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Articles for the *Proceedings* should normally be sent to the Editor at the Dorset County Museum before 31st October for publication in June the following year.

COVER

A wood engraving of Ashley Chase by Reynolds Stone, 1909-1979, from *The Old Rectory,* published by Warren Editions, 1976.

In 1981 a major exhibition of the work of Reynolds Stone was held in the Dorset County Museum. We are grateful to Warren Editions for kind permission to reproduce the engraving to commemorate this event.

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WRECK AND PLUNDER IN 18TH CENTURY PORTLAND

GLANVILLE J. DAVIES

During the 18th century the island of Portland must have presented an aspect as forbidding as it does today, though then the bleak land mass crouched in the sea was truly an island, entirely separated from the mainland and tenuously linked only by a rope-drawn ferry boat. Even late in the century this ferry was acknowledged to be 'a very dangerous navigation', which made the passage of people and goods a very hazardous affair. Not until 1839 was the danger of passage removed, and a toll bridge provided from Portland through Wyke Regis to Weymouth.[1] Portland, during the 18th century therefore was an isolated community: geographically isolated by its severance from the mainland; socially isolated by its separate customs and traditions. Only with the villagers of Wyke Regis, through whom some Portlanders purchased some supplies, and with whom they shared the offshore fishing grounds, was there any affinity; and this is made evident in much of their joint activity in wrecking.

Few Portlanders had travelled far, and Smeaton in 1756, when supervising the quarrying of stone, was told that all the workmen, whose robust labours he so admired, had been born on the island 'and many of them have never been further upon the main land than to Weymouth'.[2] This insularity had led to the development of customs and traditions not generally found on the mainland. These customs nurtured a close spirit of kinship which bound the island's villages into one community. Gavelkind, land tenure based on equal partition at each generation, was a form of land-holding which by the 18th century had been supplanted throughout England and Wales. Its effect was to create a different social structure on this Crown land, with a fragmentation of holdings and the consequent levelling down of all social class. A modestly wealthy strata – a 'middling sort' – could not exist in Portland society, for no cumulative land-holding was possible; the one sure guarantee of gavelkind was that poverty would be evenly shared. Alongside this went an unusual family structure by which the women selected their mates – invariably Portlanders – and entered into marriage only after pregnancy was confirmed. Smeaton's foreman, a Londoner, was very proud of the fact that illegitimacy was unheard of, and with unconscious irony he assured his employer that 'previous to my arrival here there was but one child on record . . . that had been born a bastard in the compass of 150 years'. Failure to achieve a pregnancy 'after a competent time of courtship' meant that 'they are not destined by Providence for each other', and the woman was free to seek another suitor 'as if she had been left a widow, or that nothing had happened'. The consequence, of course, was an intimately bound community – a matriarchate – jealously guarding its separateness, and different from most other English local communities. With '*all* marriages here . . . productive of children', newly-weds all had children to support, and with only limited and meagre resources on the island, the general standard of living of the islanders must have fallen with each marriage ceremony.[3]

The island's main industry, quarrying, supported most of the families. Certainly for the greater part of the 18th century there was only unskilled labouring work for the community's men. Skilled, and better paid stone masons were imported after 1739, for until that date all Portland stone was 'shipped in the rough . . . to be sawn and fair wrought to the particular purpose where wanted'.[4] Even though families were supported by quarrying, there was little of wealth to be gained by the workers who laboured: their task was merely to hew out the stone and cart it to the pier from which it could be shipped. The dominance of quarrying on the small island meant that spoil-heaps of rock and sub-soil were scattered over the island, reducing further the already meagre areas available for crops and livestock.

Agriculture, despite the approving comments of antiquarians who observed the corn, grass and livestock on the island, depended upon a stony, wind-swept soil, and a primitive strip system of farming.[5] All the disadvantages of production which one normally associates with medieval farming methods were present in 18th century Portland. Whatever agriculture existed, it is certain that it provided only bare subsistence; there could have been little surplus production. While Weymouth citizens enjoying blazing hearths of Newcastle coal, Portlanders huddled over cow-dung fires on a tree-less island; while Weymouth citizens paid for their 'night-soil' to be discreetly disposed of on the sands, Portlanders carefully conserved their ordure during winter, until the spring sowing, when it would serve to fertilise the fields. Those on the mainland could enjoy the benefits of the produce of the entire region; those on Portland, with little wealth available for purchase, and the isolation imposed by their geography, had to rely upon the island's limited production. While others could enjoy easy access to the mutton, corn, beer, fruit, serges and flannel being produced within the county, Portlanders, in the main, had to restrict themselves to the meagre results of their own agricultural labours.

But Portlanders possessed two clear advantages: a dangerous 'race' created by the confluence of powerful tides from West Bay and Weymouth Bay, and a rocky coastline unforgiving of any error of timing or seamanship in the age of sail. Contemporaries were well aware of these dangers, and in 1716 two lighthouses were erected to warn mariners of the treacherous coast. In 1789, with shipping increased and the dangers unabated, Trinity House rebuilt one lighthouse in a more prominent position so that it served 'for a mark by day or night'.[6] But danger to mariners spelt promise to Portlanders, for past their shores swept Dutch and English ships carrying tea and silks from the East Indies, fruit from the Mediterranean, naval stores from the Baltic, brandies from France, wines from Spain and Portugal, and tobacco from Virginia. The English Channel was a funnel of trade, opening into the Atlantic, and directing laden ships past Portland and on to London and Amsterdam.

FOOTNOTES

1 J. H. Bettey, *The Island and Royal Manor of Portland* (University of Bristol, 1970), pp. 109-112.

2 J. Smeaton, *A Narrative of the Buildings and a Description of the Construction of the Eddystone Lighthouse with Stone* (London, 1791), p. 65.

3 *Ibid*, p. 65.

4 *Ibid*, p. 62.

5 Antiquarians like Leland, Defoe and Hutchins were observers of the rural Portland scene, but their descriptions have too often been accepted uncritically. Perhaps, in the words of Professor Mathias, they mythologise, 'enjoying the choice of not having to live there'. P Mathias, *The Transformation of England* (Methuen, 1979), p. 133.

6 J. Hutchins, *The History and Antiquities of the County of Dorset* (3rd ed., 1861-74, EP Publishing, 1973, 4 vols.), vol. II, p. 823.

Adverse winds, storms, fog, errors of navigation or ship handling, dashed vessels on to the Portland rocks and Chesil Bank, spilling cargoes into the sea. To deprived Portlanders all these cargoes were valuable. The *Katherine* of Brest in 1702 carried only chestnuts, yet the assembled crowds 'beat and abused ye officers in ye execution of their duties'.[7] The *Johannes* of February, 1773, provided another example, for though plundered, those arrested had pocketed only scraps of sailcloth, twine and shirts.[8] Even when the cargo was entirely lost, the wreckage remaining: ropes, cordage, sailcloth and shattered timbers, were well worth the effort of salvage. 'Happy is he that comes first with his Bag and his Hatchet, to cut and carry off what he can . . . out of the Cargo or Materials of the Ship'.[9] Islanders of Scilly valued wreck timber highly, and they, like the Portlanders, lived on land which had been stripped of trees.

It is not surprising therefore that the villagers of Portland should have occupied themselves occasionally in wrecking and smuggling. Whereas smuggling as a crime could be precisely defined – the evasion of custom duty – 'wrecking' was a more general term which covered the luring of vessels ashore, and open, defiant plunder, through all activities associated with wrecks, down to casual beachcombing and the pocketing of items found on the shore.[10] From as early as the 12th century the law had been specific about the crime of wrecking; and from 1713 the statute against wrecking and plunder had to be read aloud four times each year in all churches along the sea-coast.[11] Undoubtedly, and especially in the untutored mind, there was some confusion, for right of wreck had often been granted to lords of manors, and it was assumed, perhaps wilfully, but always wrongly, that salvage by all people, whatever their station, and the grant to all landowners of the right of wreck along the coast, existed as legal rights. This belief could only have been deepened by the occasional and well known disputes which broke out between Customs officers and the local landowning gentry. In January, 1716, the Customs Controller at Weymouth had to threaten Mr. Weld with the Dragoons at Dorchester before he would surrender a hogshead of French wine which he had seized. In March, 1741, another incident was recorded when, 'at Distant times', 32 Pipes of wine had drifted ashore, and on the two Pipes which floated past West Lulworth, Mr. Weld, to the obvious chagrin of the Customs, claimed Royalty.[12] In November, 1766, a blatantly illegal act occurred when two casks of turpentine out of a Dutch ketch 'lost near the Race of Portland', were picked up by boat off Weymouth by several servants belonging to Mr. Weld, and then jealously guarded as Royalty for their master, whose home, and land, lay 10 miles distant.[13] Without doubt, for both commoner and gentry, the apparent difficulty in interpreting and enforcing the law of wreck served both their ends, and, perhaps, it was to everyone's advantage to maintain a confusion. Whatever the difficulties of legal interpretation, the particular response and reputation of Portlanders were well known, for when any wreck occurred they 'appropriate whatever they can find to their own use', and 'plunder without remorse'.[14]

The administration of the laws concerning wrecking and smuggling on Portland rested entirely upon the Customs service based at Weymouth. During the 18th century Portland had a Coast-waiter and a Riding Officer to enforce these laws, while at sea, in addition to the heavily manned offshore cruisers based at Poole, Weymouth operated oared vessels to patrol the Portland Roads. Occasionally, militiamen assisted, and this occurred, for example, in July, 1738, when, as Customs officers searched the villages, soldiers stood guard in the street 'to observe if anything was carried out of the houses whilst the officers was searching'.[15] But, the resident officers on the island could only hope to seize the occasional salvaged or smuggled item; any wreck, or any organised running of goods, would be attended by such a force of islanders that even the combined power and authority of the entire Weymouth Customs could not prevail.

> 'On Saturday morning Last a French Vessell from Nantz of about Twenty tonns Loaden with Wines for Dunkirk was driven on shoar and Lost on the Beach west of Portland . . . Great Numbers of Country and Portland Men came down upon us in Disguise Arm'd with Axes, Hatchets, Clubbs, and beat us from the Goods Wounding Severall of Us very Much.'[16]

Any kind of Customs activity provoked hostility. In April, 1718, a Tidesman approached two boats off Portland, but each had 'seven or eight lusty Portland fellows', and John Morris of Weymouth, a hired hand on the Customs boat, was beaten so badly that 'he now lyes in danger of his Life'.[17] Such incidents were common, and normally violent, so the Customs man who dared approach a boat off Portland in July, 1720, was brave, or willing to risk his life foolishly; he escaped with bruises and the ignominy of having his foremast torn away, and then drifting helplessly in Weymouth Bay.[18]

Certainly, as all Customs men discovered, enforcement of the law on Portland would not be met with acquiescence. The Commander of the Customs sloop, *Cholmondeley,* investigating several boats 'in the hand wash' off Portland Castle, and 'upward of Twenty People assembled' on shore, was repulsed with a volley of stones, and unable to approach. The Weymouth Customs officer reported that:

> '. . . unless some speedy and effectual method be taken to put a Stop to the Audacious and Insolent Behaviour of these Islanders, no Officer may with Safety enter the Island to Execute his Office. And we have Reason to believe that any Ships in Distress comming on Shoar in or near the Island of Portland, no Officer of the Customs will Venter to lay out all Night in order to Protect and Defend such unhappy sufferers, and Guard their Goods, for fear of being knock'd on the Head with a Volley of Stones from the Islanders.'[19]

An example of the kind of incident which Customs men feared, and about which they frequently complained, occurred in February, 1787, when 'the People of the Island assembled to the number of 200 or more' to salvage casks

7 E. Carson, *The Ancient and Rightful Customs* (Faber & Faber, 1972), pp. 116-117.
8 Public Record Office (PRO), Customs Outport Records (Cust.), 59/14.
9 T. Francklyn, *Serious Advice and Fair Warning to all that live upon the Sea Coast of England and Wales, particularly to those in the Neighbourhood of Weymouth and Portland* (1754).
10 J. G. Rule, 'Wrecking and Coastal Plunder' in D. Hay, *et al., Albion's Fatal Tree* (Penguin, 1977), p. 169.
11 12 Anne, *c.* 18.
12 PRO, Cust 59/1; Cust 59/5. One Hogshead = 63 gallons; one Pipe = 126 galls.
13 PRO, Cust 59/12.
14 Hutchins, *Dorset,* II, p. 826.
15 PRO, Cust 59/5.
16 PRO, Cust 59/1, 10th February, 1717/18. Assembly of any eight, later five, people, 'hindering' officers, could lead to transportation to the plantations.
17 PRO, Cust 59/1.
18 PRO, Cust 59/2.
19 PRO, Cust 59/7, February, 1747.

of wine, and the approaching Customs boat was attacked, and the crew 'struck, abused and very ill treated', while 'the mob began to throw stones, and with them stove the boat'.[20] As Hutchins, in another context, so aptly observed, the Portlanders 'were anciently famous for flinging stones . . . and surely no people could be better provided with ammunition'.[21]

It was remarkable how quickly, upon news of a wreck, a crowd would assemble. Customs men attempting to recover the wreck's cargo would be immediately attacked and beaten off, while the islanders plunged into the surf to rescue the goods, or launched their boats to converge on the wrecked vessel. The Customs men failed to recover any cargo from the *Jesus Maria Joseph* because the mob 'Beat, Hounded and Resisted us in the Salvidge'.[22] When a Cornish vessel foundered in January, 1762, the ship broke up on the rocks and the cargo of brandy floated to the surface. 'One hundred and fifty people assembled at the Place where the casks were taken up . . . Many of them endeavoured as much as they could to obstruct and prevent the offrs from securing the casks'. Portlanders seized the casks from the Customs men and flung them back into the sea, or 'enclosed' them on shore. Fishing boats set off with ropes and stones, sinking the brandy as fast as it was discovered, so that, to the frustration of the Customs, 'when the boats returned there were neither casks nor stones in them'. Following this incident, eight men of Portland and Wyke were arrested, but very little of the cargo was recovered.[23] But, even when the ship remained intact, and the cargo secure in the hold, islanders boarded and plundered. The Snow, *Johannes,* in difficulties, was driven ashore by the master, but, 'a Great Number of People Assembled', swarmed over the vessel, and 'broke open the Captain's Cabin', and the hold, and seized all goods which they could find. The Customs man present, alone, thwarted in his attempt to guard the vessel, 'in a Passion', assaulted a bystander – a naval lieutenant – because of his apparent indifference to the open plunder taking place around him.[24] The incident caused much concern to the Customs Controller at Weymouth, not because of the plunder, for that was too commonplace to observe, but because the lieutenant prosecuted the Customs man for assault.[25]

During the 18th century there were several occasions when goods secured by the Customs men were forcibly seized by the Portlanders because the islanders felt that they had a right to ownership, or a right to a share of the proceeds of any sale. Under law, Customs men were entitled to a moiety, or a one-third share, of any sale price raised at public auction following the confiscation of smuggled goods. With wreck, the law was different: no property from a wreck could be condemned by a JP, and entered in the warehouse for eventual sale where rights of ownership could be established. Customs men found it convenient to disregard the possibility of ownership claim, for who wished to become involved in a protracted dispute over the ownership of foreign goods carried in foreign vessels, or for owners and insurers to argue against the officers' evidence that, after immersion in seawater, the goods recovered were unfit for sale except at public auction, and with low bidding? It was, undoubtedly, easier for Customs men generally to treat salvage as they treated smuggled goods; and it was, undoubtedly, easier for their superiors to disregard the exact letter and spirit of the law, aware that such shares from sales provided incentives for low paid officers who needed encouragement in their duty. Unfortunately, this Nelsonian interpretation had two effects: first, it equated the law of wreck with that of smuggling, and the general populace felt that they had a right to a one-third share of the proceeds, in the same way that informers on smuggled goods had; and, secondly, that officers were not securing goods on behalf of owners – possibly a laudable act – but, selfishly, on behalf of themselves. Portlanders, like others, resisted the Customs officers' seizure of salvaged goods, and where they had no alternative except to admit to the salvage, expected, as a 'right' a one-third share of the proceeds of sale. An incident of this nature occurred on 1st August, 1706, when a ship carrying tin went down off Portland, 'and no person coming on land alive', the islanders went to the trouble of dredging up 150 blocks of tin. Important as this cargo was, it had no remarkable value in Dorset, and the Portlanders petitioned, 'praying one third part thereof for their trouble', but, cannily, refusing to part with the tin 'until there be direction for paying them'.[26] The success of the Customs men in securing the brandy out of the wrecked sloop *La Bien-Aimé* showed the reverse of this, for it angered the Portlanders who, on this occasion, were unsuccessful in their salvage attempts. The brandy was temporarily housed in a locked building on Portland, but that night, by removing the thatch, some brandy was lifted out and stolen. The Customs Controller at Weymouth was left with the unenviable task of transferring the remaining brandy to the warehouse at Weymouth ' . . . but we are of opinion that the said removal will be attended with some difficulty', for the building on Portland was surrounded by watchful islanders.[27] Probably, however, the one incident of this kind which caused the greatest furore was the sinking of the *Peggy* on 7th March, 1767, for that ship, bound for London from New England with mahogany and whale oil, also carried chests of gold intended for the London Customs House. 'A great Number of Portland Boats are now Creeping where the Ship was lost'. Some loose dollars and the lid of a large money chest had been picked up by the 16th March, and this aroused such excitement that by the 25th almost 200 small boats were dredging and fishing near the spot. Eventually, one full chest of dollars had been recovered, and it was transferred overland to London, 'brought hither . . . by a very great Number of Portland Men who for a long time seemed determin'd to retain it in their own Custody till the Salvadge should be adjusted'. The gold was 'weighed in their Presence, and the Chest chain'd and Locked by separate Locks, and for the greater certainty that no Embezlement should be made, one of the Portland men for himself and the Rest fix'd Tape on Two of the sides of the Chest and affix'd two Seals therein'. Meanwhile, in Weymouth, the Collector drew up a list of those who, in his opinion, had assisted in the salvage; and the Portlanders drew up their own list. Only by combining all the names could the islanders be satisfied, and to the clear annoyance and incredulity of the Customs men, a list of no fewer than 187 names was submitted to London. As the Weymouth Controller sourly observed, 'it is not improbable that a great Part of the Salvers (being Quarriers of Portland) might in the Time they attended on this have Earned more Money by their proper Employ than their Shares in a third part may

[20] PRO, Cust 59/17.
[21] Hutchins, *Dorset,* II, p. 809.
[22] PRO, Cust 59/1, January, 1716.
[23] PRO, Cust 59/10.
[24] PRO Cust 59/14, February, 1773.
[25] The law was clear: by 26 Geo II, c. 19, it was a capital offence to remove anything from a vessel whether or not any member of the crew remained on board. In the case of the *Johannes,* the entire crew was saved.
[26] *Calendar of Treasury Books,* 1705-1706, XX, Pt. III, p. 730.
[27] PRO, Cust 59/15, 21st October, 1778.

amount to'. Hopefully, small boats continued to hover around the wreck until the middle of April, long after, in the Controller's view, 'all hopes of Success vanish'd'.[28]

But if the episode of the *Peggy* had its lighter side, the violence occasionally directed against survivors showed the darker side. During a winter gale, in early January, the massive 350-ton *Hope* failed to clear the coast, and at 2 a.m. she struck by the head, and the stern was carried out to sea. 'The Country People came down in great Gaungs and carry'd off what they could lay their Hands on'. The cargo spilled out of the broken ship, and to add to the excitement, three Tidesurveyors came across a chest of gold which the *Hope* had gathered in the Spanish West Indies. Of the crew of 74, few survived, despite the fact that the beach was crowded with people, and the bows, still intact, had buried in the shingle. Days afterwards the bodies, stripped of all clothing, were being discovered, and one, with certainty, had been stabbed to death and covered over in a shallow grave.[29] The only explanation which the Customs Controller could offer was that two members of the crew, upon coming ashore, fought, and one buried the body of the other! The explanation, weak as it was, was not commented upon by the London office, and the entire matter was discreetly buried in the pages of the letter-books.

An equally terrible incident occurred in November, 1795, when troopships being convoyed by naval vessels ran ashore at Portland and Chesil. The *Catherine, Venus, Piedmont, Thomas, Golden Grove* and *Aeolus* were driven ashore and 275 bodies were eventually recovered. The rocks and beaches were littered with bodies, and plunderers swarmed everywhere, ignoring the living, and deaf to pleas of help as they stripped the bodies. Some survivors who managed to gain the shore, found that no-one was prepared to ferry them to the mainland because they were too busy collecting clothes and items from the wrecks. With all means of identification removed, the dead could not be identified, and the only way of separating the officers from the men – presumably to ensure a different burial place – was to examine the hands of the corpses, separating off those who had earned their living by manual labour![30]

Everything which the plunderers recovered from the wrecks was valuable, for that which they could not use they traded. As the Customs Controller observed: '. . . little Tradesmen and Shop Keepers in this place buy up any Goods weares and merchandizes the Portlanders can steal or carry off on every ships being stranded or Lost on Portland Beach'.[31]

Portland was an island of limited resources, a close community, a low standard of living, and the opportunity of occasional picking from the wrecks. Those who plundered – those against whom authority raged – were generally poor: like Thomas Carter in October, 1739, 'in a Poore and Miserable condition wth a wife and four children', found with some tea, and prosecuted; and John Sweet, also a family man, 'in very miserable circumstances'.[32] Greed was not the chief motive for these men, and the other plunderers on Portland, else the episode of the *Peggy* would have ended in fighting along the shore as plunderers squabbled over the wreckage and cargo; instead, sporting coloured cloths as distinguishing marks to identify themselves, the villagers divided up the beach into search areas, and methodically combed their assigned part of the beach while companionably watching their neighbours doing the same. Once discovered, objects were quickly exchanged in Weymouth for food, clothing and other items of worth on the island. The comment of the Customs officer in February, 1742, was perhaps as much as observation on the standard of living of the Portlanders as it was on the difficulty of tracking down plundered goods:

> 'We have caused a thorough Rummage in Chysell and other places in Portland adjoyning the place where the Ship was lost yet nothing of any value was found among the Inhabitants.'[33]

[28] PRO, Cust 59/12.
[29] PRO, Cust 59/7.
[30] C. Smith, *A Narrative of the Loss of the Catherine, Venus and Piedmont Transports, and the Thomas, Golden Grove and Aeolus Merchant Ships near Weymouth on Wed the 18th of November last* (London, 1796).
[31] PRO, Cust 59/8.
[32] PRO, Cust 59/5.
[33] PRO, Cust 59/6.

THE CHILDREN IN THE CEMETERY: CHILD MORTALITY AND PUBLIC HEALTH IN LYME REGIS 1856 TO 1979

JOAN B. WALKER

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I wish to thank Harry Williams, Clerk to Lyme Regis Town Council, and his deputy, E. F. Griffin; Margaret Holmes, the Dorset County Archivist, and Philip Roper, Registrar, for access to documents. I am grateful to Dr. George Tee, formerly Director of the Public Health Laboratory Service, Dorset, with whom I initially discussed the subject of child mortality, and to Helen Yool and John Fowles for their helpful criticism of my typescript.

After making a survey of the Lyme Regis Cemetery for the Victorian Society in 1978, I was impressed by the material available and it seemed worthwhile to study the changes in the health of the town, since the opening of the cemetery in November, 1856, with particular reference to the children buried there. Why were there so many at first and how did improvement come about?

THE REGISTER OF BURIALS

In the first two volumes[1] I found a record of a self-contained community, static for a hundred years and showing only a gradual change in its social structure, as transport by horse and sailing ship gave way to steam (The London and South Western Railway opened its branch line in 1903).

The family names recorded in 1857 are familiar today – such as Hodder, Rugg, Curtis, Quick, Jefford, Hallett, Upjohn, Rowe, Toms, Loveridge – while their descriptions from 'gentleman' to 'labourer' covered every profession, trade and skilled occupation needed to maintain the community. There were carpenters, yeomen, grocers, stone-boatmen, mariners, tailors, drapers, tinmen, cordwainers, fishermen, blacksmiths, surgeons, customs officers, etc. An attempt to classify them into the Registrar General's Social Groups and compare those buried during the first ten years with those of the decade ending in Volume I, 1932, showed a remarkable replacement of skilled workers by the 'Intermediate Group' of traders and retired professionals. With improved communications the need to be self-supporting ceased, and Lyme turned to its seasonal holiday trade, offering homes for retirement in the cottages vacated by the indigenous population.

THE CHILDREN

It was the number of entries of the burial of infants and young adults that first shocked me. Of the 72 burials in 1857, 39 (i.e. 57 per cent) were of children under 16 years of age. The numbers fluctuated year by year and suggested epidemics, but when the 10-year periods were studied there was a steady reduction in the overall totals and in the percentage of children, with the exception of the period of the Second World War, for which no census figures are available and when the structure of the population is not apparent (see Table I and Figures I and II).

WHERE AND HOW THE CHILDREN LIVED

The ancient borough of Lyme Regis covered only 45 acres and for centuries the rest of the parish was in the possession of one family, the Henleys of Colway Manor. Lyme might have developed differently if the rural portion had been in the normal several owners' hands. The total area of 1,237 acres consisted of hilly farmland with small pastures enclosed by old hedges and banks where primroses grew in great abundance, and an old sexton told me he was considered to be an expert in lining the children's graves with them. Tracks connected one farm to the next, but there were few cottages so that many farm labourers had to live in the town and walk several miles to work each day. The total population of the borough[2] between 1851 and 1931 varied between 2,800 and 2,300 inhabitants until the Second World War. In the 1951 census it was 3,200 and in 1971, 3,403, but in the summer the resident population might be treble that of the winter.

This small seaside town with its port is set in a bay with exceptionally beautiful coastal scenery and is noted for its mild climate, its sunshine and fresh air. However in Victorian Lyme there was gross poverty and overcrowding in the cottages in the lower part of the town along the river. Ancient Lyme had developed along the river partly because of the instability of the land to the east and west, but also because in time of raids by privateers, protection from the town forts was essential. When Lyme had a thriving wool trade, between 1300 and 1700, the population was little less than that of today, but because the natural area for expansion was closed by the Colway Tithings, it was crammed into the original borough's 45 acres. The mediaeval architectural plan may still be traced in Coombe Street but the warren of buildings leading off it by narrow passages to courts in the rear were, for the most part, destroyed in the great fires of 1803 and 1833. Roberts[3] noted that this was of benefit to health, but the remaining cottages were those described by Dr. Bangay[4] as unworthy of being termed houses. One living-room and one bedroom for a family of ten was not uncommon so that communicable diseases spread rapidly. Cleanliness could not be maintained when the water supply and the privy outside were shared. In spite of these conditions Lyme escaped the cholera epidemic which precipitated the passing of the first Public Health Act in 1845.[5] It is doubtful if the Act made any impression on the Lyme Regis Borough Council of that time, although none of its provisions would have altered the recurrent epidemics of infectious diseases which caused the highest mortality in children.

Throughout the second half of the 19th century there was a sharp contrast between the houses of the well-to-do and those termed 'working class'. Silver Street, Sidmouth Road, Pound Street and Pound Road were attractive tree-lined roads of fine houses built in the Regency style with pleasant gardens. They belonged to merchants and landowners. Broad Street too had good residences interspersed with shops; it included the Great House where Pitt and also the Mitfords had stayed.[6] Marine Parade aspired to some gentility in its eastern part. Church Street was on

1 Register of Burials, 1856, Lyme Regis Town Council Office.
2 Census for Lyme Regis, 1861 and 1871, Dorset County Reference Library, Dorchester.
3 George Roberts, *History of Lyme Regis*, 1823.
4 Reports of the Medical Officer of Health for Lyme Regis, 1887 to 1909.
5 Charles Singer, *A Short History of Medicine*, 1928, Oxford at The Clarendon Press.
6 Cyril Wanklyn, *Lyme Regis – A Retrospect*, 1922, London, Humpreys.

TABLE I
Record of Burials in Lyme Regis Cemetery.

Decade ending	Population	Total	Burials Children	Per cent
1866	2,537	539	224	41.9
1876	2,603	519	145	28.1
1886	2,290	402	105	26.0
1896	2,365	373	75	20.4
1906	2,095	341	57	16.7
1916	2,772	313	39	12.4
1926	2,882	286	22	7.6
1936	2,620	308	21	6.7
1946	No census in 1941	409	36	8.8
1956	3,200	340	12	3.5
1966	3,526	301	7	2.3
1976	3,403	255	3	1.1

the decline, together with Monmouth Street. The landlords (including the Henleys), who owned a great deal of poor property, did little maintenance until compelled to do so after the appointment of the first medical officer of health in 1882. Coombe Street continued into Horse Street, over Gosling Bridge to Pickle Square, Mill Green and Mill Lane to Jericho. These were all addresses found in the register[7] of the children who died in the smallpox, scarlet fever and measles epidemics. Sherborne Lane was another poor area connecting Broad Street by a steep cobbled footpath to Gosling Bridge. The first cottage hospital was established at its upper end, at Providence Place, in 1873. These are also the streets recorded in the 1861 census[8] where the 52 workers in the silk mill at Mill Green lived:[9] and the register of deaths also stated that Robert Legg aged four years was 'drowned accidentally in the Millpond of the Silk Factory' in 1857. The silk thread industry must have been of short duration in Lyme Regis. It can be traced from 1851 to 1875 through the census returns and *Kelly's Directory* but by 1880 the employer, Mark Lawton, who appears to have started it, had become a baker. Although the Factory Acts of 1833 and 1847 stopped much of the abuse of child labour, work in the lace and silk factories was exempt.[10] In 1861 25 children between the ages of 8 and 15 were employed in the Lyme silk mill. By 1871, however, there were none under 10 years old. Factory legislation by then prohibited the employment of children under 11. Overcrowding at home and working all day in the little factory must have made ideal conditions for the transmission of infection.

NURSING A SICK CHILD IN A COTTAGE

Dr. Richard Bangay, who was a general practitioner and the first medical officer of health to be appointed in Lyme Regis, gives a contemporary account of a typical workman's cottage in 1892.[11] He says: 'At the present time there is widespread solicitude on the part of county councils and charitable organisations in favour of giving help to the poor in sickness . . . but the proffered instruction to those who are badly housed must appear little better than a mockery to the sick, and the task of nursing with success is impossible. A skilful nurse attaches great importance to the favourable surroundings in cases of sickness where warmth, an even temperature, perfect rest and quiet, an ample supply of fresh pure air without a draught and the like can be maintained, and she measures her power of relieving the sufferings and of saving the life of her patient by the means at hand of possibly securing such conditions'. Dr. Bangay was stating the only methods known at the time for treating seriously ill people, he continues: 'Say a trained nurse was sent to take care of two children, in the bitter month of March of 1890, that were suffering from serious chest and brain affections, in a house consisting of three separate divisions, two small and ill constructed sleeping places upstairs with a sunless aspect and no fireplace. In the bottom room was the only fireplace in the house and here the sick children had their beds made upon chairs. The doorway was flush with the side of a narrow pebble-paved busy street. The ill-fitting door was opened and shut many times an hour by the rest of the children and others going necessarily in and out to the dank lean-to . . .'.

'That both children died could not be a matter of surprise. That they would have both recovered had there been a decent bedroom with a fireplace where they could have been properly nursed is, in my opinion, most probable.'

NUTRITION

Few details of the diet of the occupants of the houses just described have been found but it is known that one shilling a day was a not unusual wage for a young labourer even up to the First World War. Families were large and although Lyme is a town most of the borough was farmland and children might walk several miles to work having had very little breakfast. It was not until 1867 that The Gangs Act restricted the hiring of children until they were eight.[12] From 1875 English agriculture went into a decline due to a series of bad harvests and the development of the American prairies. Even before this the Report of the Select Committee of 1867 stated that Dorset was one of the six most underfed counties. In Somerset barley meal, turnips, cabbages and a little bread were the staple diet of labourers earning 7s. 6d. per week. In a personal communication a man born at Mill Green in 1903 told how his mother rebuffed the vicar when he called after the eighth child was born and suggested that perhaps this should be the last. ''Tis none of your business' was the reply, and she had at least two more. One day this mother tossed her son her only shilling and sent him to buy a sheep's head and a swede. The head was stuffed with rice and pulses and boiled to feed her hungry family.

Through wise rationing in the Second World War, nutrition in England was markedly improved. The obese adult grew slim, but school milk and dinners produced a generation of outstandingly healthy young people.

INFANT MORTALITY

In the first 50 years of the 19th century, it has been found, by studying the Parish Burial Registers[13] that the child mortality rate (15 years and under) was 40 per cent of the total burials until the decade immediately before the cemetery was opened (1846 to 1856), when the figure rose to 48 per cent and then steadily declined. Smallpox seems to have accounted for this particular peak, but in our records many little children died a few hours or days after

[7] Civil Register of Deaths from 1837, Registrar of Births and Deaths, South Street, Bridport.
[8] Census, *op. cit.*
[9] M. M. Crick, 'Silk in Dorset', *The Victoria History of the County of Dorset,* ed. Wm. Page, London, 1908.
[10] G. M. Trevelyan, *English Social History,* Longmans Green, 1946. Gulie Lister, *Lister Thesaurus,* Lyme Regis Museum. *Clay's Handbook of Environmental Health,* MacDonald and Janes Ltd., London, Revised by F. G. Davies and H. K. Lewis, London, 1977.
[11] Reports of Medical Officer of Health, *op. cit.*
[12] R. J. Brown, *The English Country Cottage,* Robert Hall, London, 1979.
[13] Lyme Regis Parish Burial Register, Dorset County Records Office, Dorchester.

birth and were certified 'debility from birth', 'marasmus', 'prematurity' and 'convulsions'. The hazards of being born alive and surviving until the fifth year were many in the Victorian era. Prematurity, dangerous midwifery practices, cold, inadequate or faulty feeding and the many various infections prevailing, were all factors which were more in evidence in the burial figures before the appointment of a medical officer of health in 1882.

TABLE II
Infant Mortality in Lyme Regis.

Year	Births	Deaths Years of age at death 0-1	1-5	5-15	
1849		20	6	13	
1855		12	2	4	Register
1859		15	7	3	
1869		9	13	5	of
1870		5	4	5	
1871		11	4	3	Burials
1878		6	10	2	
1885		9	5		
Appointment of Medical Officer of Health					
1887	59	2	1	1	
1888	64	3	4		Reports
1889	62	3	2	4	
1890	55	10	6		of
1892	50	4	1		
1893	44	7	2		MOH
1894	45	9		1	
1895	42	3	4	3	
1897	46	3	4	3	
1898	53	5	2		
1899	41	4	1	2	
1900	37	3			
1901	45	6	1		
1902	46	5	5	1	
1903	37	1	3	1	
1904	45	2	3	1	
1905	38	2			
1906	39	2		2	
1907	41	3		1	
1908	42	4			
1909	29	2			
1910	38	2	1		

EPIDEMICS

Information about epidemics has been obtained from the Civil Register of Deaths and later from the reports of the Medical Officers of Health for Lyme Regis. That death certificates are unreliable for statistical purposes is well known, and archaic terminology increases their inaccuracy. Nonetheless, both sources gave so much circumstantial evidence of prevailing conditions that it seemed worthwhile to indicate the extent of the problem (see Figure 2). By the Infectious Diseases (Regulation) Act 1837 some statistics of the prevalence of infectious diseases in England and Wales became available. However, it was not until 1st June, 1896 that the Lyme Regis Borough Council thought it necessary to adopt the new Infectious Diseases (Notification) Act 1889. In the Minutes of the Lyme Regis Urban Sanitary Authority[14] for 1896 the Mayor reported that the vacated Boys' Schoolroom was to be used temporarily as a hospital for the reception of infectious patients and he nominated himself and Alderman Henley to arrange for the removal of patients and their reception there. There is no record of this totally inadequate accommodation ever having been used.

The origin of Lyme's epidemics is hard to trace. The doctors often said they were brought in from outside but not, it seems, by sea. Local children mostly remained in Lyme and travel and communications were limited at the time of the most severe epidemics. It is of interest that mortality rates were already falling before any public health measures, apart from vaccination, were introduced. Variation in the virulence of certain strains of infecting organisms and immunity of a population due to previous attacks must have played a part in the improvement (see Figures 1 and 2).

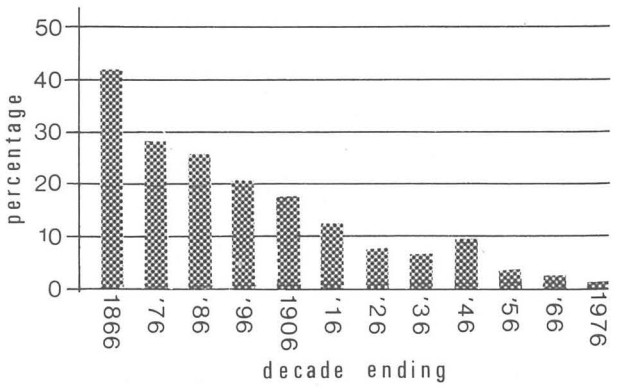


Figure 1. Children as a percentage of total burials in Lyme Regis Cemetery.

In view of the large number of burials in 1857/1858 **cholera** was the first condition that was considered as there had been severe epidemics in the Devon ports during the previous 20 years.[15] Although Dorset was less affected, Lyme was a port and carrying on some trade. Yet, when eulogising the healthiness of the town in his guide *The Beauties of Lyme Regis,*[16] Rowland Brown says 'In 1856 when cholera was epidemic elsewhere there was not a single case in Lyme'. His statement is confirmed by the register of deaths. Later, the medical officer of health was alive to the danger of cholera as in 1890 he noted 'In compliance with notices from the Local Government Board with reference to the danger of cholera, inspection: all ships entering the harbour from infected ports during the time notified were duly inspected and excellent provision made for isolation in case of need but which, fortunately, we have so far had no occasion to make use of'. As late as 1893 the *Bridport News* mentions a local cholera scare and reported that the isolation hospital at the Cobb (the present Sailing Club) was declared ready. Dr. Bangay was again ordered to inspect incoming vessels at 10s. 6d. a visit.

Although Lyme apparently escaped cholera there is evidence that **smallpox** was responsible for many children's deaths. In the Parish Burial Register there is a note for 1803 that the total burials were 45 and of these 26 were children who had mainly died of smallpox and measles. A random search in the Civil Register showed that in 1849 39 children died and 13 of these were certified as smallpox victims. In 1857 39 children died and 10 of them had smallpox, but after this date, despite careful search, no more

[14] *Urban Sanitary Minute Book*, Lyme Regis, 1894-1898, Dorset County Records Office, Dorchester.
[15] Charles Creighton, *History of Epidemics in Britain, Vol. I*, Frank Cass and Co., 1965.
[16] H. Rowland Brown, *The Beauties of Lyme Regis and Charmouth*, Daniel Dunster, Lyme Regis, *c.* 1858.

