4 Aims, Objectives and Methodology *by O Lelong, with contributions from J Hamer, L Sharpe, C Barrowman and M Donnelly*

4.1 General aims

While these and other fieldwork projects in the Upper Clyde Valley have yielded a great deal of information about its prehistoric occupation, the Blackshouse Burn Environs Project was focused more specifically on the Pettinain Uplands and the valleys to the west and south-west. It aimed to enhance our understanding of prehistoric activity in this part of Upper Clydesdale and build upon that gained through the excavations at Blackshouse Burn and Cloburn Quarry in the 1980s, as well as the more recent work discussed above. More specifically, it aimed to identify traces of lowland activity that might be contemporary with the upland monuments and to complete the upland survey work begun in the 1980s.

4.2 Specific objectives

The objectives of the **topographic survey** were to produce detailed plans of the monuments at Chester Hill and Blackshouse Burn as well as the settlement remains on Cairngryffe Hill and Swaites Hill, in order to record and better understand their character, relationships and topographic context. The surveys were also designed to inform the future management of the sites, which were being damaged at the time of survey by stock, rabbits and vehicles.

The objectives of the **geophysical survey** were to subject the interior of Chester Hill fort and parts of the interiors of the large and small enclosures at Blackshouse Burn to electrical resistivity and magnetometry survey, in order to establish whether buried features such as ditches or hearths could be detected and to further understand the monuments' construction and use.

The objectives of the **field walking** were to identify scatters of lithics and other cultural material in ploughed fields in the valleys to the west of the Pettinain Uplands, which might indicate the locations of settlement contemporary with the monument complex; to plot the locations of any material found; and to collect and analyse it in order to better understand the nature and distribution of prehistoric settlement in the area.

The objectives of the **trial trenching** over the lithic scatter at Carmichael were to investigate whether or not features or deposits contemporary with the lithics survived beneath the ploughsoil; to sample and record any archaeological remains found; and to establish their character and (if possible) their date.

4.3 Methodology

*4.3.1 **Topographic survey** by O Lelong*

The topographic survey was carried out over 2 weeks in October 1998 and 3 days in February 1999 in wet and windy conditions. A Sokkia SET-5 total station EDM was used, with data logged electronically using a Psion datalogger equipped with SDR-5 software. The survey of Chester Hill was carried out from five stations established around the monument, and that of the Blackshouse Burn and Meadowflatt enclosures from a further three stations linked to those around Chester Hill. The survey of remains on Cairngryffe Hill and Swaites Hill was carried out from three stations. Fence lines and other features on the modern 1:10,000 Ordnance Survey map were included in the surveys in order to position and orientate them correctly within the National Grid.

The data were downloaded and processed using Liscad 4.0 software to produce contour maps, which were then exported to AutoCAD 14.0 for additional processing and artwork. Digitized map data were used in conjunction with surveyed fence lines to position the surveys within the National Grid.

*4.3.2 **Geophysical survey** by J Hamer and L Sharpe*

The geophysical surveys of Chester Hill fort and the Blackshouse Burn enclosures were carried out mainly over 8 days in October 1998 and concluded in December 1998. Both employed Geoscan Research Ltd instruments, including an electrical resistivity meter, a fluxgate gradiometer and data processing software. The resistivity meter (RM15), set for a twin electrode configuration, had an electrode separation of 0.5 m, giving a measuring depth of *c* 0.5 m below the ground surface. The fluxgate gradiometer (FM36) used for the magnetic surveys was capable of detection to about 1 m below the ground surface.

The Chester Hill surveys employed an 0.5 m sampling density, fine enough to detect any features expected to be present, such as hut circles and hearths. The data-recording capabilities of the instruments dictated that the resistivity grid size was 20 m × 20 m and the gradiometer survey grids 20 m × 10 m.

The Chester Hill enclosure was surveyed over 5 days in October 1998 in variable weather conditions. Survey was somewhat impeded by the presence of tree stumps and mature trees and by the

banks of the monument themselves. A significant amount of metal was encountered during the magnetic survey, almost entirely old wire fencing, perhaps indicating that the monument has at some point been part of a modern enclosure. Dummy readings were inserted over most of the larger tree stumps to simplify interpretation of the results.

