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Recording the Tinworks of Dartmoor Forest

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Abstract

This paper reviews the progress of work by the Royal Commission on the Historical Monuments of England(RCHME) in the recording and mapping of Dartmoor's tin industry, during its survey of Dartmoor Forest, between 1993 and 1996. Two areas, Statts Brook and the O Brook valley, are discussed in detail: both areas where a representative range of tinworking remains survive.

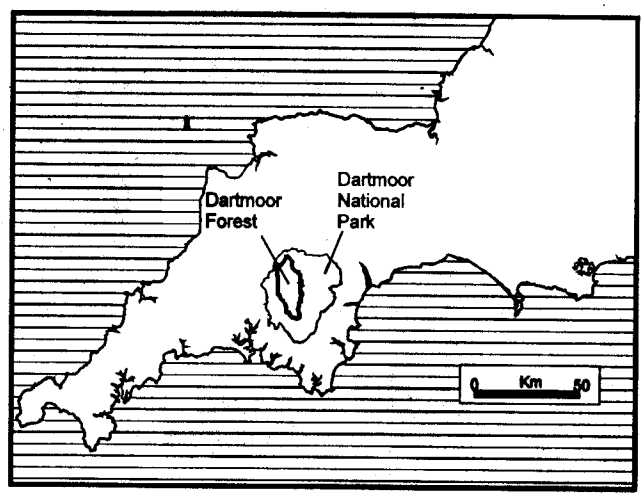

Fig. 1. Dartmoor Forest. Location.

INTRODUCTION

Dartmoor is well known for its extensive and well-preserved field remains dating to the prehistoric period. Hut circles, ritual monuments and field systems survive on a scale unmatched in landscape terms anywhere in Britain and indicate a high level of human activity on the moor, some three to four thousand years ago. Prehistory generally has been the focus of by far the greatest effort on the part of archaeologists working on Dartmoor over the past century. An equally important part of the historic landscape, though the object of far less attention by archaeologists is Dartmoor's industrial archaeology, in particular the many tin mines and processing works dating from the middle ages down to the 1930s. Although the investigation of Dartmoor tinworking has gained momentum in recent years with many of the more interesting and easily observed tinworking sites being recorded and several isolated surveys undertaken by individuals (ie Greeves et al 1994; Gerrard 1994; Gerrard this volume), no attempt has previously been made to record the wider extent of the tin industry.

In 1993 the RCHME began a project to investigate the archaeology within Dartmoor Forest. This is the heart of the upland which was, until AD1240, a Royal Forest but survives to the present as Devon's largest parish. It has been the objective of the project to record the full range of monuments within the study area, from earliest times, down to AD 1945. The landscape approach to recording and mapping which the Commission chose to employ for the Dartmoor Forest Project has offered a good opportunity to include the tin industry, as part of a wider archaeological landscape survey.

While the boundary of the Forest is clearly a rather arbitrary line to use as the limit of a landscape survey, leaving several monuments incomplete, it has to be seen as a first phase of what it is hoped may develop into a more complete survey of Dartmoor. Also, the Forest is a large enough area for a general analysis and contains a sufficient variety of sites to be representative of upland Dartmoor as a whole. This is particularly true for the field remains of the tin industry, as the Forest contains a very representative sample and in pure statistical terms, they form the greater percentage of the total monuments recorded as part of the project.

A variety of scales and techniques have been used to survey the tinworking sites, from 1:10 000 scale, for all sites where extent and location only are recorded; 1:2500 for complicated and extensive areas, such as openwork complexes and large mines; 1:1000 and 1:500 for closely detailed or highly representative sites, such as some dressing floors. As Commission resources are extremely limited, the use of larger scales has to be highly selective and the emphasis generally has been on accurate, basic scale mapping and getting sites into the record rather than on detailed analysis. The Commission is not in the business of pure research which would conversely require much more intense effort focused on fewer sites. It is for this reason that detailed surveys of extensive, highly complex sites such as streamworks, of which we have mapped over six square kilometres at 1:10 000 scale, has not been possible.

