

## 4. Tapping Old Patrick - Water Power at Quarrelton

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In the period immediately preceding the industrial revolution, one of the most important assets in a region was a supply of coal. Before the availability of good roads to transport minerals, a local supply was crucial. Renfrewshire is not renowned for being a major coal-producing area, but in the eighteenth century there were dozens of coal pits scattered throughout the county<sup>1</sup>. There were also several much more substantial collieries. One of the main centres of production was on the southern fringes of what is now Johnstone, where the famous 'thick 'or '100 foot' Quarrelton coal was worked from the 17th century<sup>2</sup>.

### Quarrelton

A plan of Quarrelton surveyed in 1733 shows many coal and lime workings<sup>3</sup>. The earliest workings were immediately to the west of the mining village. Gradually, as the workings became deeper, they became too low to drain naturally. Drainage was provided by a pump situated over a shaft at the lowest point of the coalfield. The pump was powered by a 'Water machine' which is shown on a 1733 survey of the area<sup>4</sup>. The water supply was provided by an innovative scheme to divert a burn, three kilometres to the south, on the edge of Caplaw Moss (Figure 1).

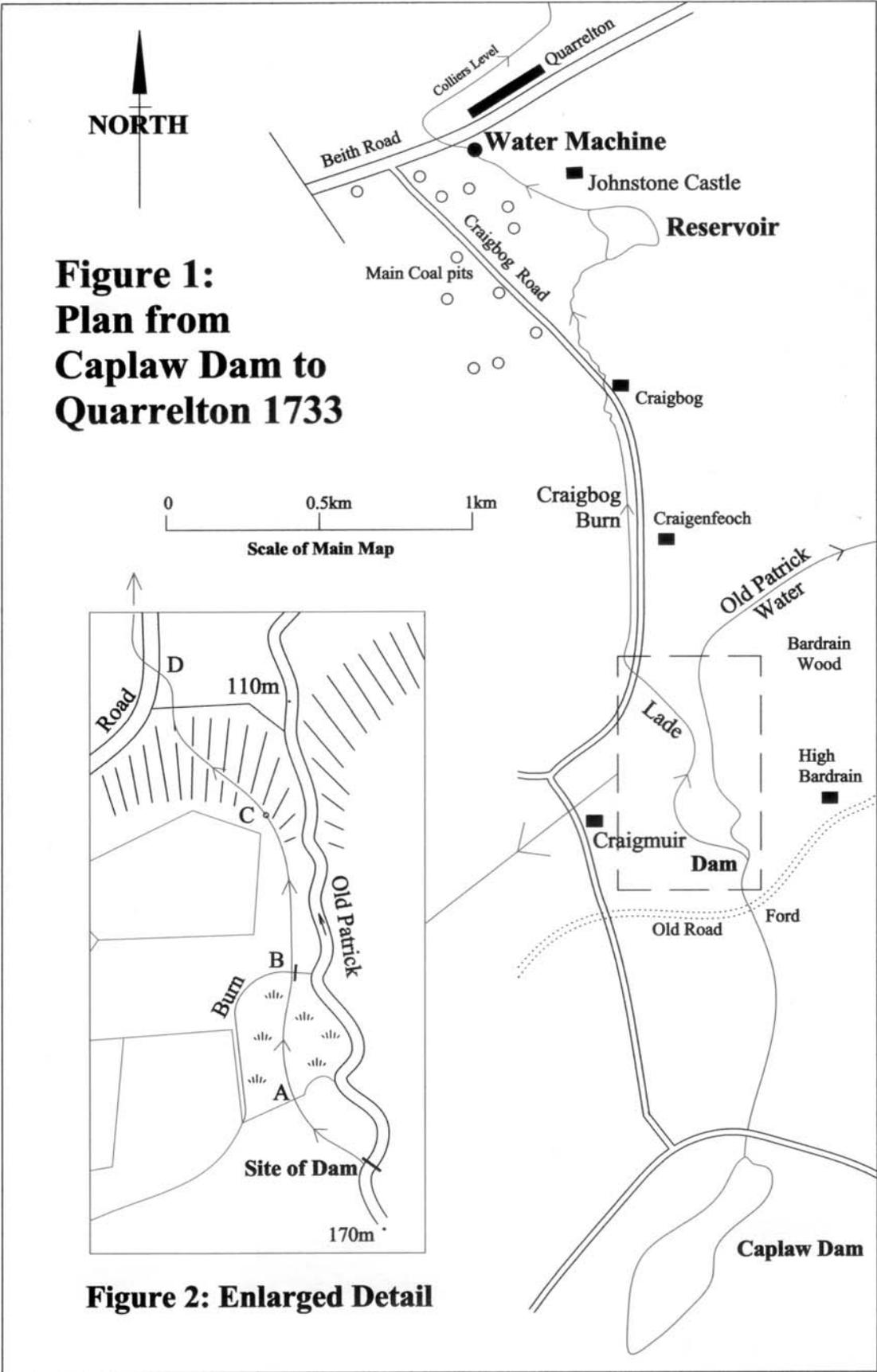
### Elderslie Burn

East of Quarrelton lay the estates of Elderslie and Newton. In the high ground south of Quarrelton, Johnstone and Newton were separated by the Old Patrick Water, also known as the Elderslie or Brandy Bum. Traditionally this burn powered Mackies and Elderslie meal mills. In the early 1790s Caplaw Moss was flooded by the building of Caplaw Dam to store water to power Elderslie Cotton Mills. This dam latterly also supplied power and process water to various other industries including Patrickbank Paper Mill, Printworks and Glenpatrick Distillery. The Old Patrick Water falls from the high moorland on Caplaw Moss to the flatter land below, in a deep gorge east of Craigmuir farm. Here a succession of spectacular waterfalls drops 60 metres over a short distance.

### Craigbog Lade

A plan of Newton survives in fragments, surveyed in 1749 for estate owner Claud Alexander<sup>6</sup>. Just downstream of a ford crossing the burn to the farmtoun of High Bardrain, the map shows a lade branching off the Old Patrick Water heading west. The branch is denoted 'This water forms Johnston's Water Engine'. This lade diverted water north west towards Quarrelton.

