

IV Recording the Roman Wall

Alan Whitworth

ON 16th July 1993 the status of Hadrian's Wall and its military zone as World Heritage site was officially marked at Cawfields by the unveiling of a plaque by H.R.H. Princess Margaret in the presence of Jocelyn Stevens, the Chairman of English Heritage, H.E. the Italian Ambassador and other dignitaries. The importance of Hadrian's Wall has of course long been officially recognised by the Department of National Heritage and its predecessors who have had the bulk of the Wall and its associated features scheduled as an ancient monument of national importance. The scheduling will moreover shortly be subjected to a final, detailed revision under English Heritage's Monument Protection Programme. But in spite of its obvious importance, both to us and previous generations of archaeologists and conservationists, Hadrian's Wall has not enjoyed the official protection and management which some other national monuments first received in the late nineteenth century. It is the purpose of this article to outline briefly the scheduling and guardianship history of the Wall and then to describe the recording programme which has recently been undertaken for the better management and understanding of those parts of the Wall for which the State is directly responsible.

The Roman Wall (properly so called, rather than Hadrian's Wall, on early official files and in English Heritage's Historic Plans Room) does not appear in the 1882 Schedule of Ancient Monuments in the *Ancient Monuments Protection Act* of that year drawn up by General Pitt Rivers, the first Chief Inspector of Ancient Monuments. It was not until the Fifth *List of Ancient Monuments* of 1925 that the Wall was first mentioned, namely the "Section

of Roman Wall East of Heddon-on-the-Wall" and "Section of Roman Wall East of Denton Burn, East Denton". In 1929 the *List of Ancient Monuments* saw the scheduling of the bulk of the wall under a joint entry for Cumberland and Northumberland. The best known parts of Hadrian's Wall were under legal protection by 1931 with the enactment of the *Roman Wall and Vallum Preservation Order* brought about by the threat of quarrying at Cawfields (Saunders 1984, 20). This Order is still in force but in the 1960s additional areas were added at other, less spectacular, points along the wall. The protective legislation currently in force is the *Ancient Monuments and Archaeological Areas Act* of 1979.

Previous Recording

During the nineteenth century a series of archaeological examinations began to be carried out on various sites along the Wall including Chesters, Housesteads, and Birdoswald forts, the milecastles at Housesteads, Poltross Burn, Cawfields and Harrow's Scar, turrets at Black Carts, Mucklebank, Walltown Crag East and Birdoswald West and various sections of the curtain wall especially in those areas owned by John Clayton as part of the Chesters estate. Ground plans were produced for particular features, such as milecastles and turrets, and some elevation drawings but little attempt was made to produce a detailed stone-by-stone record of the fabric exposed by excavations with the notable exception of some accurate watercolour paintings by H.B. Richardson between 1848–50, now held at the Laing Art Gallery, Newcastle.

It is interesting to note the proposals in a letter written in 1889 to John Collingwood

Bruce by a Mr. Schnitger concerning the recording of the Roman Wall and printed in the *Proceedings of the Society of Antiquaries of Newcastle upon Tyne* (1891, 4, 29).

Dear Sir,

A number of gentlemen interested in the Roman Wall have thought the following proposal worthy of being placed before you, with a view of ascertaining your opinion on this subject. Shortly, the proposal is as follows: That an appeal be made through the local papers to the very large number of amateur photographers with a view of forming a staff of workers willing to undertake the labour of obtaining good negatives of the Wall from one end to the other, such as it now exists, and which, when completed, would form a permanent record for future generations. Such photographs are to be taken (1) from an archaeological point of view; (2) from the picturesque point; and are to include such *minutiae* as inscriptions, the various kinds of scabbling, marks and other peculiarities, as well as the various objects of interest detached from, yet connected with the Wall, etc. It has been proposed that a Committee shall be formed consisting of members of the committees of the following institutions: (1) The Antiquarian Society; (2) The Photographic Society; (3) The Literary and Philosophical Society; (4) The Naturalists' Field Club; (5) Professional Photographers. The object of this mixed committee is, to ascertain the best points, distribute the work, examine the negatives tendered and decide upon their suitability. With regard to the points which shall be photographed we would ask your good self to favour us with your assistance, without which we feel justice could not be done to the work. Of course a number of important details, as to the discipline to be preserved, the accuracy of the points selected, and of various circumstances, will have to be arranged by the committee, these few outlines are but a suggestion, and what is intended is that a permanent record, prepared and selected with scientific accuracy, be obtained of the Wall and its belongings, such as it now exists. This together with your *Wallet Book*, will set at rest all the questions which future generations can ask.

