# The Dunaskin Experience

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## Abstract

The Doon Valley in Ayrshire, Scotland has been the scene of a fascinating industrial diorama of a once thriving and bustling power house of the industrial revolution; a region full of coal and iron mines, ironworks, brickworks, power stations all underpinned by a comprehensive infra structure of services, dominated by an extensive steam railway system. Dunaskin lies at the heart of this region. It is the main centre of activity of the Dalmellington and District Conservation Trust and is a site of European importance with its characteristic landscape dominated by the two towering chimneys, a legacy of the ironworks which once stood there. A brief history of the site is given. An interesting facet is the Spanish connection, incredibly with the very area in which the STREMAH97 conference is being held. Dunaskin is a museum in the making and second year students from the Glasgow Caledonian University, studying on the B.Sc. course in Computer Aided Engineering, have been working on a number of projects involving the restoration of and research on a range of potential exhibits in the museum's Engineer's Workshop which is itself a scheduled ancient monument. One of these project is the refurbishment of a rare horizontal gas engine which will be used to provide motive power for a Dickinson Lathe and a Swift Radial Drill. This project has already attracted a generous grant from the Carnegie United Kingdom Trust. The restoration and history of the Stonefield Gomba truck, which is a unique product of the immediate vicinity, is discussed. Much experience has been gleaned from the pilot year of this highly successful joint venture and the lessons learned by all parties from this are catalogued in this paper from the points of view of both the Dunaskin Museum and the Glasgow Caledonian University.

## Introduction

Waterside is a small village situated between Dalmellington and Patna about 20 miles south-east from Ayr in the heart of Burns country. The village was built to house the workers of the nearby Dalmellington Iron Works, founded in 1847 at Dunaskin. The remains of the iron works which were later converted to brick works, form the core of the Dunaskin open air industrial museum. The valley of the River Doon has been the cradle of a burgeoning industrial development in the late nineteenth and early twentieth centuries. Coal and iron mines in close proximity were linked by an extensive system of railway lines which carried the raw materials to the blast furnaces of Dunaskin.

## The Dalmellington and District Conservation Trust

The Dalmellington and District Conservation Trust was formed in 1981 with the objective of interpreting and conserving the landscape of the upper Doon Valley, centred on Dunaskin and through that interpretation to stimulate job creation, economic activity and enhance social awareness of the significance of the past history of the area.

The Trust, working in close collaboration with the Ayrshire Railway Preservation Group which has established the Scottish Industrial Railway Centre at the former Minneyvey Colliery at Burnton near Dalmellington. A five kilometre railway line runs between Minneyvey and Dalmellington and plans are underway to establish a steam railway passenger service [1] as a premier attraction for visitors to both sites.

The Trust [2] is a registered charity and a company limited by guarantee. The re-organisation in 1991 replaced the Steering Group arrangement by a Board of Directors under a Chairman. The full Board meets four times a year and delegates .instructions and running authority to an Executive Committee which meets monthly. The permanent officers of the Trust are in attendance at all Board and Executive meetings.

## Description of Site

The Dunaskin site comprises the main brickworks complex which includes the Brick Kilns of the Scottish Brick Company, the imposing Blast and Engine Houses, the Engineering and Maintenance Workshops, the Dalmellington Iron Company offices, the locomotive sheds, the wagon repair shed and dwarfing all these, two towering chimneys which form a majestic landmark seen for miles around.

## Brief History of the Site

The evolution of the site spans a period of 150 years. Until the 1840's, agriculture and weaving were the predominant industries of the Upper Doon Valley. Four phases of industrial development are traceable starting from 1847. The Houldsworths business established the Dalmellington Iron Works at Dunaskin, taking full advantage of the close proximity of local deposits of iron ores and coal to fulfil its needs for the expansion of its iron making capacity. At its heyday, it must have been an awesome, even frightful, sight especially in the dark, with eight open top blast furnaces belching out fire and smoke, day and night. By the end of the nineteenth century, the local iron ore had been exhausted and foreign ore had to be imported at great expense from Spain. Newspaper reports of the time

mention the arrival of shipments of ore from Bilbao. It appears that iron ore was mined from various areas of the north coast of the Iberian Peninsula including San Sebastian and collected at Bilbao for shipment to Scotland. The last furnace was finally blown out during the miners strike of 1921 never to be relit.

