

Pouring lead for a waterproof joint, 1901



Description

This black-and-white photograph shows six men posed around the joint linking two lengths of pipe in the Coolgardie Water Supply pipeline. Two are operating a machine that melts lead for caulking (sealing) a waterproof joint. A collar of short bars interlinked by wires and chains can be seen around the joint. The photograph measures 21 cm x 16 cm.

Educational value

- The photograph shows men building the pipeline in the Coolgardie Water Supply Scheme, an engineering feat that attracted worldwide attention at the time and that has subsequently been declared an Australian national engineering landmark.
- The Scheme pipeline opened in 1903 and immediately solved water-shortage problems resulting from the gold rush that began in the 1890s when prospectors rushed to Western Australia's inhospitable eastern regions following amazingly rich discoveries at the locations later known as Coolgardie and Kalgoorlie. Men literally died of thirst in the arid country, while others died of diseases that spread due to a lack of sanitation and clean water. The gold-mining industry also needed water to develop, but attempts to obtain water from local underground sources and dams proved unsustainable and finally the pipeline from the coastal region was built at great expense.
- Caulking was a time-consuming process and a highly skilled construction stage in which individual pipe lengths were joined using a sealing process that ensured the pipeline did not leak. High-quality caulking was essential to the success of the pipeline.
- Caulking involved manoeuvring a new pipe into place flush with the last pipe laid, with a connecting piece called a ring (hidden under the collar around the pipe in the photograph) between the two. The gap between the ring and pipes was first filled with lead. An electrically powered caulking machine forced the lead into the joint, then hand caulkers sealed the joint around the locking bar.



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- There were about 60,000 joints in the 560-km pipeline, each of which had to be effective for the pipeline to be watertight, and caulking was usually carried out in sections of about 22.5 km. Some of the men included in the photograph were probably hand-caulkers.
- The particular stage of caulking that involved plugging the gap between the ring and pipes with lead was known as 'lead-running'. Before the lead-running stage, about 10 cm of coating was chipped off each end of the pipe. Once the pipes and ring were in place and lined up correctly, the gap was packed by hand with hemp rope to absorb the lead. Then the collar was fitted and clamped. Lead-running commenced when the molten lead was poured into a funnel at the top of the collar, from which it would work its way down to the bottom, gradually filling the gap.
- Lead-running gave great trouble until the lead-smelting machine, seen in the photograph pouring molten lead into the joint, sped up and simplified the process. Until the lead-smelter was devised, the lead tended to run out before cooling and solidifying tight. Use of the machine eliminated 'honeycombing' and other faults that had previously been experienced. The lead machine carried an acetylene gas generator, with the gas being burned in a small furnace beneath the pot holding the lead for melting.
- Lead-runners, some of whom are shown in the photograph, preferred to work 40 or 50 joints ahead of the caulking machine, especially in winter, as showery and cold weather affected the quality of the lead-running. Defective work had to be remedied and that delayed the caulking operations.
- The locking bar, a unique clamping mechanism used for the pipes in the Coolgardie Water Supply Scheme, runs the length of each completed pipe and the pipes are shown joined with their locking bars parallel to the ground. More than half of the original pipe laid between 1900 and 1902 is still in use today. Original pipes can easily be identified by the horizontal bar. When the pipeline was refurbished in the 1930s, the pipe lengths were laid with their locking bars at an angle to spread areas of potential weakness.
- The photograph gives an unusually clear view of the lead-running process because this is a section where the pipeline was being laid above ground on wooden collars. The pipeline was originally buried in a trench wherever possible so most photographs do not allow a view of the underside of the pipe. This photograph was probably taken near No 2 Pumping Station, about 2 km from the storage dam for the Scheme. In this hilly countryside the pipeline sometimes had to be laid across trestle bridges and sometimes in deep trenches to ensure correct alignment of the pipes.
- The men in the image are wearing their everyday clothes and do not even have gloves to protect their hands during their hard manual work, revealing the lack of occupational safeguards that is typical of the era. The pipeline was built at a time when occupational health and safety were not a concern and there was no such benefit as workers' compensation. Workers injured on the pipeline did not receive any pay until they could return to their duties.

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Creator Edgar Evans, photographer, 1901

Identifier Battye Library number 009134D

Source National Trust of Australia (Western Australia) <http://valuingheritage.com.au/>



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