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MAPPING THREE MILLENNIA OF SETTLEMENT AND LAND USE ON CROWNHILL DOWN, SOUTH WEST DARTMOOR

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ABSTRACT

Two hut circles and one hut platform, dating from Middle to Late Bronze Age (1200-600 BC), represent the earliest known settlement of Crownhill Down, and are accompanied by a network of reaves and field boundaries. After the Late Bronze Age/Early Iron Age, Dartmoor seems to have been abandoned until medieval times. The longhouse, with the dwelling at one end divided by a cross passage from the cow byre at the other, found on the Down is a typical example of a medieval one-family farmhouse with two ancillary buildings and an adjacent enclosure. Recent human activity associated with the China Clay industry has further complicated the site. This paper describes a simple mapping technique and explains how the information obtained can be used to establish the sequence of events, even though it cannot provide actual dates.

INTRODUCTION

Dartmoor is one of the richest areas left in the British Isles for discovering archaeological remains in the field. Settlements, ceremonial monuments, deliberate and accidental manifestations of past land utilisation are readily mapped.

This account serves several purposes. It provides a simple guide to the archaeology of an accessible and archaeologically interesting area of Dartmoor. Second, it illustrates basic archaeological survey and mapping techniques. Third, it emphasises the significant interactions between naturally occurring geomorphological processes and the region's complex history of leat development and drainage diversion. Finally, it demonstrates the considerable extent to which useful interpretations may be made from simple and rapid survey methods which precede more specialised archaeological excavations or historical searches.

The features mapped belong to three broad age-groupings:

1) Late Bronze Age and possibly Iron Age;
2) Medieval;
3) Post-Medieval—up to and including the industrial archaeology associated with enclosure, tin mining and China Clay extraction.

THE ENVIRONMENT OF CROWNHILL DOWN

The northern slopes of Crownhill Down are sometimes called Riddon or Ridding Down. These features, together with the adjacent Heddon Down, are located in Figure 1. Much of the Down lies on or just above the 210-213m erosional surface of southern Dartmoor. Whilst the age of this feature is uncertain, the reality and archaeological significance of the landform are readily apparent. It forms a substantial upland plain of very low relative relief, promoting poor drainage with a surface vegetation of rough grasses and occasional heather (*Calluna*), growing on peaty gleyed podsols (stagnopodsols).