The next decade, 1921-1931, saw the consolidation of local coal mining activities and the clearing of redundant blast furnaces and plant from the site. The railway network and maintenance facilities remained in use to service the coal mining industry.

In 1931, the Dalmellington Iron Company was amalgamated with the Lanarkshire based William Baird & Company and a brickworks was established on the site. During the 30's and 40's, the company thrived producing high quality 'DICO' common and engineering bricks. The workshops continued to service the brickworks, the coal mines and the railway systems.

In 1947, Bairds and Dalmellington, as the company was now known, became part of the National Coal Board and Dunaskin was made the headquarters of its West Ayr operations. Workshops, offices and brickworks remained active in the 50's and 60's , the latter under the auspices of the Scottish Brick Company.

The brickworks closed in 1976, partly due to a recession in the building industry and partly due to the exhaustion of the best clay resources. The NCB operations continued till the late 70's when the local pits were closed.

After the demise of the last coal pit at Pennyvenie, open cast mining was instituted at Benbain and from 1988 at Chalmerston. The output from Benbain was taken by lorry to the Dunaskin washer before being distributed by rail. The closure of the Benbain site in July 1986, sounded the death knell of Dunaskin's industrial usage and all industrial activity at the site ceased; the coal from Chalmerston going to the more modern .washery at Killoch Colliery.

## Birth of the Museum

With the demise of Dunaskin as a centre of industry, the site was cleared, some artefacts being demolished and others dispersed or removed to alternative sites and decay set in. The first priority for the Dalmellington and District Conservation Trust in the intervening years was to make the site safe for public access by tackling the major structural defects. In common with other sites, Dunaskin was in a Catch 22 situation. Without restoration and interpretation it could not attract paying visitors. Without revenue from visitors, exhibits, could not be restored to attract visitors. At an early stage, the need to have working machines with their attendant

visual and aural impact and their attraction to children and non-technical adults was recognised [3] and becoming very urgent.

## First Contact

At about the same time, at the Department of Engineering in Glasgow Caledonian University, a push was on to make project work more industrially relevant and to move away from sterile and artificial paper exercises. Dunaskin was seen as a way of imparting Engineering Applications II to students in an interesting, even exciting way which also benefited the museum and the community at large.

Contact was made in September 1995 and at meetings held at Dunaskin and at the University it became apparent that all parties had a lot to gain from mutual co-operation. From the exploratory talks it was decided to float a pilot scheme and a number of projects were examined. Three of these were identified at showing most promise and it was decided that three groups of four students would embark on the new venture at the start of Semester B - i.e. in February 1996.

The three projects selected were the refurbishment of a gas engine, a steam engine and a Stonefield Gomba Truck. Also the suitability of using one of the engines to power the already restored Dickinson Lathe would be investigated together with the mechanics of how this could be achieved.

## The Projects Begin

In February, 1996, three groups of four students, from the second year of the B.Sc. in the Computer Aided Engineering course, at Glasgow Caledonian University, started work on these three projects. Their remit was to carry out restoration work under the supervision of Dunaskin staff, Mr. Chris Howe for the Stonefield truck and Mr. Russell McCraken for the remaining two. As part of their work they would also research the general background of each of the artefacts and prepare display material pertaining to various aspects of the projects. One of these projects, viz., the Stonefield truck is described in more detail, next.