If you, dear sir, will think over this proposal and after consideration can see your way clear to look favourably on it, a few lines in reply will much oblige,

Yours obediently, Fr. Schnitger.

The suggestion of recording the Roman Wall photographically at this time does not appear to have been taken any further. Archaeological excavations in subsequent decades have produced more detailed ground plans of a number of sites but still the recording of the curtain wall was generally not considered necessary.

During the twentieth century a large number of sites along the Wall came into the guardianship of the Ministry of Works and its successors, and are currently managed by English Heritage. This acquisition of the Roman Wall estate, as distinct from its scheduling, started in 1933 with the gift of Corbridge Roman site to the nation by Mr. David Cuthbert, and continued until 1977 when the playing field at Corchester House, Corbridge was taken into guardianship. The progress of guardianship between these dates is shown in Appendix 1.

Consolidation

A programme of fabric consolidation on fort walls, milecastles and turrets as well as the curtain wall was initiated to ensure the stability of the exposed masonry as soon as it came into guardianship. The main campaign of consolidation was begun in 1934, under the supervision of the charge-hand Mr. Charles Anderson, B.E.M.; and by 1939 treatment had been applied to the Corbridge granaries, Benwell Temple and Vallum Causeway, Heddon-on-the-Wall, turret 7b at Denton Burn as well as the building of the dry stone field boundary wall at Winshield Crag as far as Milecastle 40. The work carried out by the Ministry's team included clearing the overburden of trees and vegetation, which had collected on the wall top and against the sides, to expose the wall down to footings level. Regrettably, while this disengagement of the curtain wall and associated structures was being carried out, no recording was undertaken by archaeologists before the various sections were dismantled and re-consolidated. Nor was any archaeologist assigned to the work on a permanent basis although there were periodic visits from the Inspectorate of Ancient Monuments based in London, from the Superintendent of Works, initially from York and then from Carlisle, and

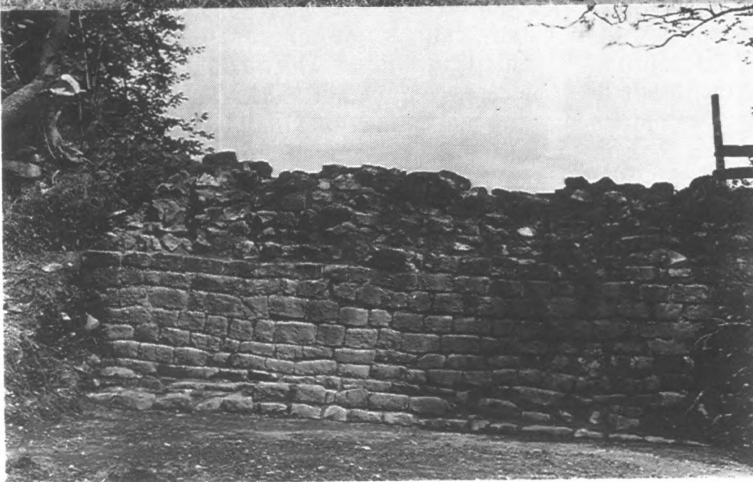
Fig 1 Consolidation work between Willowford farm and the River Irthing, 1955.