The plan of Newton was drawn by prominent land surveyor Charles Ross of Greenlaw, who also published a county plan of Renfrewshire in 1754. The survey is accurate enough to be plotted on modern maps and the site of the dam was explored by Forum members in June and November 2001 (NS 435600). Figure 2 shows an enlarged detail of the area. The lower courses of a partly-dressed rubble dam still survive, which diverted the burn just before it tumbled over several waterfalls. The lade headed north-west from the dam, until it met a minor burn at A. From here it crossed a bog and the channel is no longer obvious, confused by drainage, estate improvements and enclosures which post-date the lade. It also picked up another minor burn heading for the Old Patrick Water at B.



The next section of lade followed the 155 metre contour, but is difficult to locate on the ground. The lade becomes prominent again on the crest of the braes at 'C', where it cut across the face of the hill, and dropped steeply towards the road at 'D'. From here the channel crossed the corner of a field and thereafter contributed naturally to the headwaters of the Craigbog Burn. This burn passes various coal pits at Craigenfeoch and Craigbog on its way downhill. Below Craigbog just south of Johnstone Castle the burn fed a reservoir which stored the water for the engine.

The lade from the reservoir to the water machine can still be traced through the woods within what was Brownock hill Farm<sup>7</sup>. The channel terminated at the top of a ridge above Beith Road where a waterfall powered the machine. The tailrace from the water wheel, plus the water which it had pumped from the workings, crossed Beith Road and flowed behind what is now the "Bird in Hand" hotel. Within living memory the water emerged in a stone-lined shaft at the north east corner of the hotel grounds, where a substantial amount of minewater still erupts from the ground<sup>8</sup>. From this point it enters the Colliers Level in Linn Park, and heads east behind Quarrelton cottages, before joining the Craigbog Burn, Peockland Burn and ultimately the Black Cart.

In the early eighteenth century the engine was maintained by a millwright, Neil Small from Kilwinning. In 1728 an apprentice was indentured to look after the machine. The fee of £100 was paid by Houston of Johnstone for "maintaining, guiding, ordering and repairing his Water Wheel, Pumps, Gins and other machines for winning and out-taking his coal of Quarrelton and for draining the water therefrom"<sup>9</sup>.

