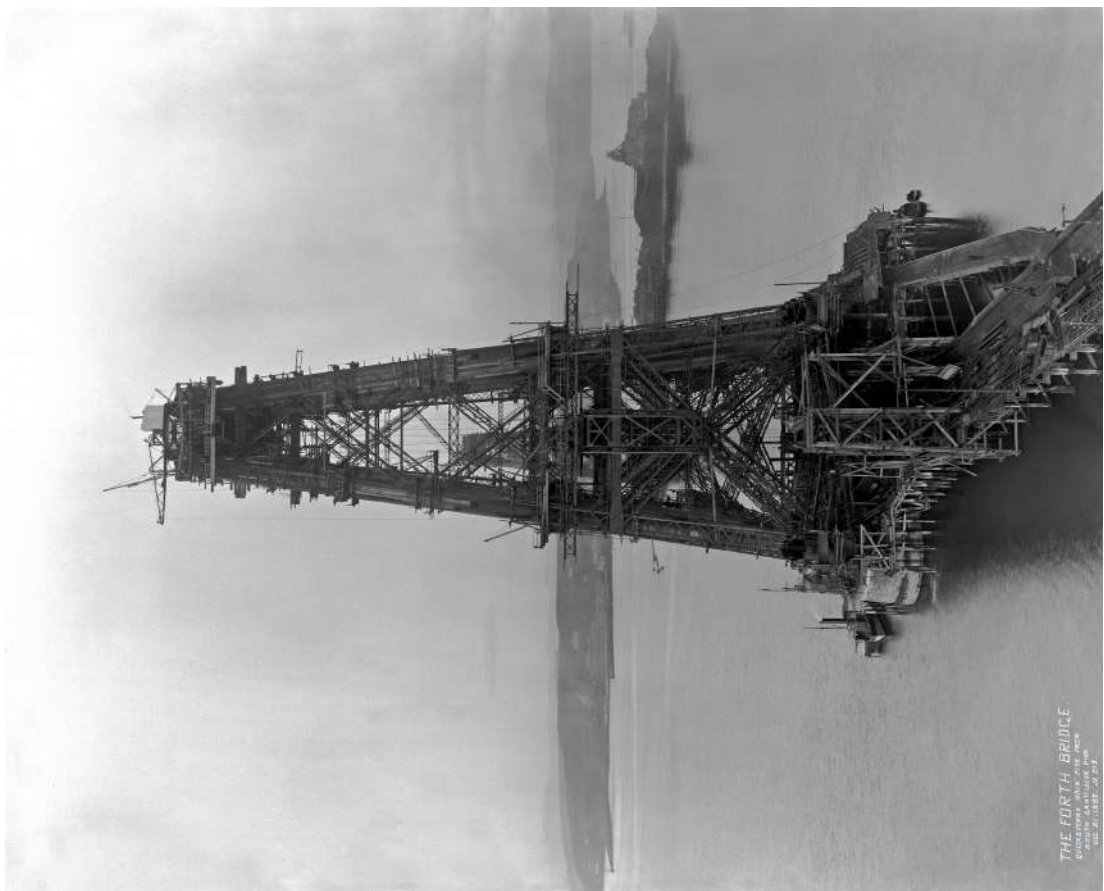
Crown copyright, National Records of Scotland, BR/FOR/4/34/347, Machines for riveting tubes on Inchgarvie pier, 14 Feb 1887



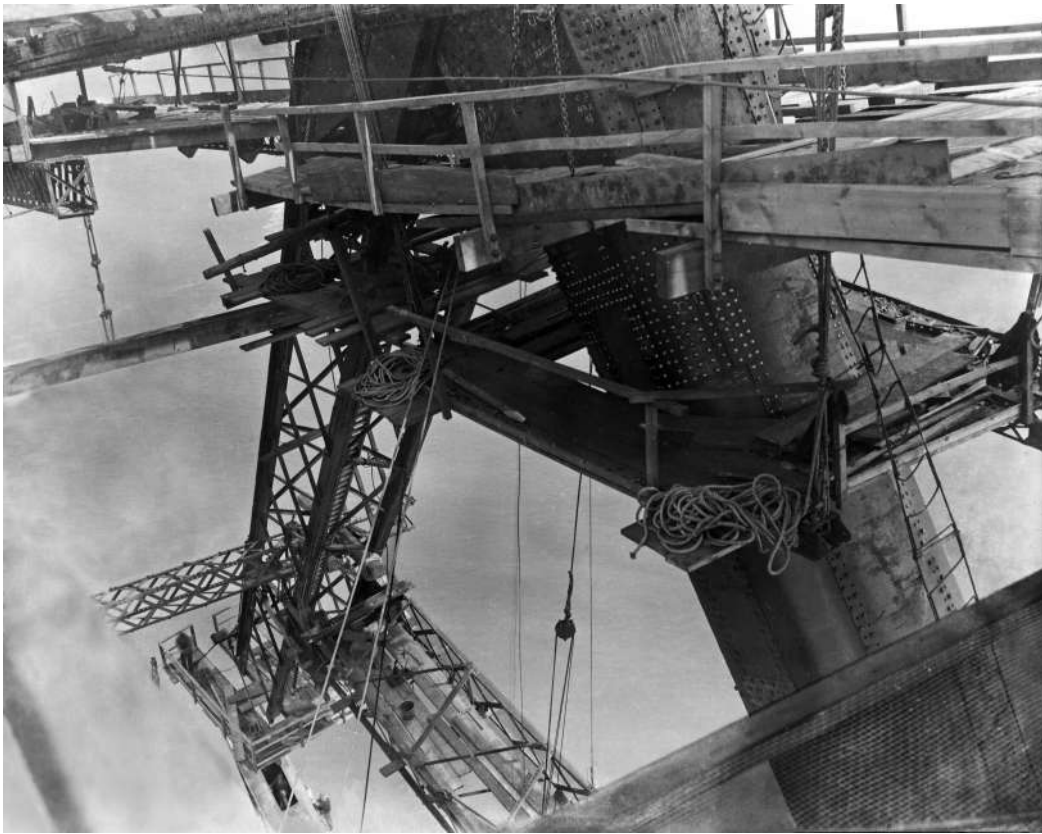