(a) Before exposure.



(b) During consolidation.



(c) After Consolidation.

the area architect also based in London. The only record that does exist for most of this long programme of uncovering and consolidation is an extensive series of photographs taken by Mr. Anderson while work was in progress. This unique record by a good amateur photographer shows various lengths of curtain wall and other elements of Hadrian's Wall before, during and after the consolidation process (figs 1a-c) and includes some detailed photographs showing how the consolidation process was undertaken. The photographs are now in three separate locations: English Heritage at Carlisle Castle, the Vindolanda Trust at Chesterholm Museum and the Department of Archaeology at Newcastle upon Tyne University, regrettably with no one organisation having a complete set of prints. As these photographs are the only contemporary record of the dismantling and consolidation of long tracts of upstanding Wall it is of national importance that copies of a complete set of this unique archive, together with the taped commentaries and typed comments by Mr. Anderson, should be held in one location by a nationally recognised organisation such as the National Monuments Record, so that access to this historical information is freely available and the material can be stored and maintained in a suitably controlled environment.

In Mr. Anderson's day it was not envisaged that the wall would be consolidated in its state of ruinous collapse. Where the wall face had fallen away from the inner core this was straightened and rebbed by dismantling some sections of face and replacing them in their original vertical position. The joints between the facing stones, where no Roman mortar survived, were cut out and repointed with new lime mortar mix with a little cement added for strength. To indicate that this was new work, the pointing mortar was usually left slightly recessed from the stone face. A waterproof core capping of cement rich mortar was also added to protect the inner core and shed rain water.

The length of the original Wall was 117km (73 miles) of which a mere 9km survives as visible remains; 5.8km having been consoli-

dated and 3.2km remaining unconsolidated, including the re-set but "dry" stones known as "Clayton wall". The sections in State guardianship total 9.1km of curtain wall, including buried sections, together with parts or all of five forts, seven milecastles, eighteen turrets, two temples, the abutments of two bridges and three short lengths of vallum.

THE RECENT RECORDING PROGRAMME

During the early 1980s the Department of the Environment realised that the policy of consolidating or re-consolidating the curtain wall and associated structures without prior recording could no longer continue. It was also realised that no drawn records existed for nearly fifty years of Roman Wall consolidation. To rectify this anomaly it was considered necessary to produce a full and detailed record of what was in the care of the State. This would then provide the primary base record and become an essential management tool for a variety of purposes, including the recording of areas where stone replacement might become necessary owing to climatic or visitor damage and the provision of a base for analysis once this new repointing and consolidation has been carried out. The drawings would also provide the architects and superintendents with the required information on which to base contract specifications, and the stone masons with plans and elevations on which could be detailed any necessary remedial work. This on-going programme of recording maintenance work allows future generations to understand in greater detail the history of Hadrian's Wall as an ancient monument. The base record can also be utilized for research purposes, for example the petrological analysis of the wall fabric in relation to known Roman quarries in the area, or the varying types and sizes of stone used, tooling marks and techniques, etc.

The first phase of the detailed recording of the Roman Wall and its associated structures in the care of what was by 1983 the Historic Buildings and Monuments Commission for