## The Stonefield Truck Project

The Stonefield truck has its roots in the immediate area round Dunaskin. Started in 1974, as a joint project between a Jim McKelvie and the Scottish Development Agency, the company was initially located in Paisley, with some prototype work undertaken by Jenson Motors. Soon after, the firm moved to Cumnock and started production in 1978. Having produced just over 400 units, Stonefield went into liquidation in July 1980. The company

continued to survive through a number of crises till the early 90's, including a change of name to Gomba-Stonefield and back to Stonefield again and a move of factory to another development area near Rochester. In its day it was an innovative vehicle, perhaps too much so. Rather than a conventional chassis it was built on a space frame concept made of welded rectangular hollow sections and eschewing cross-bracing yet giving a strong and rigid frame. The early models were only available with automatic gearboxes.

The truck at Dunaskin originally belonged to Doon Valley Council but had lain idle for seven years before restoration commenced. It had a 3-litre Ford Granada V6 engine and a Borg - Warner three-speed automatic gearbox. Some initial work had already been started by Mr Chris Howe. In the first few weeks the sub-systems of the truck were dismantled, examined, cleaned, logged and stored. The body panels were removed and the chassis cleaned and treated for rust. It was decided not to completely dismantle the engine and this decision was vindicated when the engine was successfully started - one of the high points of the project.

The pattern of working for the students was, to be ferried in the University minibus every Tuesday from Glasgow to Dunaskin, a 120 mile round trip. The driver, Mr Brian McMahon, a technician in the Department of Engineering also proved to be a very valuable member of the team working on the Stonefield Truck. The students also had another day, Friday, at the University to do research, plan the programme of work, and to do other academic activities to complement the practical work at Dunaskin.

Lack of planning and structure in the initial stages on the part of the students and supervisors resulted in very little work and loss of morale and motivation. Allowing for travelling time, there was only a window of four hours in which useful work could be done. The luxury of getting to Dunaskin and then thinking about what was to be done simply was not available. Finding that tools were needed but had not been brought from the University could be a disaster. Weekly formal meetings were instituted for each group. Work to date was to be discussed and work was to be planned for the next trip to Dunaskin and any other business or problems were to be tackled. Minutes of these meetings were to be kept. The first couple of meetings were chaired by the academic supervisor who then handed over control to the students, sitting in for the next few meetings before withdrawing completely. Apart from giving the students valuable experience in running meetings, planning, etc. this also emphasised their ownership of the project and that they had to interact with the museum staff and drive their own project rather than passively accepting orders and waiting to be told what to do. Another source of disappointment for the students was their expectation that the truck would be "restored to its former glory". It had to be pointed out to them that this was not realistic in

the short period of twelve weeks and that they had in fact accomplished a great deal in the short time available.

A problem encountered by the other two groups was the long time scale in getting permission from Historic Scotland to, for example, lay concrete plinths for the engines to be mounted on. This resulted in weeks of delay which could be ill afforded in the short time span available for the projects. Very long term advance planning and anticipation in these circumstances is absolutely essential.

The lessons learned from the first year of running these projects will be applied to make them run more smoothly and productively next year. As already mentioned, advance planning by the Museum and University staff is essential to forecast and plan in order to avoid potential barriers to progress. Two such examples might be, seeking permissions and having tools and equipment available when needed. There really is no time in a 10 - 12 week period that can be spared waiting for these. Because there is only a four hour window in the day spent at Dalmellington in which productive work can be done, this has to be tightly planned and structured. It requires supervisors to have a focused idea in advance of what is to be done and for this be effectively communicated to the students. It also requires the students to take ownership of the project and, at the very least, to agree these activities interactively with the supervisors. Ideally they should drive the project. All this requires that the project context and aims are realistic and are planned in advance in minute detail. This particularly applies to the practical work done at the Museum. This has however to be done tactfully so that the students do not feel that they are not in control Tight control without stifling the enthusiasm of the students is necessary.

## Conclusions

In conclusion, this pilot year was successful in varying degrees for all the groups. It was not surprising that the more structured 'Stonefield' project made the most progress. The groups learned some aspects of team working and extended their knowledge in areas not covered by the syllabus. The lessons learned are being applied by the Museum and University staff for the benefit of the next cohort of students.