At Chester Hill, the survey area did not include the banks of the monument, for two reasons. The banks are very steep and proved difficult and dangerous (to both instruments and operators) to negotiate. Also, resistance values proved extremely high over the banks, in some cases going beyond the scale of the meter. Such high readings were useful, showing that the banks can be assumed to be constructed of stone, freely draining and with little soil cover; however, they can prove problematic at the processing stage, masking more subtle features in Geoplot and necessitating the application of low-pass filters to the data.

At Blackshouse Burn, the geophysical surveys extended over part of the interior of the small enclosure and along a transect through the western entranceway and into the interior of the large enclosure. An evaluation survey was first carried out at a sampling density of 0.5 m, using both instruments, and at this point the RM15 was chosen to continue the survey into the interior of the large enclosure. This survey had a reduced sampling density of 1 m to allow for maximum ground coverage, due to time constraints and the large area to be covered.

The data from the surveys were processed in Geoscan's Geoplot 3, the Windows version of the data processing package used with Geoscan instruments.

*4.3.3 **Field walking** by C Barrowman and M Donnelly*

The field walking on the Carmichael Estate was originally scheduled to take place over the winter of 1998–99; the estate planned to plough fields as machinery was available over that period, and so after ploughing it should have been possible to let them weather for a few weeks prior to walking them. However, because of the extremely wet conditions in Lanarkshire over that winter, the autumn hay crop was not fully gathered until February, and so ploughing did not begin until then. As spring sowing was scheduled for early April, this left a relatively narrow window in which fields could be ploughed, allowed to weather and then walked.

Between late February and late March 1999, 16 fields on the estate were examined; these are marked on Illus 1. Some additional fields which would have been worthy of survey, including those between Fields B and D, were ploughed very late in the season and so there was not sufficient time to examine them before sowing took place.

An initial assessment of the archaeological potential of the 13 fields was carried out by the authors, both experienced field walkers with extensive knowledge of lithic material, in late February 1999. Each field was walked in 20-m transects and finds were left in place, marked by pin flags. This provided a general picture of the locations and densities of lithic material and informed the methodology for the more detailed field walking that followed.