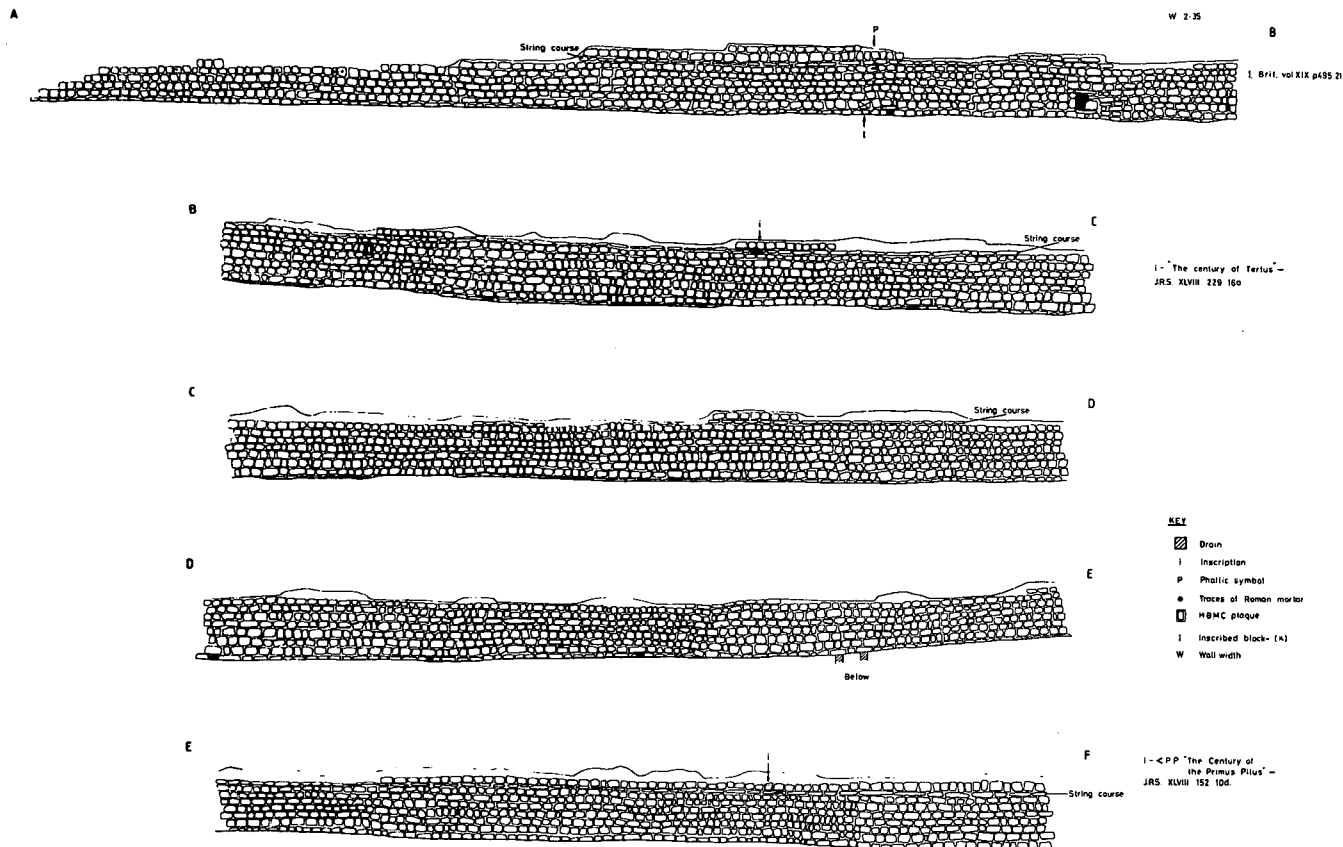
England (English Heritage) was the survey by rectified photographs carried out by Messrs. Plowman Craven and Associates. This survey consisted of a series of overlapping 1:50 photographs and formed the basis for the detailed enhancement programme carried out by the author and his assistants since 1985. Any corrections, alterations and additions to the rectified photography were carried out by on-site visual investigation. For obvious practical reasons some sections of the wall were not covered, especially the north face of the curtain wall where steep slopes or cliffs made it impossible to obtain rectified photographs. In these lengths the Wall face was drawn by hand measurement, in some cases for over a kilometre.