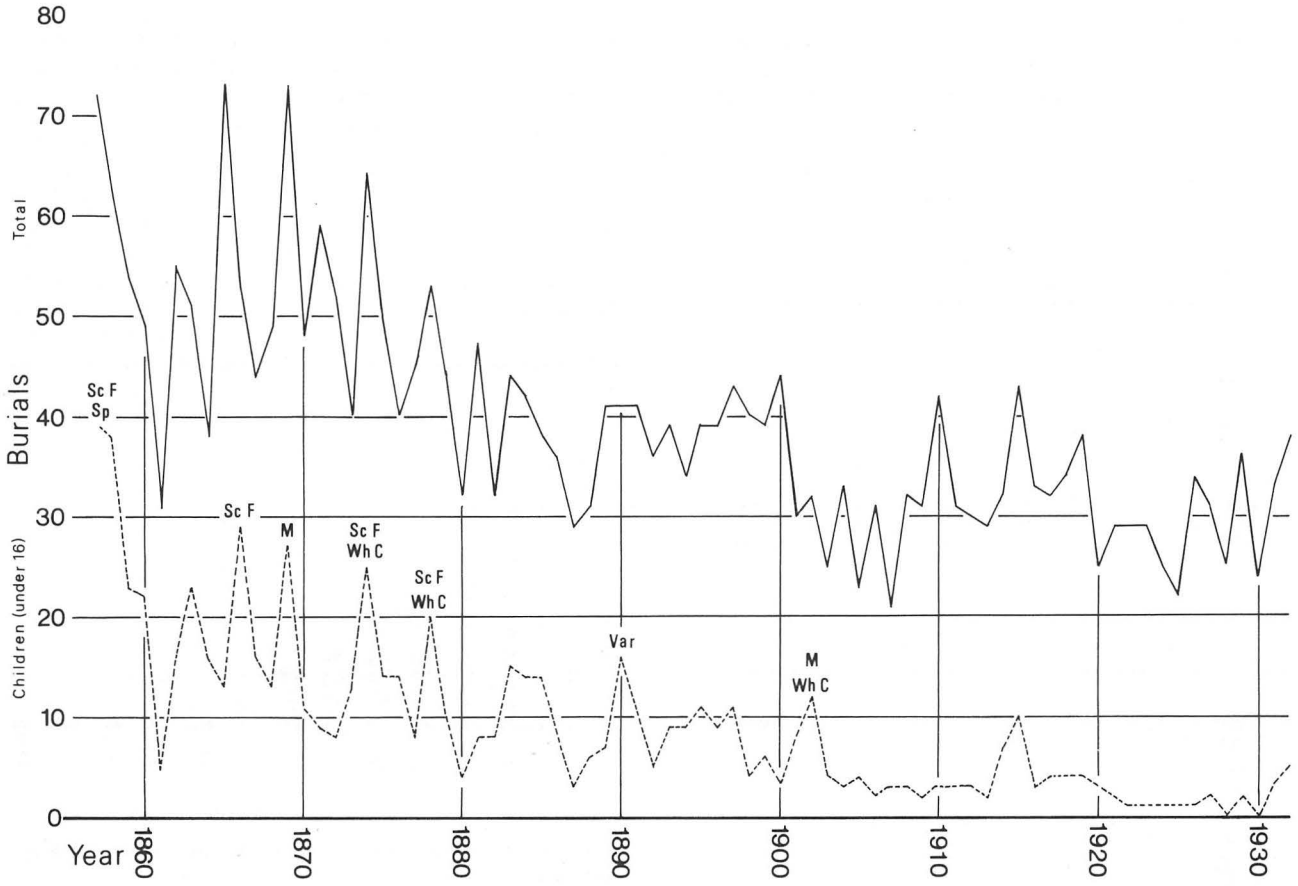


Figure 2. Burials in Lyme Regis Cemetery, 1856-1932, from the Burial Register; the upper line shows total burials per annum; the lower line shows burials of children under 16 years old, annotated with epidemics. ScF = Scarlet fever; Sp = Smallpox; M = Measles; Var = Various infections; and WhC = Whooping cough.

smallpox is mentioned. By the Act of 1840 free vaccination was offered to protect children of the poorer classes but it was not until several years after the Act of 1853, when all infants were obliged to be vaccinated before the age of three months, that Lyme became free of this killer of her children. Exemption from vaccination could be granted by magistrates when parents appealed for medical and conscientious reasons and there are newspaper records of this practice in Lyme. In 1913 the Medical Officer of Health for Dorset, in his annual report,[17] noted the increasing number of unvaccinated individuals which increased the likelihood of an outbreak of smallpox. He had serious doubts about hospital accommodation in such an event. At Lyme the two rooms at the Cobb were still the only isolation available.[18]

A severe epidemic of **scarlet fever** began in Lyme in 1856 and continued into 1859. Twenty-three children were certified as dying of 'scarletina maligna', 'scarletina anginosa', or 'scarletina suppressed eruption'. It was this disease which caused the high proportion of child burials in the new cemetery. After the first Infectious Diseases (Registration) Act of 1837, it was shown that scarlet fever in England and Wales nearly doubled its mortality in 1840,[19] and continued with exacerbations for 20 years. Children under five were particularly vulnerable. Happily the condition caused few deaths in Lyme after 1897. Dr. Spurr reported in 1898 that two cases of scarlet fever had occurred at 'Little Park' in August, in a child and the mother who were on a visit. The drains from 'Little Park' discharged into the neighbouring field, so at the Medical Officer of Health's request a cesspit was dug. The overflow was to run in an open ditch to the river below. It seems possible that the two patients were relatives of F. T. Palgrave, the poet, who had last visited 'Little Park' in 1897, shortly before he died.

In 1902 'Ten cases of scarlet fever and four of erysipelas were notified . . . scarlet fever first appeared at the common lodging house (the Dolphin Inn) in Millgreen early in May in a navvy who had walked from Portland. I isolated him as well as circumstances would permit in that house; he was nursed by the landlady who did everything in her power to prevent the disease spreading. After the peeling stage was over the infected room was sulphured, limewashed and thoroughly scrubbed and fortunately no other case occurred there. The other nine cases were scattered in various parts of the town, as the notification forms will show, and extended through the remaining months of the year. The disease was of a mild type and caused no

[17] *Medical Officer of Health for Dorset: Reports 1909-1972*, published by Dorset County Council, Area Health Authority Office, Herrison Hospital, Dorchester.

[18] Some of the early work on innoculation, before Jenner, was carried out in Dorset by a Yetminster farmer, Benjamin Jesty, who used material from cowpox to inoculate the arm of his wife and daughter in 1774, but his wife had a severe local reaction and the experiment was not repeated. A Lyme apothecary is said to have informed Sir George Baker (1722-1809), President of the Royal College of Physicians, about another case of the domestic use of cowpox matter by the mistress of a farmhouse.

[19] Creighton, *op. cit.*

deaths'. In the following year there were 42 cases with one fatality and Dr. Spurr said 'although the majority were mild they caused considerable suffering and inconvenience'.

In 1905 there is a significant note by Dr. Spurr: 'The two cases of scarlet fever occurred in May in the house of Robert Hallett in Pound Road. As milk was retailed from the house, I suggested that the milk should not be brought into the house or premises, but taken directly from the cow sheds to the customers. This plan, I believe, was faithfully carried out and there was no spread of the disease. The house was thoroughly disinfected and the town water laid on'.

There are no accounts of **diphtheria** in Lyme before those of Dr. Spurr. It is possible, however, that some of the cases certified as 'scarletina maligna' were associated with diphtheria. In 1823 Pierre Bretonneau described diphtheria and gave it its name and there would have been an interval before the two conditions were differentiated clinically and the new term used.[20]

In 1890 one child's death was certified from diphtheria but there is no indication of the total number of cases. In 1897 Dr. Spurr made a special report on 19 cases of diphtheria and it is of interest that there were also 19 cases of scarlet fever in the same year; four cases occurred in March all in one house and one patient died. In June there were 11 cases of diphtheria in various parts of the town and of these five died. Three cases occurred in July. In 1899 there were two cases in one house in the New (Cobb) Road and one died. The drains were still under suspicion but were investigated and 'found to be perfect in construction'. There was an isolated case in 1904 which proved fatal and Dr. Spurr's two children were afflicted. Both recovered and there were no other cases in Lyme: though it is probable that some of the children certified as dying of 'membranous croup' had, in fact, been suffering from diphtheria. After the causal bacillus was isolated by Klebs and Löffler in 1883[21] accurate diagnosis could be made by taking throat swabs for culture and microscopy; but laboratory facilities would not have been easily available for this country practitioner dependant on his trap or the Bridport horse-bus.

Although **measles** had caused the deaths of many children it was not added to the list of notifiable diseases till well into the 20th century. In the spring of 1824 Exeter suffered a severe epidemic of measles when 17 children were buried in one day. In Lyme, measles accounted for four deaths in 1857 when scarlet fever was also epidemic. In 1869 measles was rife throughout Britain and in Lyme there were 18 children's deaths certified 'measles'. In 1888 when measles was once more epidemic in the West Country Dr. Bangay said 'The epidemic commenced on 2nd September in a small school and in a private house on the same day . . . two thirds of the children of the town suffered from the disease; there were two deaths'. In the measles epidemic of 1902 Dr. Spurr closed the schools for a fortnight in May; two children died. In August, 1907, the schools were again closed on account of measles but there were no deaths.

Whooping cough, sometimes spelt 'hooping' cough, was the recurrent cause of death in children throughout the Lyme Regis records, but the total incidence cannot be estimated. There were six deaths in 1858, six in 1863, five in 1878, one in 1892, five in 1902, one in 1905 and one in 1910. After the registration of deaths (1837) whooping cough was said to have been the third commonest cause of death in children in the whole country, and continued to be a scourge until an adequate programme of protective vaccination was instituted in the 1940s.

In is perhaps surprising that the **enteric fevers** did not play a greater role in Lyme Regis epidemics in the 19th century, before the water supply and the methods of sewage disposal were improved, and the importance of hygienic food-handling realised.

Dr. Bangay wrote 'In the spring of that year (1889) an epidemic of **typhoid fever** spread over the lower part of the town causing many serious cases of illness and from which two deaths occurred. The disease seems to have had its origin in the 'Malaria' arising from that part of the river into which some drains from Church Street and from the slaughter-house flow, fouling it most where it is hemmed in by the houses at the bottom of Coombe Street. A less extensive outbreak of the disease occurred again in the autumn attended with one fatal case, making three deaths from typhoid fever'.

'In the early part of January' (1898), Dr. Spurr noted, 'an isolated case of the disease occurred in a house in Church Street. The patient, a boy of 8 years, was removed to our cottage hospital (The Gables) and after a tedious convalescence made a perfect recovery. I think it was owing to the prompt removal from his home and the careful nursing he received whilst in hospital that the disease did not spread. The drains and closets of the surrounding cottages were inspected and found very defective and notices being served upon the owner (Colonel Henley) the necessary repairs were carried out.'

'In May (1899) a case of typhoid fever occurred at one of the coastguard cottages at the Cobb; a child was removed to the cottage hospital and made a perfect recovery. The parents of this child had recently come to the town from Salcombe where in all probability the disease was contracted. I wrote to the Medical Officer of Health for that district who informed me that the coastguard cottages there were new buildings with good sanitary accommodation, but their water supply was not above suspicion. In June the maid of the cottage hospital was taken ill and in about a week she died. A post mortem examination was held when evidence of typhoid ulceration was found in the bowels proving that this disease was the cause of death. Notwithstanding all proper precautions having been taken in nursing the child, it would appear probable that the maid contracted the disease from the child. There was no spread of this fever.'

Naturally, **tuberculosis** claimed victims in Lyme. Throughout the records each year there were two or three young adults who died of 'phthisis', the wasting disease not considered infectious at that time. There were also little children certified as dying from 'effusion of the brain' which may be interpreted as 'meningitis' and quite possibly tuberculous meningitis. It is conceivable that the infection was transmitted from the old people who had chronic coughs and infected sputum.

Robert Koch (1843-1910)[22] discovered the tubercle bacillus in 1882 and it is probable that some steps towards prevention were initiated afterwards, but notification of tuberculosis did not become obligatory until 1912, and by this date the figures for incidence and mortality had already begun to fall, possibly because of sanitorium care with its isolation and better feeding.

In 1913 the Medical Officer of Health for Dorset[23] put

[20] Singer, *op. cit.*
[21] Singer, *op. cit.*
[22] Singer, *op. cit.*
[23] Medical Officer of Health Reports, Dorset County Council, *op. cit.*

forward the first scheme for tuberculosis management for the county. Great advances in prevention and treatment were developed later. Young children were protected by BCG vaccination and mass radiography, now discontinued, enabled early diagnosis to be made and early treatment to be given by the specific antibiotic streptomycin with its associated drugs.

CONCERN ABOUT THE PUBLIC HEALTH

Treatment of existing illness has always preceded any measures for its prevention but in the early part of Queen Victoria's reign there were stirrings of conscience in the well-to-do and better informed members of society. Florence Nightingale, Charles Dickens,[24] Charles Kingsley and other writers stimulated the women to action, and thus the ladies of Lyme,[25] led by the Reverend Dr. F. P. Hodges, founded a cottage hospital in Providence Place, Sherborne Lane, which it was hoped to maintain for £100 a year. The cottage could accommodate two men and two women with a nurse, who seemed to have been continuously on duty, at a salary of £16 per annum. This cottage was used from 1873 till 1889 when there was a temporary move to Keble Cottage, just above the Holmbush fields. But this too was unsatisfactory, and in 1897 'The Gables' was acquired. It was a larger house, opposite the Parish Church, where it was possible to increase the number of beds to eight and provide one private room.

It is notable that one of the earliest operating theatres to be installed in any cottage hospital was built for Lyme by the distinguished surgeon, Joseph Lister, who later became Lord Lister of Lyme Regis.[26] Arthur Lister, his brother, paid for the equipment and Miss Isabella Lister, with other members of the family, interested herself in the detailed arrangements. These were the early days of antiseptic and aseptic surgical techniques, which were being developed as a result of Lister's own work. The Gables functioned for 30 years until the Reverend G. F. Eyre, who was mayor at the time, donated 'Hernlee' in Pound Road in 1927. This became the core of the present hospital, taken over by the South West Regional Hospital Board. It continues to give service of outstanding value to the people of Lyme.

PUBLIC HEALTH

Some years after the passing of the new Public Health Act of 1875 Lyme appointed her first Medical Officer of Health. Dr. Richard Bangay, who was already in general practice in the town, took office in 1882 and wrote his first report in 1886, which consisted of a letter on double notepaper headed 'Belmont', Lyme Regis. It took several years of correspondence and stern letters from the Secretary of the Local Government Board in Whitehall to get anything approaching an acceptable report on the sanitary condition of Lyme Regis. As late as 1891 the Secretary said 'I am to request that your next annual report may contain specific information on these points – drainage, water supply, house accommodation and arrangements for the disposal of excrement and the removal of refuse – and I am to transmit for your guidance the enclosed memoranda as to annual reports of Medical Officers of Health'.

Poor Dr. Bangay never quite met all the official requirements but, as we have seen, he recognised that it was infectious diseases that slew his children and he pleaded for Government help to improve the housing of the working people. He wrote 'I drew attention to the fact that during the bitter month of March 1890 when the epidemics of whooping cough and influenza were prevailing and severe, nine deaths occurred and seven of these were of infants and children under five years of age. Under any circumstances of fair play these seven children, victims of one short month's cold and sickness should have been now alive and well'. By 1894 he was writing about sanitary matters, having visited, with the Sanitary Inspector, slaughter houses, bakeries, dairies and dwellings. 'I have written to many of the owners and agents of these properties with regard to the insanitary state of their premises with results as satisfactory as can be under the circumstances'.

'During the less rainy period of the summer months it was necessary to complain of the insanitary state of the bed of the river. There was an accumulation of rubbish and filth and the foul openings of the drains emptying into it were too high up the water'. However he notes that the scheme for a better water supply should be progressing in 1895.

Before resigning in 1896 Dr. Bangay wrote a final indictment on housing of the working classes in Lyme. 'Many of the "houses" are situated in the lower part of the town, where they are crowded upon the slopes of an unclean river, which they further contribute to foul by the discharge of their drains and refuse into it. Many of them are placed back to back, others are worse still, backed into the side of the hill, half buried behind where the damp floor and walls give off *mefitic* exhalations, causing a *zymotic malaria,* which, owing to the want of light and ventilation, make these places a hot-bed of disease-producing germs, especially of those germs which give rise to diphtheria, scarletina, rheumatism, etc. Many of such "houses" have no fireplaces in the bedrooms, no back door, and are constructed regardless of any provision necessary for the health and decency of human occupation. Whole families are domiciled in houses limited to a two-bedroomed accommodation with low ceilings, and where every part is equally cramped for space and sanitary convenience. It cannot be surprising that so much sickness and chronic wretchedness is met with in the dwellings of the poor, and that the rate of mortality is high . . . it is not enough to empower local authorities to take up the work of seeing to the better housing of the poor and to leave the exercise of that power optional. Such authorities are often too handicapped by vested interests to be capable of independent action. In order that any such power should be effective its exercise must be compulsory'.

Assessment of a situation in all its nakedness is the first step towards coping with it and it was left to Dr. James Spurr, who succeeded Dr. Bangay, to do this. However, he was able to start on a happy note because on 16th July, 1896, the Mayor, accompanied by the Corporation and a public procession, performed the ceremony of 'turning on the water' at Horn Bridge. Dr. Spurr described in detail the new system of water supply and how it was brought from Nelly Brown's Well. This supply was a great improvement on independent wells and springs, but not always adequate with the increase in the number of flushing water closets, or in a dry summer when it was necessary to increase the watering of the streets. Then it became essential to turn off the main supply at night.

[24] Edna Healey, *Lady Unknown,* Sidgwick & Jackson, London, 1978. Cecil Woodham Smith, *Florence Nightingale, 1820-1910,* Constable.

[25] *The Story of Lyme Regis Hospital 1873-1973,* pamphlet, 1973, compiled in aid of the voluntary funds of the Hospital and as a tribute to the many who have worked for and in it.

[26] Sir Rickman Godlee, *Lord Lister,* Macmillan, 1917. Richard B. Fisher, *Joseph Lister 1827-1912,* Macdonald & James, 1977.

Drains and sewers were surveyed by Messrs. Wilts and Philloth of Cheltenham in 1898 and reported in detail by Dr. Spurr. The old drains were partly stone culverts and partly earthenware pipes, but because of the steepness of the hills and plentiful rain-water they had kept in fair condition. A 24-inch sewer was to be constructed to carry the outfall at the Assembly Rooms, to be discharged at sea on the eastern side of Broad Ledge to low water level. Another was to be constructed to the west of the Cobb, picking up the drains discharging on to the beach together with the Cobb Road sewers. 'In laying out these new outfall sewers ample provision should be made for a probable increase of population, which, as Lyme will shortly be served by a railway, is extremely likely'. The estimate for the work was £8,000. It was completed by 1900, and it is the system of sewage disposal used in 1979.

Every year Dr. Spurr reported individual defects and his requests to the landlords for their repair. 'The drains and closets of the cottages surrounding the Boys' Home were found to be defective. Notice was served on the owner, Col. Henley, and repairs were carried out'. There is a report on the inspection of five bath houses: two had defective drains and one needed whitewash.

Slaughter houses came under inspection too. They were visited twice and found to be in a very clean state but a nuisance was complained of from one occupied by Mr. Harris at Guildhall Cottage. 'During September (1899) it was found that rats had carried offal into cracks in the wall and this becoming decomposed sent forth a most awful stench. The Town Hall adjoins this slaughter house, and the rats being able, through the dilapidated condition of the walls, to carry this refuse under the floor of the room (where the magistrates sat), it caused such a nuisance that one morning the magistrates had to quickly leave the Hall'.

The several slaughter houses were far from satisfactory and Dr. Spurr recommended that there should be a public abattoir built out of town with a good supply of town water. Nevertheless, the slaughter house in Poole's Court was still reported short of water in dry weather in 1905, and in 1906, because Col. Henley, the owner, could not agree with Mr. Lord, the tenant, to improve the drains and water supply, permission was given to build a new slaughter house behind the shop in Broad Street which was supplied by town water.

After the Factories and Workshops Act of 1901[27] Dr. Spurr inspected the four factories and 24 workshops in the town. He found no overcrowding, satisfactory sanitation and the means of escape in case of fire were good with one exception, a house in Broad Street used for dressmaking and subsequently closed.

RE-HOUSING THE WORKING CLASSES

Year by year Dr. Spurr condemned old cottages and reported new building. In 1896 there was a typical case of overcrowding in a cottage in George's Court owned by Mr. Wallis. It had two bedrooms and was occupied by James Hodges, his wife and seven children. As they could not find another house in Lyme they had to move to Charmouth. A second house in Coombe Street owned by Mr. Farnham Senr., tenanted by Mr. Jones and family, was condemned. This family found another house in Lyme but the onus was then on the occupier to find his own solution after eviction. There was no obligation on the local authority to re-house the unfortunate occupant.

In 1904 six new cottages were completed, several old ones repaired and 20 new closets fitted with flushing tanks. In 1906 two new cottages were built, seven in 1908, five of these in George's Court; and the open space, later to become the little square garden in Monmouth Street, was presented by James Tisdall Woodroffe, JP. No. 16 Mill Green was condemned and the old couple, the Whickers, were removed to the Union. More overcrowding in Jericho, Coombe Street and George's Court was rectified. By the time Dr. Spurr retired in 1927 there seem to have been 30 new cottages and in 1929, Dr. Cook, his successor, reported that the Lyme Regis Borough Council had completed the first stage of a new housing scheme at Colway Mead, 'thirty parlour houses and six non-parlour houses have been erected and all are occupied and overcrowding is almost completely relieved'.[28]

By the Second World War the Lyme Regis Borough Council owned 139 properties; 236 have been built since then and 21 single bedroom flats with a warden's flat are under construction. It is expected that 16 two-bedroom flats and two four-bedroom houses will be completed by 1981 (this has been accomplished).[29] Thus more than one-third of the 3,403 inhabitants of Lyme Regis (1971 census) are living in accommodation owned by the Council. This must be some of the best in Britain. There are no slums, all the houses have delightful views, good gardens and are maintained to a high standard. It is not surprising that they change tenants infrequently. Surely Dr. Bangay must look down with approbation. The living standards of the whole community have reached a very high level and the health of the children has never been better.

This study has concentrated on the period immediately following the opening of the Lyme Regis Cemetery in 1856, which happens to coincide with the time of the greatest advances ever made in public health in Britain. The object of the study was to find the cause of the very high mortality rate in infants and children under the age of 16, and to show how improvement came about. When the Civil Register of Deaths became available the causes of the fatal epidemics were identified, but there were more factors that might have been studied had ease of access and time allowed.

The fall in the rate of child deaths must be attributable to many factors which were occurring simultaneously; some were specific and others due to a general awareness of the need to improve the total environment. It is probable that at the beginning of our period of study it was the control of smallpox which had the greatest effect. Smallpox had always been present in Britain before Edward Jenner (1749-1813) published his paper on vaccination in 1796, but effective legislation did not come until 1853, three years before the cemetery was opened.[30]

Public concern in recognising a problem is the first step in solution and tribute is due to some significant personalities.

It is presumptuous for Lyme to claim more than a tenuous connection with Thomas Coram (1668-1751). Although born in Lyme, he left the town when young, but he accepted the honour of becoming a freeman of Lyme in 1749, four years after the opening of his Foundling Hospital in London. His influence continues in the Thomas

[27] Trevelyan, *op. cit.*
[28] Medical Officer of Health Report, Dorset County Council, *op. cit.*
[29] Chief Housing Officer, West Dorset District Council, personal communication.
[30] Singer, *op. cit.*

Coram Foundation for Children which has expanded its researches into the health, education and social care of *all* children.[31]

Joseph Lister (1827-1912), on the other hand, had a far closer connection with Lyme by adoption and by choosing its name when honoured with a peerage. Through his work and teaching, along with that of the remarkable group of Victorian scientists, greatly improved living standards and expectation of life have evolved.

John Fothergill (1712-1780) in his 'Account of the Sore Throat attended with ulcers which hath of late years appeared in the City of London'[32] recognised scarlet fever as an entity and it was the late Professor L. P. Garrod, a distinguished bacteriologist, who wrote shortly before his death in 1979,[33] that he considered the disappearance of diseases caused by the *Haemolytic streptococcus* to be outstanding therapeutic advance of modern times, since it was the first bacterial infection to become amenable to chemotherapy. By the *Sulphonamides* not only *scarlet fever* but *Streptococcal septicaemia* and *puerperal fever* are diseases of the past and readily available facilities for bacteriological diagnosis provided by laboratories have also helped.

The massive legislation for public health passed in the 19th century eventually percolated to such little towns as Lyme. Dr. Bangay's appointment as first Medical Officer of Health, although some years after the second Public Health Act 1875, was important. His great contribution was to expose and condemn the squalid conditions under which the poor children lived. Dr Spurr, who followed, is remembered in the town today for his kindness and indefatigable industry. He not only visited his patients away over the hills in his pony and trap, but under the new Acts of Parliament he inspected, supervised and reported infectious diseases, water supply sanitation and housing. He insisted upon improvements being made by reluctant landlords. It has been left to his successors to apply the benefits of the whole of modern medicine.

The Victorians accepted the death of their children as 'The Will of God'. Today a child's death is rare and most commonly accidental.

[31] R. H. Nichols and F. A. Wray, *The History of the Foundling Hospital,* Oxford University Press, Humphrey Milford, 1935. Ruth K. McClure, *Coram's Children: The London Foundling in the Eighteenth Century,* Yale University Press, 1981.

[32] *In the Circle of Sir Joseph Banks,* Library Notes, Royal College of Physicians, London, 1978.

[33] L. P. Garrod, 'The Eclipse of the *Haemolytic streptococcus', British Medical Journal,* 16th June, 1978.

SOME CONJOINED ARTIFACTS FROM A NEW MESOLITHIC SITE AT HENGISTBURY HEAD, DORSET

R. N. E. BARTON

Introduction

Mesolithic material has often been collected at Hengistbury Head, but until recently it had never been recovered from a well-stratified context. In 1980 rescue excavations began at a new site discovered by a local collector, Mr. R. Powell. He had observed a particularly rich concentration of microlithic artifacts eroding out of sandy deposits near the cliff-edge, on the southern side of the Headland. The first season of excavations, directed by the author, have uncovered a dense scatter of Mesolithic flint artifacts including many microliths. By re-assembling some of the artifact material, it has been possible to demonstrate the contemporaneous nature of many of the finds and recognise certain technological features of the flint industry.

The Site

Hengistbury Head is a well-known promontory, 1.5 km long, which juts into the sea near the Dorset coastal resort of Bournemouth. It is bounded on the southern side by the English Channel and to the north by the estuary of the Rivers Stour and Avon. The Headland is dominated by Warren Hill, an important landmark, which reaches a little over 37 m OD at its highest point. Superficial deposits of windblown sands cover much of the Headland and where erosion has cut deep natural sections, the sands often reveal a well-developed podsol formation.

The Powell Mesolithic site lies on the eastern slope of Warren Hill, at Nat. Grid Ref. SZ 1721 9059, close to the 30 m contour (Fig. 1a and b). Part of the site is situated along the edge of the cliff which drops almost vertically to the seashore below. The artifacts are found partially exposed on a wind-eroded surface and can be traced east and west along the deflated area at the cliff-edge. The flint scatter can also be followed a few metres north into a low bank of undisturbed sand deposit. Here, as in many other areas of the Headland, the sands support a rich heathland vegetation dominated by Marram Grass. The southern extent of the scatter is not known and it is likely that this part of the site has been damaged by cliff erosion. A low mound marking the remains of a Bronze Age barrow, originally excavated in 1919 by H. St. George Gray (Cunliffe, 1978, 15), is located approximately 35 m north-west of the new site.

The first season of work at the Powell site began in September, 1980 and lasted for a period of one month. During this time a total of 3,151 artifacts was recovered from 23 squares excavated. Attention was focused on an area close to the low sandy bank where earlier large numbers of Mesolithic implements had been discovered. Mr. Powell located the richest find spots for the investigators. Using a conventional metre grid system, squares were laid out contiguously along a magnetic north-south axis. These were arranged in such a way as to sample both the deflated sands and the undisturbed deposit of the bank. As in other parts of the Headland the sands in the bank section revealed soil horizons characteristic of a well-developed podsol. Each metre square was subdivided into eight rectangular units (50 × 25 cms) and excavated in spits of 2 cms or 5 cms thickness, depending on the richness of artifact density. For example, it was found when digging the podsol that consistently low numbers of finds occurred in the grey sand of the A1 horizon, whereas the A2 horizon below, produced a marked increase in the artifact concentration. With this system, heights were recorded to within 2 cms for the majority of artifacts. In addition, all spit units were separately dry-sieved using an eighth of an inch (0.317 cm) mesh, and then sorted for further finds.

Stratigraphy

The Mesolithic artifacts are stratified in fine sands about a metre in maximum thickness. Where the sands are partially denuded at the cliff-edge, they reveal thin spreads of coarse gravels. These are thought to be terrace deposits of Pleistocene Age (Green, 1946). However, the gravels are not as extensive here as in other parts of the Headland. Near the site the spread is often diffuse and isolated pebbles also occur within the lower levels of the sands. This might suggest that wind deflation is largely responsible for their accumulation along the cliff-edge. Beneath the gravels lie a long series of Eocene Sands, Silts and Clays, which today form the main mass of the Headland and are well seen in the cliff sections.

The fine sand is marked by the distinct colour bands which characterise the horizons of a well-developed podsol. Although these are clearly features of pedogenesis and cannot be confused with layer boundaries, it is interesting to note that the richest concentration of Mesolithic artifacts does correspond approximately with the pink A2 horizon. However, a number of implements have also been recovered from the A1 horizon, and several flakes can be conjoined with typical enough Mesolithic material in the pink sands below. No artifacts have as yet been found in either the deposits overlying the fine sands or in the lower part of the same deposit. At the top of the sands, a thin band of dark organic material appears to truncate the A1 horizon of the podsol. It forms a sharp boundary between the main body of the sands and a series of alternating sand layers and turf lines. That the latter may be very recent in date is suggested by the incorporation of modern brick within sediments of similar composition at the top of Warren Hill. In the lower part of the sands, the Bfe horizon forms an extremely hard iron pan, which can be many centimetres thick and is archaeologically sterile. In some areas of the deflation surface remnants of the iron pan are clearly visible. Where the pan has cemented the fine sands, they form a durable crust that also serves as a temporary buffer to further cliff erosion. In places the plan also appears to have penetrated the gravels and the top of the underlying Eocene Beds.

The Flint Industry

The flint industry is laminar in appearance with a marked preponderance of small blades or bladelets. The majority of artifacts are sharp and unabraded, but a few show signs of patination and are whitish in colour. At the time of writing, insufficient metrical data is available for formal subdivision of the blade classes and the term 'bladelet' will be used here in a general sense. The term 'bladelet' refers to a small flake whose length is more than twice its width. For broken fragments the definition is extended to include those pieces carrying traces of earlier bladelet removals on their dorsal surfaces and displaying more or less parallel sides. Figures for the total number of tools and artifact waste are presented below. Fire-crazed and thermally frac-

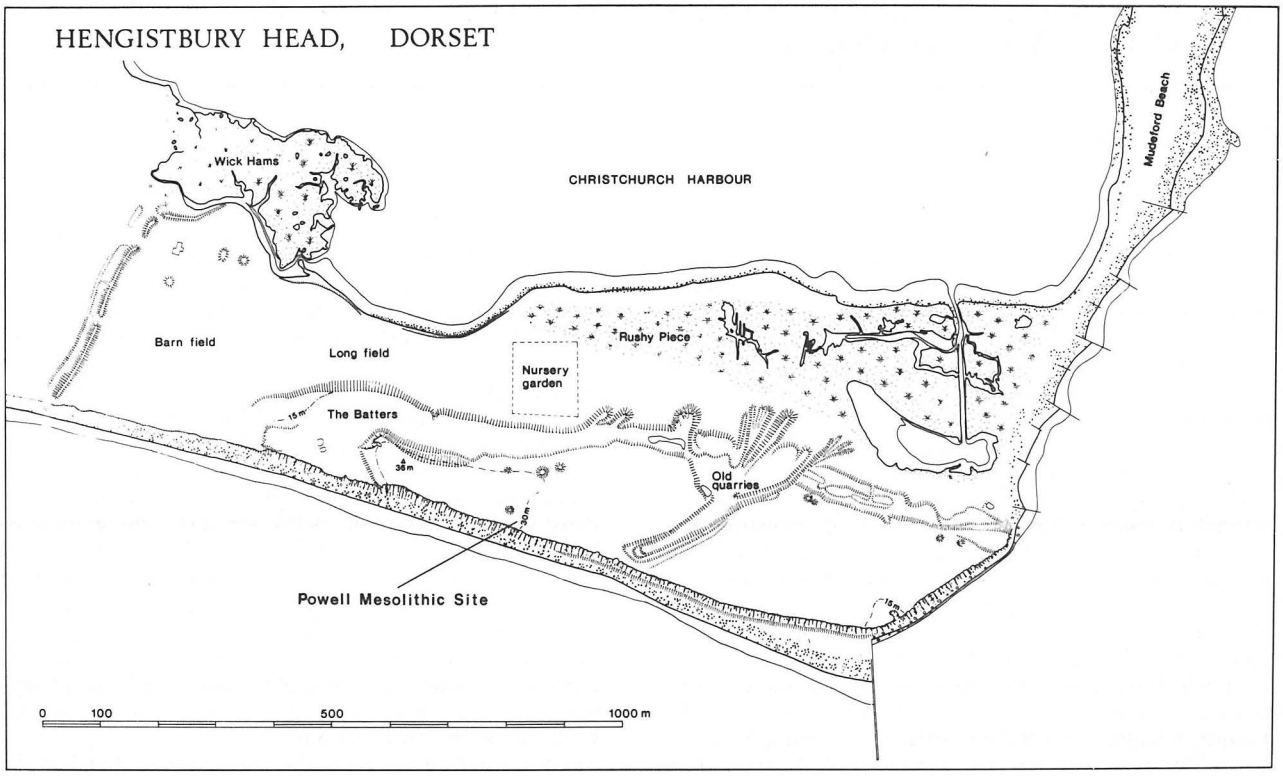


Figure 1. Location of the Powell Mesolithic Site (1a) with schematic ground plan of 1980 excavation area (1b) opposite.

tured pieces are indicated in brackets and throughout are included in the overall totals.

Total Number of Artifacts (1980 Excavation)

Bladelets	1,642	(156)
Flakes	999	(131)
Small chips ≥ 1 cm	470	(56)
Cores	40	(—)
	3,151	

Over 60 per cent of the flint assemblage consists of broken pieces. This suggests that the above totals may be slightly inflated but so far only very few artifacts (36) with breaks have been successfully conjoined.

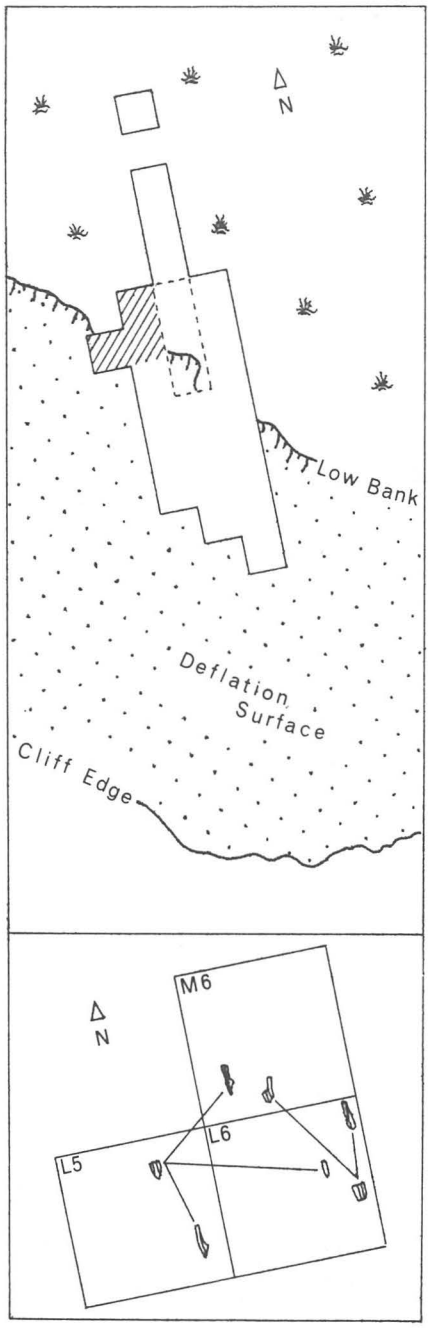
Artifact Waste

Cores:	1 Platform	5	
	2 Platform	23	
	≥3 Platform	8	
	? Fragments	4	
		40	
Core tablets		18	
Crested Pieces		44	
Indeterminate		4	
		66	
Microburins:	Bulbar end, notch right	27	(1)
	Mishits, notch right	2	(–)

The majority of cores are of the two-platform type. Many, but not all, are characterised by bi-directional flaking from opposite ends of the core. In two examples, cores which appeared to have only one striking platform were able to be transferred to the two-platform core class, following conjoins with plunging waste flakes (Fig. 3). In classifying the core tablets and crested pieces it was not always possible to separate the two types of waste; several would appear to fit into either category and have therefore been grouped as indeterminate until refitting of the industry is further advanced.

Finished Forms	(1980 Exc.)		(Powell Coll.)	
Microliths:				
Obliquely blunted points (Pts. with oblique proximal truncation)	62	(6)	33	(5)
Points blunted down one edge (Pts. backed down one lateral edge)	4	(–)	2	(–)
Indeterminate	5	(1)	9	(2)
	71		44	
Scrapers:				
Flake	5			
End of blade/bladelet	2			
Truncated pieces	4			
Microdenticulates	7			
Retouched pieces:				
Flakes	16			
Blade/bladelet	21			
Total	126			

The overwhelming majority (87 per cent) of microliths from the Powell Site are points formed by an oblique truncation at the proximal end of a bladelet. In keeping with all other microliths from the site, the bulb of percussion is absent, having been removed during manufacture by steep secondary retouch (*cf.* Clark, 1934, 55). Fifteen of the obliquely blunted points from the excavation (plus one from the surface collection) show added retouch on the leading edge. One of these is also retouched along one side at its base. Double-opposed basal retouch is displayed on only one excavated point (Fig. 2, bottom row, centre).



All the microburins from the site are bulbar examples with the notch displayed on the right side (proximal end nearest). This seems entirely consistent with the position of retouch on the microlith points and demonstrates a clear link between the tool-type and the waste product. So far, no microliths have been refitted to a microburin, but several of the obliquely blunted points still retain a facet at their extreme tip which would correspond to the scar left by the removal of a microburin – further evidence that the microburin technique was used at the Powell Site.

One of the laterally backed points displays a breakage pattern of a different kind. Thin burin-like removals are shown at its tip (Fig. 2, top left). These features have been described elsewhere as 'impact fractures' and may have resulted from the sort of blow caused by an arrowhead striking bone in its target (Newcomer *pers. comm.*, Jacobi, 1979, 65). We have reproduced similar breaks experimentally by firing arrows pointed with microliths into meat and bone targets (Barton and Bergman, forthcoming). The damage incurred can appear at the hafted end of the microlith as well as the tip.

Microdenticulates form a highly characteristic group of artifacts at the Powell Site. They are all produced on bladelets never longer than 6 cms and the blank is either curved, or curved and slightly twisted, in profile. The tiny denticulations are usually located along a concave edge and, in five out of seven bladelets, on the right side of the piece. In six of the microdenticulates the retouch is produced from the dorsal surface, whilst in all cases the serrations are equally spaced and cover the greater part of one edge. The concave profiles of several other bladelets from the site display edge-damage similar to that which occurs on the microdenticulates. On these pieces the serrated edge is absent, but the scalar damage which often accompanies the denticulations (usually visible on the ventral surface and contiguous with the saw edge) is present, and may indicate a similar pattern of use. Microwear studies now in progress on some of these artifacts may soon help identify the likely cause of these distinctive wear traces.

One of the truncated pieces (Number M6/3-/8) also shows signs of edge damage, perhaps indicative of its use as a tool. 'Half-Moon' breakages, identical to those described by Keeley (1980, 4), are visible macroscopically in a small area on the left edge of the piece.

Some unretouched flakes from the Powell Site display bright spots or streaks of gloss on their dorsal or ventral surfaces. The distribution of gloss is often sporadic and not confined to the working edges, as is more usually the case with use-polishes. Bright spots of gloss have also been observed on the cortex of some flakes and a recent high magnification study of several artifacts (using SEM) has shown that the gloss cannot be attributed to use-wear. It seems more likely that such a gloss constitutes a natural polish caused by chemical alteration of silica at the surface of the flint (Anderson-Gerfaud *pers. comm.*). Gloss of a similar kind has already been reported on artifacts from fine sand and silt deposits (e.g. at Knowle Farm, Savernake, a Lower Palaeolithic Site: Dixon, 1903; R. Inskeep *pers. comm.*).

Raw Material

All the artifacts so far recovered from the Powell Site are made of flint. With the possible exception of one broken slab of ironstone found at the site, no other stone material seems to have been used by the Mesolithic occupants. The flint is generally fresh in appearance and unabraded. Some of the material shows slight signs of patination, but for the most part is easily distinguishable from the calcined and broken natural pebbles which sometimes occur in the archaeological deposit. The exact provenance of the flint used at Hengistbury is not known. From the reconstruction of several cores and the morphology of the cortical surfaces of flakes, it would appear that at least two, and possibly more, different flint sources were exploited. The flint from the site can be broadly divided into two categories: small elongate pebbles with smooth exteriors; and nodules of irregular shape with a thick chalk cortex. Analogues of these flint types are not found in the sands on the Headland today, although smooth pebbles of flint do occur in the gravels at Hengistbury and are also incorporated in the present beach material. It is conceivable therefore that some of the flint derives from an earlier shoreline or watercourse, possibly near the occupation area. The larger chalky nodules, however, are unlikely to have a similar provenance. Their thick cortex shows an absence of weathering which could indicate that they were quarried directly from a chalk outcrop. Today, the nearest such outcrop lies less than 14 km from Hengistbury and forms

the remains of an escarpment that probably once extended from the Isle of Wight to the Isle of Purbeck (Everard, 1954). That the differences between the two flint types can be attributed to post-depositional changes or the effects of recent weathering seems highly doubtful. Both categories of flint display marked consistency in patina and cortex type, notably when conjoins are made between flints of the same group.