The Down offers commanding views in all directions, except to the north and east

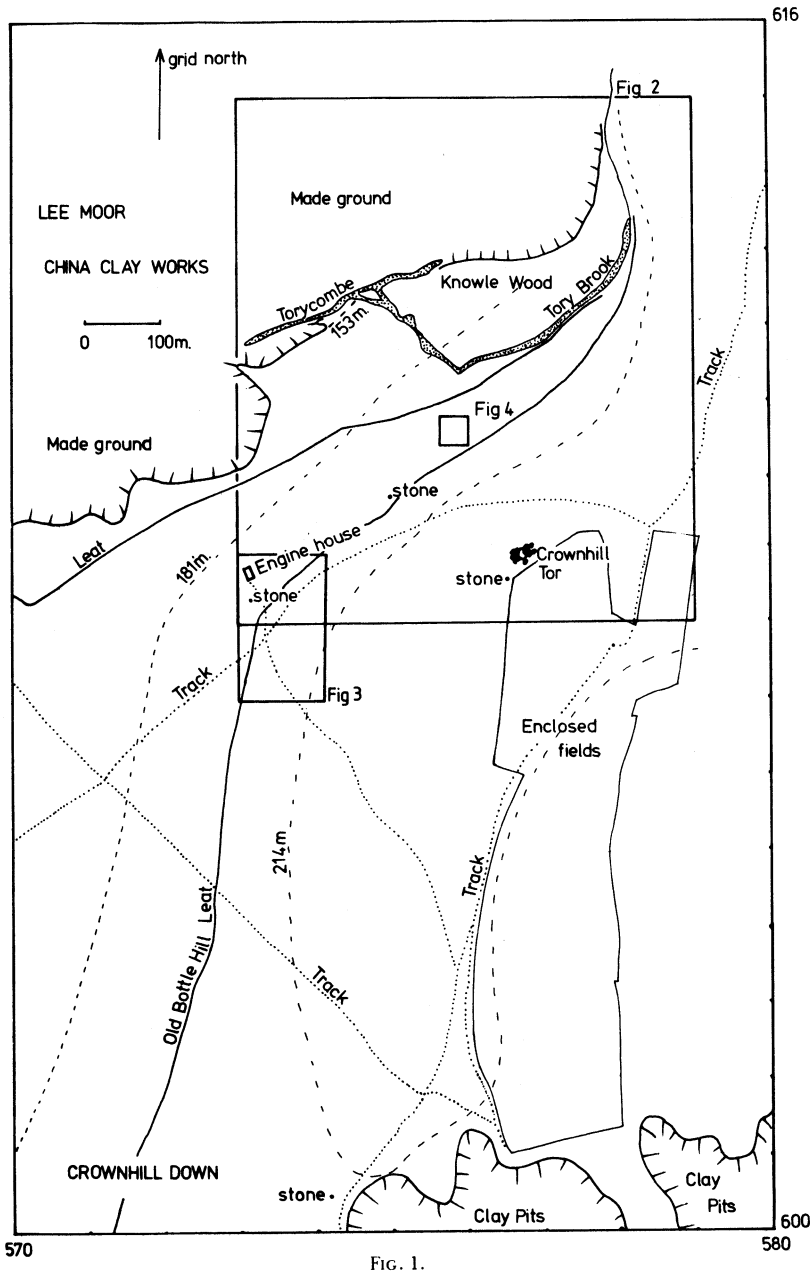

FIG. 1.

Crownhill Down, Dartmoor, showing location of detailed plans.

where visibility is restricted to only 3-4km by higher ground. It is consequently very exposed to severe weather. Precipitation can be heavy and is estimated to average about 1250-1500mm (50-60 inches) per year. Evaporation losses are likely to be relatively small.

Ultimately the broad scale geomorphological and pedological features of the Down relate to a primary underlying geological control, which has notably

influenced settlement location and some aspects of land use. The summit plain is eroded across Dartmoor Granite, whilst the slopes to the west and south are developed on the more readily eroded metamorphic aureole rocks—in this case Upper Devonian Slates. Superficial deposits of growan, a sandy grit which includes granite cobbles and boulders, are widespread on the summit plain and northern hillslope (I.G.S. Sheet 349D, Ivybridge). By analogy with nearby sites in the Erme Valley, these drifts are probably of periglacial origin and deposited during the last (Devensian) stage of the Pleistocene (Gilbertson and Sims, 1974).

To the west, south and east, the erosion surface gives way to gently sloping ground, which whilst being better drained, still supports peaty gleyed podsols with bracken (*Pteridium aquilinum)* and gorse (*Ulex* spp.,) taking advantage of the slightly improved soil conditions of the slopes. The northern slopes of Crownhill Down, Riddon Down, are notably different. Sound granite outcrops at Crownhill Tor. The tor was shattered during the Pleistocene by freeze-thaw activity to generate a clitter field of granite scree about its northern and western margins. Quarrying has undoubtedly added to the scree in some directions, whilst stone taking and field clearance have restricted its dimensions to the south and east. Below the longhouse, shown in Figure 2, exposures in the ravine at the western end of the Tory Brook, indicate that the granite beneath the lower half of this slope has been extensively kaolinised. The overlying growan has consequently acquired a more clay-silt rich matrix than the upslope deposits. The boundary between the sound and kaolinised granite is marked by the appearance of spring water at the surface. Presumably the rapid movement of soil moisture through the coarse upslope growan (throughflow) is reduced upon meeting the lower, more clay-silt rich, growan resulting in spring development, spring sapping, and overland flow in gullies. These features distinguish this lower northern slope from most of the others developed about the Down.

One major spring promotes a mire and flush bog immediately to the east of the longhouse. Whilst the spring water is relatively free of fine contaminant particles, considerable "natural pollution" by kaolinised clays can occur lower down when stream flow rates are sufficiently high to take the fines into suspension.

Mapping

The archaeology of the Down has been mapped in four stages by students. First, a reconnaissance survey leading to the formulation of an outline map, an inventory of the features found, and a general interpretation of their stratigraphical and chronological relationships. The second stage consisted of large scale mapping of the area, its individual features, and the more precise elucidation of those stratigraphical and chronological relationships. Third, a definitive map of archaeological and associated landscape features was produced by compiling all the available data. Finally the map was checked in the field.