This paper focuses on two areas of the Forest, at Statts Brook and the O Brook, which have merited particular attention because they contain good examples of tinworking. Both are areas dominated by tin openworks. It is with this somewhat neglected category of working that the Commission has been particularly able to enhance the record. They are certainly among the most spectacular of Dartmoor's man-made landscape features, and although some have been recorded in part by the Ordnance Survey at larger scales, many others have not. Both study areas also contain much of additional interest in the way of tinworking evidence. In particular the remains of mines and processing works, from later episodes of activity.

STATTS BROOK (Fig. 2)

The survey of the Statts Brook area in 1992 was aimed specifically at detailed recording of an openwork complex. As its name suggests the survey focused on the area around the Statts Brook catchment but includes part of the Walla Brook valley also, with the eastern limit being the Forest boundary. Although this effectively divorces this part of the complex from the rest of the Birch Tor Vitifer area, the majority of which lies beyond the Forest boundary and of which our survey only covers the westernmost section, this does not

really affect the results as far as the openworks recorded are concerned.

The workings on the west and south-west slopes of Water Hill, north of the road, offer a fine example of a tinworking landscape and with their water systems clearly laid out and well-preserved. They demonstrate concisely the extents the tinners would go to supply their workings with water and in turn how important that water must have been to the process of extraction at lode working sites. Water to all of these openworks was supplied by just three leats, two of which