Methods

The rectified photographs were traced on to waterproof draughting film to enable them to be used on site in all weather. Every facing stone was checked and any missing ones that had been obscured in the photographs by vegetation etc. were added, to ensure that every stone in the fabric of the wall or associated structures was accounted for. The on-site enhancement of the rectified photographs also included indicating sections of horizontal offset courses and their widths together with any vertically offset or inset courses. It has been suggested (Bruce 1863, 20) that the vertically offset/inset courses seen only on the south face of the Wall are where the sections of various work gangs joined. These variations in wall thickness are not considered to be of original Hadrianic build (Birley 1961, 87) and can now be seen as a rebuilding of wall face which had collapsed during the Roman period. Drains and water culverts through the wall have been recorded. In the Birdoswald sector the drains are fairly evenly spaced every six metres, presumably as the natural drainage is from the south towards the wall. Further to the east, in the central sector, where the Wall follows the line of the Whin Sill escarpment, the drainage is generally away from the wall and drainage channels through the Wall are not so frequent. Areas of the surviving Roman lime-rich mor-

tar, either between the block joints or adhering to the block faces are recorded. No specific evidence has been found so far during the recording project for the use of a whitewash or lime based plaster on the wall fabric although evidence from Peel Crag (Crow 1991, 59) Heddon, and Denton Burn (Daniels 1989, 73) suggests that such a covering may well have been applied to some of the wall face. Facing stones with the incised "diamond broaching" pattern have been recorded as have any stones with distinctive or other unusual tooling pattern. To date, blocks with diamond broaching have been recorded in the curtain wall only at Heddon-on-the-Wall, Cockmount Hill and Walltown Crag together with Vindolanda fort and Lea Hill turret. Some facing stones have incised marks which appear to be either Roman numerals or perhaps related to the process of quarrying and stone dressing (*Britannia* 1989, 333). However, the precise meaning of these marks is as yet not fully understood. They take the form of either an X or V, sometimes inverted, or a right angled cross. Before the recording programme the location of similar blocks had been noted at Throckley, Chapel House milecastle 9, Walbottle, Black Carts and Limestone Corner (*Britannia* 1976, 381). Also noted during recording were a number of blocks with crosses and saltires as well as crosses within an outline border. Since 1985 this number has been increased by the discovery of a further twenty-two blocks, the location and description of which have been published in "Roman Britain in 1987-1993" in *Britannia*. Also recorded during fieldwork were the locations of Roman centurial stones and phallic symbols which had been consolidated *in situ* in the Wall fabric. So far the location of twelve known inscriptions in the curtain wall have been recorded, as have five phallic symbols which have also been drawn at 1:1.

Contained within the curtain wall fabric in the Birdoswald sector are three blocks with a blank panel surrounded by an incised line. These may be blocks where the centurial inscription had not been completed or perhaps where the inscription was not incised as normal



Site. HADRIANS WALL EAST OF BIRDOSWALD		code.	date. JULY 86	Sheet
Site Sub Division. South Face (1 of 4)	Drawing Number.	1:50	metres	56

Fig 2 Example of recent record drawings. South face of Curtain Wall east of Birdoswald (part of Sheet No. 56, reduced).

but was painted. The Roman milestone on the Stanegate adjacent to Vindolanda fort has no inscription and it is likely that the details were painted onto the cylindrical block (Pevsner 1992, 599). The relevant publication references to all the above stones have been recorded on each archive sheet. It is of some note that Birdoswald fort and the curtain wall from Harrow's Scar milecastle 49 to turret 49b, a distance of 800 metres, contains the largest concentration of *in situ* blocks having some form of symbol. Within this sector are three phallic symbols, seven inscriptions, eight inscribed blocks and three blank panels. Although some of this concentration may have been the result of a rebuilding of the wall face during the Roman occupation it is unusual for such a variety of blocks to survive in such a confined stretch of Wall. This is possibly because elsewhere along the wall nearly all the stones of interest were removed by the early nineteenth-century antiquarians.

In areas where the Narrow Wall is built on top of the Broad Wall, the facing stones of both Wall gauges have been recorded. The width of the Wall face at various selected intervals is also recorded on the archival drawings.