Reconnaissance Survey and Inventory

Survey

The first stage in any archaeological survey on this scale must be to establish the general characteristics of the archaeological and landscape features—their type, frequency, distribution, stratigraphical and environmental relationships. These data

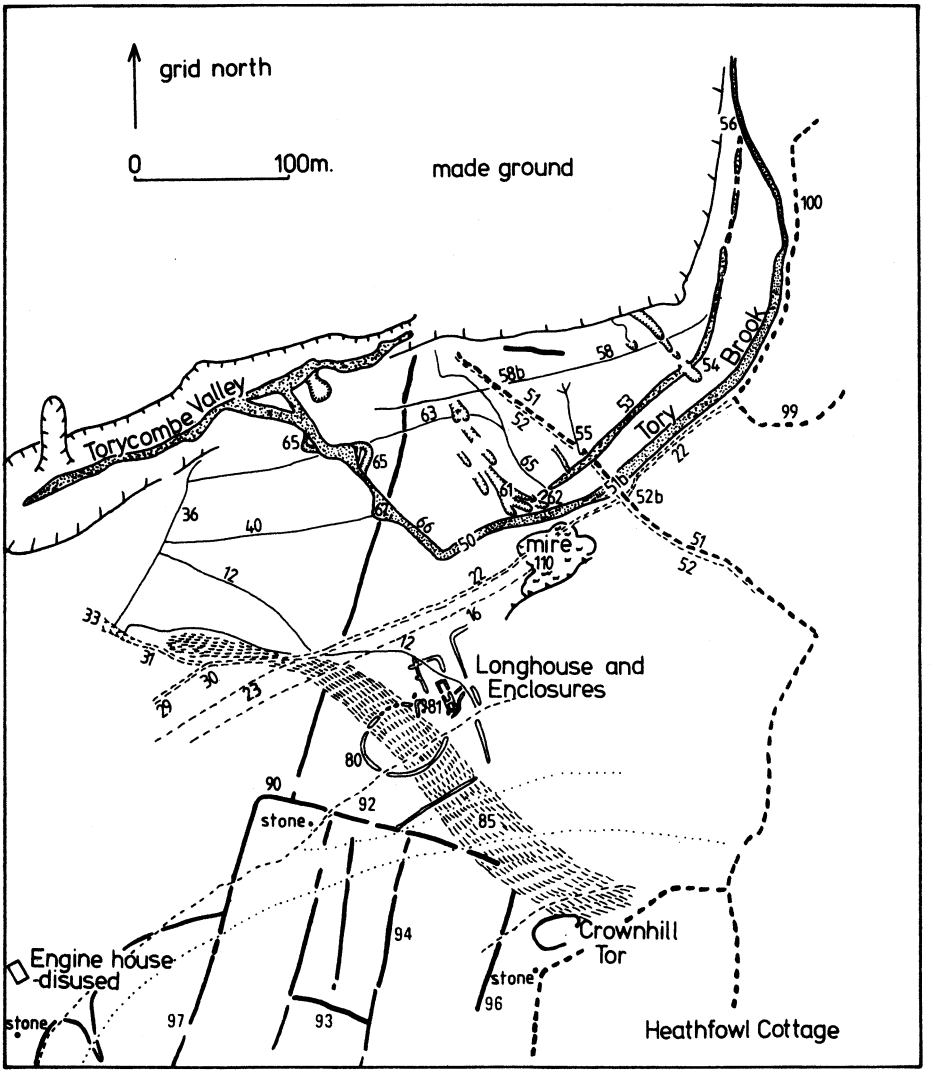

FIG. 2.
Major archaeological features on the northern part of Crownhill Down.

may be obtained, summarised and displayed in the form of a general map which can then be used in the formulation of more detailed mapping and excavation programmes.

The basic equipment needed at this stage is very simple; a compass, a tracing or copy of the appropriate 1:10,000 or better the 1:2,500 Ordnance Survey Sheet (in this case O.S. Plans SX 5761 and SX 5760); optionally a 30m tape, although pacing may be adequate.

The procedure is then to field walk the area, making an inventory of the archaeological and landscape features, whilst sketching in their general form and location on the Ordnance Survey Plan. Landmarks, pacing, and the compass are used to fix positions. Each landform, feature and intersection of features is given a

code number. Appropriate notes on the type, stratigraphical, and environmental relationships of each point are entered into a notebook. At this stage the map is highly stylised, and concentrates on the broader details of the area.

Inventory

The following archaeological and related landscape features are found on Dartmoor and are located in or adjacent to the study area.

Prehistoric monuments

The existing monuments on Dartmoor all date from between the Early Neolithic and the Late Bronze Age/Early Iron Age (3500-500 BC), after which the Moor was abandoned until medieval colonisation (Worth, 1971; Pettit, 1974). The prehistoric sites fall into three main categories:

1. ***Sepulchral and ceremonial.*** A small number of chambered tombs and long cairns on the Moor date from the Early Neolithic (3500-2500BC), whilst stone rows, which often lead up to small cairns, are mainly Late Neolithic (c. 2 000BC), and combine both burial and relgious/ceremonial functions. Simple cists for burial, and stone circles are of similar date, while circular burial cairns of stone or turf are likely to date from the Early Bronze Age (1800-1200BC). None occur in the area surveyed, though a small round barrow cemetery lies at the south end of the ridge at National Grid Reference SX 572597.
2. *Hut Circles, Hut Platforms, and Enclosures.* Huts consisting of either simple platforms dug into the slope, or of stone circles 5-15m in diameter, are a common feature of the Moor. These hut circles are often revetted inside and out by larger upright stones called orthostats. The huts occur singly or in groups, or within stone walled enclosures. Two hut circles and one hut platform occur within the Riddon Down field system on the northern part of Crownhill Down (Fig. 3). The date of enclosures and huts is Middle to Late Bronze Age (1200-600BC), though one or two have been dated as late as the earliest Iron Age (600-500BC) elsewhere on the Moor (Fox, 1955).
3. *Reaves and Field Boundaries.* Reaves are linear stone banks up to 2m, wide and 0.5-0.6m, high, which formed territorial boundaries, especially between river valleys. Sometimes parallel reaves were laid out at right angles to the main reave, along lines 10-15m, apart. Occasionally, such reave systems measure over 1km in length. In some cases these are further subdivided to form field plots. Isolated areas of small rectilinear fields of greater or lesser regularity are also known, such as that on Riddon Down (Fig. 2). Some may have been for cultivation, but most were most probably for stock control. Field boundaries consist of either terraces or denuded stone banks with occasional orthostats. They are largely contemporary with the settlements—Middle Bronze Age to Earliest Iron Age (Fleming and Collis, 1973; Collis, 1978; Fleming, 1978*a, b*).

Medieval Occupation

After the subsequent abandonment of the Moor, well over a thousand years passed before it was recolonised in the Late Saxon Period; only to be largely abandoned again in the late thirteenth and fourteenth centuries. The typical one-family farmhouse consisted of a *longhouse* with a dwelling at one end, divided by a cross passage from the cattle byre. Occasionally there were ancillary buildings within an enclosure. On lower ground there are field enclosures with traces of

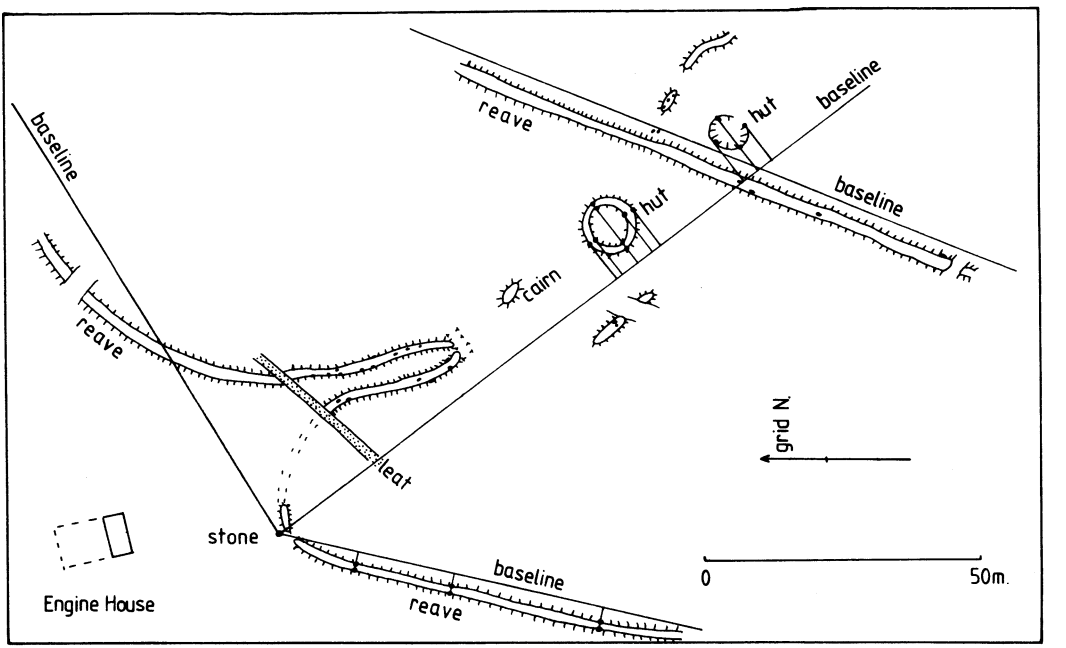

FIG. 3.
Example of off-set survey being used to map simple features such as reaves and hut circles.

cultivation, but these are lacking on the higher moors. The Riddon Down longhouse shown in Figure 4 occupies a natural hollow in the hillside. It has clear entrances in the long walls. To the north is a small attached enclosure, either for stock, or a small garden. There are two ancillary buildings, and an adjacent enclosure, which may be a re-used prehistoric oval enclosure. The whole complex is partially enclosed by two features—a bank, which has a sharper profile than the prehistoric banks, and secondly by the end bank of the prehistoric field system which was in part reconstructed. The banks are not ditched, as was common in the medieval period.