So far there is no evidence amongst the finished implements for the preferential selection of one particular flint colour or textural type. As one might expect, the tools are as varied in colour and texture as are the cores and waste. But none of the finished forms has yet been refitted to a diagnostic portion of pebble or large nodule. Whether the efficient production of bladelets was facilitated by careful selection of raw material must therefore remain uncertain. However, on the evidence of the reassembled cores, it would seem that opportunistic use was generally made of the raw material. In most cases the method of core reduction represents a rapid and economic way of producing

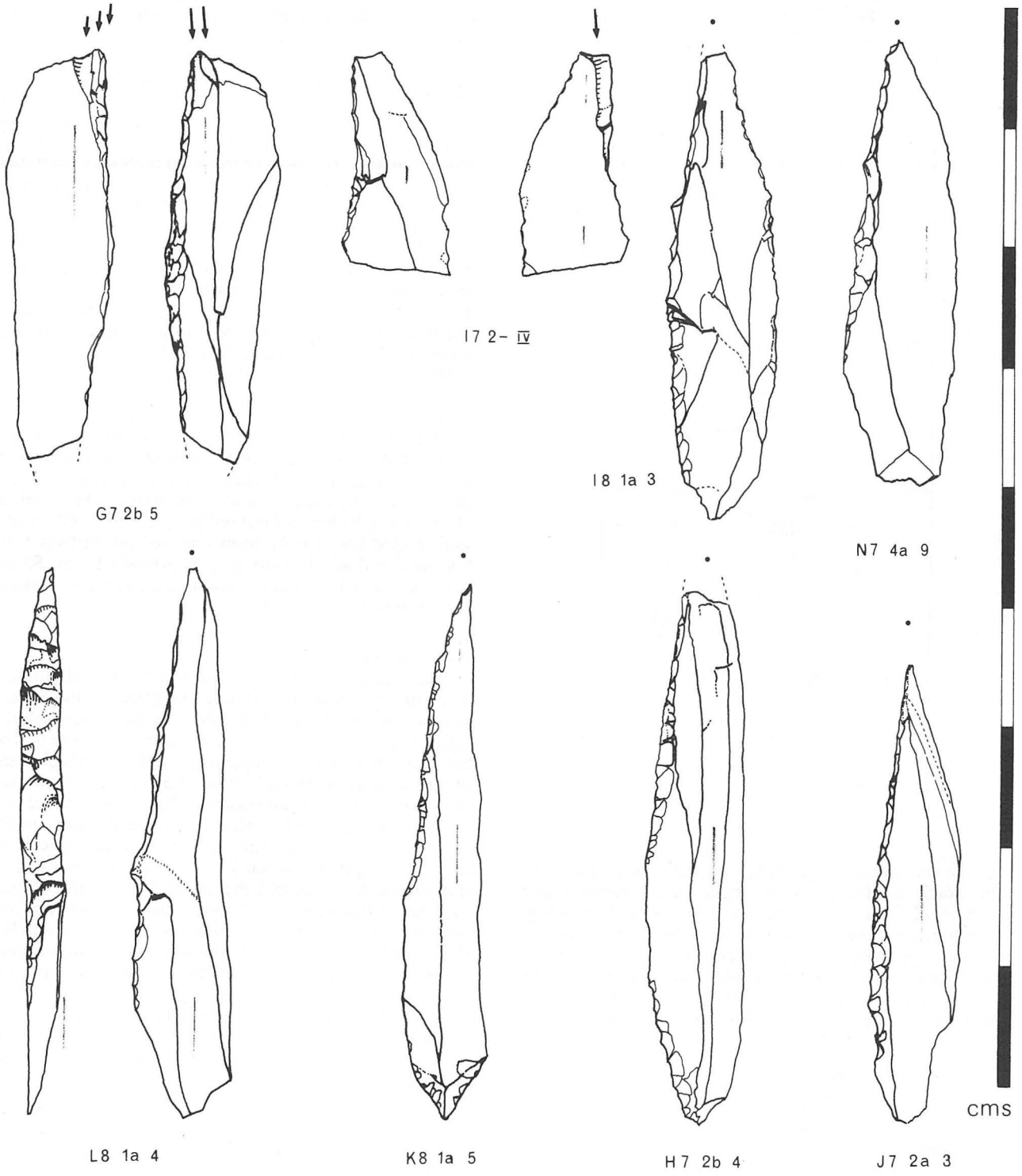


Figure 2. Microlith points from the Powell Site. Extreme left, top row: Point backed down one lateral edge, with 'impact' fractures at proximal end. Bottom row: Points with oblique proximal truncation; Centre bottom: With double-opposed basal retouch. All at twice life size.

bladelet blanks, whether from pebbles or larger pieces. It is also interesting to note that many of the discarded bladelet cores are not fully worked out but would appear capable of rejuvenation and further use. This might not only show the superior skill of the Mesolithic flint-knapper, but also indicate that there was no great restriction on the availability of raw material near the site.

Conjoins

Stone artifacts detached from the same block of flint are linked by a chain of successive actions that generally occur over a very short time. By re-assembling the flint artifacts it is possible to demonstrate their closely contemporary nature (Van Noten, 1978, 61). With evidence from conjoins it is not only possible to reconstruct the actual order of flake removals, but often also to deduce the particular manufacturing technique used by the prehistoric flint-knapper. Moreover, in the rare instances where post-depositional disturbance has not greatly affected a spread of artifacts, it is also possible to retrieve important information on the internal spatial organisation of an occupation site (Leroi-Gourhan and Brézillon, 1972).

At Hengistbury, the work of reassembling the material from the Powell site has only just begun and will continue as the excavated area becomes larger. Nevertheless, enough progress has been made already to show that systematic conjoining will be useful for solving correlation problems of a stratigraphic nature and will help the interpretation of technological and typological features of the flint industry.

The irregular vertical distribution of artifacts in the sands has proved especially problematical, and in this respect the evidence of the conjoined pieces can be useful. Nothing within the sediments has allowed us to recognise different stratigraphic layers or distinguish an original activity floor (or floors). Although most of the artifacts occur in levels which correspond to the A2 horizon of a well-developed podsol, the distinct colour-banding in the sands is of pedogenic origin and as such is not a useful layer marker. By matching up a series of conjoins across the site, a picture begins to emerge of a spread of related artifacts lying in a diffuse scatter of finds about 30 cms thick. Individual conjoins have been made between waste separated by depths of up to 14 cms in the same square, whilst a series of refits from adjacent metre squares shows a vertical interval up to 39 cms. Similar depths have been recorded for conjoins from other sites in sands: for example, at the Epi-Palaeolithic site of Meer in North Belgium a vertical interval of 30 cms for refitting pieces is not unknown (Van Noten *ibid.*, 62, Fig. 13).

The association at the Powell Site of numerous waste flakes and cores suggests an area where intensive flint-knapping activity once occurred. Further proof that on-the-spot flaking took place is provided by the conjoins, of which there are now over a hundred examples. Preponderant amongst these are waste flakes, the by-products of knapping manufacture, which can be re-fitted to cores found only a short distance away. So far, most of the conjoins occur over a relatively limited horizontal distance, usually within adjacent squares. This clustering would appear to indicate that the pieces involved, and probably the rest, are not likely to have moved very far from where they were originally discarded. There is also no reason to suspect, on present evidence, that major mixing of unrelated industries has occurred at the site. Indeed, based on the spread of refitting artifacts, the whole assemblage would appear to be more or less homogeneous, although there is no way at present of determining whether the site was visited once or many times during the Mesolithic.

The preponderance of bladelet waste and microlith tools suggests that most of the flint-working at the site was directed towards the manufacture of small, regular blade blanks intended for conversion into tools. Here, conjoins have proved especially useful in determining some of the techniques used for preparing the cores and detaching the bladelets. The methods that we have been able to reconstruct by conjoins are as follows:

Elongate pebbles were often first prepared by removing one or both end(s) of the pebble, thus providing one or possibly two striking platforms. The outer surface was generally stripped of cortex down the whole of one side. Bigger nodules of flint seem to have been treated in a slightly different manner. In many cases they appear to have been broken up in a rather haphazard fashion, only the more useful fragments with workable inner surfaces being retained. On most of the cores substantial areas of cortex are still visible and its removal may have been deliberately omitted, perhaps because it was considered unnecessary. The next stage in the core reduction sequence generally involved the preparation of a central ridge or crest running down the decorticated surface of the core. Such a ridge can be prepared by bilateral or unilateral flaking before being detached. Once removed it will leave more or less parallel ridges which will then allow a series of well-controlled bladelets to be struck from a core (*cf.* Brézillon, 1968, 96-8). In nearly all examples of crested pieces from the Powell Site, the cresting occurs along one side of the ridge only. The general absence of bilaterally crested pieces may indicate that the stone workers at Hengistbury deliberately first chose a block with an acutely angled edge, which then required only cursory preparation. Indeed cresting preparation may not be necessary at all when making blades on some angular material (Bordes and Crabtree, 1969). At the Powell Site cresting seems to have been the preferred method, but it was not used exclusively. In at least one example, that of a reassembled core made on an elongate pebble, the method of reduction was clearly different. As with the other cores on pebbles, the ends were removed and one side was stripped clean of cortex before a number of bladelets were struck. In this example the scars left by the flat cortical flakes adequately served as ridges to guide the bladelet removals, and no cresting was employed.

Reassembled cores from the site also show that the sequence of bladelet detachments was often interrupted by the need to abrade the striking platform (Fig. 3, a and e) and resharpen the angle between the platform and the flaking face. The latter was generally undertaken when the angle fell close to 90 degrees and achieved by removing all or part of the platform at either end of the core (i.e. removing a 'core tablet'). This was often followed by re-cresting of the main flaking face. Abrading the striking platform is a useful method of smoothing away unwanted overhangs left by previous removals from a core (Tixier *et al.*, 1980, 1973). It may also serve to strengthen the platform against the full force of the percussor when detaching a blank and prevent crushing of the platform (Bergman *pers. comm.*). At the Powell Site many bladelets carry the stigmata of platform abrasion at their proximal ends (Fig. 3, c).

The presence of numerous crested pieces and core tablets, and observation of partial cresting on several cores, suggest that many of the cores went through a series of rejuvenations before they were finally rejected. Figure 3 (a-d) illustrates a two-platform core which has probably undergone such modification. Following the detachment of a series of bladelets, the core was then recrested on the flaking face. After removal of the crested bladelet (b), at least one other bladelet was detached (c) before a flaking accident occurred which almost certainly led to the core's final abandonment. In striking the last bladelet (d), the

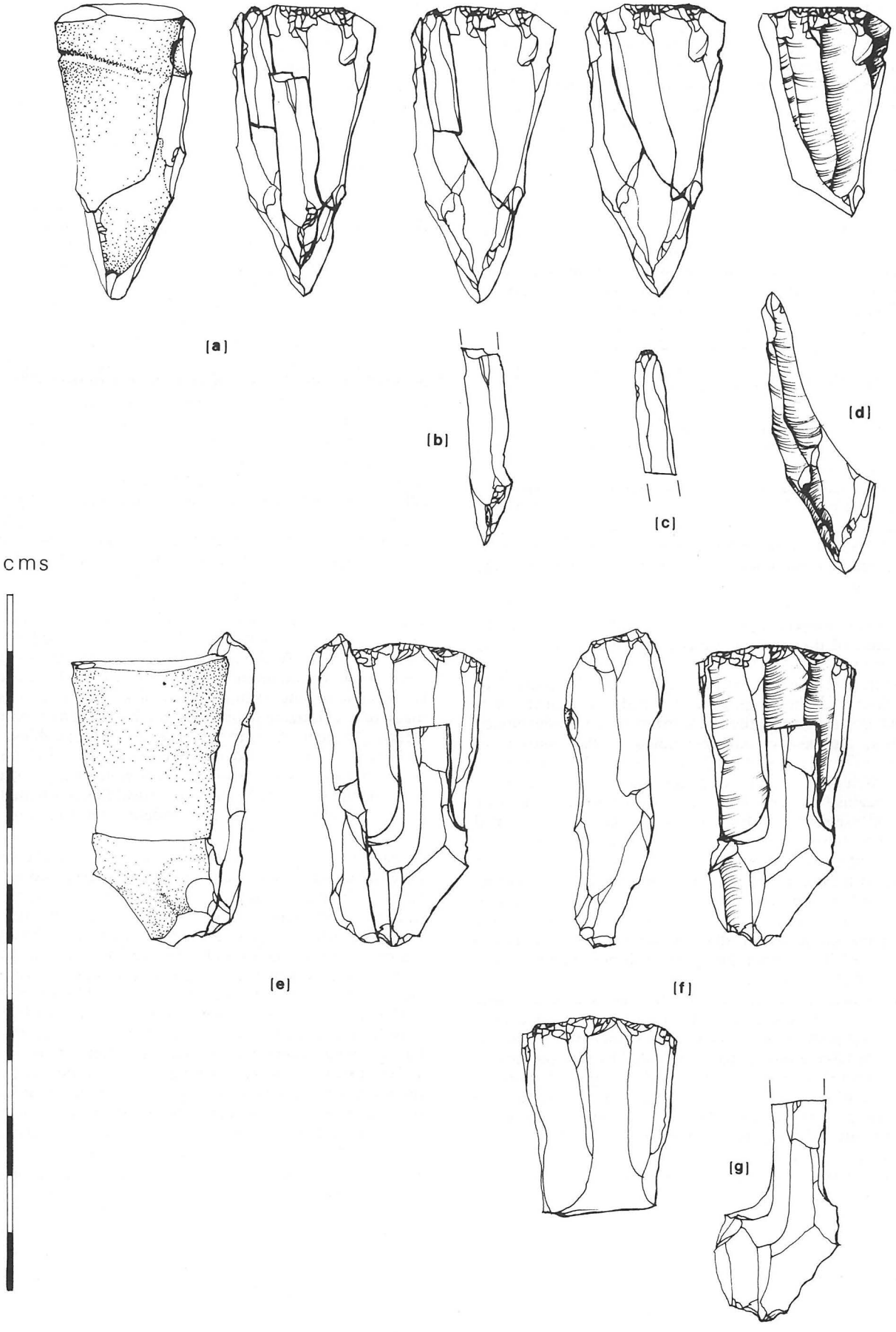


Figure 3. Reassembled two-platform cores from the Powell Site, at life size.

blow was perhaps delivered too firmly with the result that the bladelet plunged, carrying with it the opposing striking platform. Plunging and hinging represent fairly common accidents in flint-knapping and evidence for them is commonplace in the assemblage at Hengistbury.

Conjoining has also proved particularly useful in explaining some of the anomalies in the industry that are not otherwise apparent from a reading of the typological list. Of the two-platform bladelet cores at the site, many fall within the double-opposed category. This is a recurring 'type' at the site and certainly represents a highly efficient method of core reduction with bladelet removals being directed from both ends of the core. Seemingly less effective use of the raw material is made by detaching bladelets from only one platform which does not allow an easy way to by-pass or correct natural flaws, as does the other method. The one-platform core is quite a common element in the flint assemblage but, as our results show, this need not suggest any differences in the reduction techniques at the site. In several examples, single-platform cores are marked by a large removal at one end, usually opposite the main striking platform. By conjoining plunging waste to the cores it has been possible to demonstrate, for two examples at least (e.g. Fig. 3), that these are really broken two-platform types. If this is confirmed for other one-platform cores, as seems likely, it would appear that the reduction method employed for these pieces was no different from that used for the two-platform cores. This would be consistent with our belief that a small group of flint-knappers sharing common manufacturing techniques were working at the site.

As for the earlier stage of core preparation and reduction, examination of the ventral surfaces of cortical pieces reveals that many have prominent bulbs and well-marked cones of percussion. These features are normally considered characteristic of the hard hammer mode (Newcomer, 1975, 98) and suggest the use of a heavy duty percussor in the early stages of the knapping sequence. Two possible hammer stones exist from the site. Both show marks of battering but, since they are also of flint, some doubts as to their actual use must remain. In marked contrast to the other waste, much of the bladelet material displays features on the ventral surface more usually associated with a soft hammer mode of percussion, i.e. a flattened, diffuse bulb; and a lip between the butt and ventral surface (Newcomer *ibid.*). These features might suggest the use of a wooden billet or antler hammer but the choice of a soft stone percussor cannot be altogether discounted (Ohnuma and Bergman, 1982).

Discussion

The new Mesolithic site at Hengistbury Head presents a sizeable accumulation of flint scattered over a relatively restricted area near the present cliff-edge. The conjoinable pieces and the large quantities of flint waste suggest the presence of a knapping area where prehistoric flint workers were engaged in the production of bladelet blanks from specially prepared cores. Some of the cores appear to be of flint not locally obtainable, but which may have been brought to the site from chalk outcrops lying not far to the south. From the nature of the waste it is evident that many of the bladelets produced were intended as blanks for the manufacture of microlithic tools. Some were carefully shaped by abrupt retouch into points which may then have been used to tip arrows. Archery equipment is certainly already known from early Postglacial contexts in Northern Europe and occasionally, in waterlogged sites, microliths are found still attached to their wooden arrowshafts (Clark, 1975, 111). However, it could be argued from the presence of tools such as scrapers at Hengistbury that other activities were practised at the site too.

Whether the site forms the remains of a temporary hunting bivouac or a more sizeable encampment is impossible to ascertain on present evidence. So far, no hearths or any other structures have been recognised which might furnish clues as to the length of occupation. That fireplaces were once present is perhaps indicated by the occurrence of small quantities of burnt flint, thermally fractured natural cobbles, and flecks of charcoal. Nevertheless, these features could equally well be explained by brush fires which need not have been contemporary with any occupation. In conclusion, we might reasonably speculate that the Headland was a convenient place to set up camp for a mobile group of hunters. The site chosen affords excellent views over an extensive coastal plain now covered by the sea and is strategically placed near the main confluence of the Rivers Stour and Avon. In addition, the free draining sands, with their properties of heat insulation, may also have contributed to the choice of site (*cf.* Mellars, 1978, 254).

Accurate comparison between the flint industry at the Powell Site and Mesolithic industries from other parts of the British Isles is made difficult for the present by the lack of firm dating evidence and the limited nature of the excavated sample. Future seasons' work may help us close these gaps. Meanwhile, it is worth observing that the absence of small geometric microliths in the assemblage would suggest that the industry belongs to the Early Mesolithic (Jacobi, 1976, 75).

At first glance, a Mesolithic flint assemblage in sands may appear an untidy jumble of artifacts and hardly a promising source of archaeological information. However, simply by reassembling part of the flint material at the Powell Site it has been possible to demonstrate some technological and typological aspects of the industry, and gain some worthwhile and sometimes unexpected results. The conjoining of artifacts has also shown itself as a useful stratigraphic tool at this site, where the wide vertical scatter of finds belies the fact that most of the artifacts probably belong to one short occupation period.

Acknowledgements

That rescue work was begun at the Mesolithic site owes much to Mr. Ronald Powell, its discoverer, and Mr. Michael Ridley of the Russell-Cotes Museum, Bournemouth, who brought the site to the attention of the City Corporation. Bournemouth Corporation, the landowners, have allowed us generous use of their equipment and provided a substantial contribution towards the cost of the excavations; to them I owe special thanks. I would also like to thank Professor Barry Cunliffe, and Dr. Derek Roe, my research supervisor at Oxford, who have helped at all stages through my work. I also owe a special debt of gratitude to both Mr. Simon Collcutt and Mr. Christopher Bergman who have been constant sources of valuable technical advice. Finally, I am indebted to Ms. Christine Wilson and Mr. Rupert Cook for their help in producing the line drawings.

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EXCAVATIONS AT SOUTH GROVE COTTAGE, DORCHESTER

D. W. A. STARTIN[1] with contributions from JO DRAPER, JUDI STARTIN and JANET WEBSTER

SUMMARY

Early Roman occupation was represented by a pit of c. AD *70, and later 1st and 2nd century spreads of material. These seemed to respect an early boundary on the line of the later ramparts. The lower chalk and turf rampart appeared to date from* c. AD *100-125. A large enigmatic chalk-and-flint feature just to the north of the early rampart, appeared to be immediately followed by the upper rampart layers, which could be either late 2nd/early 3rd century* AD, *or possibly late 3rd century* AD.

Later Roman features include part of the robbed foundation of a later 3rd/4th century building, and four 4th century pits. Two phases of cobbling at the back of the rampart are probably late Roman, as may be several unsealed small features. Modern terracing and pits were also found.

The site lies just behind the 19th century South Grove Cottage on the junction of Trinity Street and Bowling Alley Walk (Fig. 1). The excavation took place in September, 1972, partly at the instigation of the developers, the Rob Walker Group, who also provided direct financial aid. The land to the north and west of the area has already been developed by Lee Motors Limited, now a subsidiary of the Rob Walker Group.

Thanks are due to the following people for their help on site and in the preparation of the publication: Mr. G. Dannell for the preparation of the Samian Report; Mrs. J. Webster for the Small Finds' reports; Mr. M. J. Rouillard for Pottery and Small Finds' drawings; Mr. T. H. Ambrose for published sections; Mrs. J. Startin for site drawings, work on finds, and many other things too numerous to mention; and to Professor B. W. Cunliffe, for advice and help with this text. Thanks are also due to the Rob Walker Group for the permission to excavate and for financial aid. I am very grateful to Miss A. Blanch for typing this text.

[1] This report was submitted for publication in 1974, and is here published as submitted, except for the pottery report which has been revised. *Editor.*

The Site

The trench measured 16.50 m by between 5 m and 6 m and was positioned on the tail of the Roman rampart about 30 m west of the probable location of the south gate at the junction of Trinity Street and South Street. In response to the problems of spoil storage and removal, the trench was reduced in width by 1.50 m for the excavation of the Roman layers. Initially the site was cleared of undergrowth and old car parts by a drott. Following a trial excavation a further 80 cms of disturbed topsoil were removed by a JCB under close supervision. The rest of the

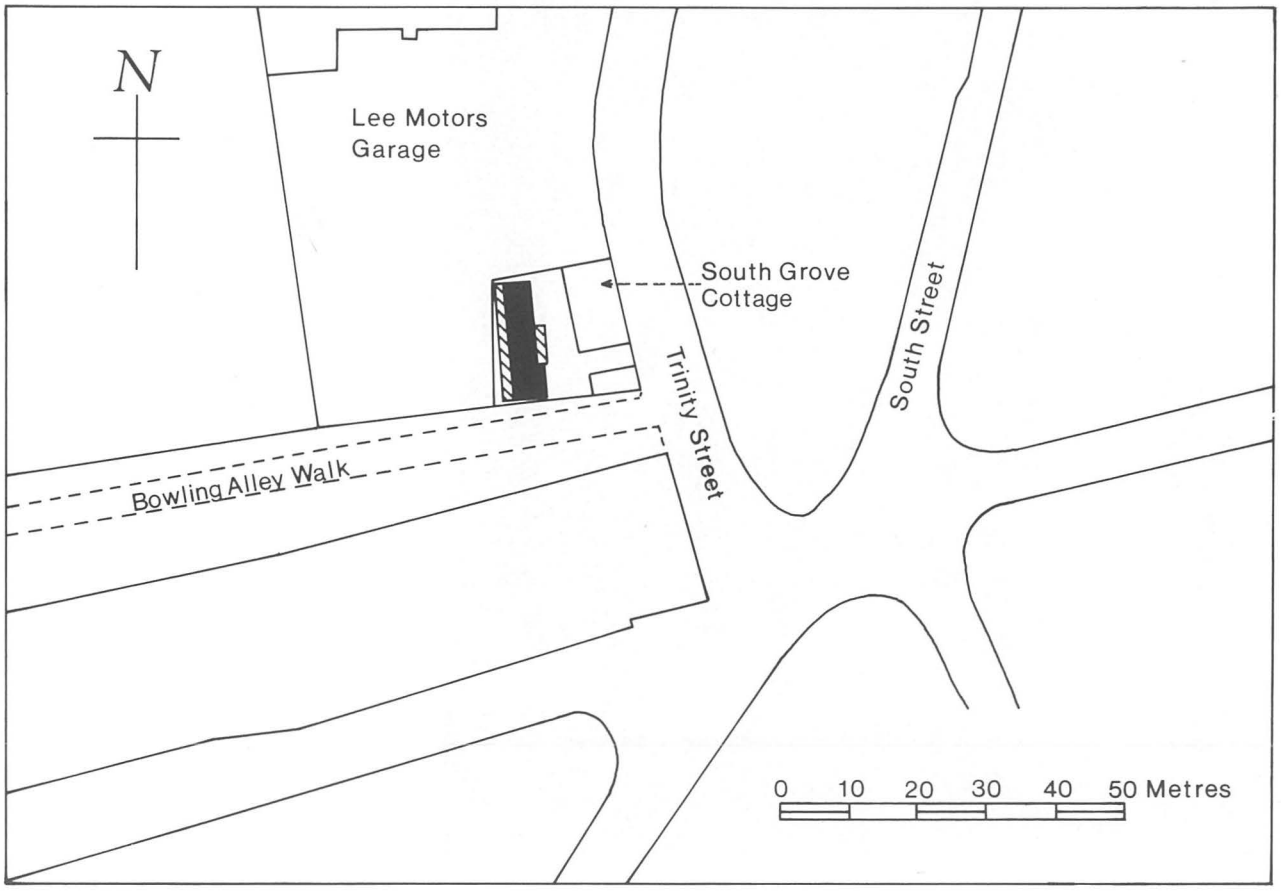

Figure 1. South Grove Cottage: Site location plan.

work was carried out by hand, with the help of between six and ten volunteers.
The natural subsoil was chalk with red clay 'solution' pockets capped by up to 10 cms of archaeologically sterile clay or clay-with-flints.

Previous Discoveries
These are mainly well documented by the Royal Commission (1970). Of particular note are the excavations of Roman remains dating from the Antonine period to the north of the site (Kirk, 1939; RCHM, 1970, monument 191, p. 562), and the observation of the rampart section just west of the site in 1955 (*ibid,* monument 176,[2] p. 552 and fig. p. 456). A complete section across the southern rampart was excavated in 1969-70 (Putnam, forthcoming).

[2] Monument 176 (RCHM, 1970) is probably not a road. It is the same chalk-and-flint feature which occurs again in this trench (layer 61) and also in the 1969-70 excavations (Putnam, forthcoming).

Early Roman Occupation (Figs. 2 and 3)
The earliest phase of the site is represented by a pit and three related spreads of material containing occupation debris and separated by thin discontinuous chalk layers. The pit (pit 8: layer 60) was small, sub-rectangular, and cut to a depth of about 70 cms into the natural subsoil. The fill was homogenous and consisted of a grey-green clayey soil with light charcoal flecking and occasional medium flints (pottery nos. 1-8). The lower spread (layers 59, 49) was continuous with the fill of the pit and both were sealed by a thin layer of dirty trampled chalk (layer 48: pottery nos. 9-16). Above this was a second spread, also sealed by a trampled chalk layer (layers 58, 50: pottery nos. 17-21), followed by a third spread (layer 57: pottery nos. 22-33) which was below a 10 cms thick layer of clean, turfy, brown clay (layer 56: pottery no. 34). These spreads were of the same description, i.e. grey gritty clayey soil with chalk and charcoal flecks, occasional flints, and occupation debris, and were formed mainly in the area south of

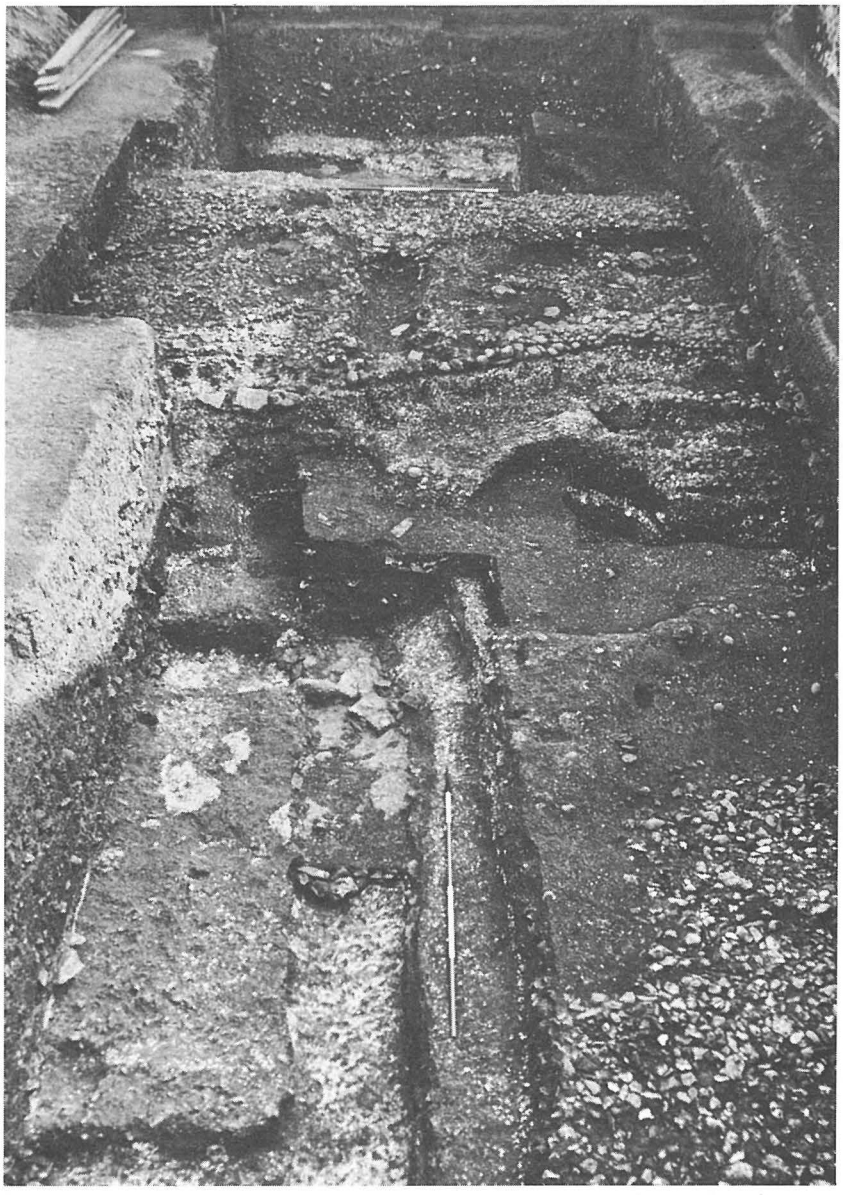

Plate 1. South Grove Cottage: General view of the trench looking south with the Roman structure in the foreground, then partially excavated Roman pits with the cobbling beyond.

pit 8 and north of the chalk-and-flint feature (layer 61); where they extended north of the pit they were cleaner, less well defined, and contained fewer finds.

Interpretation

The desertion of the Iron Age hill-fort at Maiden Castle probably occurred about AD 70 (Wheeler, 1943, p. 65 and p. 67), and it was from roughly this period that the pottery from our earliest occupation came. The small pit would seem to have been used as a cess pit, after which the area to the south of it may have been assigned for general rubbish disposal (layers 59, 58, 57). At least two attempts were made to seal this rubbish by means of the chalk layers. The clean brown clay can be interpreted as either a further sealing spread or as a turf line representing a break in the use of the site. The layers to the north of pit 8 were probably the result of casual deposition.

The pottery from the latest of the spreads (layers 57, 56) can be dated to the middle of the 2nd century AD. No evidence for any structures of this early period was found on the site. The extent of the occupation outside the trench is not known, but similar stratigraphy was absent from published section[3] (RCHM, 1970, fig. p. 546) which was some distance to the west of the site. Of more interest, however, was that the spreads did not appear to the south of the chalk-and-flint feature, either above or below the lower rampart layers: this could be taken to suggest an original boundary, pre-dating and along the same line as the feature, constructed at the time of the earliest occupation.

[3] The published section is admitted to be non-representative. A photograph (DFR 108), now in the Richmond collection in the Ashmolean, shows a chalk layer in the same position as the ?primary rampart (layer 27) on this site. The 1955 excavation also produced pottery of late 1st and early 2nd centuries date.

Plate 2. South Grove Cottage: General view looking south after the removal of the cobbling, etc. Pit 4 is middle ground right. The quern stone middle background left is Fig. 13 no. 8.

ROMAN DEFENCES

The discussion here will be confined only to that part of the Roman defences that extended into the trench. This includes the tail of the southern rampart and a chalk-and-flint feature running east-west beneath it. It has previously been suggested (RCHM, 1970, monument 174, p. 547) that the rampart involved two phases, a primary earthwork constructed some time after AD 130,[4] and a later addition to the back of this which was probably related to the construction of a wall along the front face at the end of the 3rd century.

Lower Rampart Stratigraphy (layer 27)

The lower rampart stratigraphy lay directly above the natural subsoil at the south end of the trench (Fig. 2). It consisted of tips of compacted chalk and grey soil mixed with thin layers of turfy brown clay and contained, in the upper levels, ash and charcoal (pottery nos. 54-62). These layers appeared to respect the edge of the chalk-and-flint feature (layer 61), but had no definite relationship with it. The pottery recovered was of mainly 1st century date, but included one sherd that could be dated between AD 100 and 125.

[4] It is worth note that Frere (1967, pp. 250-1) argued for the erection of primary ramparts during the period after Marcus Aurelius and before Severus, possibly during the reign of Commodus.

The lower rampart stratigraphy can be interpreted as either the tail of the primary rampart by analogy to the 1969-70 section, or as the spoil heap resulting from the excavation of the trench for the chalk-and-flint feature. While the former explanation is felt to be correct, elucidation of this point would have involved the extension of the section southwards below Bowling Alley Walk and outside the area owned by the developers of the site (Fig. 1).

Chalk-and-Flint Feature (layer 61) (Fig. 3 and Pls. 3 and 4)

At the south end and running east-west across the site was a broad, shallow, fairly flat-bottomed trench cut some 50 cms into natural and nearly 3 m wide. The lower 30 cms were filled in a deliberate sequence, repeated three times, of a layer of flints one flint thick, followed by, and packed with, a layer of well-trodden dirty chalk (pottery no. 53). The upper surface of the fill was almost absolutely flat, with only one or two flints protruding, and showed signs of wear or use.

The interpretation of this feature is difficult; it was massive, well-constructed, well-finished, unweathered, and apparently, unused. In addition we know that it stretched beneath the south Roman defences, at least as far west as the 1969-70 excavations. The only finds from the whole feature were of 1st century date but, since it quite clearly cut the early occupation layers to the north (layers 48, 49, 56-60), these finds must be viewed as residual. On this site

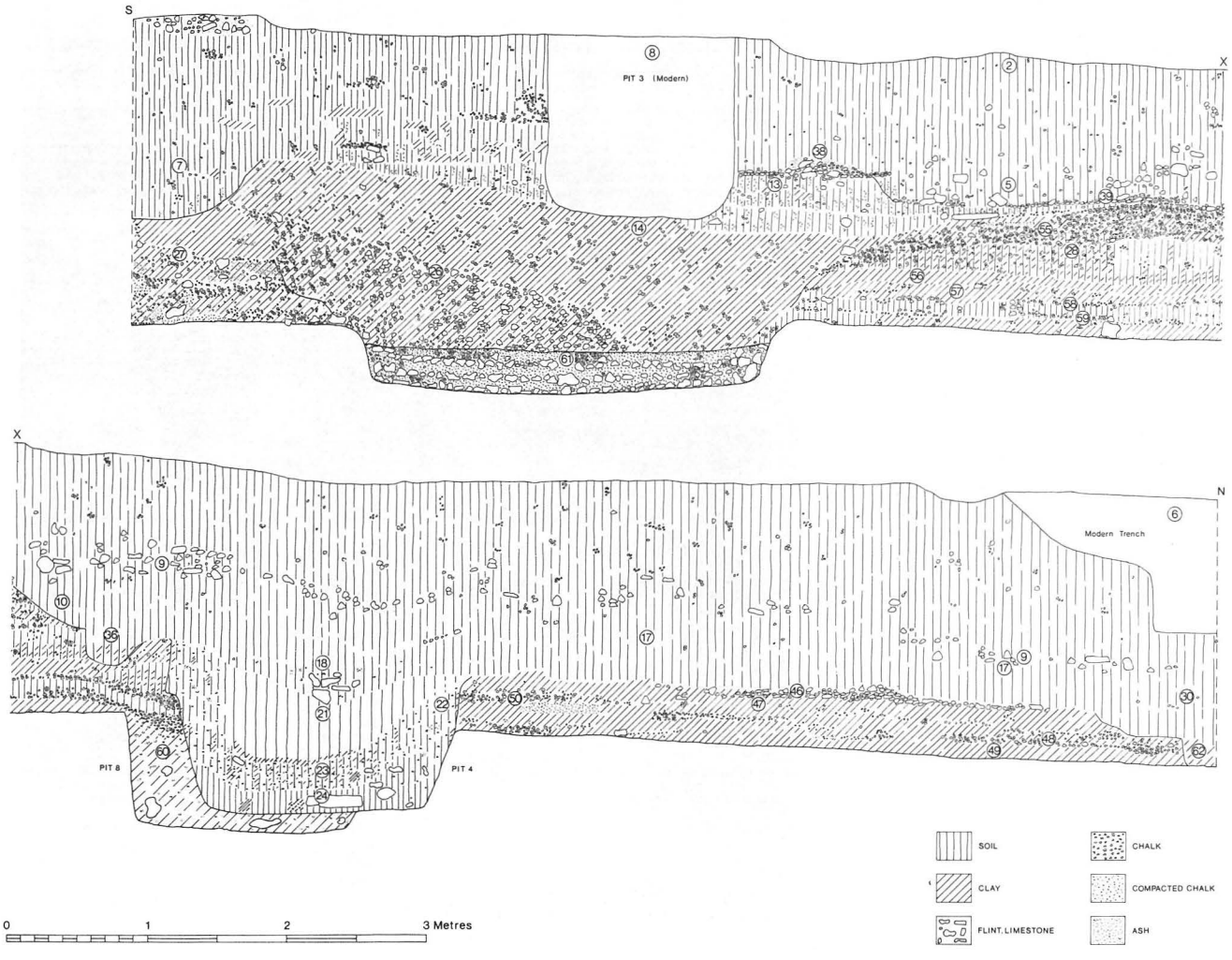

Figure 2. South Grove Cottage: Section north-south. For section line see Figure 3.

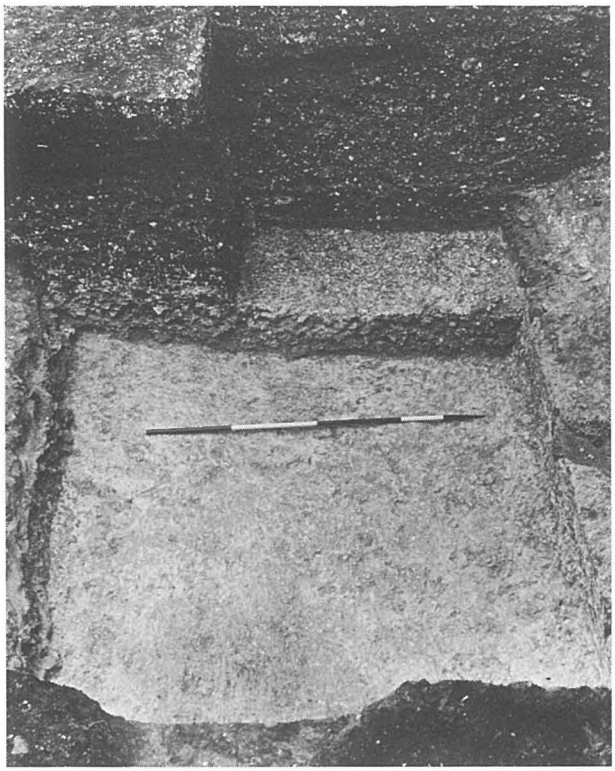

Plate 3. South Grove Cottage: The chalk-and-flint feature, looking east.

the feature was directly superseded, without any trace of intervening stratigraphy, by the thick clay upper rampart layers (layers 14, 26): one possible interpretation therefore, is that it represented the foundation of a defensive structure which was abandoned in favour of a new scheme of which this rampart formed a part. The dating of the foundation will depend on the dating given to this rampart.

The excavation of the foundation, through the early occupation spreads into the natural subsoil, resulted in the formation of two throw-out layers (layers 28, 55) on top of the spreads (Fig. 2). The lower layer (layer 28) consisted of mixed brown clay and ashy soil which, above and to the north of pit 8, merged with the upper spreads (layers 56, 57) into a cleaner light brown clayey soil (layer 47). On top of the clay ash mix, thickening away from the foundation to 30 cms in depth just south of pit 8, but apparently not extending north beyond the pit, was a deposit of compacted chalk fragments in a clay and earth matrix (layer 55); this deposit lay directly below the same clay layers (layers 14, 26) that sealed the foundation.

At the north end of the site, in and on the top of the cleaner clay (layer 47) was an irregular tip of flints (layer 46) (Fig. 4) between one and two flints deep; this tip did not appear to represent cobbling, and may have been connected with the construction of the foundation.