On the curtain wall only the north and south elevations have been recorded, as a plan of the wall top core, totally reconsolidated in modern times, was not considered worthwhile within the constraints of the project, although ground plans were produced for all of the recorded milecastles and turrets as well as gateways, interval towers and angle towers in the forts so far completed.

The fieldwork has normally been carried out between April and December with the final drawings being produced in the Carlisle Castle office over the winter period. The completed inked drawings have been sent to the Plans Room, Keysign House, London for accessioning with the rectified photographs. Copies, together with the original fieldwork annotated drawings are kept at Carlisle Castle.

FUTURE WORK

During the course of the recording project it was considered desirable to include, as an ancillary project, any pieces of architectural moulded stonework which had been incorporated either within the fabric of the curtain wall, forts, milecastles and turrets or were lying loose within the guardianship area. During 1991 a large dump of blocks was located adjacent to Harrow's Scar milecastle 49. This consisted of approximately ninety-eight blocks with a chamfered face and two merlon capstones which had been placed there by Mr. Anderson, while uncovering and consolidating the stretch of curtain wall east of Birdoswald fort between 1956 and 1960. The only record of this stone dump is in some typed comments Mr. Anderson made in 1975 regarding the photographs he had taken of the works in progress in this area. The chamfered blocks appear to have formed a string course which had fallen from the upper section of the wall and photographs taken at the time of consolidation show that some lay on the north side of the Wall. The merlon capstones presumably came from the milecastle at Harrow's Scar, as this type of block with a chamfered edge on more than two faces is only found at forts, milecastles and turrets (Crow 1991, 61). Recent excavations at Peel Gap uncovered a ten-metre length of similarly chamfered blocks from the base of the Wall on the north side (Crow 1991, 59). A large number of chamfered blocks from Peel Crag were recovered in 1909 and photographed (Simpson 1976, 115–16 and fig. 26). Further Anderson photographs show a pile of blocks with chamfered faces which were located in the Walltown Crag sector of the wall.

Recently a partly buried stone pile near the commandment's bath house at Chesters fort has now been set out for public display. A number of pieces of architectural stonework were recorded including columns, plinths, niches, voussoirs, chamfered blocks and several pieces of sculpture. Two pine cone finials from the west gate at Great Chesters have also been recorded and removed to Carlisle Castle for safekeeping. The recording of architectural

mouldings for the Wall as a whole is, however, still in its infancy.

The opportunity has also been taken to record a number of sites which are not in State guardianship but where it was felt that a record of the wall fabric is required. This has included lengths such as Cockmount Hill curtain wall, Great Chesters fort, Long Byre near Thirlwall, the section of "Clayton wall at Peel Craggs and Turret 44b at Mucklebank. It is envisaged that eventually all sections of upstanding wall including fort walls will be recorded and that the completed drawings will be scanned to allow them to be transferred to computer disc. This will allow any future consolidation, repointing, or stone replacement work to be added to the existing archival records to ensure future generations are fully aware of the extent of the contemporary interventions. It will also mean that for the first time ever practically the whole surviving wall will have been recorded to one consistent and detailed standard.

Some of the completed drawings have already proved useful in the re-consolidation of parts of the wall. The bastle house at the south gate of Housesteads fort was recorded in advance of stabilization (Whitworth 1990, 127) and the drawings, together with the photographs, were used in ensuring that the dismantled stones were consolidated in their original position. At Great Chesters fort the drawings were utilized by the firm of architectural consultants, Johnston and Wright, to ensure that the contractors Messrs Keartons of Alston were given the required amount of detailed information, to show precisely where judicious repointing and rebuilding work was to be carried out. Other lengths of Hadrian's Wall where the drawings have formed part of the work specifications include Harrow's Scar milecastle, Birdoswald fort, the curtain wall at Willowford and Winshields. With the introduction of competitive tendering for consolidation works, the Hadrian's Wall drawings have proved themselves to be an invaluable management resource which has allowed for specific and quantifiable works projects to be designed and completed with the maximum archaeological information being recorded both before

and after consolidation intervention.