Medieval and Post-Medieval Trackways

The field boundaries are cut by a large number of trackways and paths whose functions and dates are unknown. Some are just routes over the Down, others are connected with peat, tin, or stone exploitation. Immediately west of the longhouse is an extensive area of rutting (Fig. 2), probably connected with stone removal and transport from Crownhill Tor.

Post-Medieval Agrarian and Industrial Archaeology

1. *Hedgebanks, enclosures, ditches* and the *"contemporary" field system,* form a complex pattern of land divisions. Hedgebanks on Dartmoor and adjacent hill summits may appear superficially similar. However where sections are available, a wide variety of constructional forms can be seen. These were variously designed to aid timber growth, impound animals or form permanent parish boundaries (Gilbertson, 1973).
2. *Leats* are artificially dug water channels running almost parallel to the contour, abstracting water from surface and sub-surface flow, transporting it about and

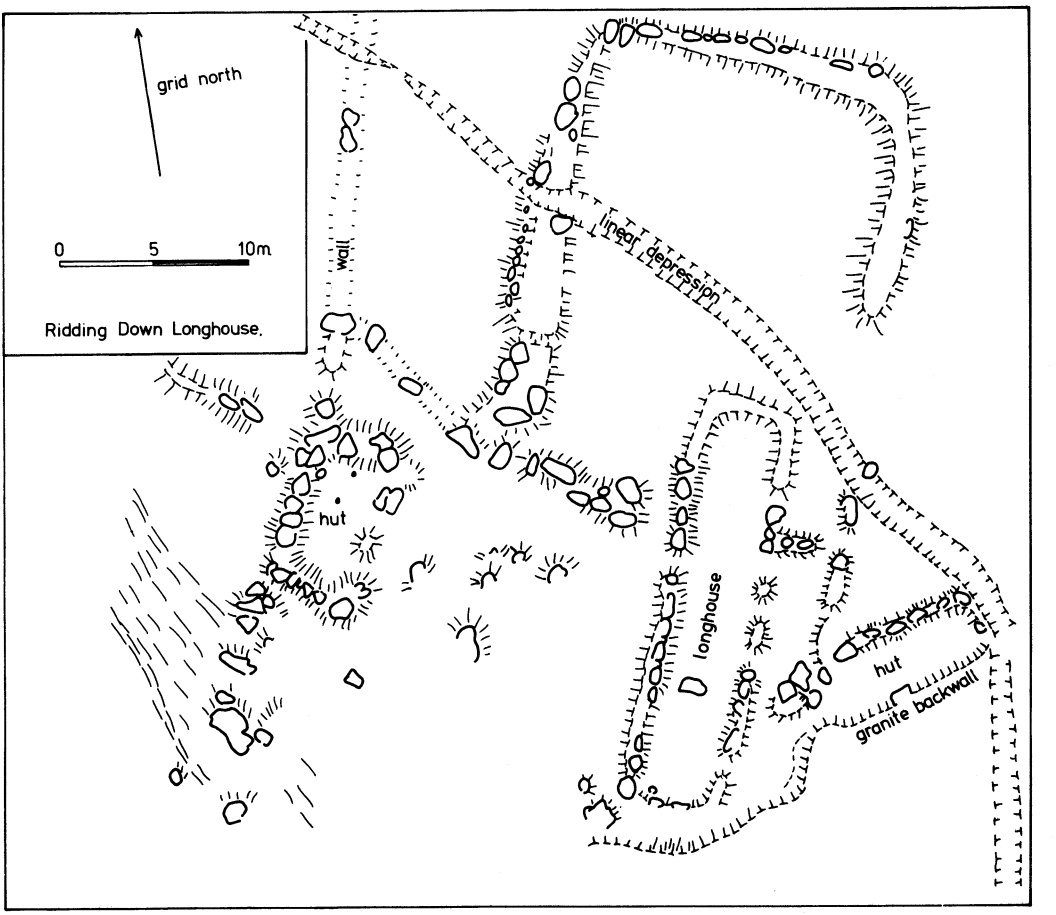

FIG. 4.
Plan of the medieval longhouse and enclosures on Riddon Down.

away from the Moor. Farms and mining settlements obtained considerable supplies in this manner. Bottle Hill Leat on Crownhill Down (Fig. 1) transported water to the former Bottle Hill Mine (National Grid Reference SX 564587) which produced substantial quantities of copper, as well as tin, in the early nineteenth century (Harris, 1972). Leats or drains tend to be preserved as sheep tracks after falling into disuse.

