6. FIELD INVESTIGATIONS

THE PROJECT AREA at Wilson's Run consists of a corridor crossing the valley of the stream somewhat east of the present road. The corridor crosses upland, an abandoned mill race, the stream, and the floodplain of the stream (FIGURE 5).

Soils in the project area are Hatboro silt loam. These soils are the wettest and most poorly drained in the New Castle County Piedmont. Uses of such soils are extremely limited by their wetness (USDA, SCS 1970). Therefore, the project area has a very low probability of containing sites of prehistoric or historic human habitation.

Nearby is an area of Codorus silt loam, which is characterized by moderately well drained gentle slopes along waterways. In preparing the park's cultural resources management plan, Cara Blume tested two small areas of Codorus soil on either side of the run, a short distance southeast of the project area (Blume, Clark and Dunn 1990). The three tests uncovered no prehistoric evidence and a few historic artifacts typical of a cultivated field. The tests terminated in rocky soil between 20 and 35 centimenters below surface.

In conclusion, Blume and her associates determined that "No prehistoric sites are likely to be preserved on these eroded terrace settings," of which the project area is an example. Therefore, prehistoric archæology was at best a peripheral consideration in the present project.

Just south of the project area is a complex of buildings associated with the former Wilson sawmill and gristmill complex (N-1397, 7NC-B-30). This mill system operated into the twentieth century, most lately as Colonel Henry A. duPont's sawmill. The existing concrete mill ruins apparently date primarily from Colonel duPont's era. A fuller history and assessment of significance will be found in the park management plan.

The project area crosses the race that powered this mill, as well as the water source, Wilson's Run. Since dams over the run today are obviously modern, it would be useful to know the location and elevation of the original dam or dams. The race has been truncated by the existing Thompson's Bridge Road, making it difficult to follow above the road. A topographical survey was therefore necessary to tie together the broken line of the race and its vertical position relative to the mill ruin.

Under the present road, there should be remains of earlier raceway bridges. If the race was filled during a subsequent rebuilding of ther road, there is a possibility that it survives intact under the fill. Removal of the road should therefore reveal considerable detail about the successive hydraulic systems that have served the mills through time.

The race in the open field southeast of the present road has been smoothed by erosion, but its outline is clearly visible. It was determined that a test trench into the race would permit an assessment of the value of this feature in the interpretation of the mill complex.

In view of the high potential for information recovery in the raceway and the low potential for prehistoric sites, it was decided to concentrate on the race.

The first test (PLATE 11) was a hand-dug trench ten feet long and about 18 inches wide (FIGURES 5 AND 6) across the apparent edge of the mill race berm. In this location, the race had been considerably flattened, compared to the remains a short distance to the east.