ACKNOWLEDGEMENTS

I wish to thank especially Dr. Stephen Johnson, formerly the English Heritage Inspector of Ancient Monuments for Hadrian's Wall, who initiated the projection 1985. The work on site, often in extreme weather conditions, and in the Carlisle office, could not have been carried out without the dedicated assistance of the following: Alison Whitworth, Jane Clark, Huberta Robinson, Ken Browel, Ruth Soames, Kate Snape, Katherine Wilson and Caroline Richardson. My thanks are also due to David Sherlock, English Heritage's current Inspector of Ancient Monuments for Historic Properties (North) and Katherine Egglestone, its Estates Surveyor; also to James Crow formerly of the National Trust at Housesteads, now at Newcastle University, Tony Wilmott of the Central Archaeological Service for providing drawings of his excavation at Birdoswald; Paul Austen, the Hadrian's Wall archaeologist of English Heritage Conservation Group based at Carlisle and Harry Beamish, archaeologist for the National Trust. Photographs and record drawings for this publication were supplied by English Heritage Plans Room, Keysign House, 429 Oxford Street, London W1R 2HD.

The publication of this report has been granted by English Heritage.

APPENDIX 1

Portions of Hadrian's Wall in the guardianship of the Secretary of State for National Heritage.

Note that unless recorded as a gift, these parts of the Wall and its associated works are in State guardianship but not ownership.

<i>Site</i>	<i>Guardianship date</i>
Corbridge Roman Site (Gift)	15 May 1933
Benwell Vallum Crossing (Gift)	4 June 1934
Denton East and West including Turret 7B	4 June 1934
Banks East and Turret 52A (Gift)	14 August 1934
Heddon-on-the-Wall (Gift)	9 May 1935
Benwell Temple (Gift)	18 January 1936
Winshields including Milecastle 40	29 October 1937
Poltross Burn Milecastle 48	27 November 1938
Walltown Craggs including Turret 45A (Gift)	1 November 1939
Vindolanda Stone Fort and Milestone	5 November 1939
Planetrees	30 June 1945
Gilsland Vicarage Garden	16 November 1945
Chesters Bridge East Abutment	3 April 1946
Sewingshields including Milecastle 35 and Turrets 35A and 35B	30 May 1946
Willowford	25 September 1946
Milvain and Turrets 48A, 48B	25 September 1946
Birdoswald Fort Curtain Wall and Turret 49B	25 September 1946
Harrow's Scar Milecastle 49	25 September 1946
Brunton Turret 26B	20 February 1947
Banks Hill	26 July 1950
Housesteads Fort	12 October 1951
Lea Hill Turret 51B	12 August 1952
Piper Sike Turret 51A	12 August 1952
Carrawburgh Mithraeum and Milecastle 31	30 July 1953
Chesters Fort	11 March 1954
Cawfields Curtain Wall including Milecastle 42 and Turrets 41A, 41B	7 November 1960
Walton Dovecote Bridge (Gift)	19 January 1963
Blackcarts Curtain Wall including Turret 29A	18 May 1970
Pike Hill Signal Tower	28 July 1971
Hare Hill	30 October 1972
Corbridge Corchester House Field (Purchase)	7 July 1977