3. Eighteenth and nineteenth century open cast tin and copper mines generally required substantial quantities of water, often running at speed, with which to concentrate the ores. These mines were mainly on mineralised veins through the aureole rocks. Consequently the leats may lead into *chutes* or *ravines* (Fig. 2, feature 33) designed to expedite the passage of water down slope.
4. The advent of the *China Clay* industry in the region has lead to the construction of further drains and *culverts* in this case designed to catch water that would otherwise flow under or onto waste tips. The industry itself has left many derelict remains such as engine sheds (Figure 2).
5. Nineteenth century boundary markers, labelled "stone" on the Ordnance Survey

plans and in Figure 2, are most useful for establishing the position of other features in the field.

6. Finally, the area below the longhouse has a distinctive geomorphology; being characterised by extensive *gullies* developing from springs by spring sapping and overland channelled flow.

DETAILED SURVEY AND MAPPING

The choice of detailed survey and mapping procedures is often governed by practical considerations. However, in this case, the subjects of the survey lend themselves to study by standard procedures. Long linear features are most efficiently mapped by *offset survey*. This technique will also satisfactorily cope with individual or small groups of hut circles (Fig. 3) or even the longhouse (Fig. 4). Larger complex features associated with the longhouse, such as the oval enclosures, are best mapped by *plane table survey,* as described by Coles (1972). Many of the features to be mapped are not visible on aerial photographs, even taken in winter with low angle sun and minimum vegetation cover.

Offset Survey

The basic method is illustrated in Figure 3. The baseline is laid out with ranging rods or tape. Distances are then measured along the baseline, and then from it at right angles to the features to be mapped. The outline of the feature is drawn in between the plotted points. Right angles may be laid out using 3;4;5 triangles, or a compass. It is essential to fix precisely on the Ordnance Survey base map the exact point of each end of the baseline. In this particular case a main baseline was laid out along the northern (lower) bank from which further baselines were projected at right angles to follow other field boundaries. These were in turn tied together by further east—west base-lines producing a complex grid, which was then related to the boundary marker stones located on the Ordnance Survey base plan.

Compilation

The individual survey data were replotted onto an Ordnance Survey sheet to produce the final map of the archaeological remains of the region, which is shown as Figure 2. Problems in final compilation will occur if inadequate attention has been paid to: locating the detailed mapping areas on the Ordnance Survey base map; correct orientation of the survey baselines; marking the survey topic, title, date, scale, and direction of magnetic north on each survey plan.

AGE RELATIONSHIPS

In the absence of any artefact or feature of precisely known antiquity in many parts of the area, age relationships must be assessed from observations relating to super-position, morphological freshness, and presumed functional relationships. Whilst the first is reliable, the other two may lead to circular arguments and inadequate dating.

Super-position

The concept is used in exactly the same sense as developed by geologists in the early nineteenth century. Unless there has been some gross disturbance the feature on the top is younger than the feature buried. On occasions older features have been eroded, cut through, or blocked off, and newer features placed in or through them.

The development of a relative sequence can be illustrated by reference to Figure 2, where several features intersect with the current field wall and ditch at point 55. The fundamental point is to establish relative age: which features are younger, older or the same age as other features; not to attribute a date in years, or attribute the features to a particular cultural period.

The youngest features present are the culvert named the Tory Brook (Figure 2, feature 50) which cuts through the enclosure wall and ditch, and the spring-fed gully which has cut through the enclosure wall and ditch at point 55. It is not possible to assess directly whether the gully and culvert are of precisely the same age: they are not in contact at any location. That erosion is still continuing is attested by the current position of gully 62; the culvert would have been aligned or constructed differently if the gully had occupied its present threatening position at that time.

The Tory Brook is younger than its predecessor, culvert number 53, which has been blocked off at both ends to prevent it abstracting water from the Brook. Culvert 53 is also younger than the field boundary. The boundary wall and ditch are younger than the major leat number 22, Bottle Hill Leat, and the drain and wall 58. Leat 22 is younger than the drain and sheep track 12, which in turn cuts through the longhouse and enclosure (80, 81), and the leat 16. This latter leat and the predecessor (number 23) of the major leat 22, which emerges from under the line of 22, is younger than the rutted ground (85) of an early trackway. In turn the trackway is younger than the longhouse and the prehistoric reaves (90).