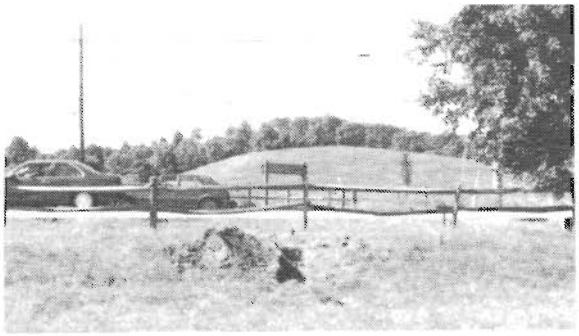
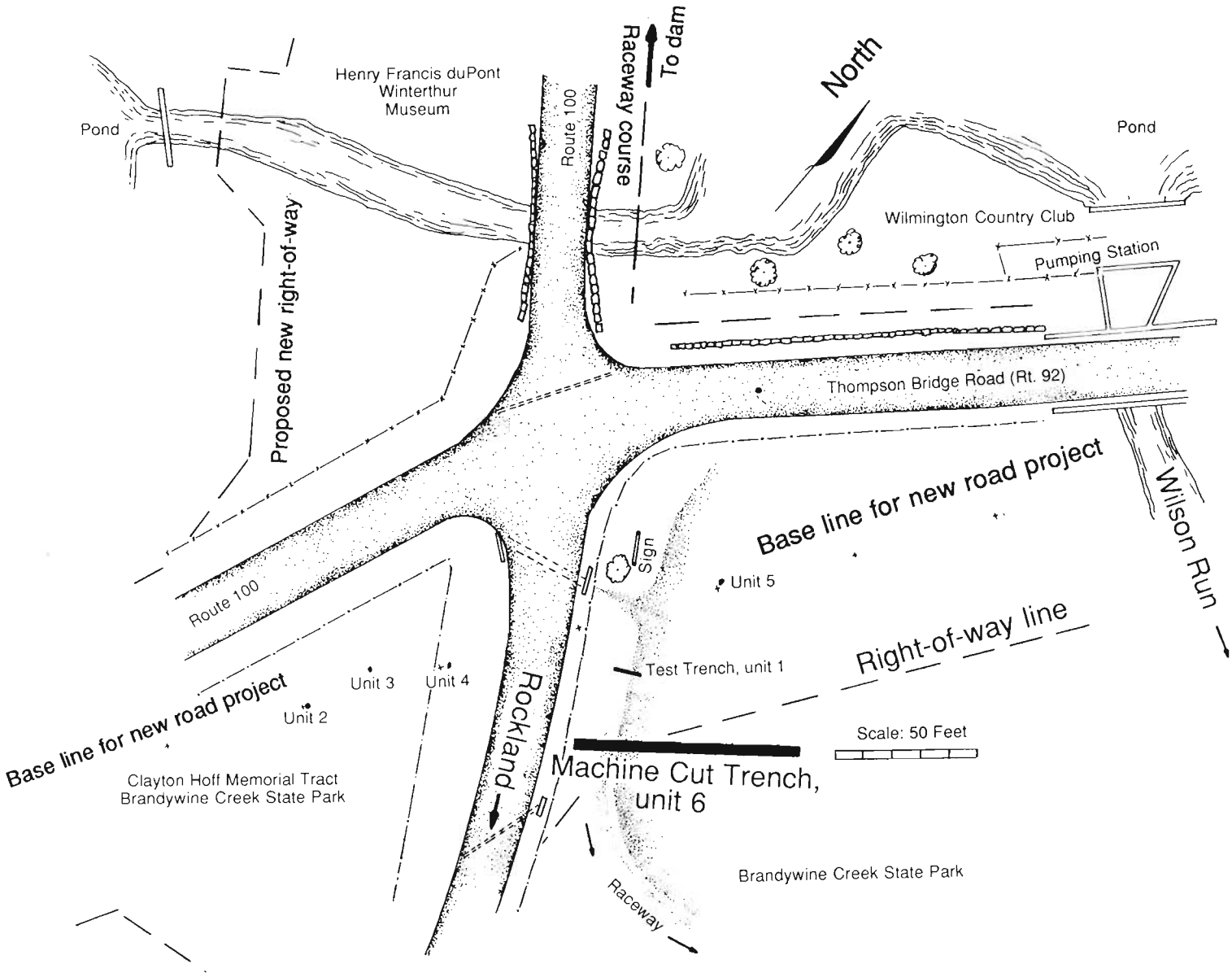


Plate 11
View southward across unit 1

Figure 5

Plan of excavations at the Road 92 and Road 100 Adams Dam project area



At the surface was a refined pebble-free turf apparently prepared for landscaping purposes. Under this layer was a uniform brown clay fill, which overlay a gravel-filled depression that appears to be a roadway. This lay on top of another uniform brown clay fill. On the high side of the trench, the hard yellow clay subsoil had evidently been cut down to make a depression for the raceway in the hillside.

The yellow clay subsoil gave way at the bottom to a layer of black muck filled with organic matter; this level could not be investigated because it filled almost immediately with water. Near the toe of the slope, some large rocks were found in place.

This small hand-dug trench demonstrated that a larger, deeper and better drained trench would be needed to interpret the succession of events in the history of the race. A machine-dug trench was therefore sunk into the race a short distance to the east.

Even though the area was unlikely to contain prehistoric or historic artifacts, a few test pits were in order, just in case the predictions were wrong. Four holes were dug with a post hole auger, down to the yellow apparent subsoil. The soil from the holes was screened.

Three of the pits were situated in the Clayton Hoff Memorial Tract. Tests 2, 3, and 4, were 50, 60, and 65 centimeters deep, respectively. The only artifact was a lag screw, not saved, in test 4.