Crown copyright, National Records of Scotland, BR/FOR/4/34/247, Riveting at Queensferry north west cantilever, 18 Jun 1888



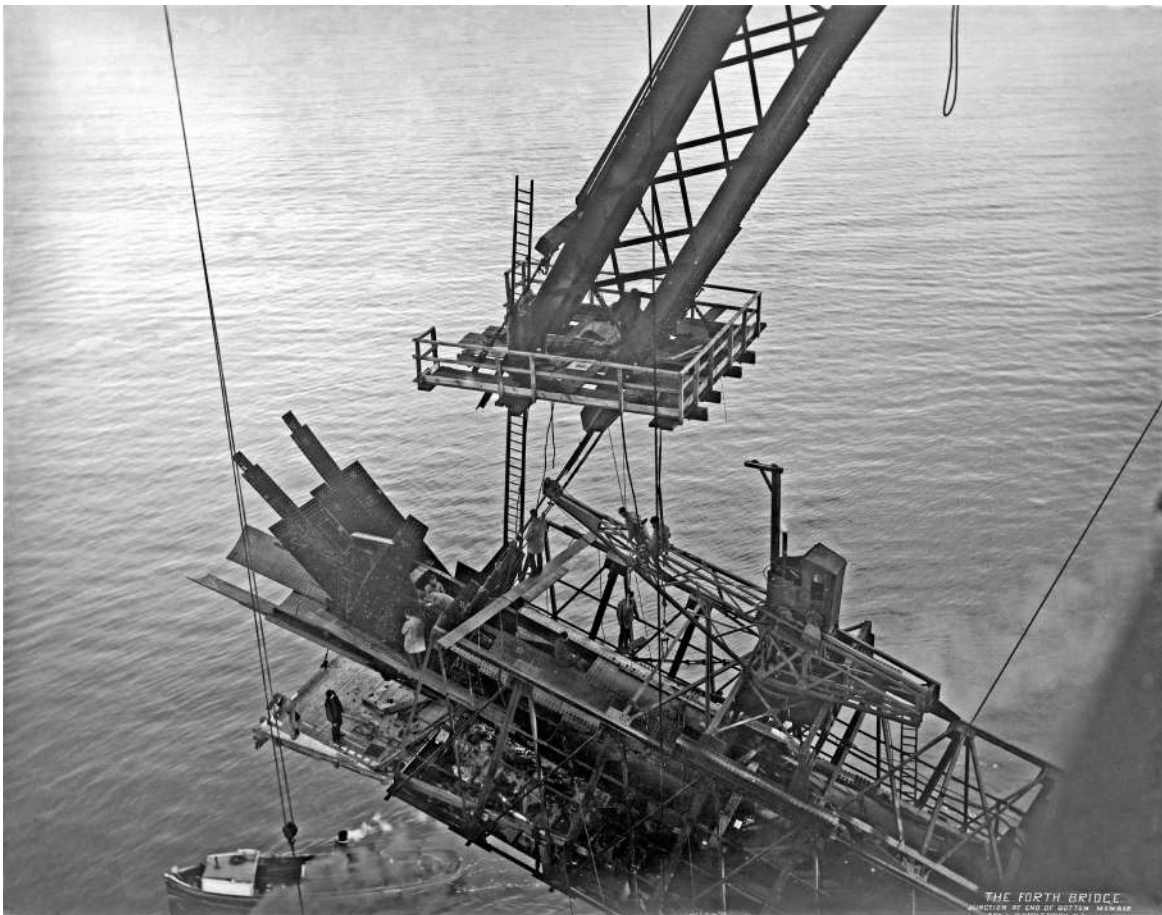
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