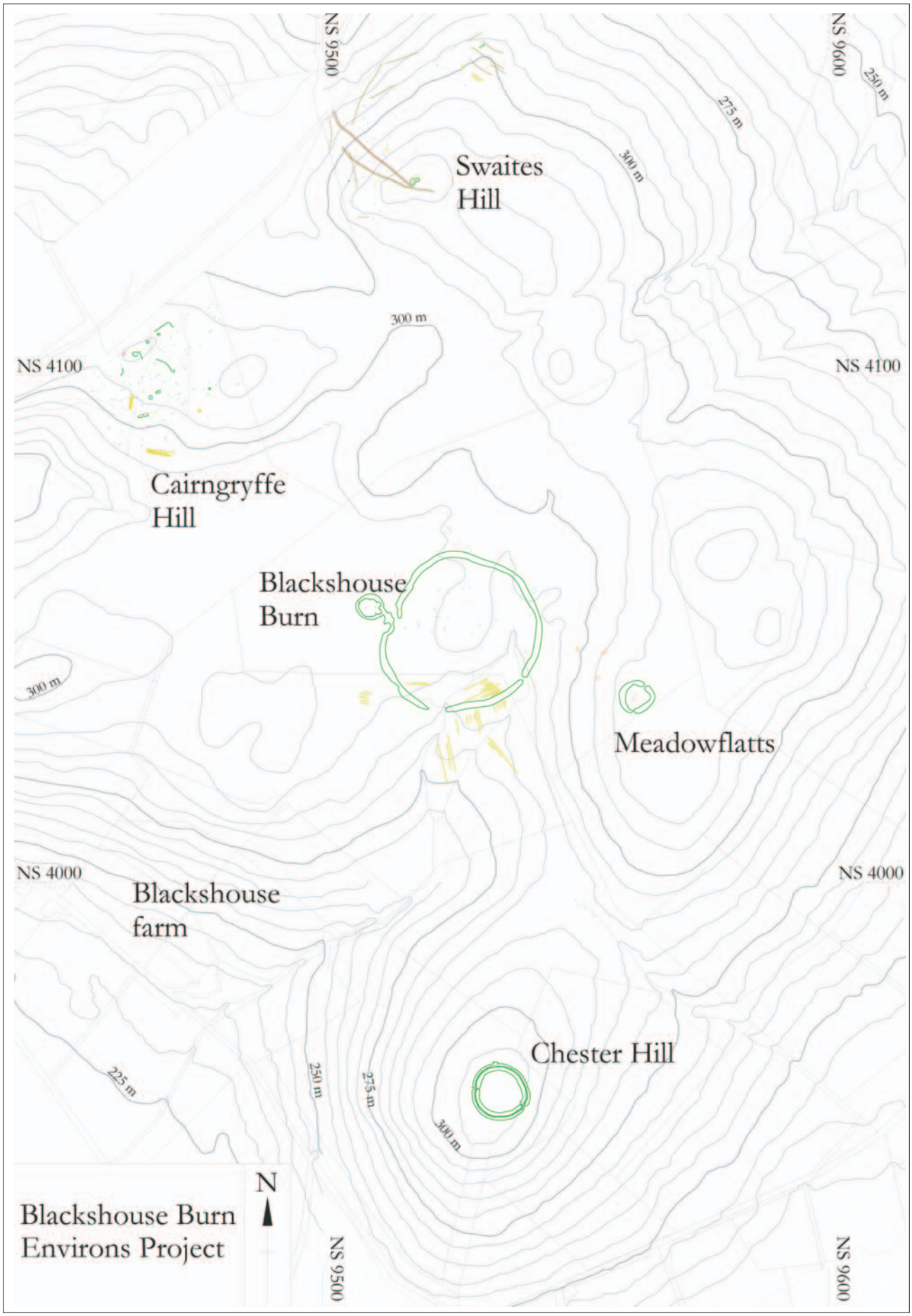
Based on the results of the assessment, four fields were selected for more detailed examination: A/B, D, K and M. These were walked in tighter transects varying from 2 m (Fields D and M) to 5 m (Fields A and K) with larger teams of archaeologists, including many students with little or no experience of field walking or knowledge of lithic materials. The students were closely supervised by senior archaeologists. Finds were bagged and left in place, again marked with pin flags. The finds were then numbered, plotted using an EDM with each reading coded with the find number, and collected.

As the field walking was partly a training exercise for students, an assessment of the lithic material collected was carried out by Mike Donnelly, and pieces that were completely unworked were discarded. The remaining material was then subjected to a more thorough evaluation to establish the general character and date of the scatters.

*4.3.4 **Trial excavation** by O Lelong*

Over the densest lithic scatter discovered during field walking (in Field M), trial excavation was carried out over 5 days in April 1999 to establish whether or not features or deposits related to the scatter survived beneath the ploughsoil. Four randomly placed, 2-m^2 test pits were dug by hand through the ploughsoil over the scatter to test its depth and the presence or absence of cultural material in it. Although no archaeological features or deposits were found in the test pits, several pieces of worked stone were recovered from the ploughsoil in all four pits, along with a large sherd of Impressed Ware in Test Pit D.

After this sampling, four trenches were opened over the scatter, using a JCB fitted with a flat-bladed bucket to strip away the ploughsoil in spits. The trenches are shown on Illus 13. The largest trench, Trench 1, was opened over the densest part of the scatter; it measured 24.5 m north/south and 3 m wide; an L-shaped extension along its east side measured 8 m long (east/west) and up to 7 m wide. Trench 2 was opened to the north of the scatter, and measured 12 m east/west by 3 m. Trench 3, opened over the south-east part of the scatter, measured 8 m north/south by 3 m, and Trench 4, over the scatter's southern edge, measured 12.4 m east/west by 3 m. The trenches were cleaned by hand, and archaeological features were subjected to sample excavation. After recording, the trenches were backfilled and the field was seeded.



Illus 2 Overall plan of the surveyed monuments