In the valley below the mill race, another auger test, number 5, encountered the same uniform reddish brown clay soil to a depth of 40 centimeters. From that level, down to yellow soil at 60 centimeters, the fill contained red brick chips and lumps of coal, indicating that the floodplain had been heavily scoured in relatively recent times.

Since subsequent development had obscured the race upstream from

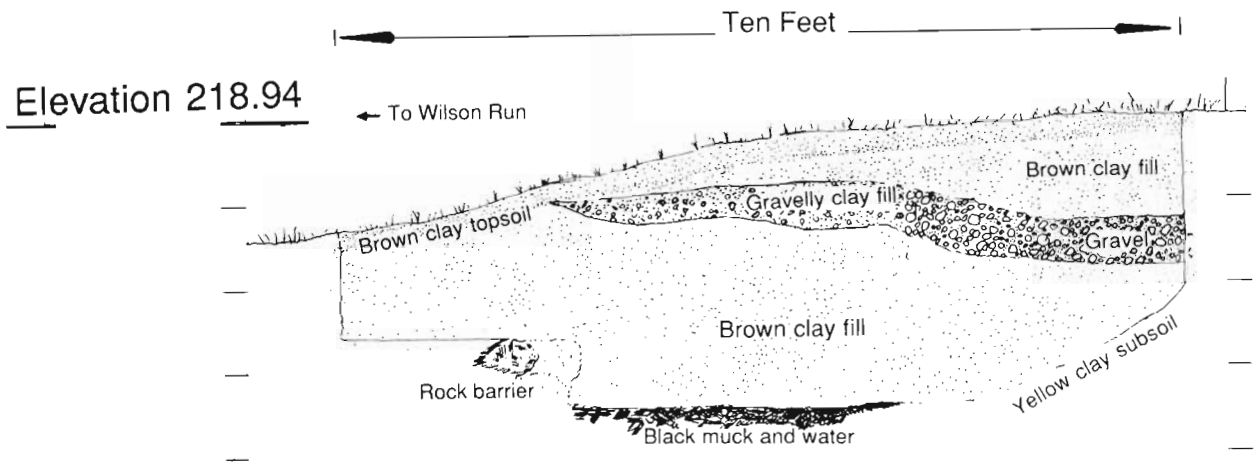


Figure 6

Test Trench, unit 1, east profile

Thompson's Bridge Road, the Department dispatched a survey crew to record the vestiges of the water power system features before they might be destroyed by construction of the new intersection. This survey clearly showed that the existing dam was built to serve the mill, the remains of which still are preserved on the park property.

The machine cut trench, opened September 27, extended eighty feet long and four feet wide (FIGURE 7). At its deepest point, the trench was more than six feet deep. Beginning point was chosen as near to the road as possible, in order to intercept any back side that might exist. As it turned out, the cut apparently barely missed the back bank.

The machine-cut profile revealed a series of construction stages of the race, probably spanning more than a century. Periods of abandonment and rebuilding were visible in detail.

At least three mills are documented on this seat, the duPont sawmill (PLATE 13, PAGE 28) being the most recent. Just before Colonel Henry duPont rebuilt the mill, it was supposed to have been abandoned for lack of enough water.

The profile reveals that several operators had attempted to raise the race. Since a miller is concerned with the top, or head, of the race, the bottom of the race can be allowed to fill as the walls are raised; this is apparently what happened here on more than one occasion. Finally, the race was filled in and a gravel metalling was installed.This was replaced by a layer of second gravel, probably to create a dry bridle path or cartway.

The first raceway, represented by strata 8, 9, and 10, was dug out of the natural subsoil at the edge of the slope. Its wall was not well-defined and while it was open, it was allowed to fill with rotten organic matter, which slopped over the edge.