Upper Rampart Stratigraphy (layers 14, 26; 13, 15, 16, 45)

The upper rampart layers were formed of a heavy brown, somewhat marly clay, the lower tips of which (layer 26) contained a higher chalk content. The one anomaly in these layers can be seen at the north end of the section (Fig. 2), where a wad of purer clay shows beneath the marly clay; this wad may relate to the lower rampart stratigraphy. Between the top of the clay deposit and the dis-

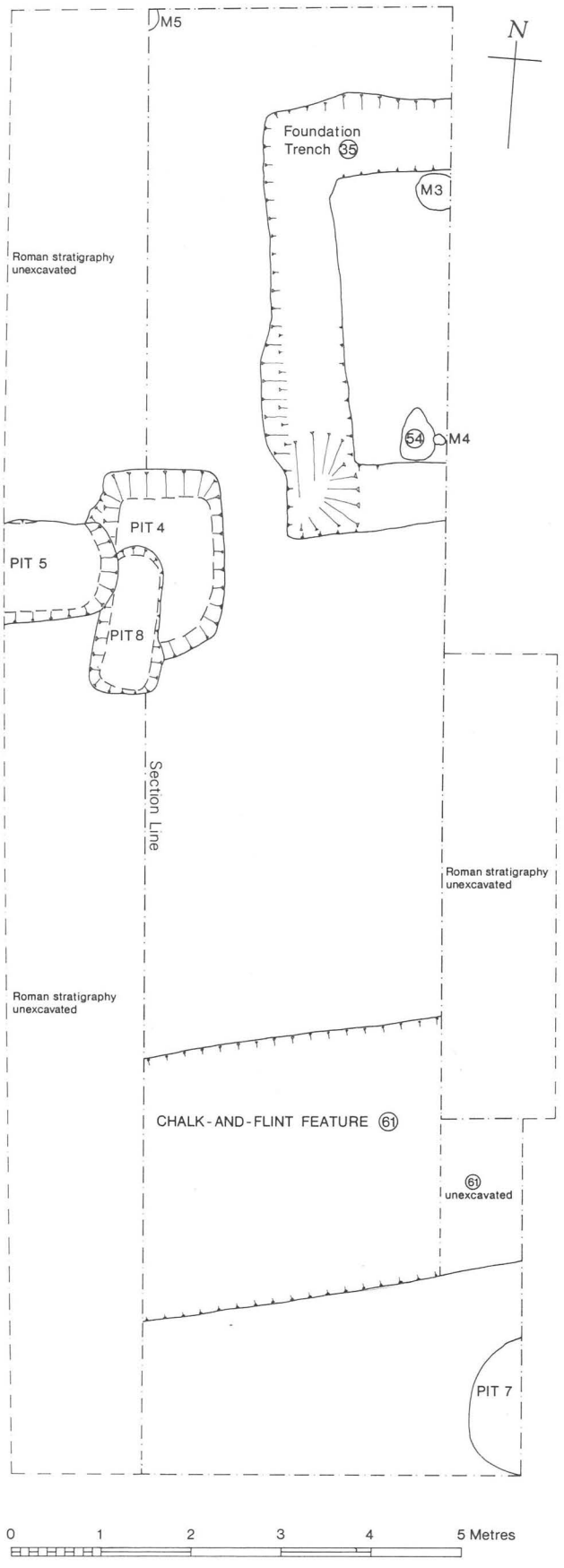

Figure 3. South Grove Cottage: Plan of early Roman features.

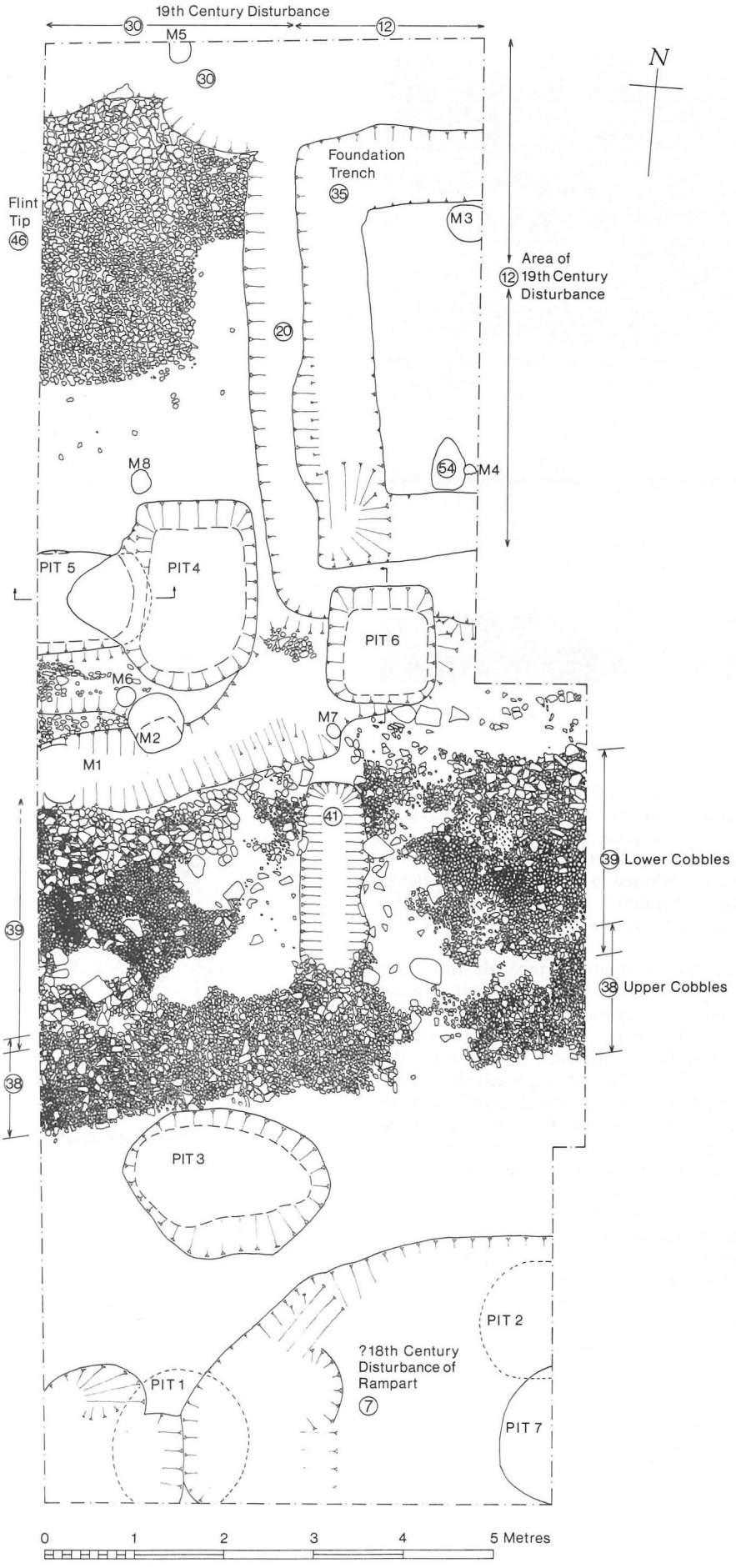

Figure 4. South Grove Cottage: Plan of late Roman and post-Roman features.

turbed topsoil there existed up to 40 cms of material (layers 13, 15, 16, 45), varying from an ashy grey-brown soil with occupation debris (layer 13) to tips of chalky clay containing some rubble and building stone. Little pottery came from the main body of the clay (pottery nos. 63-75), but that from the overlying tips (pottery nos. 76-106) was of the late 2nd/early 3rd century date.

Lack of contemporary finds and quantities of residual material have always made the dating of ramparts difficult. There would seem to be two possible interpretations for the above stratigraphy: it could either represent a late 2nd/early 3rd century reconstruction of the earthwork defences following the abandonment of the chalk-and-flint foundation; alternatively it could represent a secondary rampart constructed when the town wall was added at the front. This problem can only be resolved by further excavation of the defences. If the latter interpretation is correct, then a late 3rd century date might be suggested for the rampart following the arguments set out by Frere (1967, pp. 251-3) for the dating of walls around towns.

Summary

The interpreted sequence can be summarised as follows:

1. Use of area for general rubbish disposal, *c.* AD 70-150.
2. Erection of primary rampart. Certainly post-AD 100, possibly much later.
3. Construction of chalk-and-flint foundation. Directly prior to the deposition of the secondary rampart layers (4).
4. Earthwork reconstruction or addition. Late 2nd/early 3rd century, or possibly as late as the end of the 3rd century.

Later Roman Remains (late 2nd to 4th centuries (Fig. 4 and Pls. 1, 2 and 5)

Structural Features

On the east side at the north end of the excavated area (Fig. 3) were three joining, vertical-sided trenches (layer 35) *c.* 70 cms wide and cut between 30 and 50 cms into the natural subsoil. No superstructure survived but the trenches were partly filled with a layer of flints packed with grey charcoal-flecked earth and covered by a thin yellow mortar spread, set into the top of which were the remains of a layer of flat limestone fragments. Robbing was almost complete but the above presumably represented the base of a foundation of the west end of a masonry or timber structure; unfortunately little dating material was found (pottery nos. 107-109). The stratigraphy above the foundation had been almost entirely removed during the construction of the 19th century South Grove Cottage. However in an area running roughly parallel to the western and southern slots, about 60 cms from their outer edges, the Roman layers were undisturbed, although the earlier occupation layers had been cut away down to the level of the subsoil. The remaining fill of this feature (layer 20) consisted firstly of flints and limestone fragments in dark-grey charcoal and mortar-flecked earth above which was a dark-grey gritty soil containing flints, ash and occupation debris. This cutting might have occurred at the time of construction of the Roman building but the amount of pottery and other debris in the fill, and in the 19th century backfill layers (layer 12), leads to the interpretation that the building was robbed in the Roman period, and the pit left used for rubbish disposal. The

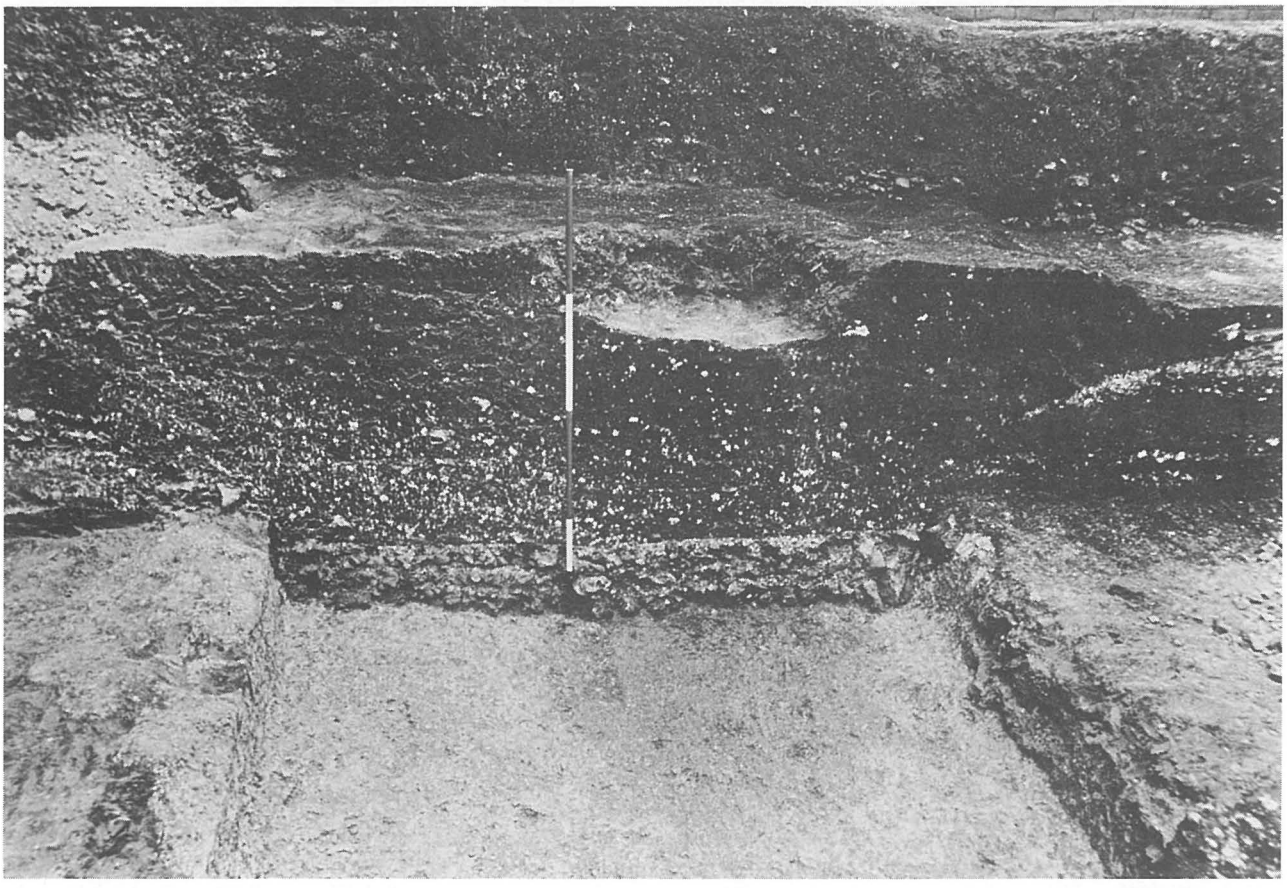

Plate 4. South Grove Cottage: Section through the chalk-and-flint feature, looking west.

pottery from the robbing was of late 3rd/early 4th century date (pottery nos. 110-122). Within the area bounded by the foundation trenches, but much disturbed in the 19th century, was a small feature cut some 20 cms into the natural subsoil (layer 54). The feature was filled with a grey-brown, clayey soil and contained miscellaneous fragments of decayed bone, probably the remains of a baby burial.

Pits

Directly to the south and west of the structure (Fig. 4) were three pits (pits 4, 5, 6) which will be described in detail below:

Pit 5, early to mid-4th century (layers 40, 25, 32, 34, 42, 33, 43) (section, Fig. 5 and Pl. 7)

The pit was sub-rectangular in plan, nearly 3 m deep, and cut by the later and shallower pit 4.

Layer 43: Loose grey-green, silty soil with ash and charcoal flecking, mixed and merged with material of similar description to layer 42. The layer occurred at the bottom and around the edges of the pit and was probably composed mainly of organic material (cess) which would have greatly reduced in volume under decomposition leaving deposits on the sides of the pit.

Layer 33: Light grey-brown clay with small rounded chalk fragments and stained green in the lower levels. Interpreted as a sealing layer. Pottery nos. 136-138.

Layer 42: Loose dark brown clayey soil. This layer is presumably also of organic origin; the brown colouration may derive from the material thrown in with the cess. Pottery no. 139.

Layer 34: Grey gritty soil with light chalk and charcoal flecking and small flints, lower levels were softer and contained a higher ash content. Earth and general occupation debris deposited as the cess layers slumped. Pottery nos. 140-145.

Layer 32: Tip of flints into the pit. Pottery nos. 146-147.

Layer 25: Dark brown-grey gritty soil with occasional flints and light chalk flecking. Pottery nos. 148-149.

Layer 40: Dark grey/black sandy soil with light chalk and charcoal flecking and occasional flints. This layer and layer 25 were probably formed from continuous backfill as the rest of the pit fill slowly subsided.

Pit 5 is interpreted as a cess pit either contemporary with, or later than, the building to the east.

Pit 4, later 4th century (layers 21, 22, 23, 24) (Fig. 2)

The pit was sub-rectangular in plan, about 1.20 m deep, and cut pits 5 and 8.

Layer 24: Compact greenish-grey fine-gritted soil with patches of chalky clay and occasional flints occurred at the bottom and around the edge of the pit. Mixture of cess and backfill tips. Pottery no. 123.

Layer 23: Grey clayey soil with small chalk fragments and mixed with patches of brown clay. Sealing layer. Pottery nos. 124-126.

Layer 22: Grey/dark grey slightly clayey, chalk-flecked soil. More soily, less well defined upper levels of layer 23. Pottery nos. 127-130.

Layer 21: Dark brown loose gritty soil, the lower levels of which merged into a brown clayey concentration. Presumably of organic origin. Pottery no. 131.

Pit 4 can be interpreted as a cess pit probably post-dating the Roman building.

Layer 18: General layer cleaned from above pits 4 and 5 in order to obtain plan definition of the features. Same description as pit 5 layer 40 but containing material similar to pit 4, layer 21. Pottery nos. 132-135.

Pit 6, mid-4th century (layer 31) (Fig. 5 for section)

The pit was sub-rectangular in plan, about 1 m deep, and cut through the robbing of the Roman structure (layer 20).

Layer 31: Black, fairly compact, sandy soil with occasional flints and limestone fragments. The lower fill was mixed with some clay from the sides of the pit.

Pit 6 contained a little pottery and a few oyster shells but apparently no organic material.

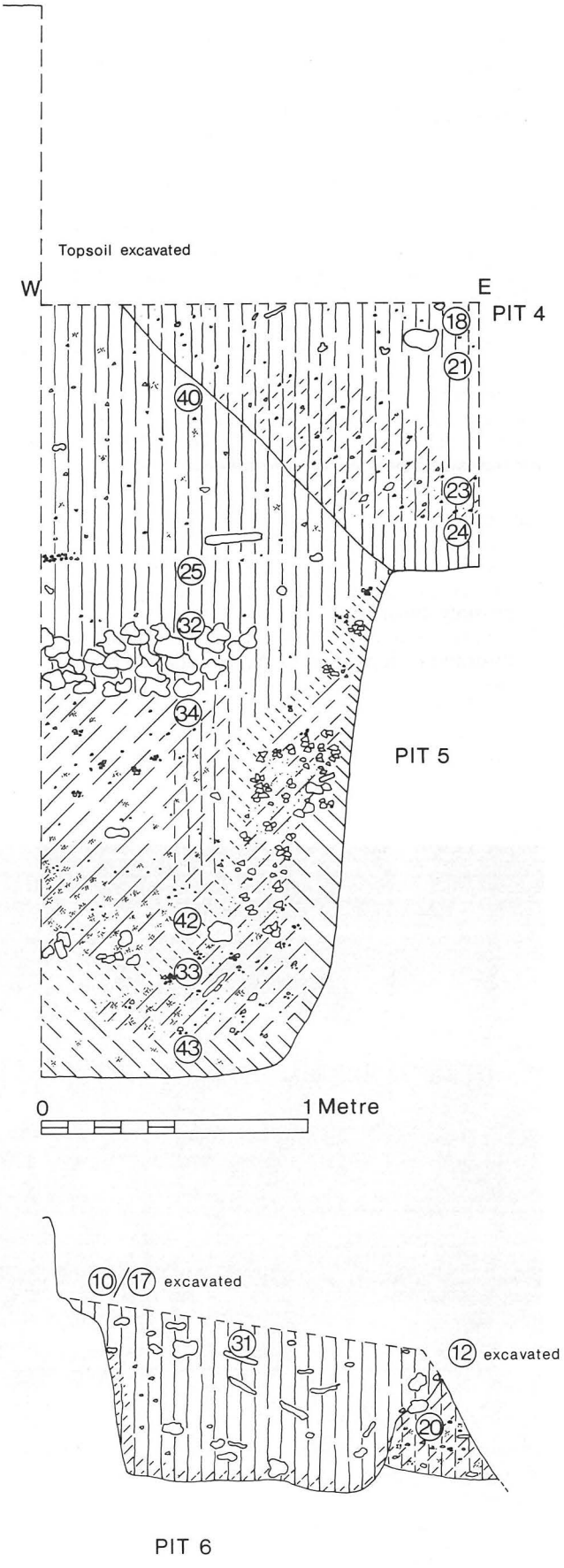

Figure 5. South Grove Cottage: Sections across pits 5 and 6. See Figure 4 for section lines.

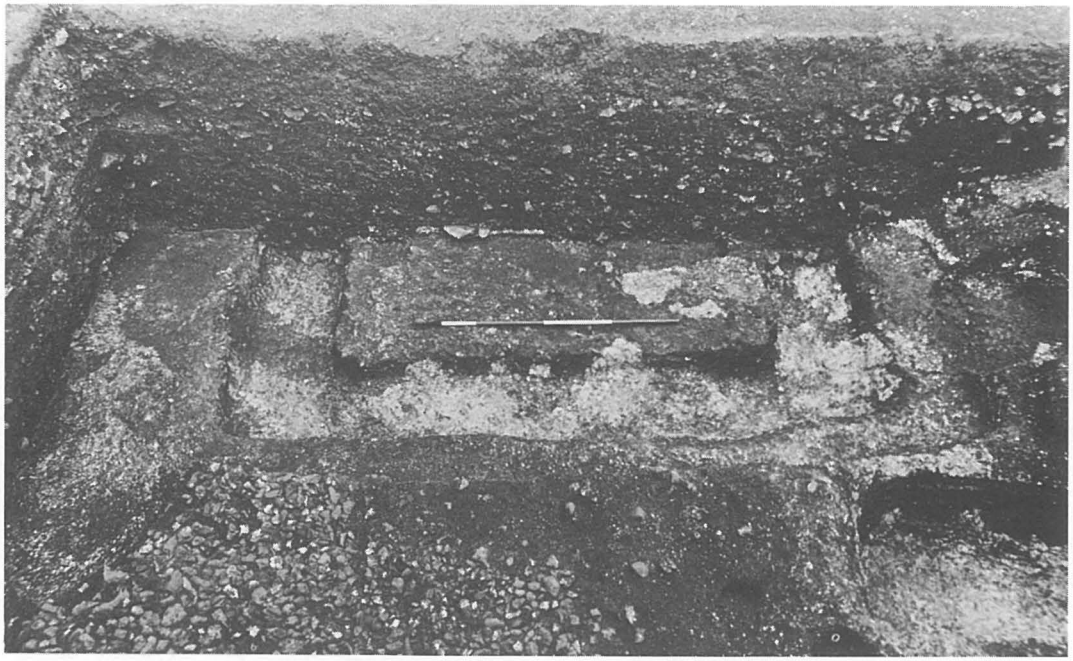

Plate 5. South Grove Cottage: The Roman structure with pit 4 right foreground, looking east.

Plate 6. South Grove Cottage: Looking east; the figure is in the foundation trench of the Roman structure, middle ground pit 4 and foreground the deep pit is pit 5. Right is part of the cobbling.

Flint Cobbling, probably late Roman (layers 38, 39) (See Figs. 2 and 4, and Pls. 1, 7 and 8)

Some time after the deposition of the clay and ashy soil tips (layers 13, 15, 16, 45) in the south end of the trench a layer of flint cobbling (layer 39) was terraced into the back of the rampart (pottery nos. 161-163). The layer was one flint thick and formed a surface 2.50 m wide running east-west across the site. This cobbling was later slighted by a shallow trench about 30 cms deep (layer 4: pottery no. 164) which was partially filled when a second narrower but thicker layer of flint cobbling (layer 38) was laid slightly to the south of the original (pottery nos. 165-166). This surface was no more than a path, being only just over 1 m wide, but it may have been used in conjunction with some of the earlier cobbling. The above layers produced Roman pottery but were only sealed by material disturbed in modern times, they cannot, therefore, be given a strict dating.

Miscellaneous Undated Features (M1-8, Fig. 4)

M1: (layer 10). Irregular gully *c.* 30 cms deep cutting edge of lower flint cobbling (layer 39). Filled with black sandy soil containing occasional flints.

M2: (layer 36). Posthole? *c.* 30 cms deep. Top fill of flints in black earth, lower fill of mixed black clayey earth.

M3: (layer 29). Posthole? *c.* 10 cms deep into subsoil below 19th century disturbance. Filled with grey clayey soil.

M4: (layer 53). Stakehole? *c.* 11 cms deep into subsoil below 19th century disturbance. Filled with black gritty earth.

M5: (layer 62). Posthole? *c.* 30 cms deep cut into early occupation layers below 19th century disturbances. Filled with mixture of black earth and natural clay-with-flints.

M6: (layer 44). Posthole? *c.* 26 cms deep cut into early occupation layers. Filled with mixture of black sandy earth and brown clay.

M7: (layer 51). Posthole? *c.* 18 cms deep cut into early occupation layers. Filled with mixture of black sandy earth and brown clay.

M8: (layer 52). Posthole? *c.* 17 cms deep cut into early occupation layers. Filled with mixture of black sandy earth and brown clay.

The above features contained Roman pottery but were only sealed by material disturbed in modern times, they cannot, therefore, be dated. Three of the features, M6, M7 and M8 are similar in nature and form a right angle in plan.

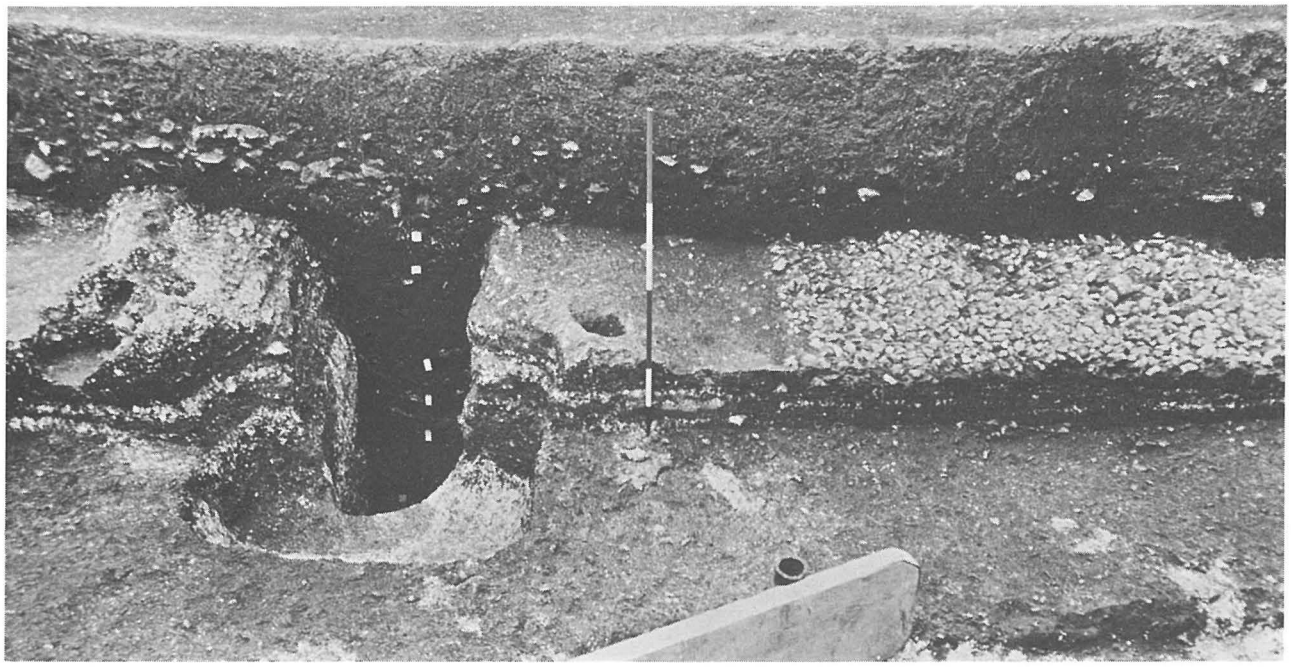

Plate 7. South Grove Cottage: The north end of the trench, looking west; pit 5 on the section and pit 4 foreground.

Plate 8. South Grove Cottage: Looking south; the cobbling with Roman pits partially excavated foreground.

Other Stratigraphy
During the construction of South Grove Cottage the ground was terraced west from the cottage as far as the outer edge of the Roman foundation trenches. This terracing went down onto the natural subsoil and, at the very north end of the site, continued right across the excavated area. The backfill (layers 12, 30) was a black sandy soil mixed with much flint, mortar and limestone rubble and was accompanied by a rubble spread (layer 9). South of the cobbled surfaces and between the rubble spread and the Roman stratigraphy was a layer of black sandy soil up to 30 cms deep (layer 17). This layer contained late and unusual Roman pottery but could have been a post-Roman phenomenon, possibly due partly to cultivation. Above the rubble was a build-up of a metre of black, chalk and mortar flecked soil up to the present day ground surface (layers 2, 5).

Other Features
At the south end of the trench the rampart layers had been disturbed by several adjoining scoops (layer 7) up to 70 cms deep, which were filled with redeposited rampart material mixed with some black topsoil. Little pottery other than Roman came from these scoops, but a possible context would be a piece of over-zealous work in the 18th century levelling of the earthwork during the construction of Bowling Alley Walk. Work may also have been carried out on the earthwork during either the Civil War or the 17th century boundary disputes with the parish of Fordington (RCHM, 1970, p.542; Mayo, 1908, pp. 469-70); this dispute involved the ownership of the ditches outside the town which were eventually backfilled.
Four further pits were excavated (Fig. 4). Pits 1, 2 and 3 were cut from the level of the present day ground surface, while pit 7 could only be recognised some 50 cms below.
Pit 1 (layer 3). 20th century rubbish pit filled with lumps of rusty iron, bottles, odd fragments of pottery and black earth, *c.* 50 cms deep.
Pit 2 (layer 4). 20th century rubbish pit filled with lumps of rusty iron, bottles, odd fragments of pottery, building material and black earth, *c.* 50 cms deep.
Pit 3 (layer 8). 20th century hold used for the disposal of waste engine oil. Seepage made this pit hard to define, *c.* 1.30 m deep.
Pit 7 (layer 37). Early 18th century pit containing redeposited rampart material mixed with topsoil. Well-mixed homogeneous fill. At least 2 m deep cut down into the natural chalk. Not bottomed during excavation. Several fragments of pottery from the lowest level.
A modern trench (layer 6) ran east-west across the north end of the site, and was probably related to the present standing garage buildings.

THE POTTERY

by JO DRAPER and D. W. A. STARTIN

Cess Pit: Pit 8 (layer 60)
1-8: All in regular almost black, or black core in brick red sandwich, fine sandy fabric of the classic Durotrigian pottery. All have a very shiny black-burnished surface, apart from no. 8 a complete handle in the same fabric which is oxidised and has very pale greyey brick surfaces.
5: *c.* 12 cms diameter. 6: Diameter uncertain.
Not illustrated: Four rims similar to no 2; one as no. 4; and two other ring bases like no. 7 but shallower.
Samian[5] (not illustrated). Dr. 29 (at least two), probably pre-Flavian. Dr. 18 (two), Nero-Vespasian. Dr. 27 (one), Nero-Vespasian. Dr. 30 (rim only), Nero-Vespasian. Dr. 15/17 (rim only), Nero-Vespasian. Illustrated: Fig. 12, no. 1, Dr. 29, pre-Flavian.
Nos. 7 and 8 are unusual vessels, but the others are all common Durotrigan forms. No. 7 is similar to a vessel found at Wadham House (Draper and Chaplin, 1982, fig. 8, no. 143) in a late 1st or early 2nd century context. In form, but not decoration or fabric, no. 7 and Wadham House no. 143 are rather like a reduced ware form from the Oxfordshire kilns (Young, 1977, R64.6) which copies samian form Dr. 30. The Oxfordshire form is late 1st or early 2nd century. Nos. 1 and 3 are similar to vessels from the Maiden Castle War Cemetery of *c.* AD 44 (Wheeler, 1943, fig. 72, nos. 186 and 187). The bowls which were the most common form in the War Cemetery (*ibid,* nos. 171-182) are not present in this group, unless they are represented by the ring bases. No. 3 can also be paralleled in a Durotrigian context at Tollard Royal (Wainwright, 1968, fig. 17, no. 57). The samian suggests a date of *c.* AD 70 for this group, so that these Durotrigian coarseware forms must still have been current then.

Lower Occupation Spread (layers 59, 49 and 48)
9-14 and 16 are between the Durotrigian fabric (as nos. 1-8) and true black-burnished ware category 1 (BB1): these are listed as ?BB1
14: *c.* 14 cms diameter.
15: Gritty pale brick fabric with a grey core: dull brick red colour-coat overall, with a white line painted externally: diameter uncertain.
Not illustrated: Two amphora sherds; a ring base; and a ?*terra nigra* sherd.
Samian (not illustrated). Dr. 29 (one), pre-Flavian. Ritt? 12 (one), Neuronian. Dr. 27 (one), 1st century Lezoux fabric, usually occurs in Nero-Vespasian context. Dr. 18 or 18R (one), Nero-Vespasian.
Quern no. 8, fig. 14. No. 13 is a distinctly Romanised dish, and the coarseware fabric from this group is closer to BB1 than nos. 1-8. The samian is of similar date to pit 8 – around AD 70, but the coarsewares suggest a slightly later date. At Exeter flanged dishes like no. 13 occur in deposits dating before the end of the 2nd century (Bidwell, 1979, fig. 65, nos. 166-168 and p. 211). Earlier dish forms there are not decorated externally like those here (*ibid,* fig. 64, nos. 115-117). It seems unlikely that the group here is later than the late 1st or early 2nd century.

Middle Occupation Spread (layers 58 and 50)
17 and 18: Durotrigian type fabric.
19 as 17 and 18: *c.* 18 cms diameter; possibly a lid.
20 and 21: Thick, heavy, regular sandy fabric; grey to black surfaces.
Not illustrated: Another rim like no. 21; another as no. 17; another similar to no. 18; one amphora sherd.
Samian (not illustrated). Dr. 29 (four), probably Flavian. Dr. 37 (one), probably Flavian. Dr. 33 (one), Hadrianic?. Dr. 18/31 (one), late 1st, early 2nd century. South Gaulish. Large plate, late 1st century.
The samian and the coarseware suggest that this is rather a mixed group, dating from the late 1st or early 2nd century, but containing earlier material.

Upper Occupation Spread (layer 57)
22, 23 and 24: Dishes; BB1.
25: Pie dish; BB1.
26: Pie dish; BB1; similar to no. 13.
27 and 28: Everted rim jars; BB1.
29: Bead rim beaker; Durotrigian fabric as nos. 1-8, etc.
30: BB1 but only slight burnish externally.
31: Lid; ?BB1
32: Counter-sunk handle; ?BB1
33: Yellowy buff fine sandy fabric; collar of a wide-mouthed amphora, probably 1st century (information from K. Hartley).
Not illustrated: One rim like no. 23, two rims like no. 26; two rims like no. 29; ten rims like no. 30; nine amphora body sherds; and three body sherds of a cornice-rimmed indented beaker as Gillam type, *c.* AD 70/80 to AD 150 (information from K. Greene).
Samian (not illustrated). Dr. 37 (one), Antonine. Dr. 31 or 18/31 (one), mid-2nd century. Dr. 33 (one), stamped C AD GATIM. Antonine, probably before AD 160. Residual 1st century material including Dr. 29 (two), Dr. 37 (one) and Dr. 18 (three).
Bronze brooch, 2nd century, fig. 13, no. 3.

Clean Clay Layer Above Occupation Spreads (layer 56)
34: BB1.
Samian (not illustrated). Dr. 37 (one), Antonine; Ritt 31 (one), after AD 150. Residual 1st century sherds.

[5] All 1st century samian is South Gaulish, and all 2nd century samian is from Lezoux, unless otherwise stated.

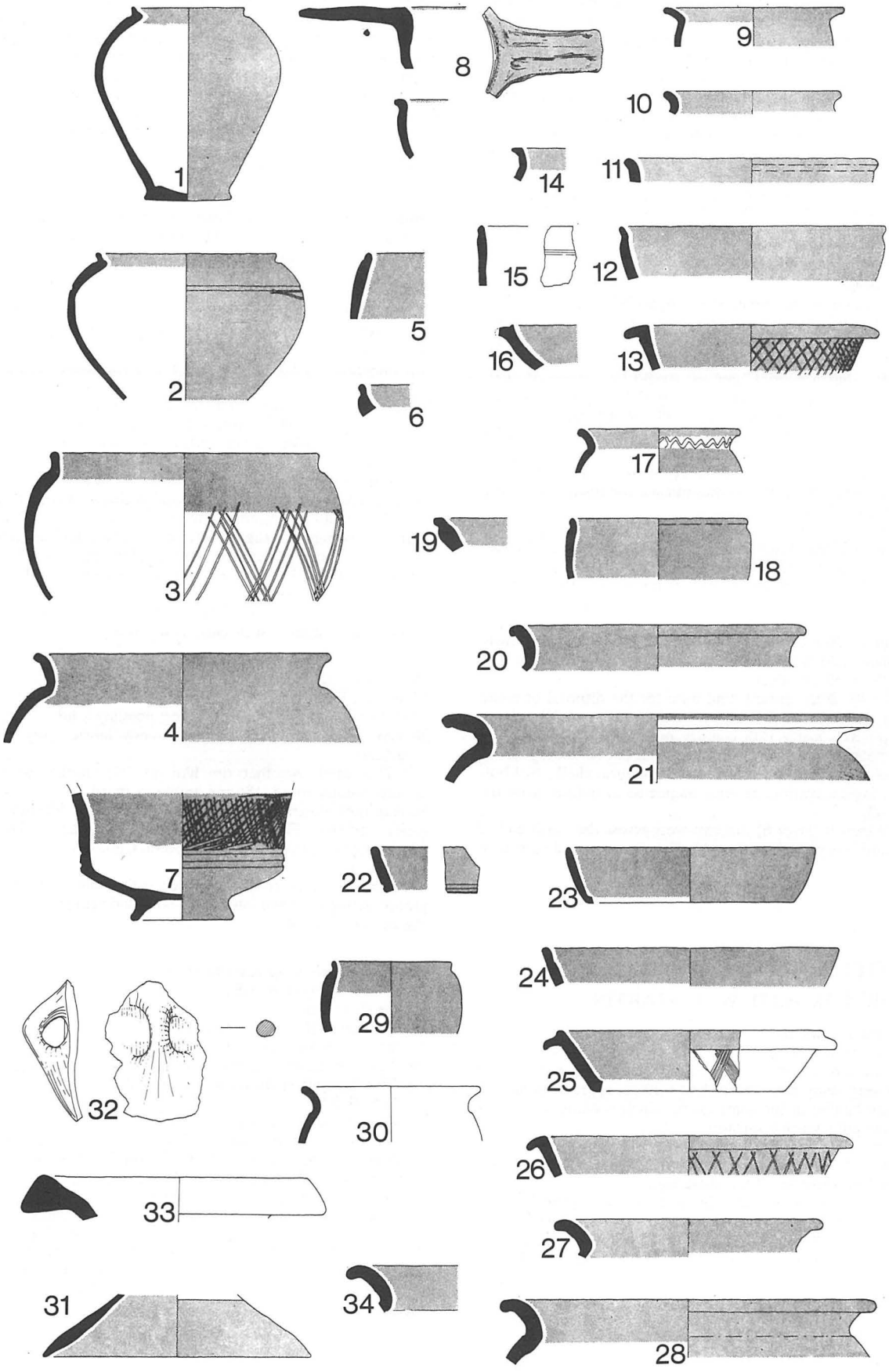

Figure 6. South Grove Cottage: Roman pottery nos. 1-34, at ¼ reduction.

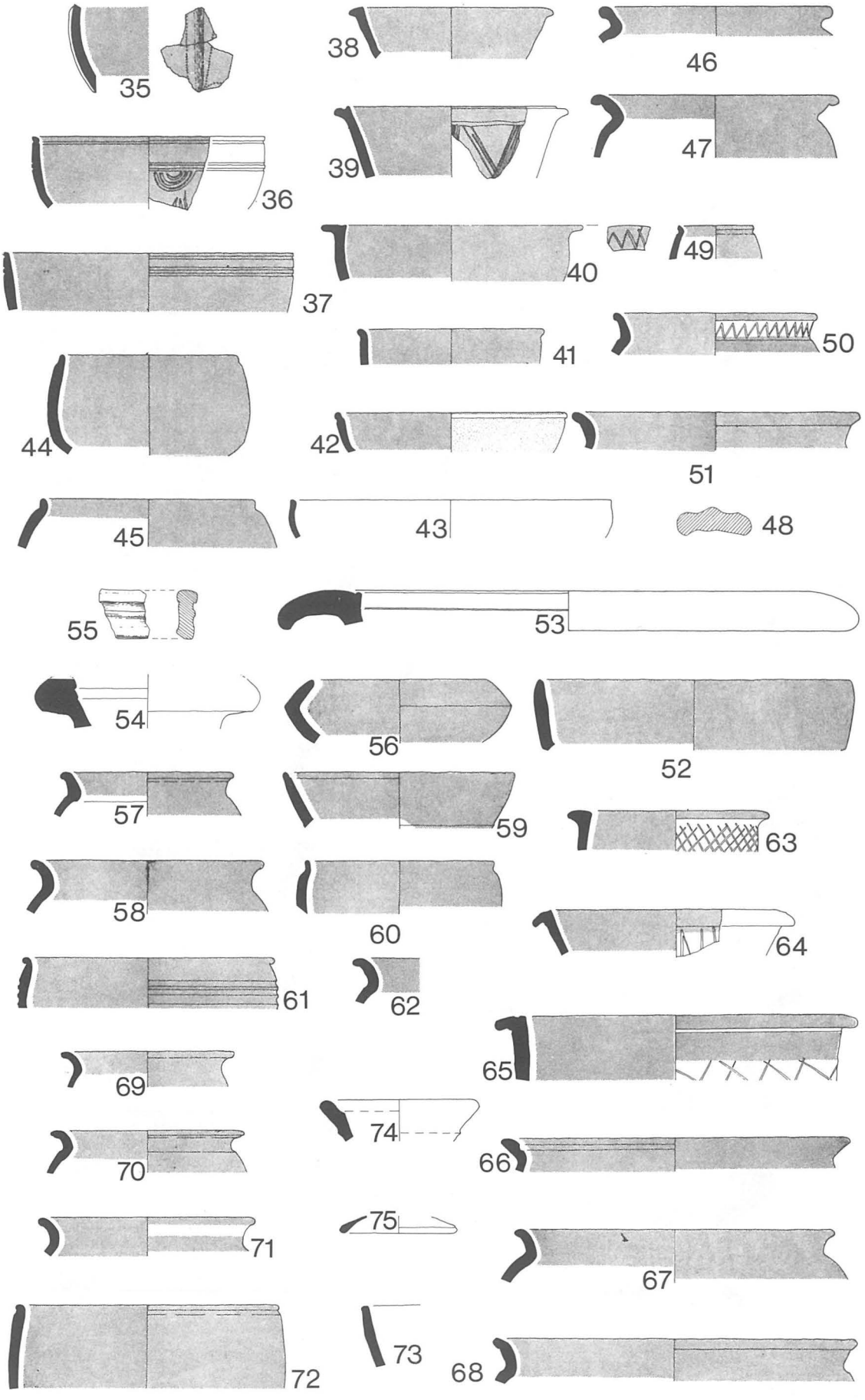

Figure 7. South Grove Cottage: Roman pottery nos. 35-75 at ¼ reduction.