APPENDIX 2

Hadrian's Wall drawing archive up to December 1993

<i>Site</i>	<i>Mon. No</i>	<i>Scale</i>	<i>Sheet number</i>
Banks East and Turret 52A	NS057	1:50	27-8
Benwell Vallum Crossing	NS438	1:20	201
Benwell Temple	NS438	1:20	202
Birdoswald Curtain Wall West	NS076	1:50	34-9
Birdoswald Turret 49B	NS076	1:20	40-1
Birdoswald Fort Curtain Walls	NS076	1:50	42-55
Birdoswald Fort Curtain Walls	NS076	1:20	224-27
Birdoswald Curtain Wall East	NS076	1:50	56-62
Blackcarts	NS080	1:50	172-7
Blackcarts Turret 29A	NS080	1:20	178-9
Brunton Curtain Wall	NS098	1:50	188-9
Brunton Turret 26B	NS098	1:20	190-1
Burnhead Curtain Wall	NS138A	1:20	236
Carrawburgh Temple	NS132	1:50	170
Cawfields Curtain Wall	NS138	1:50	111-37
Cawfields Milecastle 42	NS138	1:50	138-9
Cawfields Turret 41A	NS138	1:20	140-1
Chesters Bridge Curtain Wall/Tower	NS145	1:50	180
Chesters Bridge Abutment	NS145	1:20	181-7
Cockmount Hill (Private)	NS696	1:50	205-4
Coesike Turret 33B	NS691	1:20	168-9
Denton Dene (Local Authority)	NS186D	1:20 and 50	200
Denton Hall Curtain Wall	NS186	1:50	198
Denton Hall Turret 7B	NS186	1:20 and 50	199
Denton West	NS186A	1:50	197
Gilsland Vicarage Garden	NS264	1:50	89-92
Great Chesters Fort (Private)	1145	1:20	1-25
Hare Hill	NS296	1:50	26
Harrow's Scar Milecastle 49	NS297	1:50	63-5
Heddon-on-the-Wall	NS300	1:50	193-6
Knag Burn Curtain Wall (Nat. Trust)	NS701	1:50	230-4
Knag Burn Gateway	NS701	1:20	235
Lea Hill Turret 51B	NS379	1:20	30-1
Long Byre (Local Authority)	NS712	1:20	99
Milvain and Turrets 48A, 48B	NS419	1:50	77-88
Milvain Unconsolidated (Private)	NS419	1:20	228-9
Mucklebank Turret 44B (Private)	NS692	1:20	143-5
Pike Hill Signal Tower	NS491	1:20	29
Piper Sike Turret 51A	NS492	1:20	32-3
Planetrees	NS502	1:50	192
Poltross Burn Milecastle 48	NS496	1:50	93-8
Sewingshields Curtain Wall	NS558	1:50	151-9
Sewingshields Milecastle 35	NS558	1:50	162-5
Sewingshields Turret 35A	NS558	1:20	160-1

Milecastle 33 North Gate (Private)	NS703	1:50	204
Vindolanda Fort	NS144	1:50	215-20
Vindolanda Fort	NS144	1:20	221-2
Walltown Crag	NS644	1:50	101-9, 142
Walltown Turret 45A	NS644	1:50	110
West Grindon Turret 34A	NS690	1:20	166-7
Willowford Farm	NS660	1:50	67-73
Willowford Bridge Abutment	NS660	1:20	74-6
Winshields	NS662	1:50	147-150
Location Plans			66, 100, 146, 171, 203

REFERENCES

- BIRLEY, E. (1961). *Research on Hadrian's Wall*.
 BRUCE, REV. J. C. (1863). *Handbook to the Roman Wall*.
 CROW, J. G. (1991). "A Review of Current Research on the Turrets and Curtain of Hadrian's Wall", *Britannia* XXII. 51-63.
 DANIELS, C. (1989). *The Eleventh Pilgrimage of Hadrian's Wall*.
 PEVSNER, N. and RICHMOND, I. (1992). *The Buildings of England: Northumberland*.
 SAUNDERS, A. D. (1983). "A Century of Ancient Monument Legislation 1882-1982", *The Antiquaries Journal*, LXIII, Part I, 11-33.
 SIMPSON, F. G. (1927). *Watermills and Military Works on Hadrian's Wall*.
 WHITWORTH, A. M. (1990). "The Housesteads Bastle", *Archaeologia Aeliana*, Fifth Series, XVIII, 127-9.

Transcripts of the Charles Anderson tapes and comments are held in the Plans Room of English Heritage and at Carlisle Castle.