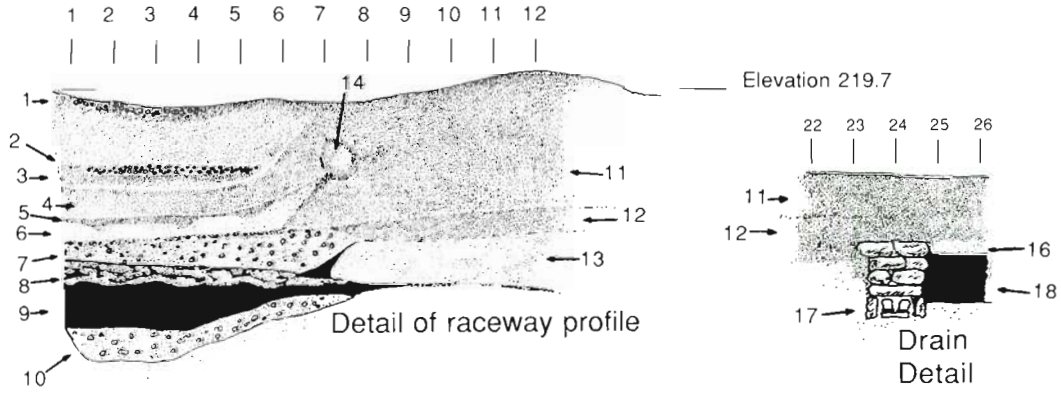


Figure 7

Profiles of Unit 6, machine cut

See table 3, page 24, for interpretation

Overall west face profile

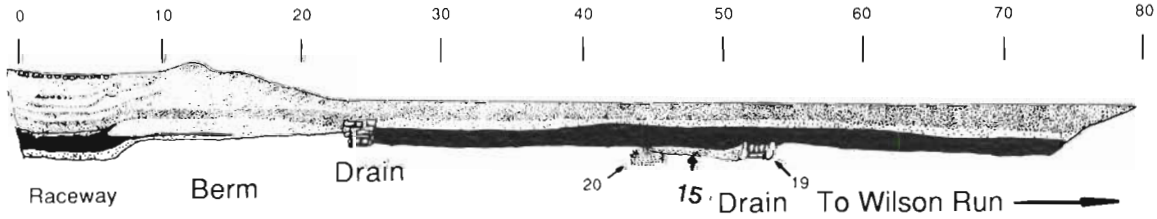


TABLE III

STRATA IN UNIT 6, MACHINE-CUT TRENCH

Refer to Figure 7, page 23

1. Brown clay loam fill, topped with two or three inches of crushed gravel
2. Thin layer of pebbles, 4.5 feet wide and an inch thick at its center, forming part of the interface between fill layers.
3. Layer of brown clay loam fill, about 5 inches thick, yellow in the bottom inch. The yellow line extends up the slope under layer 1.
4. Layer of brown clay loam fill, which loses its definition at about 7 feet.
5. Brown sand layer with an irregular bottom and a level top, apparently water laid.
6. Coarse brown sand layer, also apparently water laid.
7. Coarse pebbly brown sand fill, with a pebble surface, containing anthracite lumps.
8. Iron-rich red sandy layer mixed with black and gray muck. The bottom is extremely irregular and protrudes into the black muck layer below.
9. Dense black muck, filled with rotten vegetable matter.
10. Yellow gravelly sand fill.
11. Brown loamy clay fill, merging with layer 4 near the surface at the edge of the raceway depression.
12. Relatively lighter brown loam.
13. Dense clay fill.
14. Intrusive clay mass.
15. Gravelly sand fill around the drain structure, stratum 19
16. Yellow clay fill on top of the black muck
17. Drainage structure, containing a 1' by 6" board with two drain tiles and a stone structure.
18. Black muck resting on the subsoil and extending beyond the end of the trench.
19. A second drain structure, but without the stone wall above.
20. A layered deposit of brown and grey dense soil with considerable fibers.

A clay bank, stratum 13, raised the race by a foot. This race was filled with gravel, stratum 7, and the topsoil, stratum 12, developed over the clay.

Sticky brown clay loam was then piled up, to create the final profile of the race wall. This probably was Colonel duPont's attempt to radically increase the dam's power output by adding more than three feet to the head of water.

Each increase in the height of the race required, naturally, a corresponding increase in the elevation of the dam. The present dam, which has a concrete face, obviously dates from Colonel duPont's time or later. Previous dams, wherever they might have been located, are outside the study area.

The last stage of the race was well kept. Clean sand, strata 5 and 6, accumulated in the bottom, but there was no muck.

The loam layer, stratum 4, may have been part of a repair, or it may have been eroded in after the race was abandoned. Strata 2 and 3 represent deliberate filling; the rounded pebble layer at the top of stratum 2 probably was a pavement, as was the crushed gravel at the top of stratum 1.