## References

1. Ayrshire Railway Preservation Group/ Dalmellington and District Conservation Trust (1989) Scottish Industrial Railway Centre Development Plan.
2. Dalmellington and District Conservation Trust (DDCT) (1988) Waterside Development Plan.
3. Dalmellington and District Conservation Trust (DDCT) (1989) Doon Valley Heritage Marketing Plan.

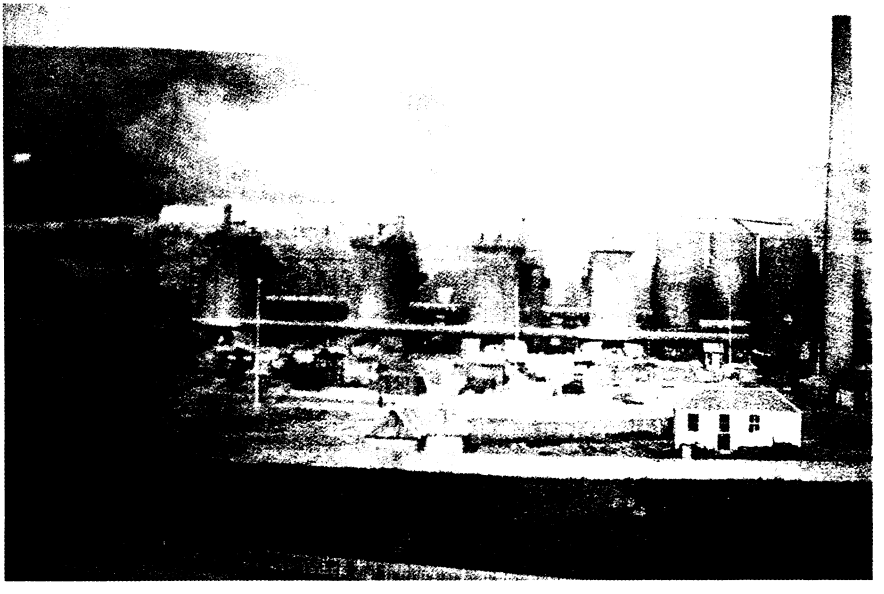

Figure 1: View of Working Iron Works.

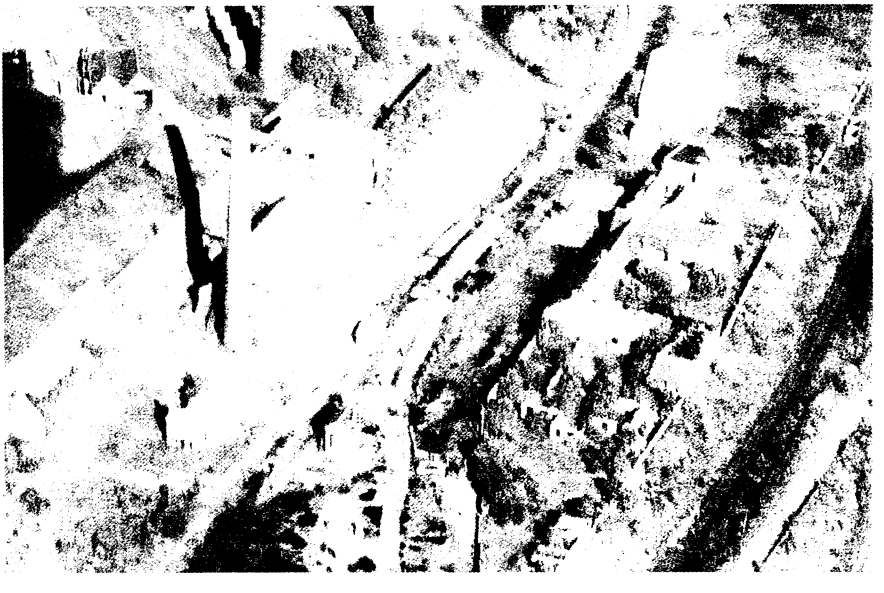

Figure 2: Aerial View of Site, Post Closure.