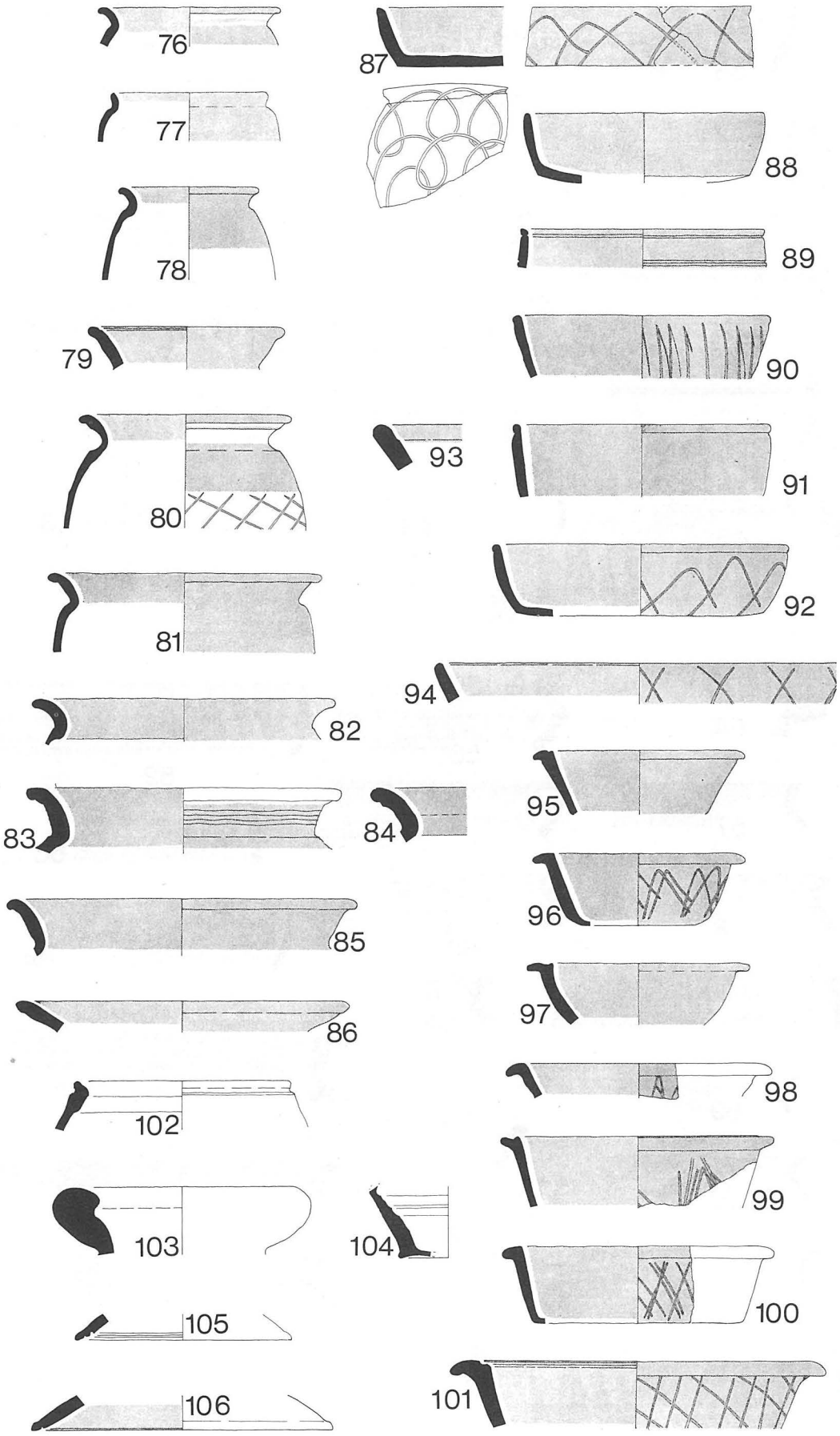

Figure 8. South Grove Cottage: Roman pottery nos. 76-106 at ¼ reduction.

The samian and coarsewares from the clay and the upper occupation spread suggest that, whilst containing earlier material, they date from around the middle of the 2nd century.

Early Occupation Layers Disturbed During the Construction of the Chalk and Flint Feature (layers 28, 47 and 55)
35: 'Finned' bowl; Durotrigian type.
36: Bowl; probably BB1; rather worn black surfaces; roughly incised decoration; part of another identical motif survives; the decoration is identical to a shale bowl found at Jordan Hill (Hutchins, 1861, fig., p. 562). The form and decoration but not the fabric is also similar to a 'London ware' type made in the Oxfordshire kilns (Young, 1977, R68.2) imitating samian form Dr. 37. Probably late 1st or 2nd century.
37: BB1.
38: BB1; but pale buffish brick.
39: Pie dish; BB1.
40: Dish; BB1; unusual form.
41: BB1.
42: Possibly a lid; BB1 but only roughly burnished externally.
43: ?BB1
44: Durotrigian type bowl.
45: Bead rim; Durotrigian type fabric.
46 and 47: Everted rim jars; BB1.
48: Handle; BB1 but orange.
48: Bead rim jar: BB1.
50 and 51: Everted rim jars; BB1.
Not illustrated: Two lid sherds like no. 31; two rims like no. 40; six rims like no. 45; 14 rims like nos. 46 and 47; one large everted rim jar BB1; one rim like no. 50; and a body sherd of hair-pin decorated fine red-brown coloured-coated beaker of hard white fabric, central Gaulish (information from K. Greene).
Samian (not illustrated). Mixture from complete date range of early occupation and including: Dr. 33, 18/31 (three), 18 (four), 29, 37, 27 (three), 15/17, and Curle II (11). Bronze brooch no. 1, fig. 13, *c.* AD 80-100.
Nos. 35 and 44 can be paralleled in the Maiden Castle War Cemetery of *c.* AD 44 (Wheeler, 1943, fig. 72). The coarse pottery and samian is again a mixture of early material and probably dates from the mid-2nd century.

Flint Tip (layer 46)
52: Plain dish; BB1.

Chalk-and-Flint Feature (layer 61)
53: Mortarium; fine buff-yellow fabric; as Gillam type 328, *c.* AD 65-100 (information from K. Hartley).
This feature cuts the early occupation spreads, and is probably therefore after AD 150.

Lower Rampart Layer (layer 27)
54: Amphora neck; fine buff fabric.
55: Handle; fine pale stone fabric.
56: Durotrigian type fabric; unusual shape.
57 and 58: Everted rim jars; ?BB1
59: Probably a lid; ?BB1
60: Bead rim; ?BB1
61: Durotrigian type fabric.
62: Everted rim jar; BB1; *c.* 12 cms diameter and six sherds of thin, fine white fabric.
Not illustrated: Sherds as nos. 58, 60 and 62; six amphora sherds; and six sherds of thin fine, white fabric.
Samian. Residual 1st century sherds but one sherd of Dr. 37 from Les Martres de Vegre to be dated *c.* AD 100-125 (Fig. 12, nos. 2 and 3).

Upper Rampart Layers

Clay Layers (layers 14 and 26)
63 and 64: Pie dishes; ?BB1
65: Pie dish; BB1 but very thick.
66: Rim with ?lid seating; ?BB1
67, 68, 69, 70 and 71: Everted rim jars; BB1.
72: Bead rim bowl; BB1?
73: Probably BB1; abraded.
74: Neck; probably BB1 but abraded.
75: Small? lid: fine buff fabric and surfaces.
Not illustrated: Three everted rim jar sherds; and one rim as no. 72.

Clay and Ash Tips (layers 13, 15, 16 and 45)
76-85: Everted rim jars; BB1. 84 *c.* 28 cms diameter.
87-92: Dishes; BB1.
93: Probably a lid; BB1; diameter uncertain.
94: Dish; BB1.
95-101: Pie dishes; BB1.
102: Bead rim jar; ?BB1
103: Amphora; abraded gritty pale greyey pink fabric and surfaces.
104: Base; hard fine grey sandy fabric; red surfaces; *c.* 10 cms diameter.
105: Lid; ?BB1
106: Lid; BB1.
Samian (not illustrated). Dr. 37 (one), Hadrian-Antonine; (one), Antonine; (rim only), late 2nd century. Dr. 33 (five), Antonine; (one) late 2nd century. 18/31R or 31R (one), Antonine. Dr. 18/31 (more than three), mid-2nd century. Dr. 33 (two), Antonine; (one), late 2nd century. Dr. 32 (one), late 2nd century, possibly East German. One 2nd century bowl.
Not illustrated: Two sherds as no. 83; one sherd like no. 80; two sherds like no. 85; one sherd like no. 87; ten sherds like no. 88; two sherds like no. 96; one rim like no. 98; one rim like no. 100; 22 BB1 everted rim jar sherds; seven amphora sherds; three pale grey gritty sherds; and one hard grey sandy sherd.

Dating of the Rampart
The problem of large quantities of residual material in major earthworks has already been discussed. The samian and coarse pottery from this site suggests that the earliest date possible for the lower rampart layers is AD 100 and for the upper rampart layers some time towards the end of the 2nd century.

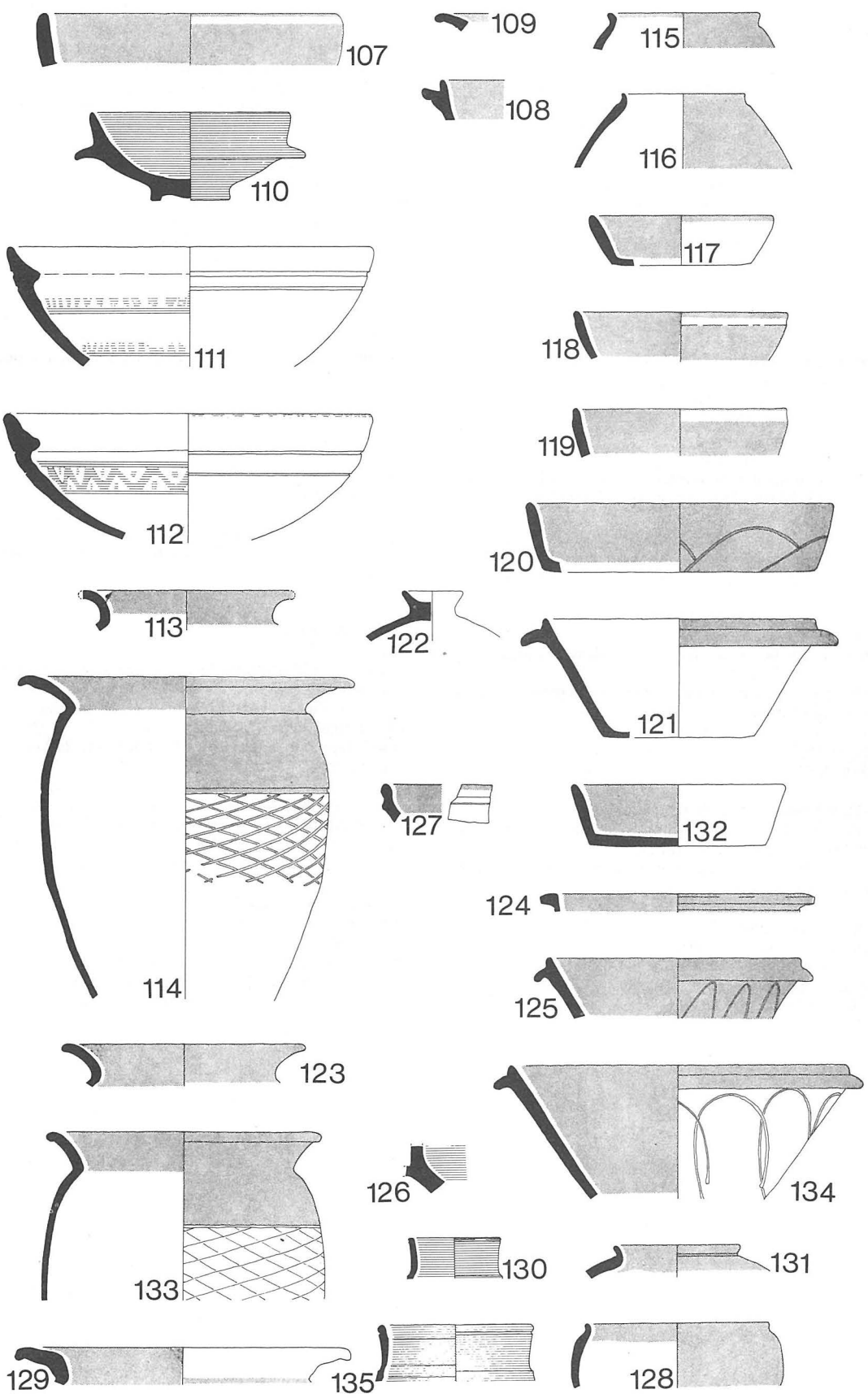

Figure 9. South Grove Cottage: Roman pottery nos 107-135 at ¼ reduction.

Building Foundation Trench (layer 35)
107: Dish; BB1.
108 and 109: BB1; diameters uncertain.
Bronze pin no. 5, fig. 13.
Not illustrated: Small colour-coated body sherds. The colour-coated sherds are New Forest and the group probably dates from the late 3rd century.

Robbing of the Structure (layer 20)
110: Bowl; fine red and buff fabric; worn red colour-case; burnt; New Forest as Fulford type 63.1, late 3rd and 4th century.
111 and 112: Sandy white fabric; browny-red painted pattern internally; as Fulford type 89.2 in fabric 2a; *c.* AD 270-400.
113 and 114: Everted rim jars; BB1.
115 and 116: Bead rim jars; BB1.
117-120: Dishes; BB1.
121: Pie dish; BB1.
122: Lid; probably BB1 but not burnished; the central hole is unusual. Mortar no. 9, fig. 14.
Not illustrated: Four everted rims as no. 113; one like no. 114; one like no 117; two rims as no. 118; four rims like no. 120; four rims like no. 121; and five body sherds of New Forest colour-coated wares.
Extremely everted rim jars like no. 114 have been found in 4th century contexts in Dorchester. A group of *c.* AD 300-320 from Dorchester Prison, 1970 (Draper and Chaplin, 1982, fig. 19, nos. 27 and 33) contains these jars and other coarsewares comparable to those here. The New Forest material suggests that the group is post *c.* AD 270.

Pit 4 (layers 18, 21, 22, 23 and 24)
123: Everted rim jar; BB1 (layer 24).
124: BB1.
125: Pie dish; BB1.
126: Hard grey fabric with red colour-coat; probably New Forest.
Nos. 124-126 from layer 23: not illustrated; two rims like no. 123 and one like no. 128.
127: Lid; BB1.
128: Bead rim jar; ?BB1
129: Everted rim jar; BB1.
130: Indented beaker rim; hard fine grey fabric; purple colour-coat; as Fulford type 27, late 3rd or 4th century.
Nos. 127-130 from layer 22, not illustrated; sherds as nos. 35 and 36; and one amphora sherd. Fig. 13, no. 7, iron object.
131: BB1.
No. 131 from layer 21: Not illustrated; two amphora sherds; one sherd orange colour-coated.
132: Dish; BB1.
133: Everted rim jar; BB1.
134: Pie dish; BB1.
135: New Forest beaker rim; fine hard grey fabric; purple colour-coat.
Nos. 132-135 from layer 18: Not illustrated; two rims similar to 134; and four everted rim sherds.
Stratigraphically pit 4 is later than pit 5. On the basis of the coarse wares and the New Forest wares it seems likely to date from the late 3rd or 4th century. The very late 4th century rubble from Wadham House (Draper and Chaplin, 1982) contains a cookpot similar to no. 133 here (Fig. 7, no. 93): it is possible that this is a late form of the BB1 everted rim jar. No. 167 below may be later still. Pit 4 is probably late 4th century.

Pit 5 (layers 43, 33, 42, 34, 32, 25 and 40)
136: ?Flagon neck; BB1; crude 'coils' show internally.
137: Lid; BB1; highly burnished.
138: Pie dish; BB1; faint burnished lines as no. 142.
Nos. 136-138 from layer 33: Not illustrated; two amphora sherds; and two purple colour-coated sherds.
139: Pie dish; BB1; *c.* 20 cms diameter.
No. 139 from layer 42: Not illustrated; two purple colour-coated body sherds.
140: Beaker rim; fine hard yellowy fabric; matt purple colour-coat; probably New Forest.
141: Dish; BB1.
143 and 144: Everted rim jars; BB1.
145: Handle; BB1.
Nos. 140-145 from layer 34: Not illustrated; one rim like no. 151; seven rims like no. 141; one rim like no. 143; and New Forest purple colour-coated sherds.
146: Hard fine yellow fabric; brown colour-coat with painted white motif; New Forest.
147: Everted rim jar; BB1.
Nos. 146-147 from layer 32: Not illustrated; one sherd similar to no. 141; and colour-coated sherds like no. 146. Fig. 13, no. 4: bronze brooch.
148: ?Flagon; hard grey fine fabric; purple colour-coat; white painted motif; New Forest.
149: Orange sandy fabric.
Nos. 148 and 149 from layer 25: Not illustrated; two everted rim jar sherds.
150 and 151: Beaker rims; hard, fine grey fabric; purple colour-coat; New Forest.
152 and 153: Everted rim jars; BB1.
154: Dish; BB1; *c.* 20 cms diameter.
Nos. 150-154 from layer 40: Not illustrated; sherds as nos. 150 and 151; and two rims as no. 154.
Pit 5 is earlier than pit 4 (nos. 123-135 above) and probably dates from the early or middle 4th century.

Pit 6 (layer 31)
155: Bead rim jar; BB1.
156 and 157: Everted rim jars; BB1.
158: Dish; BB1.
159 and 160: Pie dishes; BB1.
Not illustrated: Four sherds in hard fine grey fabric with purple colour-coat.
On the basis of the New Forest sherds, and the forms of nos. 157 and 160, this group is late 3rd or 4th century.
Pit 6 is later than the robbing of the Roman structure (layer 20), which itself probably dates from the early 4th century. Pit 6 is perhaps mid-4th century.

Cobbling Layers and Associated Features

Lower Cobbles (layer 39)
161: Everted rim jar; BB1.
162 and 163: Pie dishes; BB1.
Not illustrated: A sherd as no. 162; a shallow lid sherd BB1; two amphora sherds; and six BB1 everted rim sherds.

Irregular Feature cut through lower cobbles and sealed by upper cobbles (layer 41).
164: Beaker; hard fine grey fabric; purple colour-coat; New Forest.

Upper Cobbles (layer 38)
165: Dish; BB1.
166: Probably a lid; BB1; diameter uncertain.
Not illustrated: Three sherds as no. 165; one sherd like no. 166; two amphora body sherds; and a handle fragment from a rare fancy-handled 3rd century vessel, probably from Lezoux (as Richborough III, pl. XLII, no. 345) (information from K. Greene).
These cobbles contain material dating from the late 3rd or 4th centuries, but since they are overlain by layers disturbed in the 19th century they may be much later.

Late/Post-Roman Build-up (layer 17)
167: Everted rim jar; BB1; rather roughly decorated; smears of burnish continue under the decoration.
168: Flange necked jar; BB1.
169 and 170: BB1; rather unusual forms.
171 and 172: Pie dishes; BB1; no. 171 is probably roughly burnished externally.
173: Pie dish; hard grey sandy fabric; grey internally and darker grey to bright red externally; not BB1 but a greyware; does not occur in the New Forest type series (Fulford, 1975).
174: Dish; BB1.
Not illustrated: Two sherds as nos. 171 and 172; eight sherds similar to no. 174; and 175 BB1 everted rim jar sherds; and a very thick almost black to red colour-coated base in very fine pale buff fabric.

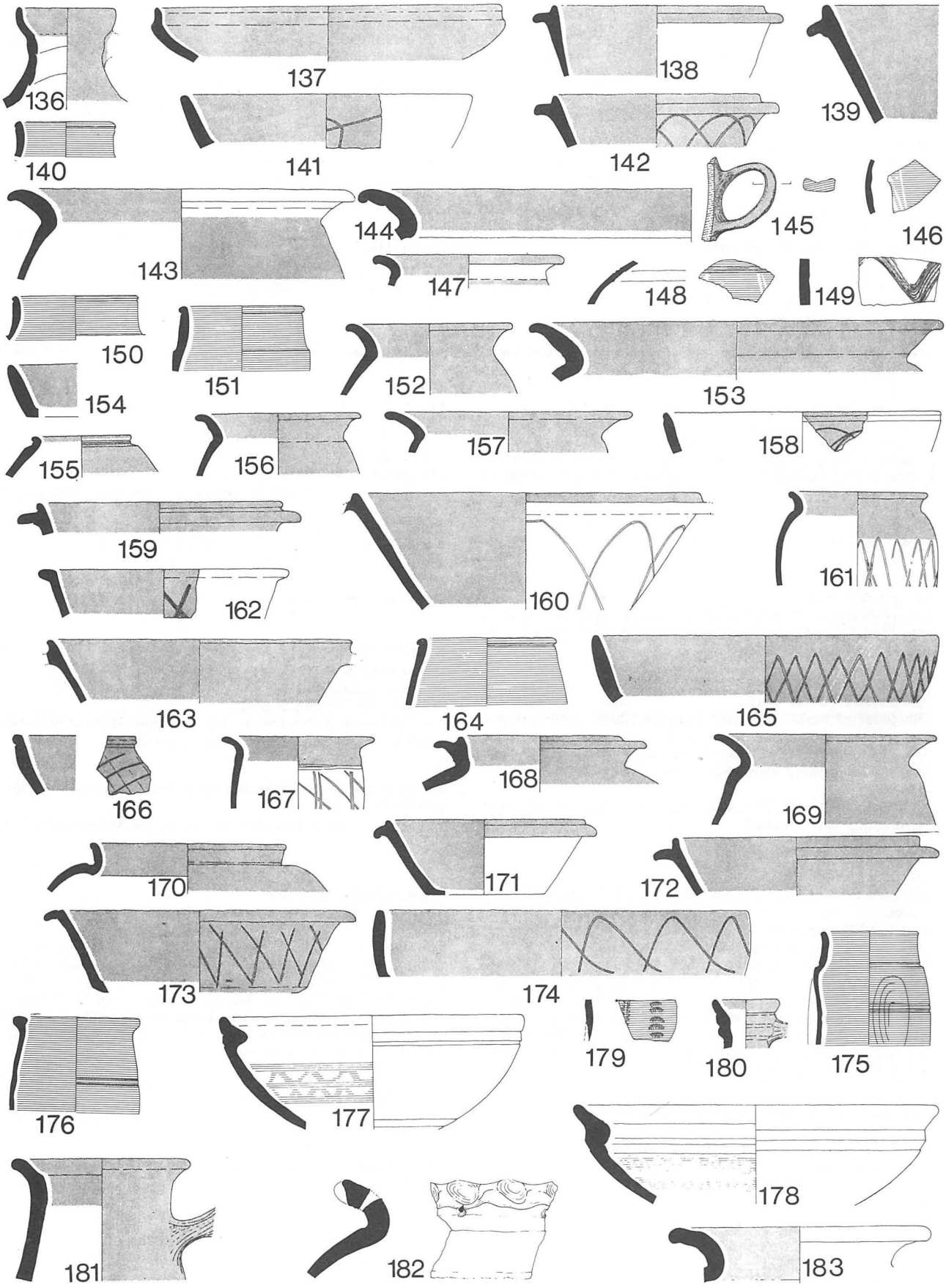

Figure 10. South Grove Cottage: Roman pottery nos. 136-183 at ¼ reduction.

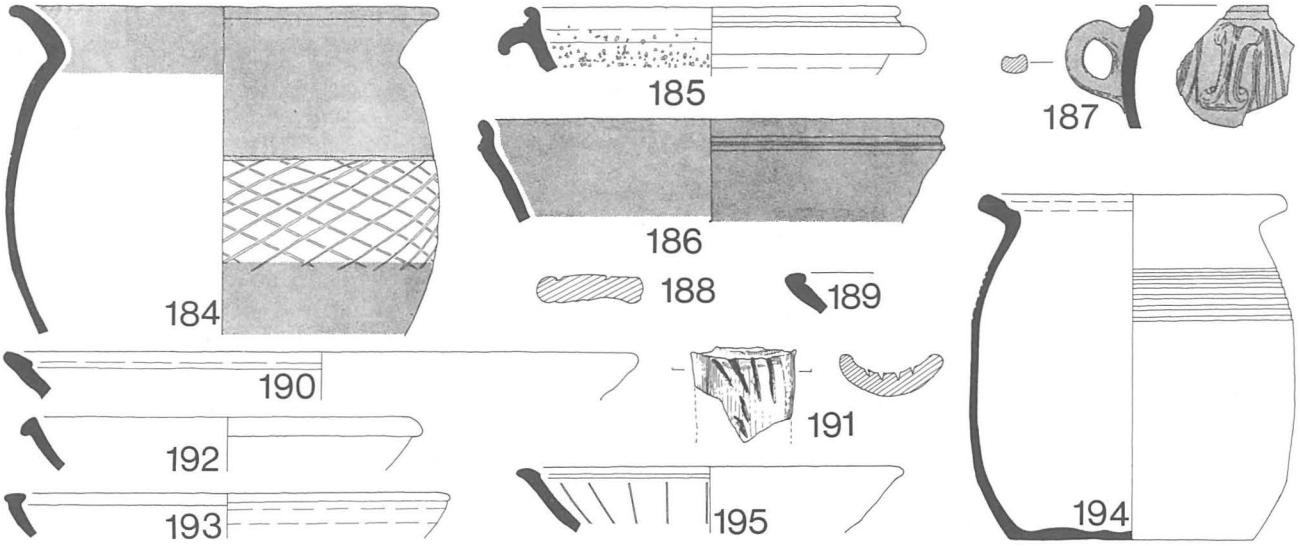

Figure 11. South Grove Cottage: Roman pottery nos. 184-188; medieval pottery nos. 189-193; and post-medieval pottery nos. 194-195; all at ¼ reduction.

Stratigraphically this is the latest layer in the Roman sequence, but it is not sealed and may have been disturbed. However, it does contain some rather odd BB1 forms which may be very late.

Post-medieval Disturbance Above the Roman Structure (layers 12 and 30)
175: Indented beaker: hard, fine off white fabric; almost black colour-coat; New Forest as Fulford type 27.15 *c.* AD 340-400.
176: Beaker; fine orange-grey sandy fabric with an orangy-brown colour-coat. Not in the New Forest (Fulford, 1975) or Oxfordshire (Young, 1977) type series.
177 and 178: Bowls; off white sandy fabric; reddish-brown painted pattern; as Fulford type 89.2 in fabric 2a, *c.* AD 270-400.
179: Body sherd; fine orange to grey sandy fabric; orangy-brown colour: coat; probably New Forest.
Not illustrated: *c.* 30 BB1 vessels in forms already illustrated.

Rubble Spread Associated with Post-medieval Disturbance (layer 9)
180: Flagon neck; BB1.
181: Neck with handle; BB1.
182: Storage jar; heavy sandy fabric and surfaces.
183 and 184: Everted rim jars; BB1.
185: Mortaria; off white mainly gritted fabric.
186: Bowl; BB1.
187: Rim and handle; BB1.
188: Handle; fine greyish-white fabric and surfaces.
These are just a small sample from a large group of more than 50 vessels.

Medieval Pottery, all unstratified
189: Cooking pot; hard grey sandy fabric with large inclusions; brick internally, and buff externally with grits up to 5 mm long showing on the surface (layer 9).
190: Cooking pot; coarse black fabric; black surfaces.
Layers 12/30
191: Slashed handle.
192: Dish?
193: Cooking pot.
Nos. 191-193 all hard, fine sandy regular grey fabric with brick red surfaces. 14th or 15th century.

Post-medieval Pottery

Pit 7 (layer 37)
194: Chamber pot; hard orange fine sandy fabric; glazed greeny-brown internally and some splashes externally; white slip bands on the shoulder externally. Probably early 18th century.
Not illustrated: Body sherds of other vessels in similar fabric.

Post-medieval Disturbance (layers 12/30)
195: Bowl; fine hard grey fabric; glazed overall greeny-brown; the slashes almost cut the pot.
Not illustrated: A sherd of 19th century stoneware.

ILLUSTRATED SAMIAN (Fig. 12).

Early Cess Pit (pit 8, layer 60)
1. Dr. 29: Slip, red-brown, smooth; hard-fired and glossy; paste pink, fine. Large rosette, probably flanked by animals. Knorr (1952, Tat 58) attributes the rosette to BASSUS GELUS, MEDDILUS and SEND. This piece is pre-Flavian.

Lower Rampart Layers (layer 27)
2. Dr. 37: Slip red-brown, fairly thick and flaky; paste red-pink with calcareous inclusions. IOENALIS uses this particular basal wreath. Note the correct construction of the veined central leaf, which was not found by Stanfield and Simpson (*cf.* Stanfield and Simpson, 1958, pl. 37.429 for a similar design). Date *c.* AD 100-125. Les Martres-de-Veyre.
3. Dr. 37: Slip red-brown, matt; paste pink, fine with calcareous inclusions. The remaining decoration shows a narrow scroll carrying five-lobed palm leaves. In the lower concavity, a hare over two lines of barley-corn. A fairly typical 'Pompeii' style vessel (*cf.* Atkinson, 1914, pl. VII, 41, 42). Date *c.* AD 75-90.

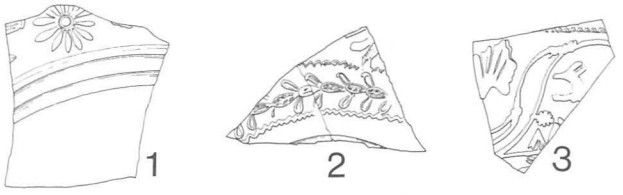

Figure 12. South Grove Cottage: Decorated samian nos. 1-3 at ½ reduction.

THE METAL SMALL FINDS (Figs. 13 and 14)

by JANET WEBSTER

BRONZE OBJECTS

1. Brooch. A large lug projects to the rear of the head and secures the axial bar of the spring through its lower hole and the external chord through its upper hole. The short semi-cylindrical side-wings have narrow plain margins and have their ends closed in flat semi-circular plates which were never pierced to support the axial bar of the spring. The bow is flat D-section and lightly curved in profile. There is an elongated V-shaped tongue running over the upper bow from the head, representing a vestigial chord hook; the line is continued down the centre of the bow in a light ridge. There remain faint traces of lightly incised lines running to either side of this ridge and defining it. Down one side of the bow, leaving a plain narrow margin on the outer edge, run two lightly incised lines with some faint traces of tiny cross lines between them, but a corresponding band of ornament and margin can no longer be traced down the other side of the bow. Because of the spring arrangement and the treatment of the bow the brooch can be assigned to Hull's Colchester BB type (see *Camulodunum,* Hawkes and Hull, 1947, pp. 310-311, pl. XCI, nos. 36-43, and *Richborough V,* Cunliffe, 1968, pp. 79-80).

The Colchester B type begins at Camulodunum in the period *c.* AD 50-65 and the type is current until the late 1st century (see *Richborough V,* Cunliffe, 1968, p. 80) where a number of BB examples are quoted from contexts of *c.* AD 80-100).

From the upper early occupation spread/'throw-out' during the construction of the chalk-and-flint feature; layer 47, small find 46.

2. Brooch. The pin was hinged. The large cross-bar has marginal mouldings at each end on the front only. From the head of the bow runs a lightly raised panel. This panel is decorated with an impressed saltire motif at the head. It terminates with a raised cast stud flanked above and below by well defined oval hollows which have now lost their original glass, enamel, or stone settings. From the lower of these oval settings, down the centre of the bow to the ridged foot, runs a panel of wavy line ornament flanked by longitudinal ridged lines with tiny dots along the outer edges. There are small plain margins down each side of the bow. The fold of the catchplate is decorated with diagonal incised lines.

The brooch is perhaps derived from the *applied hook* type, in which the hook to the external chord is rivetted to the bow, *cf.* Camerton (Wedlake, 1958, p. 220, fig. 51, no. II-IID, and pp. 219-221). In the hinged version of this type of brooch (*ibid,* nos. IIC-D) the applied hook is reduced to an ornamental plate cast in one with the bow.

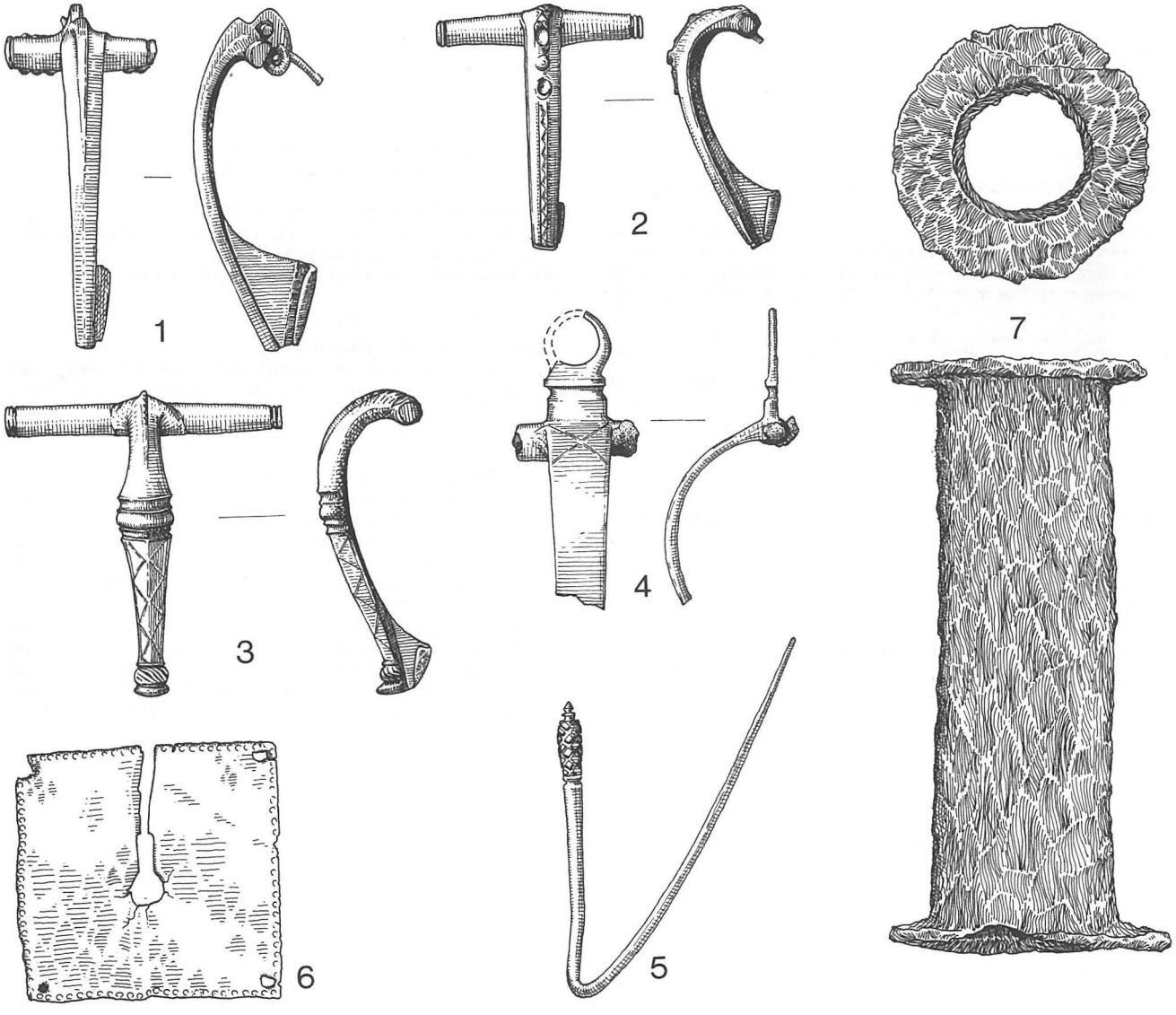

Figure 13. South Grove Cottage: Nos. 1-6 bronze at life size; and no. 7 iron at ½ reduction.

The presence of only one 'rivet' in the Dorchester brooch need present no obstacle to such an interpretation, as sprung brooches with functional applied hooks occur at Hod Hill with only one rivet to secure each hook to the bow; Hod Hill I (Brailsford, 1962, fig. 10, C100, C101). *cf.* also Camerton (Wedlake, 1958, p. 220, fig. 51, no. 21) perhaps a further derivative of the type (*N.B.* The Dorchester parallel quoted by Hull for this Camerton brooch is not like the Dorchester example under discussion here).
Hull dates the *applied hook* type of brooch to mid to late 1st century (Waddon I, Webster, 1959, p. 97, no. 25) and it seems reasonable to suggest with this type of brooch that the hinged, derived, form may be a little later.
Probably from the upper rampart clay layers, small find 24.

3. Brooch. A T-shaped brooch with a hinged pin. The cross-bar has terminal mouldings on the front only and there are mouldings describing an inverted V at the junction of the bow and the cross-bar. Down the centre of the upper bow is a ribbed ridge. Below the half round waist-knob and accompaning mouldings is a panel of decoration on the lower bow. There are slight plain margins running down each edge of the lower bow flanking the panel. The ornament comprises two rows of triangles of yellow enamel aligned along the edges of the panel with points inwards, to leave a row of lozenge shapes in plain bronze down the centre of the bow which is here ridged. There is an elaborately moulded foot. The fold of the catchplate has zig-zag line decorations.
The brooch belongs to the same family as Nor'nour (Hull in Dudley, 1967, p. 45, fig. 17, no. 94), where others of the same type are listed; the type has a limited distribution in the south-west and Hull notes that the use of enamel on the lower bow is the more common form, *c.f.* particularly Rotherley, Pitt-Rivers, 1888, pl. XCIX, no. I. Date: 2nd century.
From the upper early occupation spread; layer 57, small find 49.

4. The Upper Part of a Hinged Brooch. There is a cast head-loop separated from the head of the bow by a moulded pedestal. The cross-bar is short. The bow is broad and markedly curved and ornamented near the head with an incised cross. The cast head-loop suggests a 2nd century date. The recurrence of the incised cross on various brooch types at Nor'nour may be significant (Hull in Dudley, 1967, nos. 59, 75, 99-102, 261).
From pit 5; layer 32, small find 31.

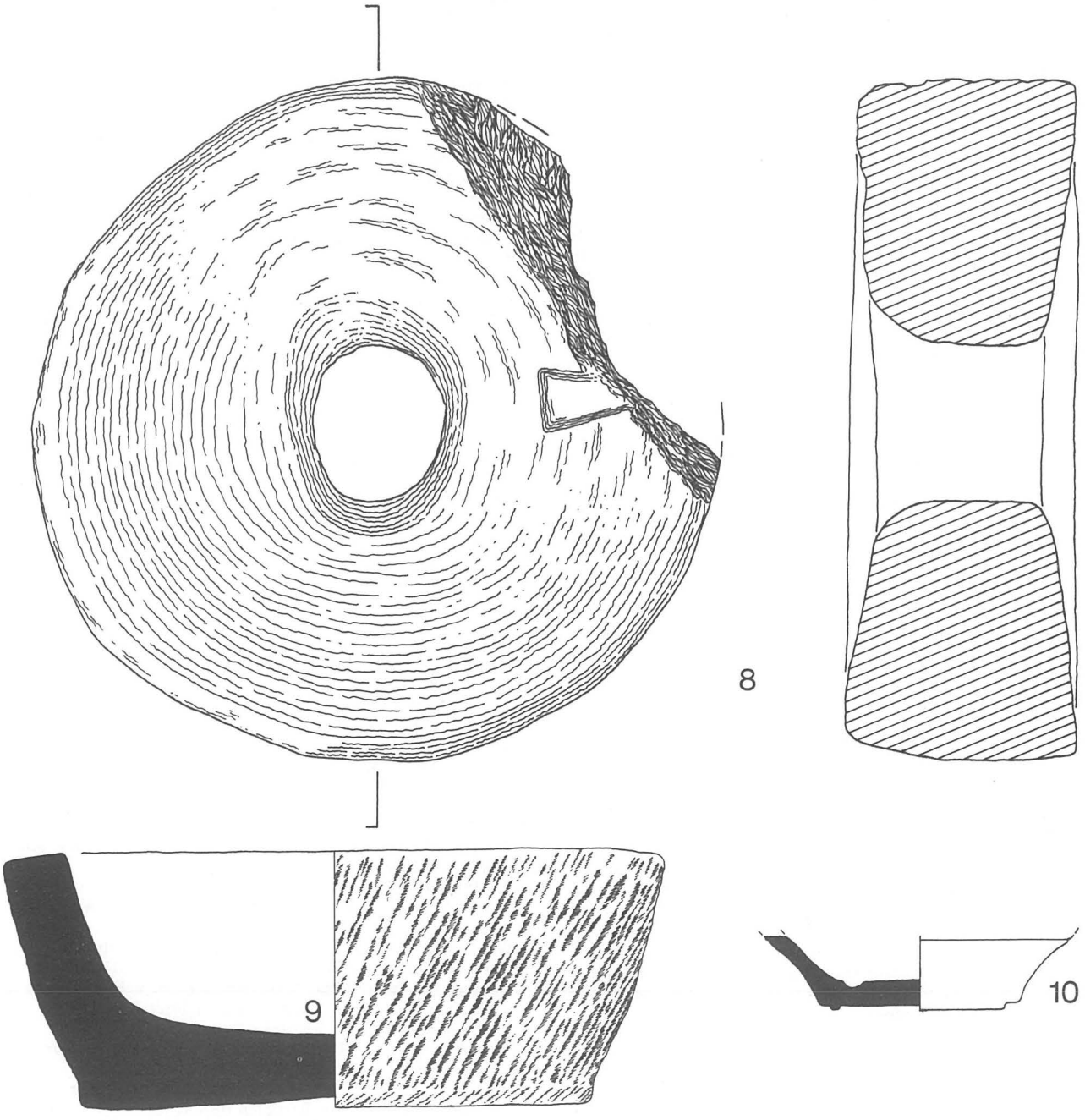

Figure 14. South Grove Cottage: Quern no. 8 at ¼ reduction; mortar no. 9 and shale bowl no. 10 at ½ reduction.