At the toe of the raceway berm was a stone structure that proved to be a covered tile drain (PLATES 14 AND 15). It divided the raceway from the meadow beyond, and marked a change in the strata.

The drain was built by first digging a trench into the subsoil 18" wide. A 1' by 6" board was then laid into the trench A double row of drain tiles was laid on the board and mortared together with a black mastic.

Flat stones were set on edge beside the tiles and a row of stones was set as a roof over the structure. Rocks were then piled on top, to create a dry-laid stone structure about a foot high above the tile. Since this drain was parallel to the race, it probably was intended to intercept any groundwater seeping out of the race. A second drain, without the elaborate covering structure, was found farther along the trench, crossing in a diagonal direction (FIGURE 8).

Just above the lower drain was a feature consisting of layers of brown and grey clay, with many fibrous inclusions.

Like the previous test, this cut filled with ground water, but it was large enough that the rising water did not outrun the recording process. When the tile drains were opened, they flowed with water, indicating that the old system was still functioning to some extent.

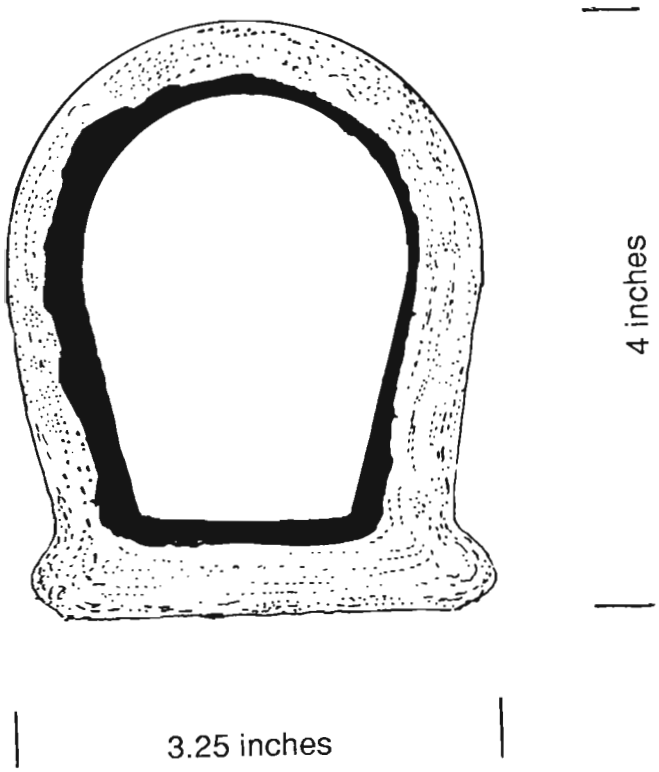


Figure 8

Cross section of a drain tile

The only artifact recovered was a section of extruded red-clay drain tile, illustrated above (FIGURE 8), 13.5 inches long. It was turned over to the Island Field Museum for preservation under accession number 90/55.

Since the mill race will be disturbed by construction of the new intersection, it was determined that an appropriate survey objective would be to make a topographical record of the race. The hydraulic system of any mill depends upon maintenance of a constant "head" or elevation from which water falls into the turbine or wheel.

Excavation had shown that the race had gone through several enlargements, culminating in the berm visible now. This berm is discontinuous, having been broken by Thompson's Bridge Road and by the small unnamed tributary stream that flows in from the southeast under Bridge 71.

Above the bridge are two cast-concrete dams (PLATE 1, PAGE 3). The lower dam, near Thompson's Bridge Road, is too low to have been the mill dam, but the upper dam appears to be close to the correct elevation.

Along Route 100, earthworks appeared to be remnants of the race, but it was not possible by cursory inspection to tie together all the parts of the hydraulic system.

In particular, a notch in the upper dam appeared to be the remains of a headrace gate. Only a topographical survey would be able to confirm that all these parts belonged to the same system.

A Department of Transportation survey party came to the site November 15, 1990 and prepared a survey of the race, which is abstracted in Figure 9, page 26. The surveyors ran a line of levels along the berm from the dam down to the mill ruins, which are not visible from the intersection. The survey ends at the mill's guard gate, just above the inlet to its turbine pit.