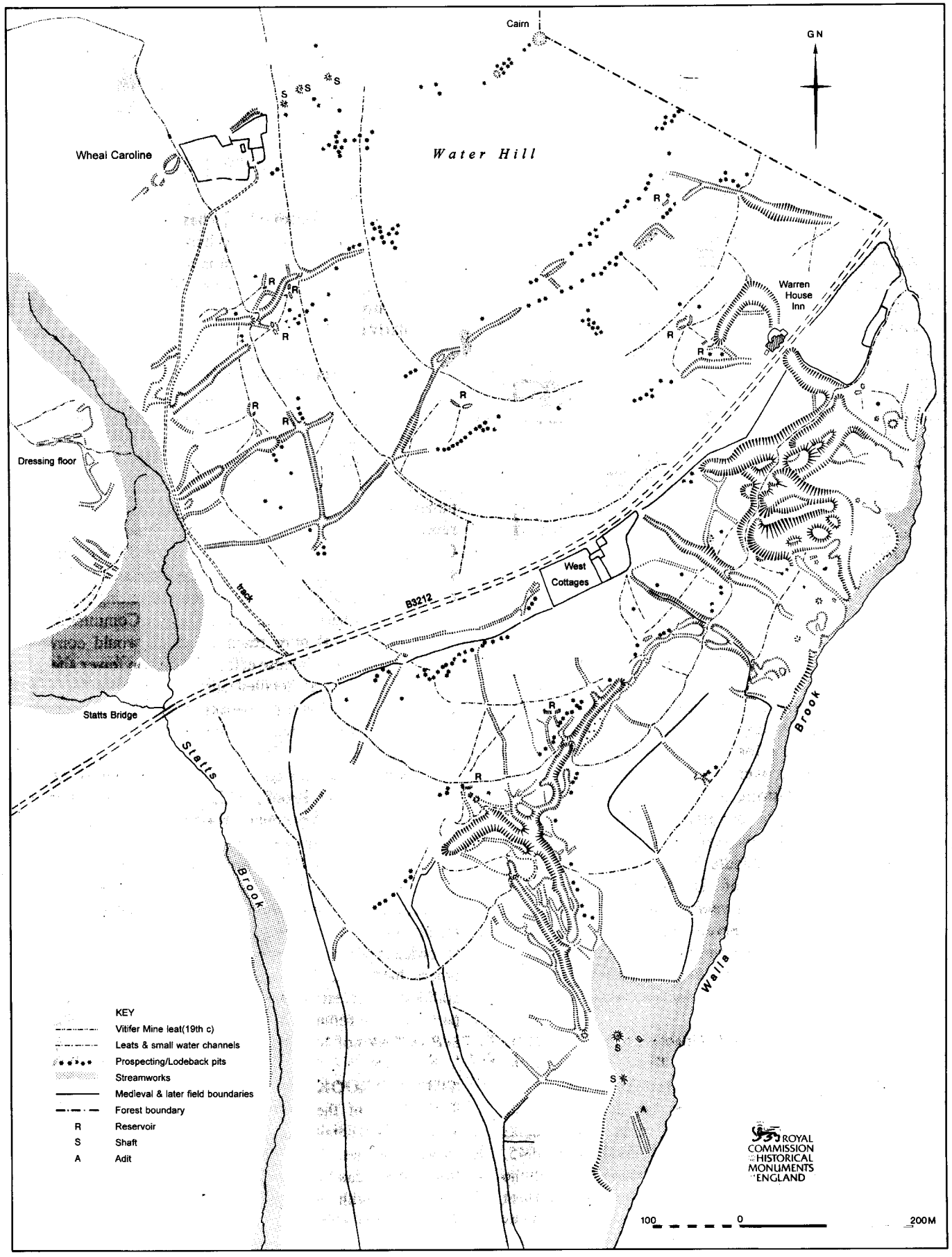

Fig. 2. The Statts Brook area, centred SX670 810. RCHME survey. A simplified version of the 1:2500 scale survey. Prehistoric features also surveyed have been omitted for clarity.(Crown copyright)

collected rainwater run-off from the slopes of Assycombe and Water Hills, and a third which diverted the upper section of Statts Brook. Survey has revealed a complex system of storage and distribution for this water with each working having associated reservoirs and diversion channels. The water was probably used in openworks as an aid to the removal of waste gravels or as a means of exposing lodes by washing away the overburden.

Field remains of course represent the last phase of activity at any site and at openworks one would normally expect some details of the earlier phases to have been altered or effaced as work progressed and this is often the case at the larger more expansive sites, such as those to the south of the road where the evidence for reservoirs and channels is missing. However, at these smaller workings, a high proportion of the remains are almost intact giving good evidence for earlier as well as some later phases. Three reservoirs supplied the two small openworks just to the south of Wheal Caroline Farm, probably using water from a leat which was later extended to supply more workings to the south.

The system of shallow channels, which distributed water to the required points have also survived well. Extraction began at the bottom of the slope and progressed upwards, with fresh reservoirs being constructed as and when the altitude of the workface exceeded that of the reservoir in use. It seems likely that the smaller openworks on the northern slope are of an earlier date than those nearer the Walla Brook to the south, as the leats which supplied the latter have been ducted through the interiors of the former.

This survey also demonstrates well the close relationship between openworks and lodeback works, which are depicted schematically at this scale. These represent a different system of lode working, which involved digging a series of interconnecting pits onto the back of the lode. They are particularly numerous on the higher sections of Water Hill, perhaps where water was in short supply, preventing openworking as a viable option.

Little documentation for early tinworking survives for this particular area though 'Waterdown Rugge' mentioned in 1522 (Greeves 1981) is likely to be one of the tinworks on this hillside, and 'Runnigemore', probably in the area of Walla Brook, was mentioned later in the 1780s (Broughton 1968-9). However, on the basis of better documented areas of Dartmoor we may be confident that most of the openworks would date to between the 15th and 18th century(see for example Newman 1987).

Other features which have been recorded as part of this survey are the remains of Wheal Caroline, a mine whose working life is recorded fragmentarily in the 19th century. The bounds of the Wheal Caroline sett are depicted on a very colourful map which accompanies a share prospectus of 1826 held by the Devon Record Office(DRO). The extents of the mine are described as covering most of the area of our survey and several of the features mentioned are still visible today. Wheal Caroline had closed by 1879, when Warden-Page reported the wheels to be standing idle (Page 1889, 170). Remains of the mine, all heavily disguised by vegetation, consist of some fine shafts near the Farm; a wheelpit, from which the masonry has been totally removed and which housed a large pumping wheel sited inside one of the former openworks - complete with reservoir and leat; shafts, adit and a square structure near Walla Brook. There is also the remains of a dressing floor on the west side of Statts Brook, which could be associated with the site, though is in a slightly more advanced state of decay than one would expect for a site of this age.