5. Pin with Pine-cone Head, *c.f.* Shakenoak (Brodribb *et al.*, 1971, II, p. 113, fig. 49, no. 83).
From the footings of the late Roman structure; layer 35, small find 38.
6. A Sheet Bronze Plate, one of a series that formed the casing for a wooden casket. The plate is ornamented with small repoussé dots round the edges and was secured to the wooden box by means of rivets at the corners. In the centre it is pierced by a key hole, *c.f.* Richborough IV (Bushe-Fox, 1949), pl. XLVII, no. 176 (also an unpublished example from Poundbury Roman Cemetery, Dorchester, Dorset).
From disturbed topsoil; layer 5, small find 17.

Iron Object
7. The object is in the form of a cylinder with the ends bent back to form a flange at either end. Its function is unknown.
From pit 4; layer 22, small find 39.

Stone (geological identification by H. P. Powell, Pitt-Rivers Museum, Oxford)
8. Upper stone of rotary quern made out of an impure shelly limestone. Only one worn patch on the grinding surface and the socket for the handle appears to be unfinished; possibly the stone was broken during making.
From the lowest of the early occupation spreads; layer 59, small find 52.
9. Soft fine-grained limestone mortar fragment.
From the robbing of late Roman structure; layer 20, small find 34.
Not illustrated: Fragment of a stone bowl similar to no. 9 from the top of pit 5; layer 40, small find 44.

Pottery (not illustrated)
Circular pottery disc, *c.* 3.5 cms in diameter, with a central perforation. Cut from a BB1 vessel with a burnished latticework decoration. From the early Roman pit 8; layer 60, small find 53.

Lead (not illustrated)
Unworked thin strip, 10 cms long, of irregular cross-section.
From the early Roman pit 8; layer 60, small find 55.

Shale
10. Base of a shale bowl. From the ashy tips in the upper rampart; layer 13, small find 20.

ANIMAL BONES

by JUDI STARTIN

Table 1. Ox, pig and sheep/goat bones from the early Roman occupation layers (layers 60, 59, 49, 48, 58, 50, 57).

Ox	Pig	Sheep/Goat
39	4	54

Miscellaneous Bones
Horse: Fragment of a metacarpal.
Dog: Fragment of maxilla.
Hen: Femur and tibia.
Human: One almost complete infant skeleton from layer 59.

Comment
Although no analysis of the animal bones from these layers was possible with so small a sample, it was noticeable that, out of a total of 95 identified specimens, there were no complete bones, and only 22 with at least part of one epiphysis present. These 22 were themselves fragmentary and six had visible chop-marks. Evidence of the age of the animals represented was slight, but there was one young sheep mandible which had its full quota of milk teeth. In addition to this, one sheep calcaneum and the two chicken bones were unfused.

Table 2. Ox, pig and sheep/goat bones from the late Roman pits (pit 4, layers 21, 22, 23, 24; pit 6, layer 31; pit 5, layers 32, 34, 42, 43, 33).

Ox	Pig	Sheep/Goat
69	13	50

Miscellaneous Bones
Horse: Two mandibles and two fragments of mandible; one maxilla fragment; one distal end of humerus.
Hen: Two almost complete skeletons; three femora; one metatarsal.
Cat: One mandible.
Dog: One maxilla fragment.
Fallow deer: One metapodial fragment.
Small mammal: Three humeri; two mandibles; one radius; one femur.

Comment
The sample from the pits was again too small to allow any analysis, but here again the bones were very fragmentary. From a total of 132 identified specimens, only one sheep metatarsal was complete. Evidence of age was again scanty but there were two young sheep mandibles, one with two milk teeth (the rest missing) and one fully mature but for the third molar which had not yet erupted. Apart from these there was one unfused distal end of a sheep humerus, one unfused ox vertebra, one unfused distal end of a pig metatarsal, one unfused proximal end of the first phalange of a pig, and two unfused femora of a hen. Twenty-two bones had clear evidence of chopmarks.

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EXCAVATIONS AT THE OLD VICARAGE, FORDINGTON, DORCHESTER, DORSET, 1971[1]

D. W. A. STARTIN with contributions from JO DRAPER, B. HOOPER and JUDI STARTIN

SUMMARY

In 1971, within the area of a known Roman burial ground, 21 inhumations and 3 cremations were excavated, all probably dating from the 2nd to 4th centuries AD. *Seven ditches, all probably medieval boundaries were found, one containing a group of probably 14th century pottery. Many of the small features found cut into the natural chalk were probably recent.*

The excavation was carried out during September, 1971, prior to the construction on the site of flats for elderly people. This work was supplemented, during the development stage, by Mr. E. Flatters who recorded information uncovered within the foundation trenches.

Thanks are due to the following people for their help on site and towards publication: Guy's Marsh Borstal, for providing a good healthy labour force; J. Startin for her site drawings; E. Flatters for construction stage recording; John Stark and Partners, architects, for granting permission to excavate; M. Rouillard for small find drawings; B. Hooper for the skeletal report; and B. W. Cunliffe for help and advice on the text.

The Site

The excavations were located partly behind the Old Vicarage at the top end of Fordington High Street (trenches 3 and 4), and partly at the rear of the foundations of the demolished cottage (no. 61) next door (trenches 1 and 2) (Figure 1). The site lay some 130 m outside the east wall of the Roman town of Dorchester, at about twice that distance from the probable position of the east gate, and approximately 90 m north-west of the Fordington parish church of St. George.

All excavation was accomplished by hand, but the only stratigraphy undisturbed by modern gardening was in the bottom 40 cms of trench 2 and the graves. The depth to the natural chalk subsoil varied between 30 cms in trench 3 to 1.50 m in trench 2. Trench 1 measured 11.00 m by 8.00 m, trench 2, 9.00 m by 6.00 m, trench 3, 11.50 m by 5.00 m and trench 4, 5.50 m by 6.50 m.

Previous Discoveries

The previous discoveries in the area are well documented

Plate 1. Fordington Old Vicarage: Trench 1 looking south-south-west; the ranging rod is in ditch 5.

[1] This report was submitted for publication early in 1973. The Roman pottery report has been revised, and the medieval pottery report re-written in 1982, but the main part of the report is printed as submitted. *Editor.*

in the Royal Commission Volume on Dorset (RCHM, 1970, p. 571, monument 216), as are some of the theories relating to them. Burials of the Roman period have been found in all except the northern, probably marshy, areas around Dorchester, and, on the south-eastern side, the cemetery is known to have extended from Salisbury Fields as far as the railway crossing on the Wareham Road.

The Excavations

The only finds of pre-Roman date were a rim (Fig. 6.1) and several body sherds from a shallow scoop in the west side of trench 2 (Fig. 3.18).

The Graves

Twenty-one burials, all cut into the natural chalk, were excavated while one further possible grave (Fig. 2.B22) (trench 2, layer 52) yielded a few fragments of bone and several coffin nails. At least one of the graves disturbed an earlier inhumation (burial 9) and three graves contained additional skeletal remains (burials 5a, 5b, 9a and 12). Burial 12, which was inserted above burial 13 (Plate 7), consisted of the skull and decayed long bones only, and may have been a token reburial; a bronze bracelet (Fig. 9.1) was found on the right ulna. All of the graves had been backfilled with chalk or with a mixture of chalk and

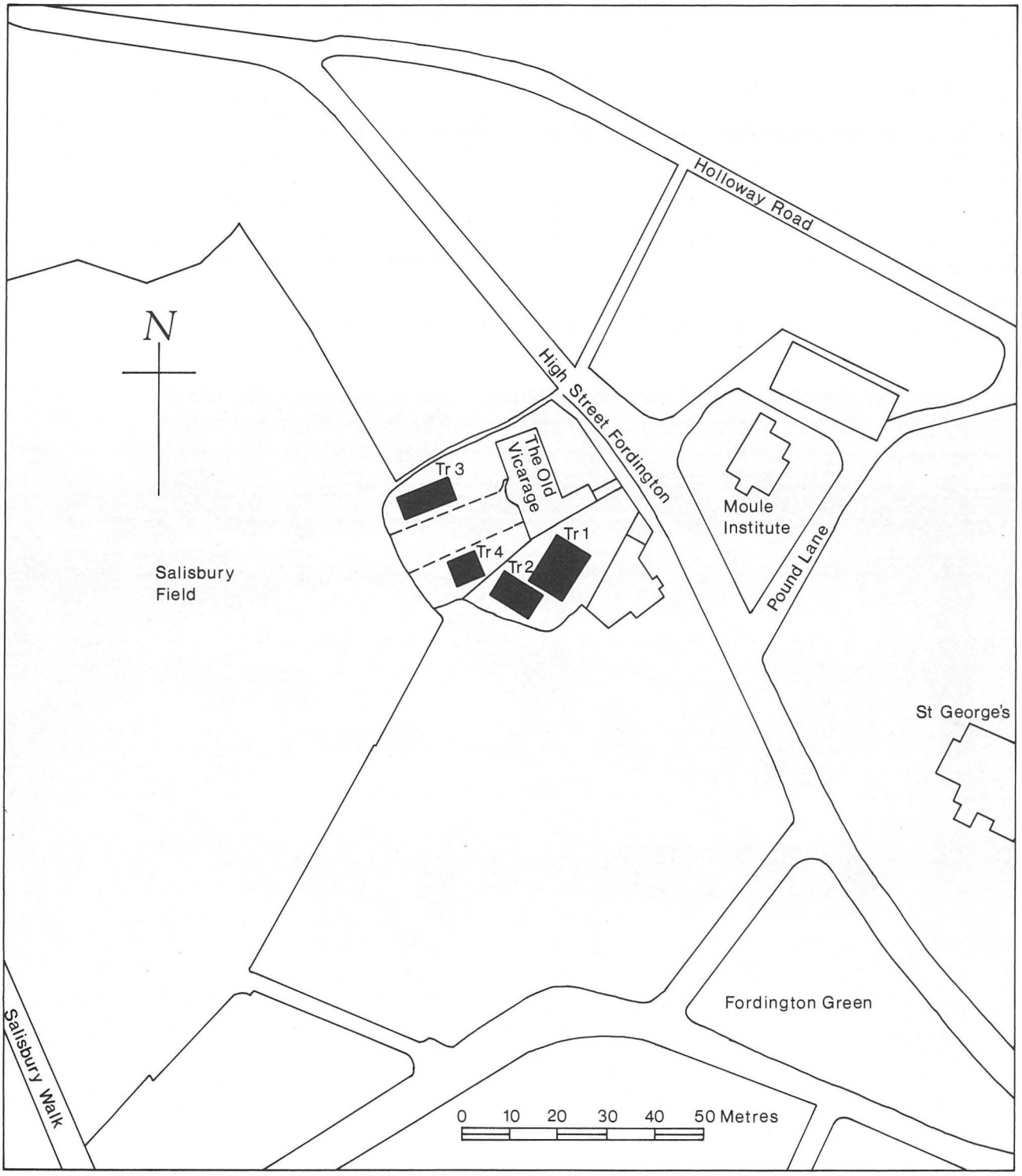


Figure 1. Fordington Old Vicarage site location plan.

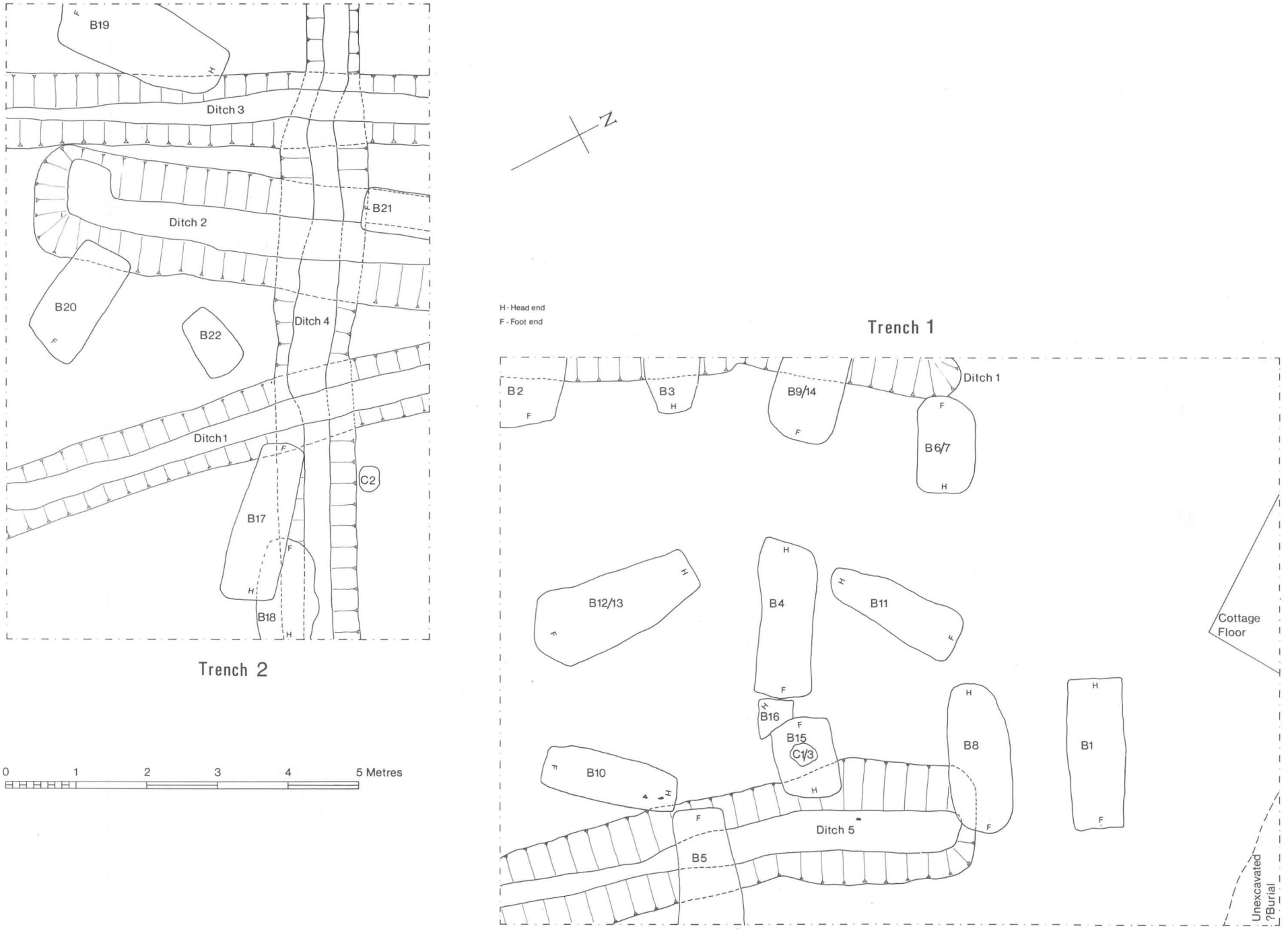


Figure 2. Fordington Old Vicarage: Plan of trenches 1 and 2 showing the graves and ditches.

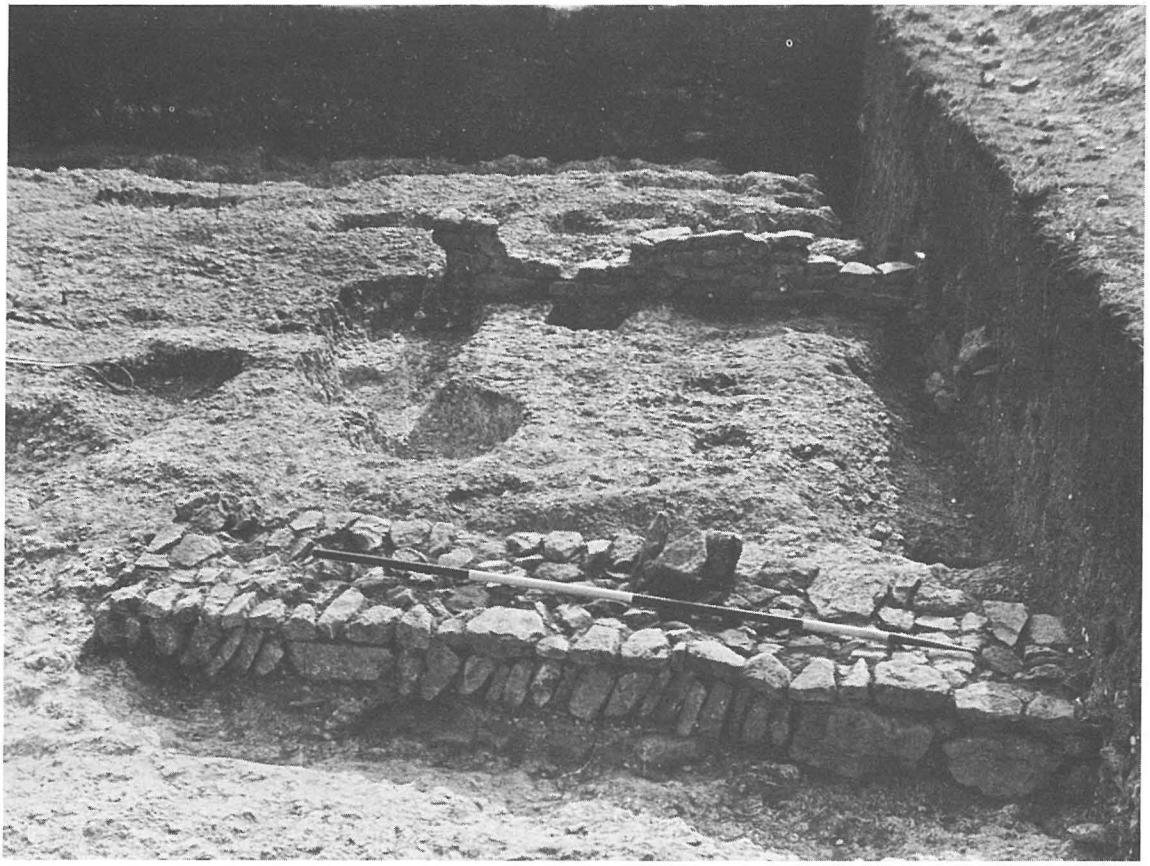


Plate 2. Fordington Old Vicarage: Trench 1 showing walls 2 and 3 looking south-south-west.

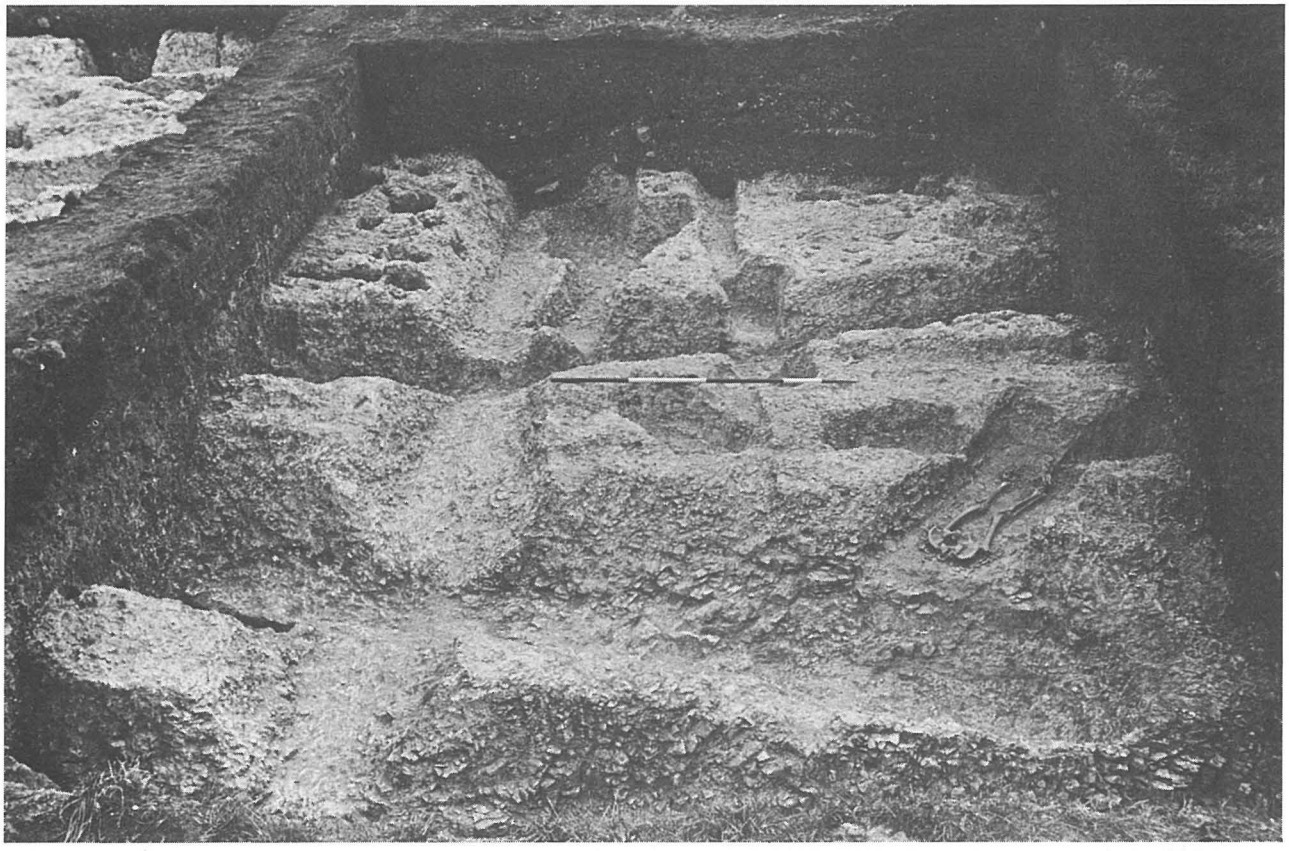


Plate 3. Fordington Old Vicarage: Trench 2 looking east-south-east; burial 20 right.

earth (graves 2, 3, 5 and 12); grave 8 also contained three layers of large limestone fragments. Little pottery was found with the burials (see below) and the only deliberately placed vessel was a New Forest indented beaker (Fig. 6.10), from burial 17. Thirteen of the burials were associated with coffin nails (burials 1, 2, 8, 9, 10, 12, 13, 14, 15, 17, 19, 21, 22) and seven had hobnails (burials 2, 9, 10, 13, 14, 19, 21). The only grave goods (Fig. 9) were a bronze bracelet from burial 12, a bronze finger ring from burial 4, and a bone pin from burial 9. There was no consistent orientation of the graves (Fig. 2) and even in the 10 graves positioned west-north-west–east-south-east, the end at which the head lay varied. Wherever the graves coincided with other features they proved to be earlier, while burial 17 was shown to be later than burial 18 (Pl. 9). A further six possible burials were left unexcavated, five in trench 4 and one in trench 1.

In addition to the inhumations, three cremations were also excavated. Two of the cremations (C1, C2) were contained in pots (Fig. 6, nos. 2 and 3) while the third (C3) came from below a cremation and may not be separate from it.

The area excavated is small compared with the potential burial area around Roman Dorchester and firm conclusions are impossible to make; a further complication is that very little is known of the archaeological context of other burials previously discovered near the site and now listed by the Royal Commission (1970). The site at Poundbury, on the opposite side of Dorchester, has produced a cemetery of the late Roman period with a disciplined east-west layout; this contrasts sharply with the lack of orientation of the Fordington burials. Previous reports (RCHM, 1970), however, suggest that Poundbury, not Fordington, may be the exception to the rule.

The Fordington burials can probably safely be assigned to the Roman period, and dated with reference to the pottery to between the 2nd and 4th centuries. The evidence, however, is by no means conclusive for the majority of graves, and later datings are possible.

The close juxtaposition of burials 15 and 16, and cremations 1 and 3, may suggest a connection between them, but no further evidence can be offered; the same is also true of burials 6 and 7, where the child burial (burial 13b) lay directly above the adult burial (B7) but had been interred without disturbing it.

The total absence of burials in trench 3 was surprising, but without more extensive excavation of the surrounding area, further comment is impossible.

Miscellaneous Small Features (Fig. 3)

As a direct result of Victorian and later gardening only a few, very modern features, could be recognised above the level of the natural subsoil. In trench 2, where two chalk spreads derived from the ditches did survive (layers 4, 12), several features could be interpreted as earlier than one of the ditches (see below) while, in both trenches 1 and 2, the features proved to be later than the burials with which they came into contact. In addition to the features shown on the plan (Fig. 3) and listed below were a number of other small disturbances of the natural chalk which were probably due either to weathering, animal burrowing, or gardening work.

Slots or Shallow Gullies

The fill is grey earth with small rounded chalk fragments unless otherwise stated; the dimension given is maximum diameter; and there are no finds unless otherwise stated.

1 Trench 2: 10 cms.
2 Trench 2, layer 43: 6 cms; cuts burial 22.
3 Trench 2, layer 33: 10 cms; one Roman body sherd; partially sealed by the lower chalk spread; note the shallow ?slot to one side of this feature.
4 Trench 2, layer 26: 30 cms; one ?Roman body sherd; partially sealed by upper chalk spread; note the shallow ?slot to one side of the feature.
5 Trench 1, layer 62: 10 cms; relationship with burial 2 unclear.
6 Trench 1, layer 42: 16 cms; relationship with burial 2 unclear.
7 Trench 1, layer 19: 12 cms.

Other Small Features

8 Trench 2, layer 27: Fill, brown clayey earth with small chalk fragments; 24 cms.
9 Trench 2, layer 28: 20 cms; later than burial 19.
10 Trench 2: Fill, brown earth +; 40 cms; later than burial 20.
11 Trench 2, layer 41: Fill, light-brown earth +; 30 cms.
12 Trench 2, layer 42: Fill, light-brown earth +; 33 cms.
13 Trench 2, layer 44: 8 cms.
14 Trench 2, layer 45: 10 cms.
15 Trench 2, layer 24: 60 cms; one Roman body sherd; relationship unclear with both ditch and slot, partially sealed by lower chalk spread.
16 Trench 2, layer 32: 20 cms; cut into ditch 1, sealed by lower chalk spread.
17 Trench 2, layer 25: 25 cms; relationship unclear with ditch and slot, sealed by upper chalk spread.
18 Trench 2, layer 18: Fill, brown earth +; 10 cms; several fragments of Iron Age pottery; cut by ditch 1.
19 Trench 2, layer 20: Fill, brown earth +; 20 cms.
20 Trench 2, layer 19: Fill, brown earth +; 20 cms; cut by 21, partially sealed by upper chalk spread.
21 Trench 2, layer 21: Fill, brown earth +; 10 cms; cuts 20, sealed by upper chalk spread.
22 Trench 2, layer 47: Fill, brown earth +; 45 cms; one Roman body sherd; sealed by upper chalk spread.
23 Trench 2, layer 31: 25 cms.
24 Trench 2, layer 30: 25 cms; two features.
25 Trench 2, layer 54: 10 cms.
26 Trench 2, layer 29: 30 cms.
27 Trench 2, layer 53: Fill, brown earth +; max. d. 15 cms.
28 Trench 2, layer 48: 12 cms.
29 Trench 1, layer 42: 20 cms; void visible in feature 6.
30 Trench 1, layer 42: 13 cms; void visible in feature 6.
31 Trench 1, layer 42: 18 cms; void visible in feature 6.
32 Trench 1, layer 62: 10 cms.
33 Trench 1, layer 42: 10 cms.
34 Trench 1, layer 25: 24 cms.
35 Trench 1, layer 45: 10 cms.
36 Trench 1, layer 44: 6 cms.
37 Trench 1, layer 26: 10 cms.
38 Trench 1, layer 27: 17 cms.
39 Trench 1, layer 20: 20 cms; one Roman body sherd.
40 Trench 1, layer 76: 14 cms.
41 Trench 1, layer 46: 8 cms.
42 Trench 1, layer 96: 27 cms.
43 Trench 1, layer 120: 16 cms.
44 Trench 1, layer 74: 10 cms.
45 Trench 1, layer 97: Fill, black earth; 8 cms.
46 Trench 1, layer 121: 15 cms.
47 Trench 1, layer 95: 9 cms.
48 Trench 1, layer 77: 22 cms.
49 Trench 1, layer 56: 16 cms.
50 Trench 1, layer 94: 30 cms; later than burial 12/13.
51 Trench 1, layer 79: 22 cms; later than burial 12/13, cuts 52.
52 Trench 1, layer 78: 12 cms; later than burial 12/13; cut by 51.
53 Trench 1, layer 118: Fill, brown earth +; 33 cms; later than burial 12/13.
54 Trench 1, layer 122: 14 cms; later than burial 12/13.
55 Trench 1, layer 123: 6 cms; later than burial 12/13.
56 Trench 1, layer 84: Fill, brown soil +; 11 cms; later than burial 4.
57 Trench 1, layer 124: Fill, brown soil +; 8 cms.
58 Trench 1, layer 59: Fill, brown soil +; 5 cms; later than burial 12/13.
59 Trench 1, layer 113: Fill, brown soil +; 20 cms; cuts 60.
60 Trench 1, layer 112: Fill, brown soil +; 30 cms; cuts 59.
61 Trench 1, layer 102: Fill, black soil; 8 cms.
62 Trench 1, layer 99: Fill, brown soil +; 34 cms; cuts 63.
63 Trench 1, layer 100: Fill, brown soil +; 22 cms; cut by 62.
64 Trench 1, layer 104: 40 cms; later than burial 10.

65 Trench 1, layer 80: 10 cms.
66 Trench 1, layer 106: 20 cms; later than burial 10.
67 Trench 1, layer 98: 6 cms.
68 Trench 1, layer 115: 24 cms.
69 Trench 1, layer 116: 18 cms; later than burial 16.
70 Trench 1, layer 117: 11 cms; later than burial 16.
71 Trench 1, layer 72: 12 cms; later than burial 16.
72 Trench 1, layer 73: 9 cms.
73 Trench 1, layer 34: 11 cms.
74 Trench 1, layer 28: 5 cms.
75 Trench 1, layer 132: Fill, grey soil +, charcoal flecks, one limestone fragment; 16 cms; later than burial 9/14.
76 Trench 1, layer 29: 6 cms.
77 Trench 1, layer 10: Fill, black soil and brick frags.; 12 cms.
78 Trench 1, layer 52: Fill, brown-grey soil +; 23 cms; cut by 79.
79 Trench 1, layer 51: Fill, brown soil +; 30 cms; cuts 78.
80 Trench 1, layer 30: Fill, brown soil +; 24 cms.
81 Trench 1, layer 107: Fill, brown soil +; 18 cms.
82 Trench 1, layer 110: Fill, brown soil +; 12 cms.
83 Trench 1, layer 129: Fill, brown soil +; 8 cms.
84 Trench 1, layer 71: Fill, brown soil +; 8 cms.
85 Trench 1, layer 70: Fill, grey earth +; 4 cms.
86 Trench 1, layer 127: Fill, grey earth + and 2 limestone fragments; 12 cms.
87 Trench 1, layer 31: Fill, grey earth + and several small flints; 36 cms.
88 Trench 1, layer 32: Fill, grey earth + and puddled chalk and chalk fragments; 36 cms.
89 Trench 1, layer 47: 10 cms.
90 Trench 1, layer 58: 22 cms.
91 Trench 1, layer 48: Grey earth + and limestone fragment packing; 42 cms.
92 Trench 1, layer 49: Fill, grey earth + and limestone fragment packing; 50 cms.
93 Trench 1, layer 67: 12 cms.
94 Trench 1, layer 54: One tile fragment; 28 cms.
95 Trench 1, layer 55: Fill, grey earth + and limestone fragment packing; 44 cms; post-medieval body sherds.
96 Trench 1, layer 37: Fill, grey earth + and several large chalk fragments; 40 cms; one medieval body sherd; later than burial 1.
97 Trench 1, layer 36: 30 cms; one medieval body sherd; later than burial 1.
98 Trench 1, layer 57: 20 cms.
99 Trench 1, layer 41: Fill, grey earth + and semi-puddled chalk packing; 30 cms; post-medieval body sherd.
100 Trench 1, layer 39: 14 cms.
101 Trench 1, layer 91: 8 cms.
102 Trench 1, layer 38: Fill, grey earth + and some small flint packing; 20 cms; medieval body sherds.
103 Trench 1, layer 40: Fill, grey earth + and limestone fragment packing; 18 cms.
104 Trench 1, layer 50: 33 cms; one medieval body sherd; ?cuts unexcavated grave.
105 Trench 1, layer 35: 19 cms.

Also shown on the plan, but not listed here, are several small features which can reasonably be interpreted as stake-holes.

Only those, very few, of the above features listed that contained stone or chalk packing, can safely be interpreted as postholes; it is noted that these features, with one exception (no. 77), clustered just behind the cottage and that two of them contained post-medieval pottery. When discussing the rest of the features it must be remembered that agriculture, grave and ditch digging, and, not least, modern gardening will all have left their mark on the natural chalk. Even interpreting all the disturbances as of structural significance, little pattern can be deduced; extension to form a larger, more helpful, plan area was, unfortunately, impossible, owing to lack of time and the encroachment of the spoil heaps over all of the spare ground around the trenches. It is, however, interesting to note that the chalk to the south of ditch 4 seems to have been terraced by up to as much as 10 cms, and this may suggest a structural connotation for the slots (features 1, 2, 3 and 4) in the trench.

Dating

Absence of stratigraphy and finds make the dating of the majority of the features impossible. In trench 2, the features sealed by the chalk spreads may at least be interpreted as earlier than ditch 4, which contained five body sherds of ?13th century pottery; and there is no reason why some of these features could not be given a Roman, or even pre-Roman date.

Pit 1 (trench 1, layer 17). Shallow scoop up to 50 cms deep. The fill was of dirty repacked chalk, fragments of slate and grey-brown earth, and contained a few sherds of post-medieval pottery. Probably associated with the cottage.

The Walls

Wall 1 (trench 1). One layer of flint and limestone rubble set on mixed grey, chalk-flecked earth about 20 cms above the natural subsoil. Presumably the foundation of a wall, possibly relating to the cottage.

Wall 2 (trench 1). One course of the actual wall remained, above one layer of pitched limestone fragments set onto natural. The wall was limestone faced with flint and limestone rubble infill and only survived in western part of trench where it was set into a scoop in the chalk, but traces could be detected as far east as ditch 5. No definite dating evidence for this wall, but pieces of it survived above burial 8, and a few body sherds of ?13th century to early 16th century pottery were recovered from the associated scoop (layers 21, 22).

Wall 3 (trench 1). One face of horizontally placed limestone fragments with, in one place, up to five courses surviving. Set on to natural chalk. No dating evidence, but this wall overlay both burials 9/14 and ditch 1.

No further interpretation can be offered for the above three walls.

Wall 4 (trenches 3 and 4). See ditch 7.

Ditches (Figs. 2, 3, 4 and 5)

Ditch 1 (trench 1, layer 33; trench 2, layer 15). This ditch was filled with homogenous grey-brown clayey earth with small rounded chalk fragments, occasional limestone fragments and charcoal flecks. It was curved, and ran approximately north-east to south-west at the northern end, changing to a north-south direction at the southern end. It had a maximum depth of 70 cms, generally sloping away to the south but not as quickly as the natural chalk. The alignment may suggest a relationship with ditch 5. The ditch cut through burials 2, 3 and 9/14, was cut by ditch 4, and was partially sealed by both chalk spreads. Finds included seven abraded Roman body sherds, some bone and occasional oyster shells.

Ditch 2 (trench 2, layers 17, 50, 51). The lower 15 cms of the fill (layer 51) consisted of a grey silty soil with light chalk flecking; this layer existed mainly in the deeper ditch terminal, but did extend slightly into the main ditch area. Above this, in the ditch terminal, was a layer (layer 50) of small chalk rubble, with occasional limestone fragments, in grey clayey earth; outside the terminal, this gradually merged into the general ditch fill (layer 17). The fill of the rest of the ditch was a homogeneous grey clayey soil with small rounded chalk fragments, occasional chalk blocks, and some charcoal flecking. Partially sealing this ditch, and slumping into the terminal, was a mixed layer of earth and medium chalk fragments (layer 15) which appeared to be rather dirty and disturbed continuation of the lower chalk spread. The ditch cut burials 20 and 21, was cut by ditch 4, and was partially sealed by the lower chalk spread. The only finds were three Roman body sherds from the general ditch layer. The maximum depth of this ditch was 80 cms in the terminal, and the lower layer (layer 51) can probably be interpreted as the result of water-born silt.

Ditch 3 (trench 2, layer 10). Homogeneous chalky brown-grey clayey soil with small rounded chalk fragments, occasional chalk blocks, and several large limestone fragments made up the fill of this ditch, which differed from the fills of ditches 1, 2, 4, 5 in that it was more chalky. The ditch, which sloped downwards towards the southern end, had a maximum depth of 86 cms, cut grave 19, and was cut by ditch 4. Finds included a relatively undateable medieval body sherd with a grey gritty fabric and several Roman

Figure 3. Fordington Old Vicarage: Plan of trenches 1 and 2 showing the ditches and other features.

body sherds. It is conceivable that this ditch may have been related to the lower chalk spread, but, unfortunately, modern disturbance at the western end of the trench had destroyed all the stratigraphy above the level of the natural chalk.