The water machine was in use until the year 1770 when George Houston replaced it with a Newcomen steam pumping engine<sup>10</sup>. The storage reservoir then became an ornamental pond or estate feature and the burn bypassed Johnstone castle to the east<sup>11</sup>. The reservoir no longer survives and the site is built upon. The Craigbog burn is culverted under the housing estate and emerges from a stone tunnel under Beith Road near its junction with Campbell Street.

On the 1733 map of Quarrelton there were a dozen coal pits, covering five acres of Brownock hill farm, clustered around the water engine<sup>12</sup>. In 1770 an underground fire caused a substantial part of the older workings to collapse, lowering the whole area by more than half a metre. Other dangers included spontaneous combustion of the seams, methane gas, breaking into old unrecorded workings, and flooding. Several miners were drowned in a flood at Benston to the west in 1860<sup>13</sup>. By the 1790's the workings covered at least a square mile, producing 20,000 tons of coal per year. A dozen pit-ponies worked underground drawing the coal along roads to the bottom of the main shaft<sup>14</sup>.

Later, as the deeper coal was worked, there were twice as many shafts over a much larger area, each 100 metres deep or more<sup>15</sup>. Some of the workings were also reached by adits (tunnels), sloping steeply underground to reach the coal. Today a large quarry is still in operation across Craigbog Road, working the whinstone which overlies the coal.

## Summary

The water machine was a crucial part of the Quarrelton workings, which provided a

substantial part of Houston of Johnstone's estate income. This is one of various early water powered innovations in Renfrewshire, which is pushing back the accepted start of industrialisation. George Houston was an acknowledged national authority on mining practice, and there is a direct link from his early use of water power at Quarrelton, through similar innovations at Corseford lime works, to his water powered cotton mills in the 1780's<sup>16</sup>.

The coal worked at Quarrelton was used either in nearby lime kilns, such as at Floors, or sold to residents in the area. The Quarrelton coal could not have been exploited without a means of draining the workings. The water machine drained the seams at their lowest point, thereby keeping all the other workings free of water. The Craigbog Lade may at first glance seem relatively remote and insignificant, but was the key to the working of the Quarrelton coal.

### Sources

1. The principal account, Nef, J .U. *The Rise of the British Coal Industry* Vol. 1 (London 1932) p.355, sidelines the Renfrewshire collieries to being part of Lanarkshire.
2. Old Statistical Account (OSA) Paisley Abbey Parish p.842; Hinxman, L.W. et al *The Economic Geology of the Central Coalfield of Scotland Area, IV: Paisley Barrhead and Renfrew*, p.25: in reality the "100 foot" coal was generally 40 to 50 feet thick, consisting of five seams directly on top of one another. Over a limited area the groups of seams overlapped, doubling the apparent thickness.
3. Plan of Quarrelton Surveyed by John Watt (1733): *National Archives of Scotland* (NAS) Register House Plan (RHP) No.22280; also manuscript survey sheets for this plan in Boulton & Watt Papers, Birmingham City Archives C/ 7/ 1 8/ 12. I am very grateful to John Moore for sharing his ongoing research on John Watt's surveys.
4. NAS RHP 22280.
5. Glasgow City Archives (GCA) TD 1318 *Speirs of Elderslie Papers: 1794 a/c* for puddling the dam at Caplaw (i.e. sealing it with clay). There may already have been a natural loch at Caplaw. When the dam was drained in the 1990's, there was no sign of one, but it may have silted-up.
6. NAS RHP 43558 *Exact Plan of the Estate of Newton the Seat of Claud Alexander* surveyed by Charles Ross, (1749)
7. Brownock hill on Watt surveys (1730), Brannocks hill (rental of Quarrelton Estate 1763), Brannocklie on 19th century OS maps.
8. Personal communication Sylvia Clark.
9. Glasgow City Archives TD 263/96: Obligement Semple to Laird of Johnstone 1728.
10. Semple, W. *History of the Shire of Renfrew* (1782) p.257.
11. See John Ainslie's map of Renfrewshire (1796)
12. NAS RHP 22280 Table of Contents: Brownockhill "Coa1 pitts and waft (waste) ground 5 acres 3 roods"
13. Hinxman *Economic Geology* p.26.
14. OSA Paisley Abbey Parish p.843.
15. Various other sources document the Quarrelton coal workings including the OSA and NSA.
16. Duckham B.F. *A History of the Scottish Coal Industry 1700-1815* (Newton Abbot 1970). p. 138.