Past field boundary intersections present special problems. Younger walls may abut against, lead off from, or generally take advantage of an older wall. However, the entire grid or network may have been constructed at much the same period in time. It may not be clear, just what abuts against what without excavation. For example, the rectangle of prehistoric reaves 91, 93, 94, may represent either:

1) subsequent internal division of a reave system represented by reaves 96, 92 and 97; or
2) an initial design that was subsequently extended outwards; or
3) they might have been built at much the same time.

The nature and significance of such time differences may not be soluble by mapping field relationships, or even by excavation.

Morphological Freshness and Morphology

In the absence of any more satisfactory criteria, medieval field boundaries and features may be separated from prehistoric ones by their (usually) more substantial proportions—field boundaries 0.3-1.0m., in height and the frequent presence of a ditch. They may form large circular enclosures (80), and be related directly to features of known medieval antiquity such as the longhouse (81). Prehistoric field boundaries are commonly lower, often less than 0.3m., in height, very degraded and associated with prehistoric hut circles.

These differences in morphology and morphological freshness reflect both differences in initial construction and the length of time that they have been exposed to weathering and other erosional agents. Features initially built with granite tend to survive far better than those built of aureole rocks.

A relative chronology of settlement, land subdivision by field boundaries, drainage modifications and gullying based on the above field methods is set out in Table 1.

Table 1 *Relative chronology of occupation and changing land use, Crownhill Down, Dartmoor*

	Period	Settlement, Land Use, Field Boundaries	Drainage	Geomorphological Impact
Youngest		Rebuilt training wall and field boundary (100)	Drainage Modifications Construction of Tory Brook Culvert 50, blocks off Culvert 53	Spring sapping and gullying abandonment of meanders in ravine (66) spring sapping and gullying attack on Culvert 53
	China Clay Exploitation 1840 On	?? commencement of tipping in Torycombe Valley; Engine house, etc.	Major Culvert 53 constructed (cut through enclosures and ditches (51/52) Drain 36 intersects flow in drains 12, 40, 58, ravine 33, leat 29 diverts water in leat 22 from ravine (33)	Erosion of meandering ravine (65) Ground and tree species stabilize base of ravine 33
		Enclosure by hedgebank and ditches 51/52/99 blocks off leat 22, drain 58.	blocking of leat 22, drain 58	
	Post-Medieval	Bottle Hill Mine for copper and tin extraction Unknown activity requiring large water supply at base of chute/ravine (33) (? open cast tinning, and tin mining)	Major leat 22 (built along line 23, cuts across 12, 89)	Erosion of chute and ravine (33)
		Unknown activity requiring water supply in vicinity of base of future ravine 33 (? open cast tinning and tin mining)	drain (63) taps gully/drain (65); drain and/or track (12) initiated; ? = ? joins drain system 58, 40, 12, 63 (cuts across (16) prob (23); activity avoids (85)	
		Exploitation of granite in Tor and Clitter	drain/gully (65) cuts out drain and wall (58)	
		? Exploitation of granite in Tor and Clitter (disrupts 80/81/90)	small leat 76 excavated ? = ? small 23 excavated (cuts across 85)	
	Medieval	Longhouse (80) and re-building of circular enclosures (81)	earliest leat construction tapping interflow and Torycombe Brook feeder streams?	Extensive rutting of ground (85)
Oldest	Late Prehistoric Late Bronze Age/ Early Iron Age	Reaves, hut circles, hut platforms, cairns, standing stones ? initial construction of circular enclosure (81)		

Interpretation

In the absence of excavation and suitable sites for palaeoecological study on Crownhill Down, the interpretation of the archaeological remains in terms of settlement location, land utilisation and modification, and past interaction with the natural environment, must depend upon the interpretation of the archaeological survey map produced by the field study.

Prehistoric Activity

Much of the prehistoric reave system takes advantage of the better drained slopes on the aureole rocks to the west of the summit plain. However, the discrepancy between the presence of so many hut circles and reaves on the present Down, and the tendency for modern farms and fields to occupy protected slopes below the summit platform, suggests that the climatic environment at the time of prehistoric habitation must have been less marginal for their agricultural systems than is the case at the present time. Presumably the climate was less severe.

There is little direct evidence of the vegetation, or soils, before or even during the period of prehistoric hut and reave utilisation. The general inference from the pollen-analyses of Simmons (1964, 1969), Courtney and Staines (1971), and Jones (1973) would suggest Crownhill Down to have been relatively open at the time.