Ditch 4 (trench 2, layer 9). In the deeper parts of this ditch, which had quite an uneven bottom, were patches of grey silty soil with low chalk content. The general fill was a homogeneous grey clayey soil with small rounded chalk fragments and occasional lenses of charcoal. The ditch had a depth of 60 cms, cut burials 17, 18, 21, and cut across ditches 1, 2 and 3. Finds included seven medieval body sherds, several abraded Roman sherds, and some animal and human bones. At the east end of the trench it could be shown that this ditch was cut from about 35 cms above the natural chalk and was directly related to the upper chalk spread. A rather

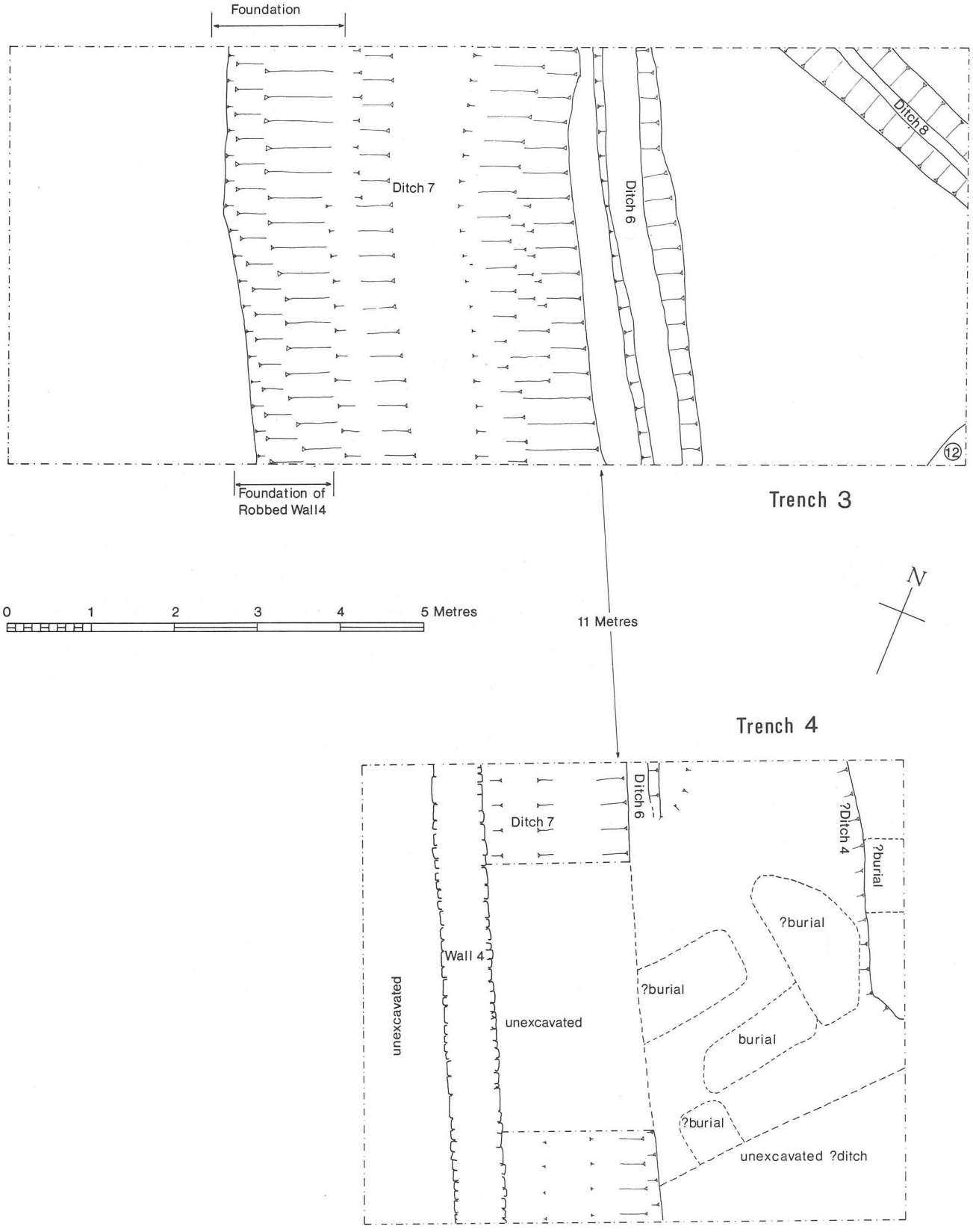


Figure 4. Fordington Old Vicarage: Plan of trenches 3 and 4.

fragmentary chalk spread appeared at a similar level at the very south end of trench 1, where it overlay ditch 5. It was hoped that we would have been able to have traced ditch 4 in trench 4, but all that remained was a slight terracing of the natural chalk (Fig. 4).

Ditch 5 (trench 1, layers 63, 86, 87). The general fill of the ditch (layers 63, 87) consisted of a grey-brown clayey soil with small rounded chalk fragments. At the southern end, betweeen 30-40 cms up from the ditch bottom, was a 10 cms thick layer of fairly clean brown clay (layer 86) which sealed occasional patches of charcoal and separated the two general layers. At the north end, where the clay layer was missing, the fill contained several large limestone fragments. The ditch had a maximum depth of 80 cms, sloped down away to the south, cut graves 5, 9 and 15 and was partially sealed by a dirty chalk layer (layer 60), possibly a continuation of the upper chalk spread from trench 2. There were no dateable finds from this ditch, but, as has been previously mentioned, its alignment may relate it to ditch 1.

Stratigraphy Associated with Ditches (trench 2, layers 13, 12, 11, 4)

Directly above the natural chalk and below the chalk spreads was a 20 cms thick layer of grey earth with small rounded chalk fragments (layer 13). This layer contained animal bones but no pottery and was only definable where the chalk spreads survived. Only ditch 4 definitely cut through this layer, which could not be separated from the fills of the other ditches. Overlying this was a spread of angled chalk fragments, up to 10 cms in size, with occasional small limestone fragments and light charcoal flecking (layer 12). This lower chalk spread was up to 10 cms, contained animal bones but no pottery, and showed no sign of having been ploughed up or walked upon. Between this spread and the upper chalk spread were some 15 cms of grey-brown silty earth with light chalk and charcoal flecking (layer 2). This layer contained animal bones and four sherds of probably 13th century pottery (no. 16). The upper chalk spread (layer 4) consisted of fairly clean, semi-puddled trampled chalk with chalk fragments up to 10 cms in size. The soil above this spread was all disturbed, either in Victorian or modern times, but a rather discontinuous dirty chalk layer (layer 3), possibly an extension of the chalk layer, could be traced over parts of ditch 3. The upper chalk spread was quite clearly related to ditch 4, and may have extended into the very southern end of the trench 1 (layer 60).

Summary

The purpose of these ditches is unknown but they may have possibly formed land boundaries in the medieval period: judging from the small amount of pottery associated with them probably around the 13th century. As a result of the slope of the ditches they could also have provided some drainage facilities. Except for the terminal of

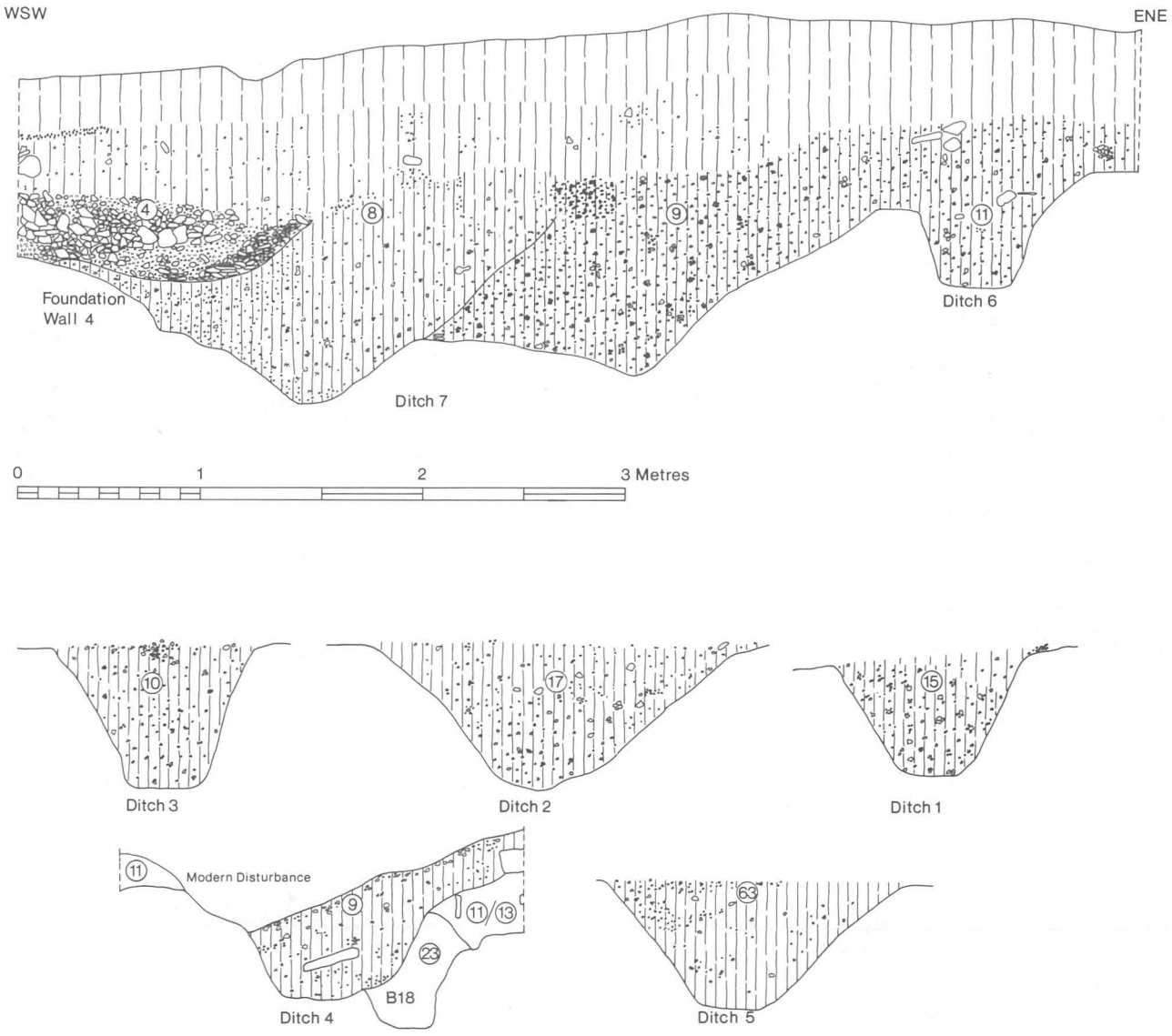


Figure 5. Fordington Old Vicarage: Sections. Top ditches 6 and 7 and wall B in trench 3 northern section; bottom ditches 1, 2 and 3 north section of trench 2; and ditch 5 northern section at burial 5 in trench 1.

ditch 2, where the rubble layer was probably deliberate, the fills were all due mainly to natural deposition and contained few finds; occupation sites, therefore, were probably at some distance from the area. If the ditches were meant to bound cultivated land, the chalk spreads would have been unlikely to survive, and if they were meant to bound pasture land, the chalk would have been a nuisance; only with much larger scale excavations can we hope either to answer the question of their use or to determine whether they form a meaningful sequence. Directionally, the later ditch 4, with its east-west alignment, would seem to be the odd-one-out and this may have been related to a complete change of policy following the development of the earlier boundaries.

Main Boundary Ditches (Figs. 4 and 5)
Ditch 6 (trench 3, layer 2 and trench 4). The ditch was filled with homogeneous grey-brown chalky earth with small rounded chalk fragments. It was to 55 cms deep in trench 3, but only existed as a terracing in the much disturbed trench 4. Ditch 6 ran parallel to ditch 7, and contained pottery (nos. 17-19) probably dating from the 13th century. Ditch 6 is probably earlier than ditch 7, and might be interpreted as a bedding trench for a structure or hedge to fence off the ditch.
Ditch 7 (trench 3, layers 5, 7, 8, trench 4, layer 4). The fill of the ditch consisted of homogeneous chalky grey-brown soil with small rounded chalk fragments, and occasional larger fragments of chalk and limestone. Ditch 7 was in fact two ditches, an original one about 1 m deep (layer 7) and a later recut (layer 8) some 15 cms deeper, slightly to the south-west. The fill of the later ditch was less chalky. The pottery from the two ditches (nos. 20-48) was similar and both are given a 14th century date. Directly above the later ditch in trench 4 was the remains of a narrow wall (wall 4); the foundations of this wall appeared, also above the later ditch, in trench 3.

Wall 4 (trenches 4 and 3) (Fig. 4). Up to four courses of the wall remained, which was limestone faced on both sides with a limestone and flint rubble infill. The wall was founded on a scoop, some 40 cms deep, filled with chalk, flint, limestone and slate fragments in a grey earth and mortar matrix (trench 3, layer 4). In trench 3 the wall had been completely robbed and only the foundation remained. The few sherds of pottery from the foundation were of similar fabric and form to the pottery from ditch 7. It was not possible to accurately date the robbing of wall 4, but this probably occurred during the life of the Old Vicarage; the robber trench could be detected at about 50 cms below the present-day ground surface.

Summary
The ditches and the wall would appear to represent a major boundary functioning from some time in the 13th or 14th centuries until probably at least the start of the 19th century; it is possible that they marked out common land on what is now Salisbury Fields.

Further Notes
Trench 3. A short portion of ditch (trench 3, layer 9, ditch 8) ran across the north corner of trench 3. This ditch was 33 cms deep, was filled with grey-brown earth and small rounded chalk fragments, and contained no finds. The edge of another possible ditch (layer 12) with a similar fill ran across the east corner of the trench. The maximum depth of topsoil in trench 3 was about 30 cms, while other than the ditches, there was in contrast to the other trenches, no features and little disturbance of the natural chalk. Had time allowed, further excavation in the area around the trench and towards trench 4 might well have repaid the effort.
Trench 4. Lack of time did not allow full excavation of this trench. Modern disturbance had eroded the level of the chalk far more than in the other trenches; had this not been so we might have been able to gain further information about the relationship of the smaller ditches to the later major boundary.

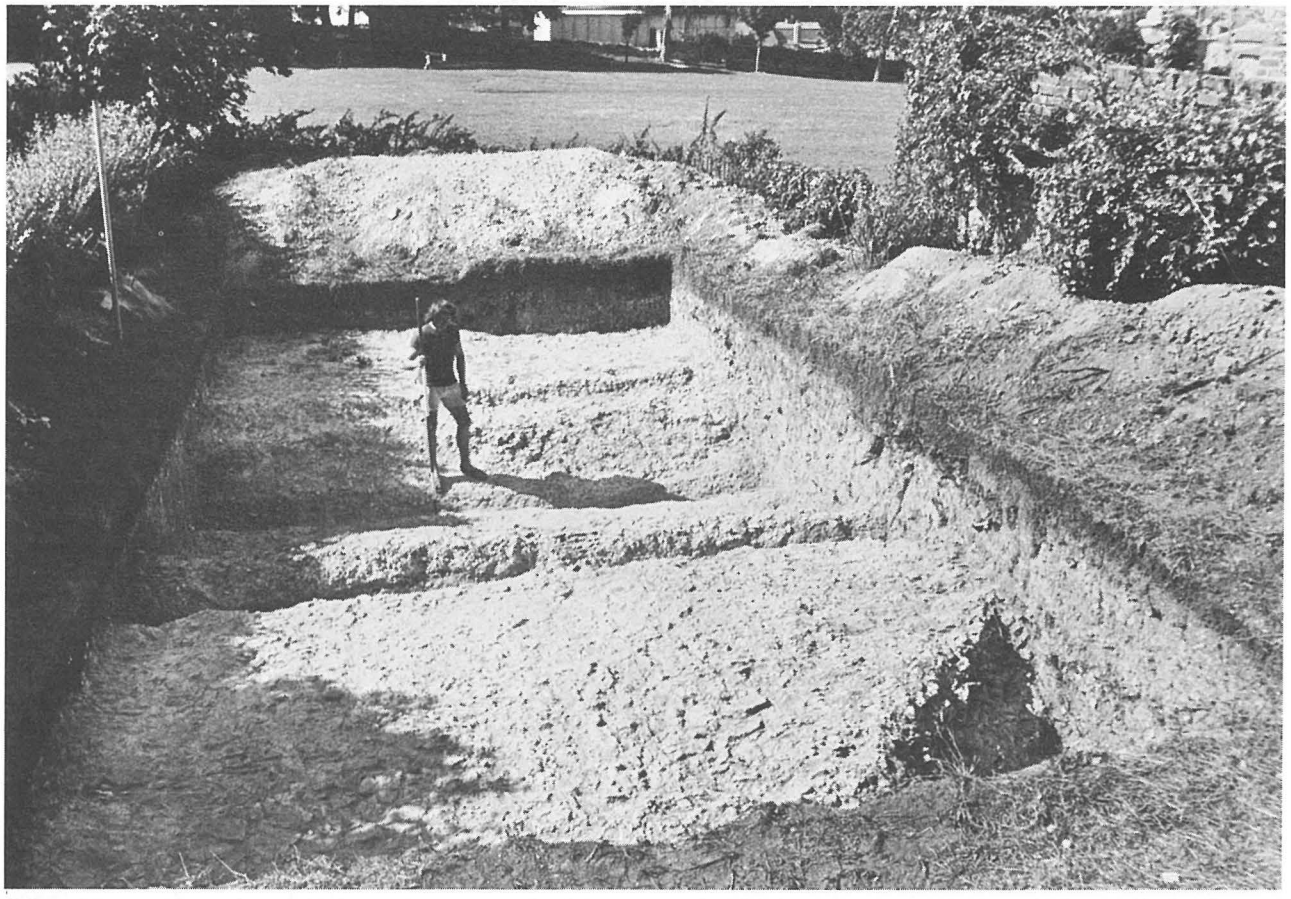


Plate 4. Fordington Old Vicarage: Trench 3 looking south-west. The figure is standing in ditch 7; Salisbury Fields in the background.

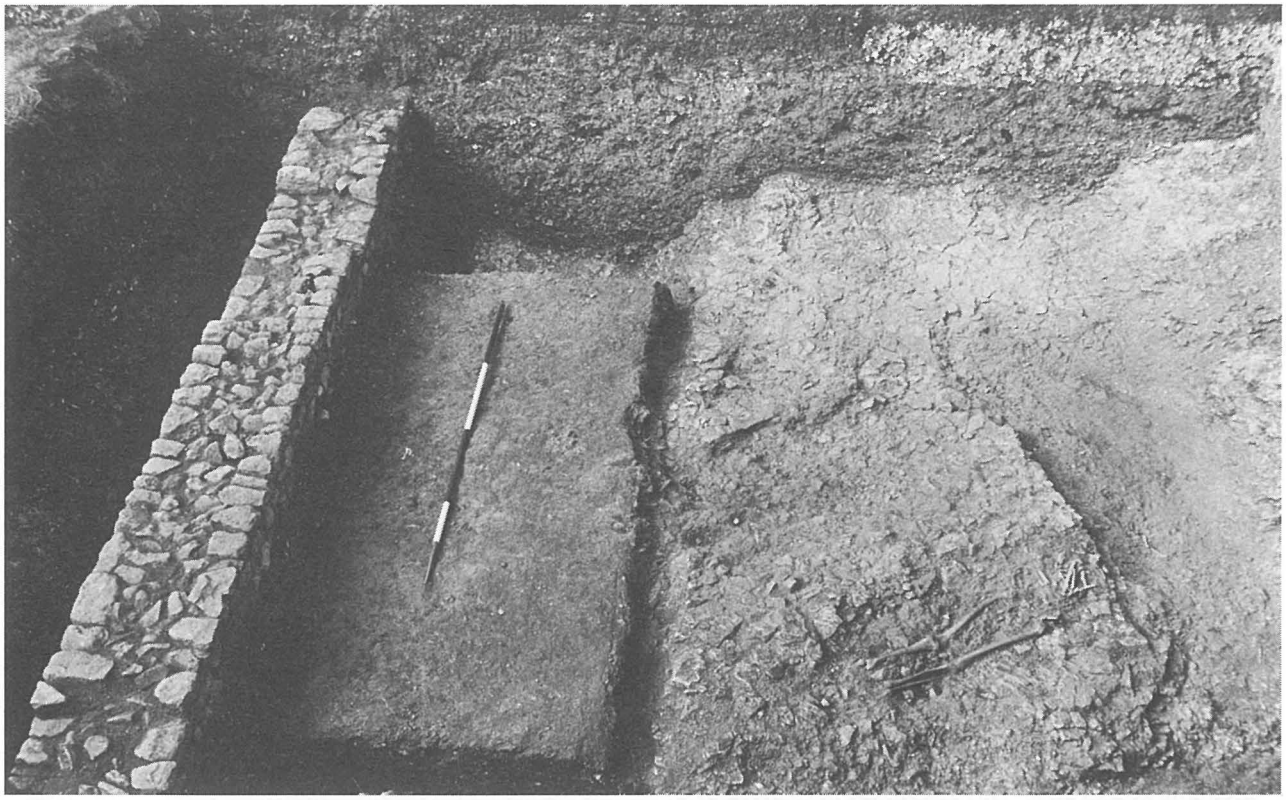


Plate 5. Fordington Old Vicarage: Trench 4 looking north-west. Boundary ditch 7 with wall 4 above.

THE HUMAN BURIALS

B. HOOPER

The small number and incompleteness of some of the inhumations precludes any elaborate statistical analysis, and only a few basic measurements have been recorded. The bones have however yielded a certain amount of non-metrical information which has afforded a small glimpse into the lives of some of the individuals. This information is based upon skeletal changes wrought by disease and injury. Conclusions as to the health of the group are necessarily conservative since there are many diseases that do not affect the skeleton.

Age at Death. In assessing the age of each individual a number of criteria were studied, including the degree of ossification of the extremities of the long bones, age changes in the pubic symphysis, degree of closure of the spheno-occipital suture, development and wear of the dentition, and amount of osteoarthritis present.

Sex. Because of its adaptation in the female for child-bearing, the pelvic girdle is the most reliable guide to the sex of a skeleton. Wherever possible in this study it has been used as the principle sex indicator followed by the skull, scapula, sternum, clavicle and sacrum.

It is not usual to attempt to sex the skeletons of children as their bones have not fully developed and the usual criteria of sexual dimorphism are not clearly defined. Despite this reservation a tentative conclusion as to sex has been made in one instance, that of burial 12 which appears to be female.

With adult skeletons there are usually a small number that prove difficult or even impossible to sex accurately. When incomplete and fragmentary remains are present the chances of error are naturally higher. Of the 15 adults examined two remain unsexed due to incompleteness and three have been only tentatively sexed. The remainder presented little difficulty and they have been sexed accordingly.

Stature. Estimates of stature have been made using the computed formula of Trotter and Glesser (1952 and 1958). These formulae although based upon modern Americans of European origin are generally considered to be the most reliable at present available.

The average height of the adult males was found to be 170.5 cms (5 ft. 7 ins.) and the females 157 cms (5 ft 1¾ ins.). Skeletons of doubtful sex have not been included in the calculations.

Non-metrical Data. A number of non-metrical or discontinuous morphological traits mainly of genetic origin have been recorded.

Several of the skulls have extra ossicles along the sutures. These ossicles or wormian bones are a commonly reported anomaly. Torgersen (1954) is of the opinion that they are inherited as dominant traits with a penetrance of about 50 per cent.

Seven skulls (Pl. 10) have orbital osteoporosis (*Cribra orbitalia*) a pitting of the roof of the orbits (Pl. 10). The aetiology of this condition is still the subject of debate. It may result from an enlargement of the lacrimal gland or even be caused by an unidentified deficiency disease. Wells (1964) mentions another possibility, that of panophthalmia or generalised infection of the eye leading to blindness. He points out that it is more frequent in childrens skulls and that among Anglo-Saxons it was found in 6 per cent of 200 skulls. There is no mention of it occurring in the large Romano-British cemetery at Trentholme Drive, York.

The retention of the interfrontal or metopic suture into adulthood is a common anomaly, with an incidence of 8.5 per cent among Caucasoids (Ashley Montagu, 1951). There are two instances among the Fordington burials (Pl. 10). Ashley Montagu (1937) considers it to be dependent upon the genetic background with genes for metopism and non-metopism.

A patent premaxillary suture and various foraminal anomalies have been noted in three of the skeletons. Percent-

age frequencies for these traits have been published by a number of authors (Wood-Jones, 1931; Riesenfeld, 1956, *et al.*). Unfortunately these anomalies are not always recorded and there is little that can be concluded about them at this stage beyond their being genetic in origin.

Two uncommon anomalies of the spine were found in burial 10. The first is a detached neural arch of the 4th lumbar vertebra and the second is a supernumerary vertebra in the cervical region. Extra vertebrae are a fairly rare abnormality and there appears to be no published frequency for British material. Allbrook (1955) in a study of the East African vertebral column in relation to race variability published a frequency range of 2-12 per cent for different groups.

Pathology. The most frequently reported skeletal disease is osteoarthritis, a degenerative wear and tear process occurring in the joints. It appears mainly in the heavily stressed joints of the lower limbs and spinal column. Over 75 per cent of the mature individuals from the Fordington Cemetery were found to be affected with the disease to a greater or lesser degree. Such a high percentage suggests that heavy manual labour was being carried out by male and female alike, perhaps agricultural work.

The dental health of the group was low. Of the thirteen jaws examined nine had paradontal disease, five were carious and two others had abscesses. The attrition on the occlusal surfaces of most of the teeth points to a coarse and abrasive diet. The use of laval querns in the preparation of food would have ensured a considerable amount of unwanted grit being eaten. This grit would have acted as a severe abrasive agent upon the teeth and caused irritation and subsequent disease of the soft tissues of the mouth. The incidence of caries is quite high for an early group.

Skeletal Adaptation. The most common skeletal adaptation noted among these skeletons is the so-called squatting facet (Pl. 10). Squatting facets are anterior extensions of the ankle joint and are thought to be a consequence of the habit of squatting when at rest. They are uncommon in Romano-British groups and when they do occur are more frequent in women than men. Of the 350 burials excavated at Trentholme Drive, York, only five females had squatting facets (Warwick, 1968). They occur frequently in Early and Middle Saxon groups but are much less common in Late Saxon cemeteries. The dearth of facets in this last period presumably indicates the increased usage of benches and chairs. At Fordington eight adults and one child have clearly defined squatting facets. Three, possibly four of these individuals are males. If all of these burials are contemporary then the squatting habit might well suggest that these people occupied a low social and economic position in society.

The remarkably round-headed skull of burial 17 is also noticeably flattened in the occiptal region. Binding of the head to a wooden cradleboard during infancy could produce this effect. Wells (1967) found that 41.3 per cent of the Saxon skulls from Red Castle, Thetford, had a marked plagio-cranial flattening and concluded that this deformation was accidental. The most likely cause being a cradling or head-binding habit in infancy.

Trauma. Burial 10, an elderly female had been decapitated. Whether this was an execution or a post-mortem beheading for ritual reasons is impossible to ascertain. The axe or sword cut through the 4th and 5th cervical vertebrae with a single stroke.

The fractures and other lesions in burial 13 may well be the consequences of a single incident such as a heavy fall. Whereas the fractured fibula and torn shoulder muscle of burial 7 are much less likely to be connected.

Signs of infection of the periosteum were found upon the shafts of the femora, tibiae and fibulae of burial 17. Such inflammatory lesions are often seen upon excavated material, but it is rarely possible to determine the cause.

Burial 1 (Trench 1, layer 18). Inventory: Complete skeleton lying supine with arms at sides and head turned to left.
Female aged *c.* 35 years. Stature: 162.2 cms (5 ft. 3¾ ins.).
Non-metrical Data. 1. Ossicles at left and right asterion.
2. Multiple mental foramina at left.
Skeletal Adaptation. Squatting facets on both tibiae (see Pl. 10).
Pathological Observations. Widespread osteoarthritis is present with much lipping as follows: margins of the trochlear of the right humerus, margins of the semilunar and radial notches of the right ulna, head of the right femur and the corresponding pelvic acetabulum, articulation of the lateral condyle of the left tibia which is also eburnated, the acromial and sternal ends of both clavicles and their corresponding articulations on the scapulae and manubrium, both 1st metatarsals and at least four phalanges. The spine is also considerably affected with osteophytes about the margins of the vertebral bodies and osteoarthritis of the articulations (see Table 1).
Dental Observations. The jaws have edge-to-edge bite with all of the teeth being crown-worn. Paradontal disease is present and the loss of the maxillary 1st molars may be attributable to this cause. Caries cavities are present in both upper 2nd molars. Radiographic examination showed that the maxillary and mandibular 3rd molars are congenitally absent.
Dental formula:[2]

C														C
7	×	5	4	3	2	1		1	2	3	4	5	×	7
/	6	5	4	3	2	/		1	2	3	4	5	6	7

TABLE 1
Osteoarthritis of articulations and osteophytes of vertebral bodies in burial 1.

Vertebra	Superior articular facet		Inferior articular facet		Osteophytes to vertebral body
	Left	Right	Left	Right	
Cervical 1					
Cervical 2			☆E	☆E	
Cervical 3	☆	☆E	☆E		☆
Cervical 4	☆E		☆E	☆E	☆
Cervical 5	☆	☆			☆
Cervical 6					☆
Cervical 7			☆	☆E	☆
Thoracic 1	☆E	☆	☆	☆E	–
Thoracic 2	☆E	☆		☆E	☆
Thoracic 3	☆E	☆E	☆	☆	☆
Thoracic 4	☆	☆E		☆E	☆
Thoracic 5		☆E		☆E	☆
Thoracic 6		☆E			☆
Thoracic 7					☆
Thoracic 8					☆
Thoracic 9					☆
Thoracic 10			☆E		☆
Thoracic 11	☆E				☆
Thoracic 12					☆
Lumbar 1	☆	☆			☆
Lumbar 2	☆	☆			☆
Lumbar 3			☆	☆E	☆
Lumbar 4	☆	☆	☆E	☆E	☆
Lumbar 5	☆E	☆E		☆E	☆
Sacral 1	☆	☆			

Key: ☆ = lipped, slight to moderate; E = eburnated; – = missing post-mortem.

[2] Dental formula: ×: ante-mortem loss; /: post-mortem loss; C: caries; A: abcess; U: erupting.

Burial 2 (trench 1, layer 89). Inventory: Lower legs only, lying supine. Post-excavation loss of bones.

Burial 3 (trench 1, layer 119). Inventory: Very fragmentary skeleton. Probably lying on its right side.
Neonatal.

Burial 4 (trench 1, layer 85). Inventory: Complete skeleton lying supine with arms at sides; right hand over right leg, left hand under left leg and right leg flexed with foot lying beneath tibia of left leg.
Male aged *c.* 30 years. Stature: 169.7 cms (5 ft. 6¾ ins.).
Non-metrial Data.
1. Slight orbital osteoporosis.
2. Retained metopic suture.
3. Multiple superior orbital foramina above left orbit.

Pathological Observations. Slight osteoarthritis is present at the costo-vertebral articulations and around the articular facets of some of the metacarpals, metatarsals and phalanges of the hands and feet. A more serious manifestation of the disease is in the cervical region of the spine, where C6 and C6 have fused together.
Dental Observations. All of the teeth are crown-worn with deposits of calculus. Paradontal disease is present and the loss of seven molars *ante-mortem* may be attributable to this cause.
There is a small enamel nodule or 'pearl' between the palatine and buccal posterior roots of the maxillary right 1st molar. Enamel nodules are fairly common developmental variations of the teeth. They vary in size and consist of a dentine core capped by a thick coating of enamel.
Dental formula:

× 7 6 / 4 3 / 1	1 2 3 4 5 6 7 ×
× × × 5 / 3 2 1	1 2 / 4 5 × 7 ×

Burial 5 (trench 1, layer 88). Inventory: Lower half of skeleton only, lying supine. (Remains of two other inhumations in the fill of this grave have been numbered 5a and 5b.) Probably male aged 25-30 years. Stature: 162.2 cms (5 ft. 3¾ ins.)
Skeletal Adaptation. Squatting facets on both tibiae.
Pathological Observations. The three surviving lumbar vertebrae have slight osteoarthritic lipping to their articular facets and vertebral bodies.
Burials 5a and 5b. Inventory: Miscellaneous fragments mixed with bones of domestic animals. Two adults of uncertain sex, one individual in 25-35 years age range, the other probably over 35 years.
Non-metrical Data. 1. Orbital osteoporosis (in both adults).
Pathological Observations. Slight osteoarthritic lipping is present about the olecranon of the right ulna and the radial tuberosity of the left radius. (Both bones appear to come from the same individual, presumed to be burial 5b).
Dental Observations. There is a paradontal abscess at the root of the 2nd right mandibular molar.
Note. Bronze staining present upon the right ulna of the individual presumed to be burial 5b.

Burial 6 (trench 1, layer 90). Inventory: Fragmentary skeleton. Neonatal.
Burial 7 (trench 1, layer 92). Inventory: Complete skeleton lying in a crouched position on its right side with arms flexed. Male aged above 45 years. Stature: 175.584 cms (5 ft. 9¼ ins.).
Non-metrical Data.
1. Two left lambdoid ossicles, one sagittal ossicle and an ossicle at the left asterion.
2. Very slight orbital osteoporosis.

Skeletal Adaptation. Squatting facets on both tibiae.
Pathological Observations. The bodies of the lumbar and three of the cervical vertebrae have slight osteophytes. The remaining fragment of C1 is eburnated on the right inferior articular facet. therefore most likely that the outgrowth is an osseous response to a tearing of the fibres of this ligament in an injury to the acromioclavicular articulation.

Trauma. There is a well healed fracture in the upper third of the right fibula (see Pl. 10). Fractures of the fibula shaft are usually accompanied by damage to the tibia or the ankle joint. In this instance neither appear to have suffered any injury. The fracture may therefore have been caused by a direct blow above the bone. The right clavicle has a bony outgrowth on the coracoid tuberosity. It is at this point that the conoid ligament is attached, it is

Dental Observations. All of the teeth are considerably crown-worn. Paradontal disease has caused some alveolar resorption and the loss of the left 3rd mandibular molar.
Dental formula:

Bone missing	
8 7 6 5 4 / / 1	1 2 3 / / 6 7 ×

Burial 8 (trench 1, layer 93). Inventory: Complete skeleton lying supine with arms at sides and hands together on trunk, with head lying to the right.
Adult (skeleton lost post-excavation).

Burial 9 (trench 1, layer 103). Inventory: Skull and heavily disturbed bones. (There are the remains of at least two burials among these bones. The skull has been designated burial 9 and a pelvis and tibiae have been tentatively assigned to it. Another pelvis and tibiae have been designated as burial 9a. A number of vertebrae, ribs, ulnae, radii, phalanges, etc., including a phalanx with bronze staining, cannot be positively attributed to either burial. In view of the doubtful elements of these two burials no stature estimates have been made).
Non-metrical Data.
1. Right and left lambdoid ossicles and an ossicle at right asterion.
2. Slight orbital osteoporosis.

Skeletal Adaptation. Squatting facets on both tibiae.
Dental Observations. All of the remaining teeth are slightly crown-worn. Paradontal disease is present and probably accounts for the loss of the mandibular 1st molars.
Dental formula:

/ 7 × 4 5 / /	/ 2 3 4 / × 7 /
8 Bone missing	1 2 3 Bone missing

Burial 9a. Inventory: Pelvic fragments and tibiae.
Probably female aged *c.* 25 years.
Skeletal Adaptation. Squatting facets on both tibiae.

Burial 10 (trench 1, layer 105; Pl. 6). Inventory: Complete skeleton lying supine with arms at sides and hands on thighs. Severed head and first three cervical vertebrae placed between the knees. Female above 50 years of age and slightly built. Stature: 157.7 cms (5 ft. 2 ins.).
Non-metrical Data.
1. One supernumerary cervical vertebra.
2. Detached neural arch of 4th lumbar vertebra. (The 5th lumbar vertebra may have had a partially attached neural arch. The bone is damaged making it impossible to establish this with certainty.)

Skeletal Adaptation. Squatting facets on both tibiae.
Pathological Observations. Widespread osteoarthritis has resulted in lipping of the pelvic acetabula, the heads and distal articulations of the femora, the proximal articulations of the tibiae, the medial and lateral epicondyles of the humeri, the head of the right humerus (left missing), the radial tuberosities, vertebral articulations of the ribs, the costal and clavicular articulations of the sternum and several of the articular facets of the metacarpals and phalanges.

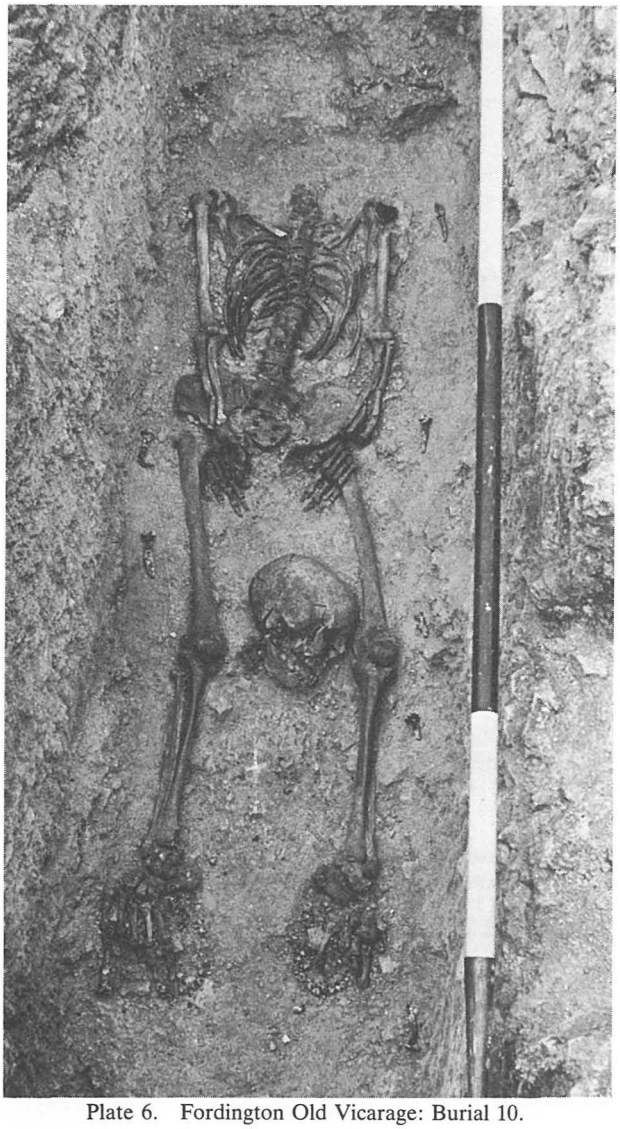


Plate 6. Fordington Old Vicarage: Burial 10.

In the spine the bodies of at least two of the cervicals and most of the thoracis are lipped with slight osteophytes. The lumbar vertebrae are more severely affected. The vertebral articulations are lipped and occasionally eburnated as follows: T7 superior and inferior right facets, T8 superior right facet, L1 inferior right facet and S1 superior right facet.

Trauma. The head been removed from the body with the 4th and 5th cervical vertebrae being cut through by a sharp instrument, probably a sword.

Dental Observations. The remaining jaw fragments show considerable alveolar resorption due to paradontal disease. The teeth show gross attrition only the roots remaining.

Dental formula:

Bone missing	
× × 6 5 / / /	Bone missing

Burial 11 (trench 1, layer 108). Inventory: Complete but very decayed skeleton, lying supine with arms at sides. Child aged *c.* 5 years.

Dental formula:

[6] e d c b a	/ / c d e [6]
e d c b /	/ b c d e

Burial 12 (trench 1, layer 114: Pl. 7). Inventory: Skull and decayed long bones only, lying supine with arms at sides. ?Female aged *c.* 9 years.

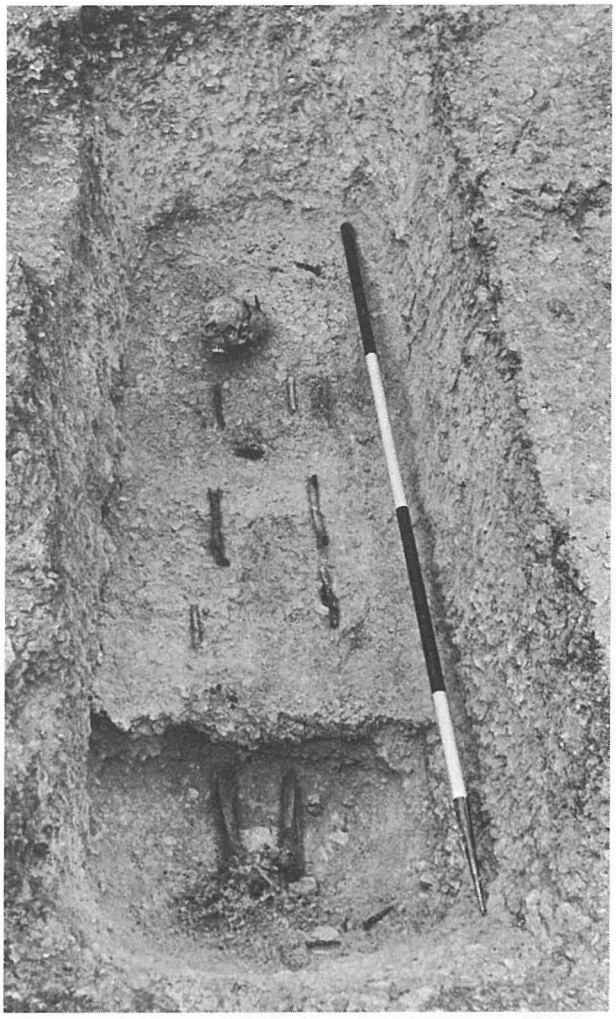


Plate 7. Fordington Old Vicarage: Burial 12 over burial 13.

Non-metrical Data. 1. Orbital osteoporosis (see Pl. 10).

Dental Observations. Of the deciduous dentition, three upper and one lower molar are carious. Another caries cavity is present in the mandibular left 1st molar.

Note. Bronze staining on right ulna.

Dental formula:

C C 6 e d c 2 1	C 1 2 / / e 6
6 e d / 2 1 C	1 2 3 d e 6 C
Bone missing but	most teeth present

Burial 12 (trench 1, layer 114: Pl. 7). Inventory: Skull and decayed long bones only, lying supine with arms at sides. ?Female aged *c.* 9 years.

Male aged 25-35 years. Stature: 166.756 cms (5 ft. 5¼ ins.).

Non-metrical Data.

1. Right and left lambdoid ossicles.
2. Multiple infra orbital foramina.

Skeletal Adaptation. Squatting facets on tibiae.

Pathological Observations. Widespread osteoarthritic lipping is present in this skeleton in the following areas: margins of the pelvic acetabulae, greater trochanters of the femora, heads of the humeri, radial tuberosity of the left radius, glenoid fossae and clavicular facets of scapulae (the right clavicular facet also being eburnated), sterno-costal articulations of the manubrium, distal articulations of the 1st metacarpals and many of the costo-vertebral articulations. The spine is also considerably affected with the disease with osteophytes about the margins of the vertebral bodies and lipping of the articulations (see Table 2).