THE O BROOK (Figs 3-5)

Few river valleys contain as much evidence of tinworking as the O Brook which must rank among Dartmoor's most interesting. It is also one of only a few major streams within the Forest where the Commission has had the opportunity to record all the tinworking within a complete river catchment. This was made possible through a combination of Dartmoor Forest Project work and a separate survey of Holne Moor, which is outside the Forest, carried out at the request of the Dartmoor National Park Authority.

Documentation for tinworking in the O Brook valley, although sparse, does give us a particularly good insight into the importance of tinworking on Dartmoor over an extended period, for not only does it have one of the earliest references to a specific tinwork anywhere in Devon, with the mention of 'Drywork' in 1240 (Somers Cocks 1970, 279), but it also possesses one of the most recently operating tin mines at Henroost or Hexworthy Mine, which, although not Dartmoor's last, closed down as late as 1919 (Richardson 1992, 33). Though quite probably not under continuous exploitation, the documented history of tinworking in the valley spans over 750 years. In the intervening period there are records of activity at Skur in the 16th and 17th centuries (Greeves 1986, 4), and the two magnificent tin mills at Week Ford, which must be among the best surviving early-modern tin-processing structures anywhere in the south-west, are documented in the 17th and 18th century (Newman 1993, 185-197).

Detailed survey of the valley has proved particularly worthwhile because it has such a diversity of tinworking remains, containing fine examples of all the main types of evidence associated with the tin industry on Dartmoor.

Streamworking covers approximately 40 hectares in the O Brook catchment. This includes the entire valley floor of the O Brook itself and its three main tributaries of Hooten Wheals Stream, Dry Lake and Lower Dry Lake. Of these, the remains associated with Dry Lake are among the finest, with very clear internal features although, for the reasons outlined above, it has not been possible to record this in detail. Nevertheless a particularly fine and well-preserved linear reservoir with a stone-faced dam, was recorded high above and to the south of the working. It was once supplied by hillside run-off, channelled via a now very faint leat from the east of Holne Ridge.

The O Brook valley is especially remarkable for its openworks, particularly Skir Gut and Henroost. The tinwork known as Skir Gut contains evidence of both streamworking and an opencast lode work or openwork, where a north-south lode has been partly weathered and deposited nearby on the west side, creating opportunities for the tinners to exploit both sources by separate techniques. The streamwork certainly pre-dates the openwork, as small patches of the former have been isolated at various points by the activity associated with the latter, which is a massive linear gully, some 12m deep and up to 25m wide, defining the eastern edge of the working. This extensive area of tinworking is so positioned that the tinners relied totally on hillside run-off for a supply of water to it, utilising the marshy plateau forming the divide between the sources of the rivers Dart and Avon. Although a complex system of water channels survive at the head of the openwork, only two rather vestigial reservoirs survive for the whole working.