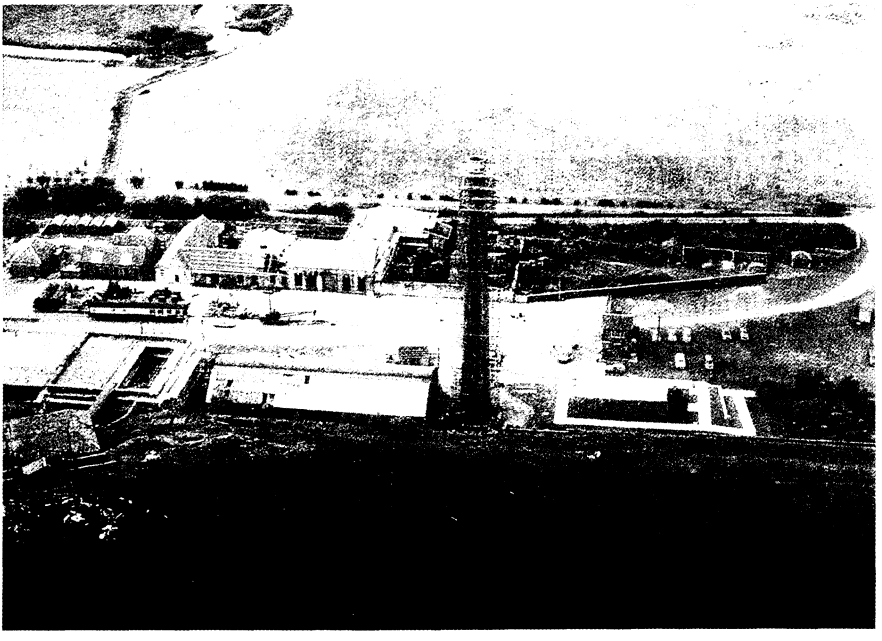

Figure 3: Aerial View of Site, Early Refurbishment.

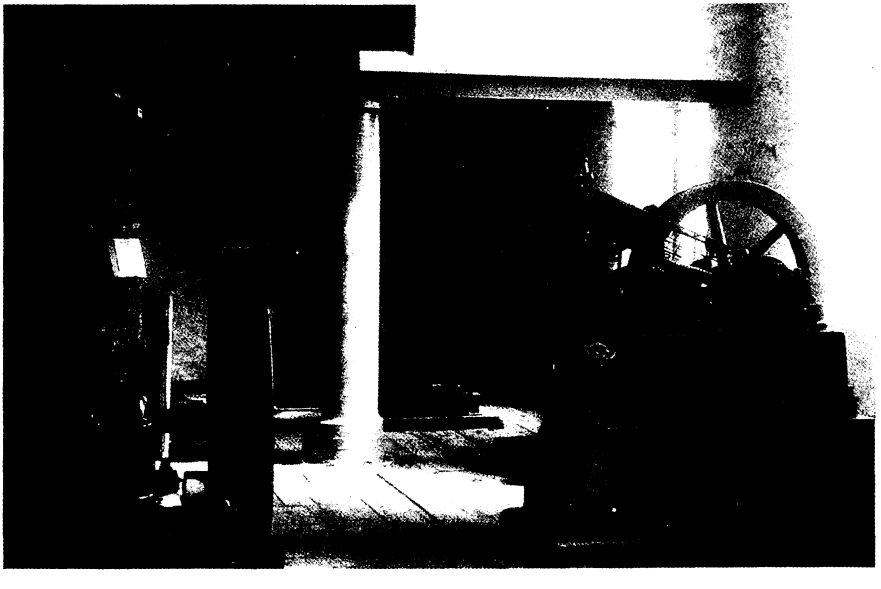

Figure 4: Interior of Engineering Workshop Showing Gas Engine in the Background and the Steam Engine on Right.