The date at which the Moor was abandoned is still unclear. One hut at Kes Tor, near Chagford, in north eastern Dartmoor is known to have been used for iron working (Fox, 1955) and is consequently attributed to the Iron Age. However, this is still a unique case. The Iron Age Glastonbury style pottery which occurs in hill-forts on the periphery of Dartmoor is totally and significantly absent from Dartmoor itself, as are Roman finds. The cause is often linked to a climatic deterioration leading to the widespread formation of blanket bog over much of the upper slopes of Dartmoor. However, in the Late Bronze Age the removal of the tree cover, may also have caused or greatly exacerbated podzolisation processes in the soil which would have accelerated bog development.

Medieval Activity

After the prehistoric period, much of Dartmoor must have been marginal land, only inhabited in periods of land hunger, such as the early medieval period. Attempts may have been made to improve the enclosed areas in the immediate vicinity of farms such as the longhouse, but the area would have been small in comparison with more low-lying sites.

The location of the longhouse and its associated enclosures appears to represent a compromise between several factors. The immediate proximity of the mid-slope granite backwall, against which it is constructed, must have offered considerable protection from inclement weather from most of the south, east and west quadrants; gales from the west and south-west represent the commonest source of bad weather today.

Whilst this particular hollow is dry, only tens of metres along the granite backwall to the east lies one of the few reliable sources of above-ground water on the Down. The accessible spring-fed mire is bounded by relatively kaolin-free slopes to the west, south and east. Elsewhere, naturally occurring "good" streams are rare.

Post-Medieval Activity

Stone gathering from the Tor and the clitter field above the longhouse may have

been important in medieval times, but the exploitation of this stone became significantly more important in recent times. The extensive rutting produced by the passage of wheeled carts to and from Crownhill Tor has broken and destroyed much of the longhouse enclosure wall.

The extensive network of leats and drainage chutes is younger than the main period of stone taking. It has a complex history. Leats have been used to tap and transport water from the mire on two, and possibly three occasions. The small older leats 16 and 23 both lead water away along the contour to the west. The younger leat 22 was also clearly designed to abstract water from this spring zone. Substantial quantities were obtained, and deliberately led down the chute (now a granite line 4-5m wide) towards point 33. Here a deep ravine 3-4m deep has been eroded. The substantial quantities of fast flowing water the chute once carried are likely to have been used to aid tin and copper mining at a site now lost beneath China Clay waste immediately downslope on the more mineralised aureole rocks. Drains 58, 40 and 63 also run in this direction and may also have been leading water to this site.

The subsequent enclosure of the landscape with large hedgebanks and ditches pays little attention to these earlier features. The age of the wood growing on the gullied land is as yet unknown; it appears, however, to be bounded by the remnants of enclosure walls. These have been altered or rebuilt during the construction of culverts and training walls by the China Clay industry, which started to develop the area in the 1840's (Hoskins, 1972; Harris, 1972).

The relative ease with which the kaolinised lower slope erodes is emphasised by the dimensions of the ravine at the west end of the Tory Brook. This Brook, together with the present streams in the Tory Combe, represent artificial channels designed to intercept water which would otherwise flow on to or under the China Clay waste tips. Whilst water has clearly been a valuable resource in earlier times, it has now come to represent a hazard to the tips. The finished map reveals the impact of continued spring sapping and gullying on the major culverts, no 53, and the Tory Brook. Culvert 53 was obviously abandoned because of sapping and gullying. This fate may soon befall the Tory Brook itself below the mire. Leakage of water from these culverts may constitute an additional source of water for the spring sapping slightly downslope. The general propensity of this portion of the northern slope to gully and erode, as opposed to the slope further west, may well relate to it being bounded by "leaking" culverts; the gullies in turn may form a partial explanation for the survival of the woodland. Cows in particular would not cope well with the gullied ground.

CONCLUSIONS

Reconnaissance survey, followed by detailed mapping, has revealed a history of settlement and land use lasting over three millennia on Crownhill Down, Dartmoor. The most active period of land management, division, and settlement occurred in the Late Bronze Age/Early Iron Age, with the construction of a large field system on the Down's better soils, and the occupation of adjacent hut circles.

There is little evidence of further utilisation until the medieval period, when a longhouse, associated with huts and enclosures, was built in a location with several natural advantages.

The subsequent gathering of granite from Crownhill Tor and its clitter field, left

major disruption of the ground surface. This activity has probably continued at smaller scales until comparatively recently.

The emergence of water in springs, gullies, and from a large mire initially provided a valuable, continuously available resource, which was used by the occupants of the medieval longhouse. It was subsequently tapped by small leats, before much larger structures led water away for mining purposes. Whilst grazing animals have continued to benefit from this supply, the spring sapping and gullying with which it is associated, have posed a problem for the most recent dominant land use in the area—the tipping of China Clay waste downslope in the Torycombe Valley.

The precise antiquity of the features found, and the landscape changes noted, await determination by excavation and historical searches.

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