Henroost in contrast boasts four reservoirs, all well-

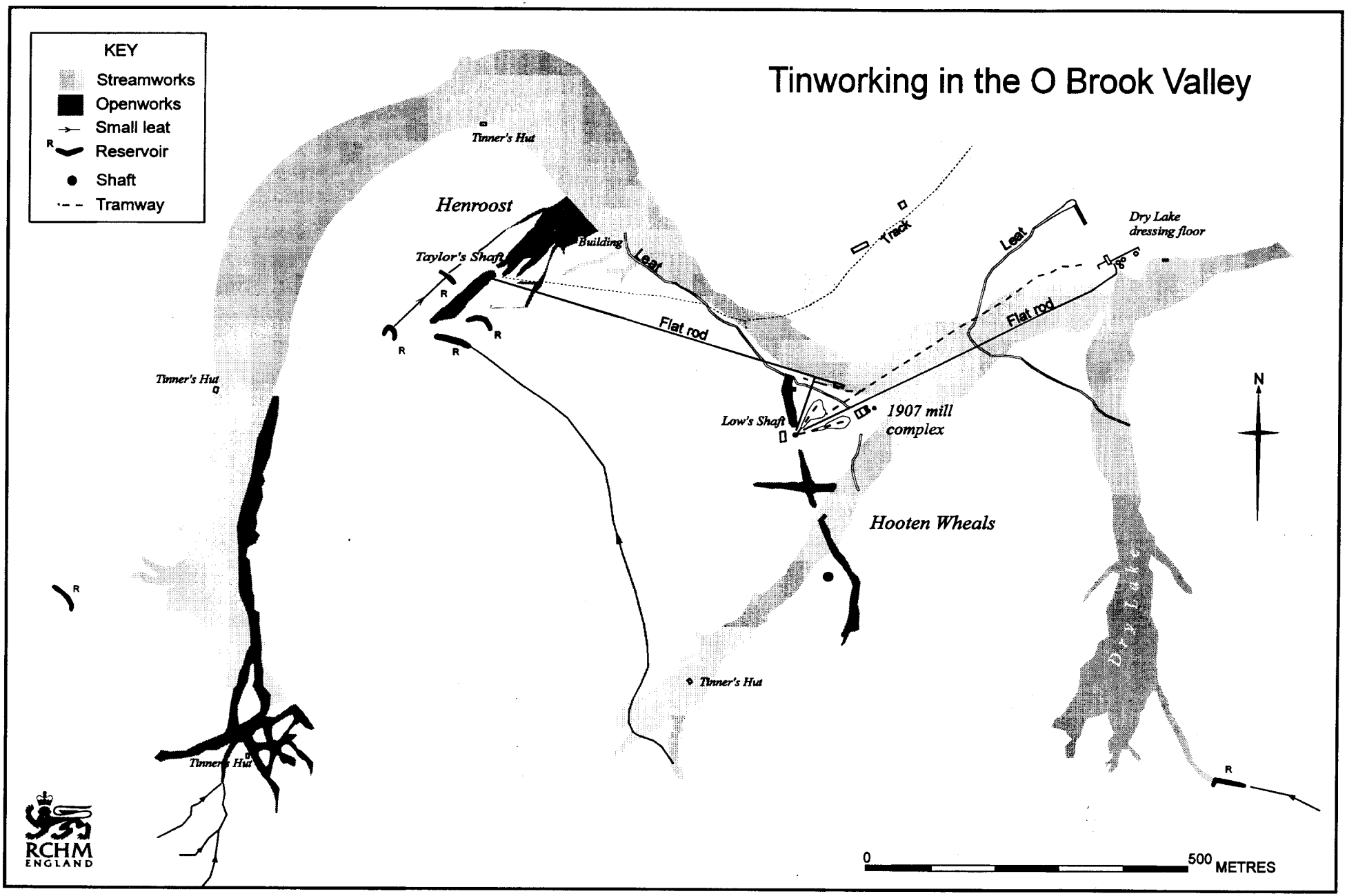

Fig. 3. Tinworking in the upper O Brook Valley. Simplified plan with interpretation based on RCHME 1:2500 survey.

preserved and including one which must rate as the finest anywhere on Dartmoor. It consists of a high crescentic bank with a central sluice opening, which is lined on both sides with huge granite slabs. The water supply to Henroost was more easily obtained than at Skir Gut, although it involved the construction of a very long leat diverting water from the head of Hooten Wheals Stream.

A close look at Hooten Wheals has revealed the rather interesting anomaly of an openwork transecting the bed of an earlier streamwork. Although lode workings do occur elsewhere closely adjacent to streamworks, at Skir Gut for example, it is less usual for them to cut through streamwork remains in this way. The lode was apparently quite deep as it was considered worthwhile in the 19th century to exploit it further by underground methods.

During the evaluation of the O Brook as a single tinworking landscape, it became apparent how numerous tinners huts are in heavily worked areas, such as this valley. These consist of small, rectangular stone-built shelters constructed within or adjacent to streamworks and openworks, and were, as tradition would have it, used for on-site accommodation and shelter by tinners, although this is not proven. Apart from the very patchy recording of this class of monuments by the OS, only one previous survey has examined them in any detail in a small area of north Dartmoor (Le Messurier 1979). The record of these sites is incomplete in both the National Monuments Record and the County Sites and Monuments Register. In the Forest as a whole, the Commission has recorded a grand total of 94 tinner' huts, representing an important step in bringing the record up-to-date and an impressive statistic.

In the O Brook catchment area there are at least eight tinners' huts located among the tinworks in the area. Some may have been built and used by the tinners, though of some others this is doubtful.