In spite of more than a half-century of weathering, the top of the race berm remains about 218 feet above sea level, which is also the probable head at both the mill (PLATE 13, PAGE 28) and the dam. This survey data confirms that the existing upper dam is at the same level and location as the last mill dam. In fact, it probably is the same dam, but its interpretation is outside the scope of this report.

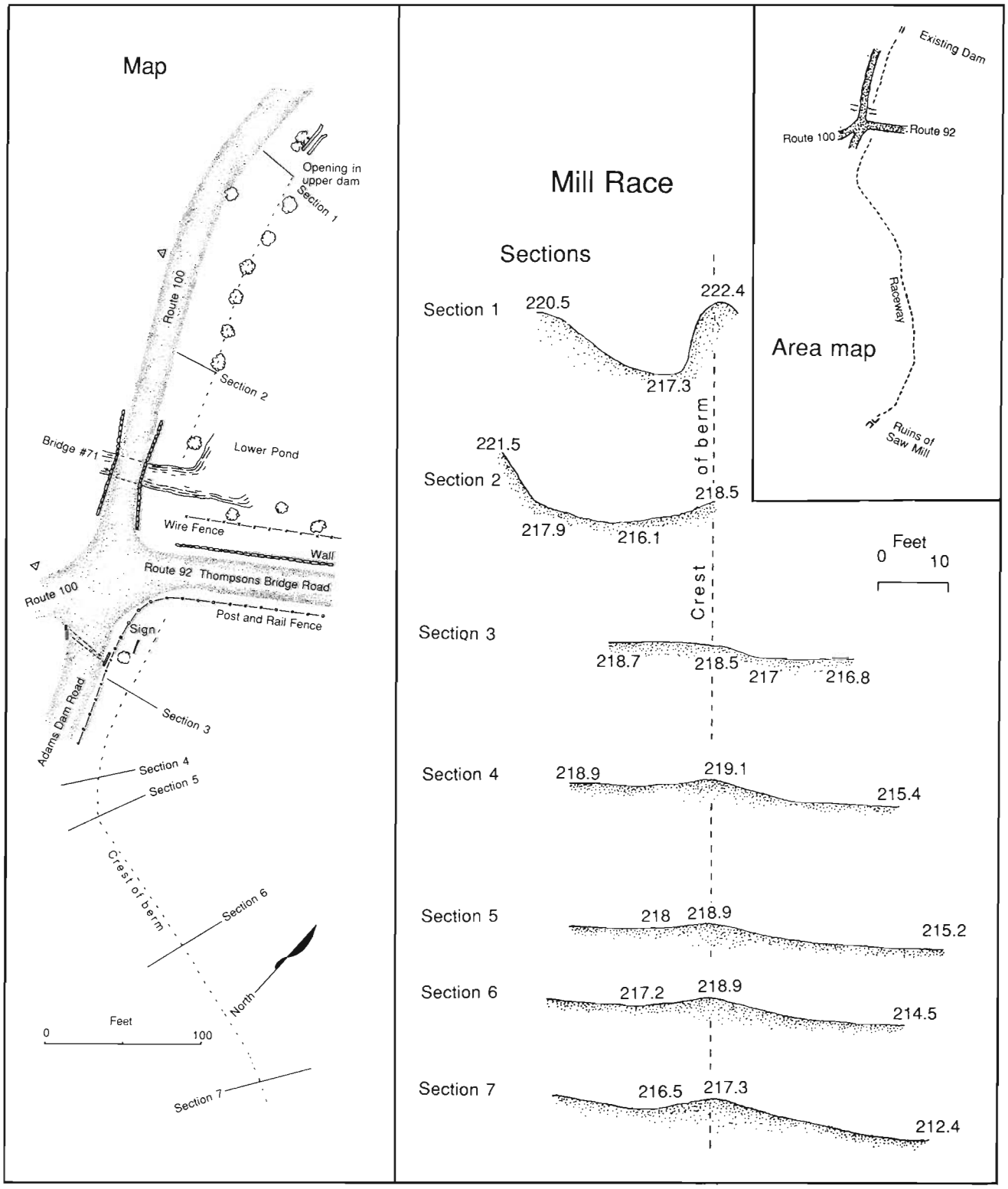


Figure 9

Survey of the mill race