Documentation for the later exploitation of the O Brook valley commences in the 19th century, when a licence was granted for a mine called Wheal Unity, and sporadic activity is recorded from then until 1919, when the mine closed, including a period in the 1890s and early 1900s when activity was at its zenith at this site. The historical aspects of Henroost or Hexworthy Mine, as it was later named, have been discussed in detail by several previous writers, including Hamilton Jenkin 1974; Greeves, 1986 and Richardson 1992, though apart from the basic 2nd edition OS plan, no accurate survey of the whole site has before been attempted. Hexworthy is among the most photographed of Dartmoor's mines and pictures of the site showing it while still operating and soon after abandonment have been published (Greeves 1986; Richardson 1992).

The main evidence of 19th century underground activity is the shaftheads, in particular Low's Shaft which once provided the main vertical access. It is a shadow of its former glory and little survives of the superstructure visible in a photograph of 1914 (Greeves 1986, Plate 11) which shows a headframe and timber structure above the shaft. The other principal shaft, though earlier than Low's Shaft was Taylor's Shaft, sited in the old tinworks at Henroost. The pumping systems used in the mine were quite remarkable and sufficient evidence survives to make an accurate interpretation(Fig. 3). The earlier pumping wheel, sited just north of the trackway, was connected to a flatrod system running over 500m to Taylor's shaft, and a narrow 'v' shape gully, and vestiges of supporting post, spaced

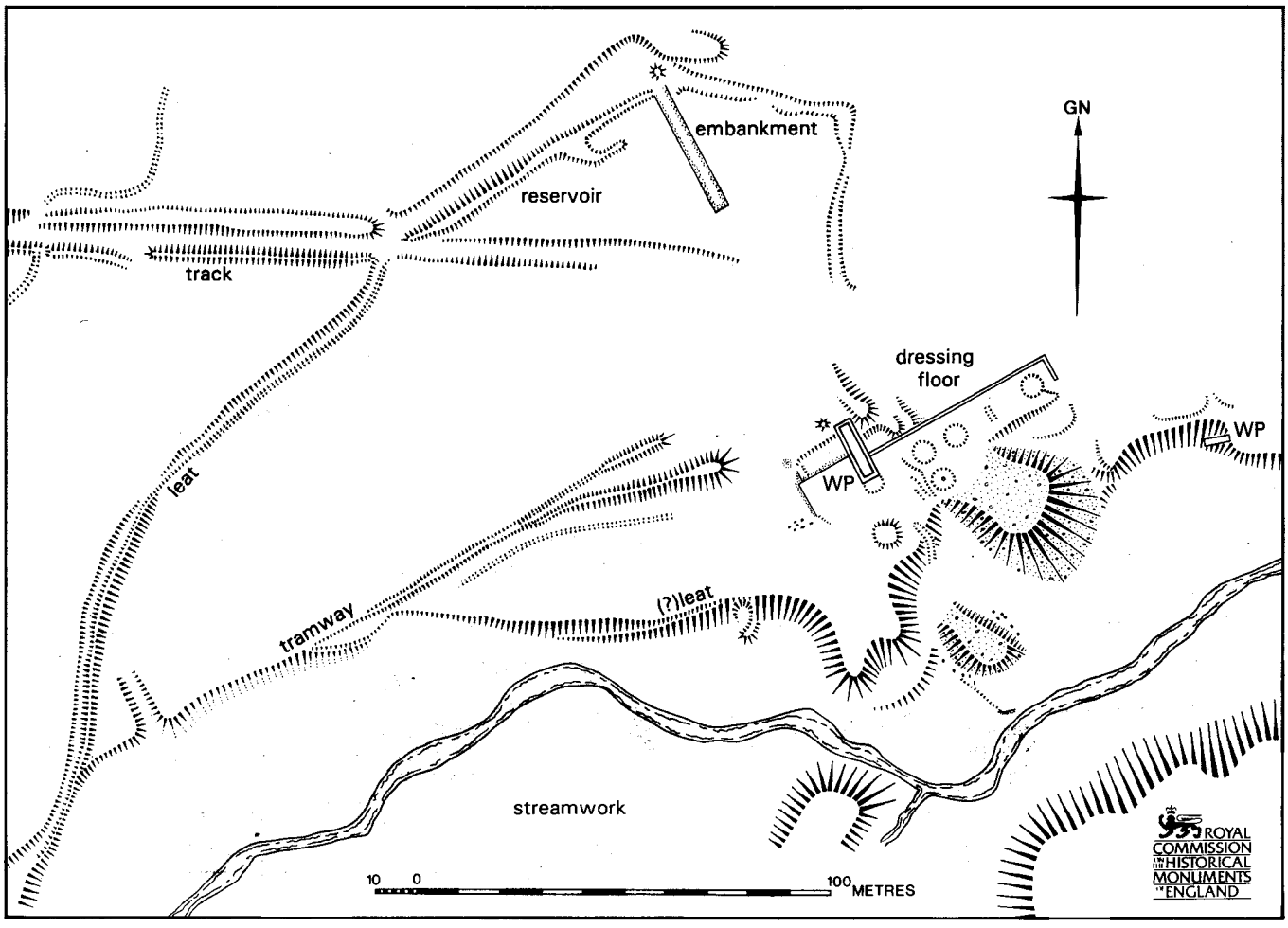

Fig. 4. Hexworthy Mine. Dressing floor opposite Dry Lake, SX66027109 . RCHME survey. (Crown copyright)

at 3m intervals may be seen over part of its course. A more impressive flatrod gully runs from this wheelpit up to Low's Shaft, and the masonry lined bob pit has survived well to one side of the shafthead.

The earlier processing works was located opposite the confluence of the O Brook and Dry Lake and comprises a well-preserved and substantial wheelpit and launder embankment, together with a walled dressing floor (Fig 4). A very fine photograph survives from about 1905, showing the wheel still in operation(Greeves 1986, Plate 4).

Today, four circular buddles, surviving as hollow earthworks, are just about visible on the walled dressing floor area and a huge mound of spoil which overlays the old streamwork scarp contains copious amounts of tin slime. The wheel also powered pumping equipment via a flatrod which ran on posts for approximately 550m. When in operation, material was delivered to this dressing floor for processing via a tramway. Although terminating in a high embankment, much of the tramway survives only as a very subtle earthwork, now heavily disguised by bracken, so it was particularly important to record its visible remains.

The 1907 mill complex (Fig. 5) is sited on the tip of the spur at the confluence of two streams, thus maximising the supply of water. The dressing floor is constructed entirely from concrete, which was once covered by a galvanised sheeting superstructure. Although the subject of thorough demolition by American troops in World War II, much ground evidence survives including concrete buddle kerbs; a wheelpit, possibly associated with the tramway; tailings channels; a large building, and a deeply cut leat.

RECORD AND ARCHIVE

The plans and reports resulting from RCHME surveys, have been deposited in the National Monuments Record, a computerised, public archive based at Swindon, and this in turn is referenced to the County Sites and Monument Registers. The Commission also supplies archaeological information to the OS for inclusion on future map revisions, continuing the tradition of depicting archaeological sites on maps which dates to the earliest days of the OS. Nineteenth century industrial remains have only recently been considered worthy of the title archaeological, and it is ironic that sites like Hexworthy Mine were originally surveyed by the OS in the 1880s as working mines are now being reappraised and re-surveyed by RCHME for depiction as monuments. Although the OS will undoubtedly exercise a degree of selection with this material, future maps at 1:10000 scale and above for Dartmoor will certainly include many more examples of tin working sites.

CONCLUSION

It is generally recognised today, that landscapes such as Dartmoor, where thousands of monuments survive from many different periods, need to be recorded holistically to do them justice. The Commission's work on Dartmoor has been deliberately designed to that effect, directed at all classes and period of monuments. This hopefully will act as an aid to future management, planning and research. Nevertheless it was only a few years ago that industrial remains would probably have been overlooked completely in a project of this type. Although the RCHME cannot hope to survey everything in detail, the record of tinworking on Dartmoor has been greatly enhanced as a result of this work.

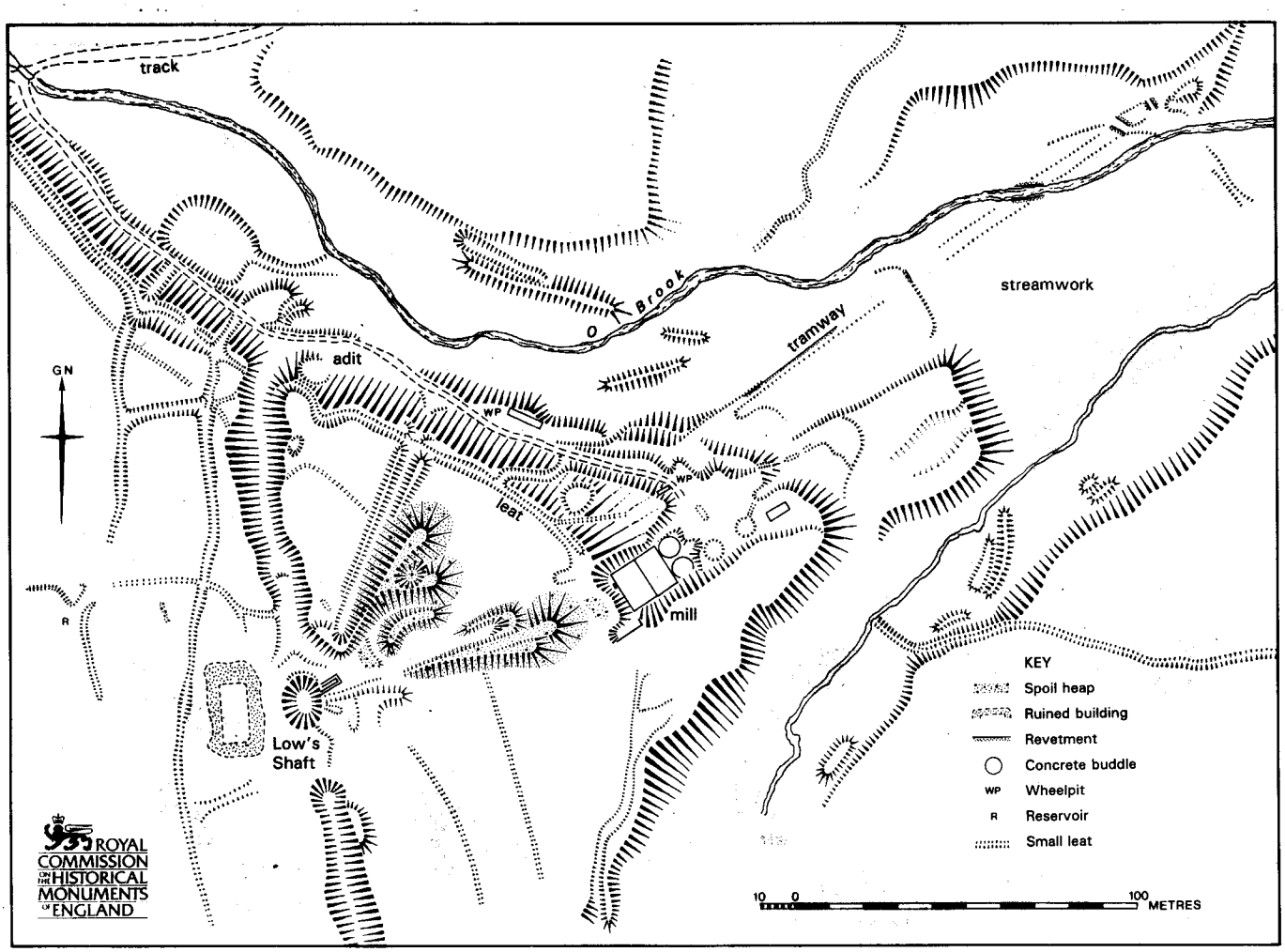

Fig. 5. Hexworthy Tin Mine SX65607080. The 1907 mill area, features associated with Low's Shaft and the course of the tramway.

ACKNOWLEDGEMENTS

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UNPUBLISHED SOURCES

The site summaries of Statts Brook and O Brook presented in this report are syntheses of the full reports now housed, together with all the archive plans, in the National Monument Record Archive.

DRO Devon Record Office Share Prospectus and Map of Wheal Caroline Mine 1826.

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