Trauma. There is a healed fracture in the upper third of the left fibula. Fractures of the fibula shaft do not often occur without

damage also being sustained by the tibia or the ankle joint. In this instance osseous irregularities at the ankle indicate that the joint has been subjected to severe lateral rotation and abduction probably in a heavy fall. It is therefore likely that the fracture and ankle injury are the consequences of a single incident.
Other injuries to this skeleton that may be contemporaneous with the above lesions are an osseous growth at the acromial end of the left clavicle and a healed rib fracture. The clavicle irregularity is probably a response to the deltoides muscle being torn at its attachment point.

Dental Observations. All of the teeth are crown-worn with slight calculus deposits. Severe caries lesions are present affecting the maxillary molars and the mandibular right 2nd premolar and remaining molars; the upper 1st molars have been reduced to their roots. Four teeth have been lost *ante-mortem*, probably as a direct result of paradontal disease which is also present. Though this does not rule out the possibility that they may also have been carious.
Dental formula:

C C C / 4 3 / ×	× / 3 4 / C 6 / C 8
C C C × 7 6 5 4 3 2 /	/ 2 3 / / 6 7 ×

TABLE 2

Osteoarthritis of articulations and osteophytes of vertebral bodies in burial 13.

Vertebra	Superior articular facet		Inferior articular facet		Osteophytes to vertebral body
	Left	Right	Left	Right	
Cervical 1					
Cervical 2					
Cervical 3					
Cervical 4					
Cervical 5					☆
Cervical 6					☆
Cervical 7					☆
Thoracic 1					☆
Thoracic 2					☆
Thoracic 3					☆
Thoracic 4					☆
Thoracic 5					☆
Thoracic 6					
Thoracic 7					
Thoracic 8					
Thoracic 9					
Thoracic 10					
Thoracic 11			☆	☆	
Thoracic 12	☆	☆	☆		☆
Lumbar 1	☆	☆	☆	☆	☆
Lumbar 2	☆	☆	☆	☆	☆
Lumbar 3	–	–	–	–	–
Lumbar 4	–	–	–	–	–
Lumbar 5	☆	☆	☆	☆	☆
Sacral 1	☆	☆			

Key: ☆ = lipped slightly; – = missing post-mortem.

Burial 14 (trench 1, layer 128). Inventory: Lower limbs only lying supine. Male aged 25-30 years, of strong build. Stature: 171.2 cms (5 ft. 7½ ins.).
Skeletal Adaptation. Squatting facets on both tibiae.
Pathological Observations. Slight osteoarthritis lipping of lumbar vertebrae.

Burial 15 (trench 1, layer 130: Pl. 8). Inventory: Complete but decayed skeleton, lying on its right side with legs and arms flexed. Child, aged *c.* 2½ years.
Dental Formula:

bone missing e / / b a	a b c d e
e d c / / bone missing	a / c d e

Burial 16 (trench 1, layer 131). Inventory: Skeleton less lower limbs, lying on its right side.
Neonatal.

Burial 17 (trench 2, layer 22: Pl. 9). Inventory: Complete skeleton. Female aged *c.* 25 years. Stature: 150.7 cms (4 ft. 11¼ ins.).
Non-metrical Data.
1. Two lambdoid ossicles at right and two at left (see Pl. 10).
2. Retained metopic suture (see Pl. 10).
3. Patent premaxillary suture.

Pathological Observations. Early osteoarthritis can be seen with lipping around the odontoid process of C2 and its corresponding articulation on C1. At the other end of the spine L4 and L5 have slight lipping around their superior and inferior articulations. The proximal articulation of the right fibula is also slightly lipped.
Dental Observations. Radiographic examination of the jaws showed that the upper and lower 3rd molars are congenitally absent.
The maxillary right medial incisor has been broken ante-mortem and the exposed dentine has been attacked by caries. The mandibular left incisor is also slightly chipped though not carious.
Dental Formula:

/ 6 / 4 / / 1	/ 2 / 4 / 6 /
/ 6 5 4 3 / /	/ 2 3 4 5 6 /

Plate 8. Fordington Old Vicarage: Burial 15.

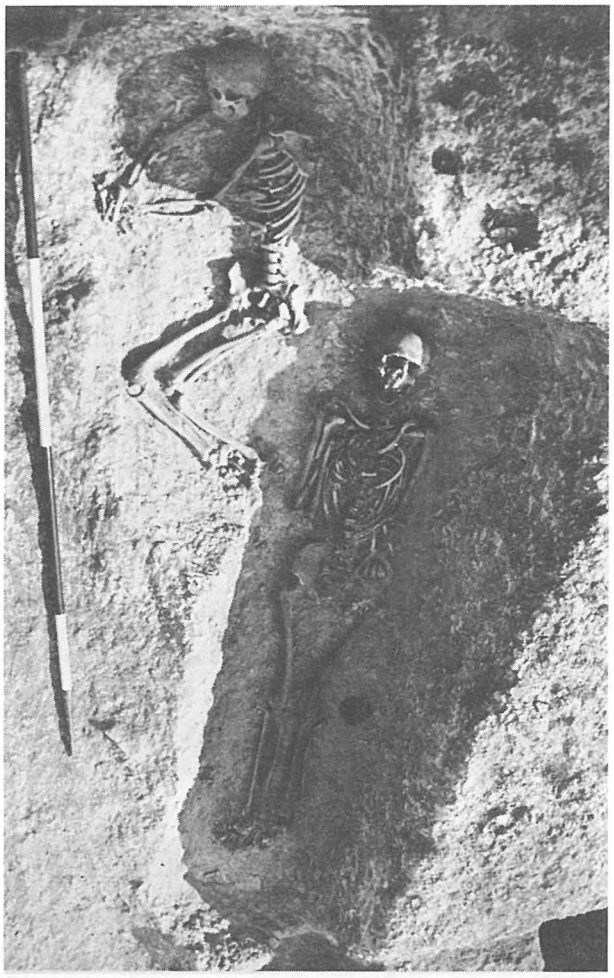


Plate 9. Fordington Old Vicarage: Burial 18 top cut by burial 17 below.

Burial 18 (trench 2, layer 23: Pl. 9). Inventory: Complete skeleton lying on its right side with knees flexed, arms out and slightly bent. Male aged 17-25 years. Stature: 177.6 cms (5 ft. 10 ins.).

Non-metrical Data.

1. Lambdoid ossicle at left.
2. Orbital osteoporosis.

Skeletal Adaptation. The skull is flattened in the occipital region and is exceptionally rounded-headed with a cephalic index of 88.76 (hyperbrachycephalic). The flattening and compensatory changes in the rest of the skull may well be the accidental effect of a head-binding or cradling habit in infancy.

Pathological Observations. The shafts of the femora, tibiae and fibulae have periostitis. It is impossible to determine whether the inflammation is the result of injury or infection.

Dental Observations. The maxillary right 2nd premolar, 1st and 2nd molars, left canine and left 1st molar together with the mandibular right 1st molar and left 1st molar are all carious.

Abscesses are also present at the roots of the maxillary left medial incisor and the mandibular left 2nd molar.

Dental Formula:

C C C 8 7 6 5 4 3 / 1	1 2 3 4 5 6 7 8 A
C 8 7 6 5 4 3 2 1	C 1 2 3 4 5 6 7 8 A

Burial 19 (trench 2, layer 36). Inventory: Complete skeleton, lying supine with arms crossed over trunk, head lying to the right. Male aged 35-45 years. Stature: 168.8 cms (5 ft. 6 ins.).

Non-metrical Data. 1. Two lambdoid ossicles at right.

Pathological Observations. There is widespread evidence of osteoarthritis in this skeleton. The odontoid process of C2 and its corresponding articulation on C1 are lipped. The remainder of the vertebrae are affected as follows: lipping is present on the bodies of C4, C5 and C6; T1, T2, T3, T4, T5, T6, T7, T8, T9, T10, T11 and T12; L1, L2, L3, L4 and L5 and most of the costal articulations. Slight lipping is also present around the pelvic acetabula and at the distal articulations of the tibiae, semilunar and radial notches of the ulnae and costal and clavicular articulations of the sternum. The margins of the articular surfaces of most of the bones of the feet are lipped and rheumatoid arthritis has ankylosed both 1st metatarsals with their proximal phalanges (see Pl. 10).

Dental Observations. All of the teeth are considerably crown-worn and paradontal disease has resulted in slight alveolar resorption.

Dental Formula:

/ / 6 5 4 3 2 %	1 2 3 4 5 6 7 8
8 7 6 5 4 3 2 1	1 2 3 4 5 6 7 8

Burial 20 (trench 2, layer 39). Inventory: Lower half of skeleton only, lying supine with arms at sides. Male, mature individual of strong build. Stature: 164 cms (5 ft. 4½ ins.).

Pathological Observations. There is widespread osteoarthritis in this skeleton as follows: The pelvis has osteophytes along the iliac crests and both acetabula are lipped circumferentially; the great trochanters of the femora, the tubercles of the tibiae, the heads of the ulnae and the head of the right radius all show osteoarthritic changes. In the right hand the 1st metacarpal is eburnated at its distal articulation and the 2nd and 3rd Phalanges of the forefinger have fused together. The remaining fragments of the 4th and 5th lumbar vertebrae are severely eburnated and lipped.

Burial 21 (trench 2, layer 49). Inventory: Legs only lying supine. Probably female aged 20-25 years.

Skeletal Adaptation. Squatting facets on both tibiae.

Trauma. The tubercle at the head of the right fibula has a small osseous protuberance which may be an ossification of the attachment fibres of the peronaeus longus muscle. Such an ossification could occur as a response to a tearing of the muscle at this point in a fall.

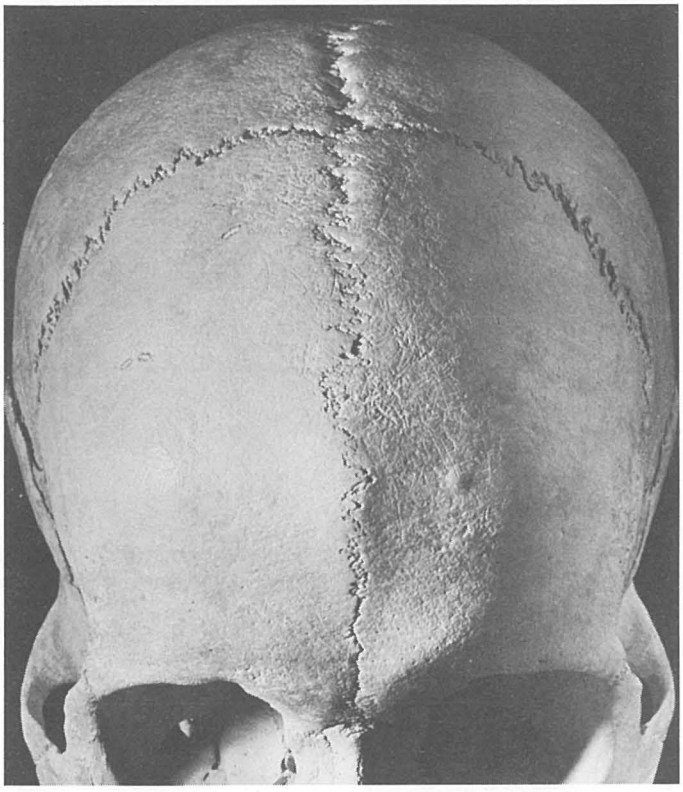
A small fusiform swelling 10 mm by 3 mm near the centre and medial to the crest of the left tibia may be a periostitic reaction to a blow. Radiographic examination was of little assistance in diagnosing the cause and its origin remains a mystery.

TABLE 3

Basic skull measurements.

Burial	1	9	13	17	18	19
Maximum length	184	176	189	178	172	194
Maximum breadth	138	137	144	168	135	146
Basi-bregmatic height	124	127	130		132	134
Basi-nasal length	107	88	101		95	109
Basi-alveolar length	105	87	93		94	
Upper facial height	74	71			70	
Bimaxillary breadth	99	91	96		96	
Bizygomatic breadth			134		131	
Nasal height	51	49	52		48	
Nasal breadth	24	25	23		22	
Orbital breadth, right	40	35	32		36	
Orbital breadth, left	40	32	33		36	
Orbital height, right	34	37	40		31	
Orbital height, left	34	31	38		31	
Palatal length	46	38	51	44	45	
Palatal breadth	37	38	40	45	41	
Cephalic index	75.00	77.84	76.19	94.38	79.71	75.25

Cremation 1 trench 1, layer 64). Adult. Weight of bone fragments: 240 g. Largest fragment: 65 mm in length. Average size of fragments: 15 mm in length. Recognisable bones: fibula, vertebrae and ribs. Extraneous materials among the bone fragments: charcoal, four nails and a small belemite fossil.



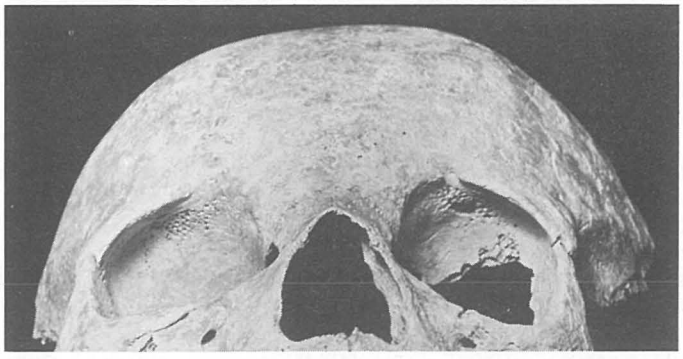


Plate 10. Fordington Old Vicarage: Details of the skeletons. Top left: Lambdoid ossicles, burial 17. Middle left: Retained metopic suture, burial 17. Bottom left: Orbital osteoporosis, burial 12. Top right: Well healed fracture of the fibula, burial 7. Middle right: Squatting facet, burial 1; Bottom right: Fusion of first metatarsel and phalange, burial 19. Copyright Institute of Archaeology, Oxford. *Photos Lorna Llewellyn.*

TABLE 4
Basic long-bone measurements.

Burial	1	4	5	7	10	13	14	17	18	19	20	21
Femur, max. length R	435		423		410	442		478	376		434	
Femur, max. length L	436		426		409		464	486	378	445	429	
Femur, oblique length R	431		421		406	442		475	371		431	
Femur, oblique length L	430		423		409		463	479	372	444	427	
Femur, trochanteric length R	416				403		444	449	360		403	
Femur, trochanteric length L	414		402				443	458	360	424	402	
Femur, min. antero-posterior diam. R	25		28	24	26	25	30	27	21	26	27	
Femur, min. antero-posterior diam. L	26		28		25	25	30	27	22	27	28	
Femur, transverse diam. R	35		34	37	33	38	36	37	31	34	36	
Femur, transverse diam. L	35		34		34	40	35	36	31	34	35	
Femur, bicondylar breadth R					75	81		86	68		85	
Femur, bicondylar breadth L			85		79		82	86	66	86	85	
Fibular, max. length R		362			312		364		293			334
Fibula, max. length L			331		315	341			297			333
Tibia, total length R	352	356	345	387	317	349	362	399	293		335	340
Tibia, total length L	348	357	343	393	315	352	372	399	299		337	343
Fibula, max. antero-posterior diam. R	33	43	38	36	36	39	37	38	32	34	34	30
Tibia, max. antero-posterior diam. L	32	41	39	37	36	39	38		32	35	37	31
Tibia, transverse diam. R	27	27	26	22	23	27	28	29	23	25	24	24
Tibia, transverse diam. L	26	25	25	22	23	26	27		23	25	24	26
Humerus, total length R	307	338		340	300	325		338	265	340		
Humerus, total length L	298	328		328		316		330	268	333		
Humerus, max. diam. R	23	24		22	22	24		23	23	23		
Humerus, max. diam. L	24	22		21	21	24		23	22	21		
Humerus, min. diam. R	19	20		18	17	18		19	17	21		
Humerus, min. diam. L	19	20		17	17	18		18	17	19		
Ulna, total length R		278		272	231	259		264	195			
Ulna, total length L				276		252						
Radius, total length R	214	251			210	235		251	180	252		
Radius, total length L		251			215	232			177	251		

Cremation 2 (trench 2, layer 6). Child. Weight of bone fragments: 20 g. Largest fragment: 20 mm in length. Average size of fragments: below 5 mm in length. Recognisable bones: skull, ribs and roots of teeth. Extraneous materials among the bone fragments: charcoal, and three nails.

Cremation 3 (trench 1, layer 125). Adult. Weight of bone fragments: 90 g. Largest fragment: 52 mm in length. Average size of fragments: 20 mm in length. Recognisable bones: vertebrae, ribs and teeth roots. Extraneous materials among the bone fragments: charcoal and one nail.

SUMMARY

The 21 burials belong to a group of which both males and females were accustomed to hard physical labour, probably of an agricultural nature. The presence of squatting facets suggests that they were of a low social and economic status.

On reaching maturity they suffered the rigours of osteoarthritis and its crippling effects. This coupled with a low standard of dental health must have resulted in a rapid deterioration of physical well-being for any individuals reaching the age of 35 or more.

With one exception, the injuries noted are consistent with accidents rather than deliberate violence. The kind of accidents that might well be the normal occupational hazards of premechanised farming. The exception, a decapitated elderly female (burial 10) may have been executed or perhaps beheaded after death as part of some unknown ritual.

It would be unwise to attempt to assign such a small sample to any particular ethnic grouping. Suffice to say that morphologically they would not be out of place in a Romano-British cemetery. The circumstantial and pathological evidence does not rule out their being post-Roman.

THE POTTERY

IRON AGE

Shallow scoop: Feature 18 (trench 2, layer 18).

1. Hand made bowl: grey-brown fabric with large flint inclusions; surfaces mottled grey-brown to brick with flints showing.

Not illustrated: two more body sherds probably from the same vessel; and 14 similar but not identical body sherds.

ROMAN CREMATIONS

Cremation 1

2. BB1: probably late 2nd or early 3rd century AD as Gillam type 141.

Cremation 2

3. Probably BB1 (black burnished ware category 1): rather crude surfaces and simple burnish; partly refired to orange on the surface; difficult to date.

GRAVES

Burial 3

4. BB1: but orange and silver surfaces; *c.* 12 cms diameter.

Burial 4

5. ?Dish: white fine sandy fabric; pinky-white abraded surfaces; *c.* 16 cms diameter.
6. BB1: *c.* 14 cms diameter.

Not illustrated: grey sandy body sherds, and body sherds similar to no. 15.

Burial 11

7. Everted rim jar: BB1: diameter uncertain. Extremely

everted rims like this occur in early 4th century contexts in Dorchester (e.g. Dorchester Prison, 1970, pit 2: Draper and Chaplin, 1982, fig. 19, nos. 27 and 33).

Burial 12

8. Dish: pale pinky grey sandy fabric; white slip surfaces; diameter uncertain; possibly New Forest.

Not illustrated: abraded grey sandy body sherds; BB1 base.

Burial 17

9. Everted rim jar: BB1; see no. 7 above.
10. Indented beaker: fine red fabric; red internally; purple-brown matt colour coat externally, and over the rim internally; as Fulford (1975) type 33.9, 4th century.

Not illustrated: abraded amphora neck sherd, ?Spanish globular 2nd or 3rd century; body sherds as no. 9 and body sherds at least three other BB1 vessels.

Not Illustrated

Burial 1: body sherd in abraded fine grey fabric.

Burial 5: body sherd BB1.

Burial 6 and burial 7: body sherds BB1; possibly the same pot.

Burial 9: body sherds in grey sandy fabric.

Burial 10: BB1 sherds.

Burial 21: BB1 sherds with brown surfaces.

Burials nos. 2, 8, 10, 13, 14, 16, 18 and 20 contained no pottery, although some of the pottery credited to burial 17 could belong to burial 18. Apart from burial 17 which contained a nearly complete New Forest indented beaker, all the pottery from the graves was fragmentary.

Unstratified Roman Pottery

11. Neck of a New Forest colour-coated beaker; hard fine grey fabric; purple surfaces.
12. Dish or jar: BB1; diameter uncertain.
13. Pie dish: BB1 but grey surfaces.
14. Everted rim jar: BB1; probably accidentally oxidised bright red.
15. Storage jar: grey sandy fabric with pale dull brick surfaces.

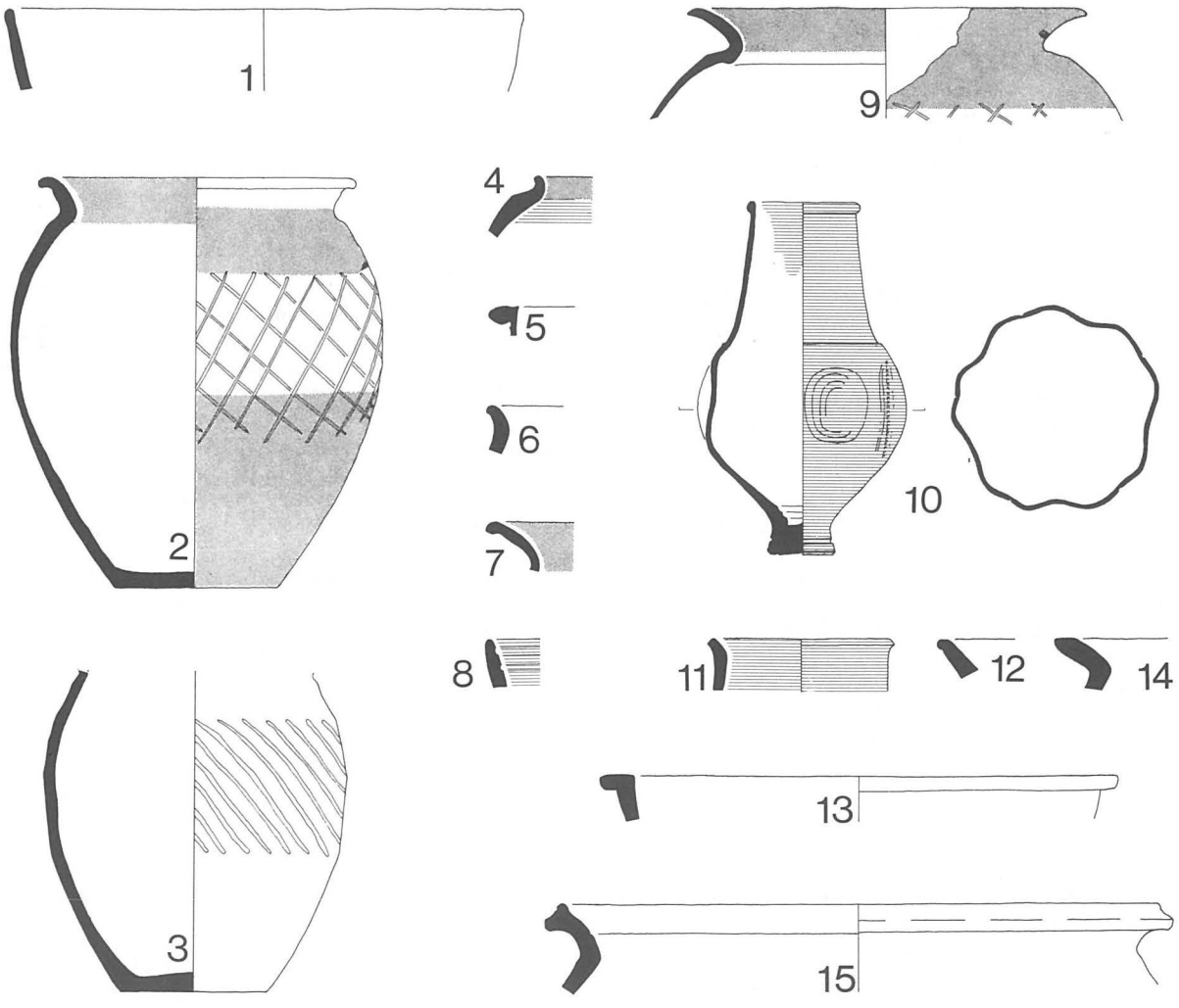


Figure 6. Fordington Old Vicarage: Roman pottery nos. 1-15 at ¼ reduction.

MEDIEVAL POTTERY by JO DRAPER

Earth layer between upper and lower chalk spreads (trench 2, layer 11)

16. Cooking pot: very hard grey fabric with medium grits; internally dark grey and smooth with some grits burnt out; externally brown to soot-blackened; parallels are hard to find and dating difficult, certainly medieval: possibly 13th century.

Ditches

Ditch 1: no pottery.

Ditch 2: cooking pot sherds similar to no. 16.

Ditch 3: body sherd in grey gritty fabric with smooth surfaces.

Ditch 4: body sherds similar to no. 16; and two body sherds in dark grey very gritty fabric with grits burnt out on the surface.

Ditch 5: no pottery.

It is very difficult to be at all precise about the dating of the pottery from these ditches, beyond the fact that it is medieval.

Ditch 6

17. Cooking pot: grey gritty fabric; dark grey, rough surfaces; possibly *c.* 16 cms diameter.
18. Cooking pot: as no. 17 but orange internally; possibly *c.* 20 cms diameter.
19. Lid, or more likely a shallow dish with 'hammer head' rim; grey sandy fabric; orange internally and grey externally; *c.* 28 cms diameter.

Not illustrated: body sherds from the forms illustrated; a body sherd in grey sandy fabric with a yellow glaze; and a body sherd in hard grey sandy fabric with apple green glaze.

This group may date from the 12th or 13th century: shallow dishes like no. 19 occur at Corfe Castle (RCHM, 1960, fig. 11, no. 12) in 12th century contexts, and in an apparently 13th century context at Wareham (RCHM, 1959, fig. 50, no. 11).

Ditch 7

20. Jar: hard grey fine sandy fabric; surfaces brick; patchy green glaze externally; *c.* 14 cms diameter.
21. Jug: as no. 20 but pale surfaces.
22. As no. 20.
23. As no. 20: *c.* 9 cms diameter.
24. Jar: dark grey fabric which much fine sand; partly glazed externally green with brown flecks.
25. Cooking pot: hard grey fine sandy fabric; brick surfaces.
26. As no. 25: possibly *c.* 26 cms diameter.
27. and 28. As no. 25.
29. As no. 25 but sooty.
30. As no. 25: *c.* 18 cms diameter.
31. As no. 25: *c.* 32 cms diameter.
32. As no. 29.
33. As no. 25.
34. and 35. As no. 25: both *c.* 23 cms diameter.
36. As no. 25: with applied strip, finger impressed, under rim.
37. and 38. As no. 25: *c.* 20 cms diameter; sooty.
39. Very odd rim: as no. 25.
40. Slashed handle: as no. 25.
41. Cooking pot: grey sandy fabric with some grits; grey-brown internally and sooty externally; *c.* 24 cms diameter.
42. Cooking pot: hard grey sandy fabric; grey to grey-brown internally; grey externally.
43. Cooking pot: grey gritty fabric: internally dark grey; pinkish externally; possibly *c.* 22 cms diameter.
44. Cooking pot: grey sandy fabric; surfaces dark grey.
45. Cooking pot: coarse grey sandy fabric with varied inclusions; brick red surfaces; *c.* 24 cms diameter.
46. and 47. Cooking pots: coarse pink-grey sandy fabric; brick red rough surfaces; sooty externally; *c.* 21 cms diameter.
48. Cooking pot: as no. 45 but rough surfaces; *c.* 20 cms diameter.

Not illustrated: body sherds in the fabrics illustrated; one body sherd fabric as no. 25, etc. with a small cross incised with a four-toothed comb; a flat base in similar fabric; two other slashed handles as no. 40; three unglazed thumbed bases in similar fabric; thumbed jug base in fine grey fabric (thick in section) with a spotty apple green glaze externally; and two white sandy body sherds with dark green glaze externally (not fine enough for Tudor Green).

The hard fine fabric of many of the vessels here (nos. 25-40, etc.) is similar to group c from Dorchester Castle ditches (Draper and Chaplin, 1982, fig. 21, nos. 87, 88, 95, etc.) and some of the forms from the Castle group find parallels here. Jug rims like nos. 20 and 22 here are found at the Castle (nos. 69, 111 and 118). Thumbed bases are present in the Castle ditches material (nos. 80, 89, etc.) but in coarser fabrics than those here. Some of the cooking pot forms are also similar. The Castle ditches material seems to date from the late 13th or early 14th century, and it seems likely that the group here is rather later than that. Here the bulk of the material is in the fine fabric, whereas in the Castle ditches about half the vessels are in a coarser fabric. Also, there is only one very elaborate slashed handle from the Castle group, whereas there are several single ones here. This group is totally unlike the early 16th century group from Dorchester Prison, 1970 (Draper and Chaplin, 1982, figs. 22 and 23) in forms, although the fine fabric is similar.

On balance the group from ditch 7 seems to date from the later 14th century.

Rubble associated with wall 2 (trench layer 21)

49. Jug: grey gritty fabric; yellowy-brown internally; externally pale green glaze; similar to no. 24 above. Possibly 14th century.

Unstratified medieval pottery

50. Jug rim and handle with slash marks: white sandy fabric; externally yellowy-green glaze with occasional brown stripes and green splashes; perhaps 14th century.
51. Jug rim and handle with applied finger impressed strip: hard grey sandy fabric; externally small areas of greeny-brown glaze; broadly similar to two jugs from the early 16th century group from Dorchester Prison, 1970 (Draper and Chaplin, 1982, fig. 22, nos. 143 and 145).
52. Jug: similar to no. 21 from ditch 7.
53. Jug: as nos. 24 and 49 above.
54. Jug: as no. 25, etc.

54-61. As no. 25, etc., from ditch 7.

55. *c.* 30 cms diameter.
58. and 59. *c.* 16 cms diameter.
62. Cooking pot: slightly coarser than nos. 54-61; *c.* 20 cms diameter.
63. As no. 62.
64. Lid, or more likely 'hammer head' shallow dish: sandy grey fabric; internally pale brown; externally grey; see no. 19.
65. and 66. As no. 64.
67. Cooking pot: as no. 25, etc.; *c.* 20 cms diameter.

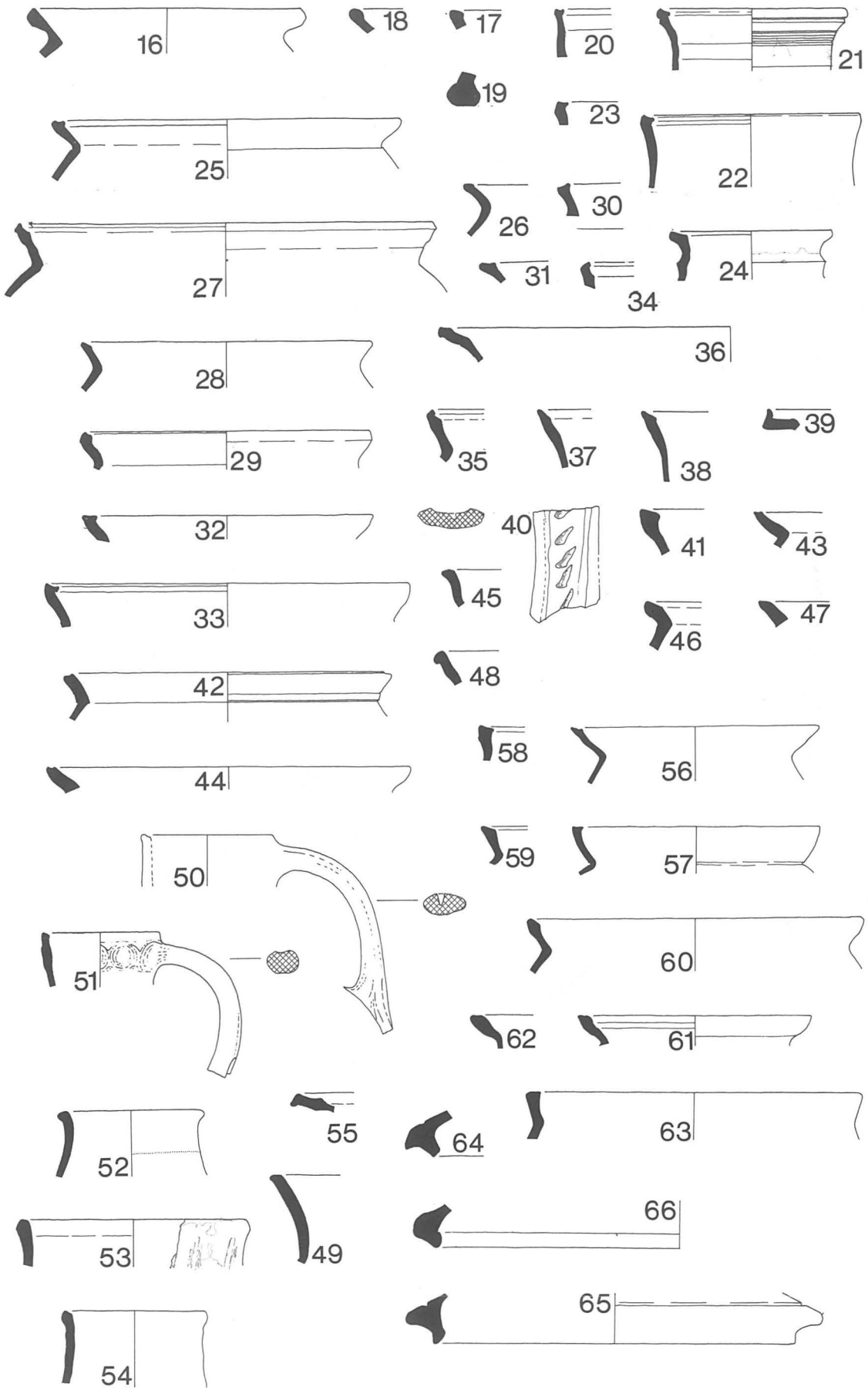


Figure 7. Fordington Old Vicarage: Medieval pottery nos. 16-66 at ¼ reduction.

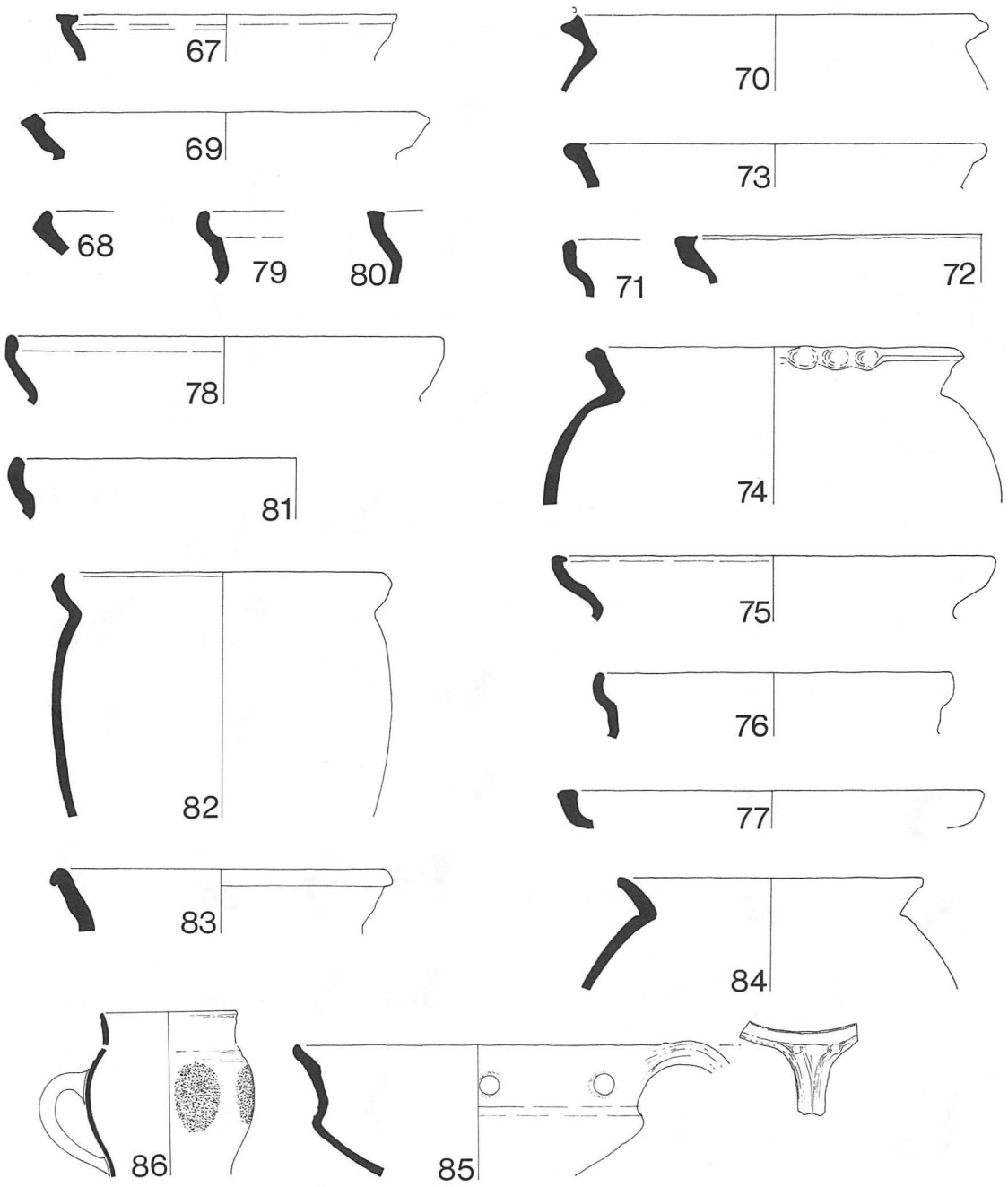


Figure 8. Fordington Old Vicarage: Medieval pottery nos. 67-84, and post-medieval pottery nos. 85-86, all at ¼ reduction.

68. ?Cooking pot: coarse grey sandy fabric with occasional large inclusions; brick surfaces.
69. Similar to no. 68; sooty.
70. Cooking pot: grey gritty fabric; browny-grey, slightly pimply surfaces: sooty.
71. Cooking pot: hard grey fine-gritted fabric; surfaces brick to pale brown-grey; possibly 13th century.
72. Cooking pot: as no. 73 but brownish surfaces.
73. Cooking pot: dark grey laminated fabric; surfaces rough, dark grey.
74. Cooking pot: as no. 73 but brick internally.
75. Cooking pot: grey fine sandy fabric with some large inclusions; dark grey surfaces.
76. Cooking pot: as no. 75 but grey to brick internally.
77. Cooking pot: grey gritty fabric with occasional large inclusions; grey, rough surfaces.
78. Cooking pot: hard grey fine sandy fabric with occasional larger inclusions; light brown to grey surfaces; similar to material from the 13th century group from West Stafford (Draper, 1975).
79. Cooking pot: similar to no. 78; *c.* 32 cms diameter.
80. Cooking pot: grey sandy fabric with occasional larger inclusions, brick surfaces; sooty; diameter uncertain.
81. Cooking pot: as no. 78 but harder; sooty.
82. Cooking pot: hard grey fine sandy fabric; brick surfaces.
83. Cooking pot: very coarse almost black gritty fabric and surfaces.
84. Cooking pot: almost black coarse laminated fabric, heavily gritted (coarser than no. 83) containing inclusions up to 5 mm long; very irregular internally; more smooth externally. The fabric of no. 84 is even coarser than the sagging based pots found at West Stafford (Draper, 1975, no. 14: possibly mid-13th century) and in the late 13th century group from Dorchester Prison, 1970 (Draper and Chaplin, 1982, fig. 21, no. 123) which are the coarsest vessels so far found in medieval contexts around Dorchester. No. 84 is also a different rim form to these vessels. It is very difficult to date and may just possibly be pre-Conquest.

POST-MEDIEVAL POTTERY: Unstratified

85. Brick, fine sandy, regular fabric: wet looking orange glaze with brown flecks overall; may have had more handles; possibly a vessel connected with cheese making, or an an unusual form of chafing dish; 17th or 18th century.
86. Mug: fine white fabric; pale yellow glaze internally; bright green lead and copper glaze externally over ovals of quartz chippings; similar to a mug from St. Nicholas' Almshouse, Bristol (Barton, 1964, fig. 67, no. 32) in a context of 1653-56.

I am grateful to K. J. Barton for identifying no. 86.

THE SMALL FINDS (Fig. 9)

by JANET WEBSTER

Bronze Objects

1. Small ribbon strip bracelet of flat D-section and without any decoration. One slightly rounded terminal survives, the other is broken. The size suggests the user was a child. Trench 1, layer 114, 25, burial 12.
2. Finger ring of thin bronze wire. The ring is decorated with closely spaced notches. Trench 1, layer 85, 20, burial 4.

Bone Object

3. Bone pine with bulbous head; point broken off; *c.f. Leicester Jewry Wall,* p.265, fig. 90, no. 70; *Lydney,* p. 85, fig. 18, no. 69. Trench 1, layer 103, 24, burial 9.

Stone Object (Geological Identification by H. P. Powell, Pitt Rivers Museum, Oxford.)

4. Mortar of shell fragmented limestone with cavities. Trench 1, layer 48, 14, miscellaneous feature 91.

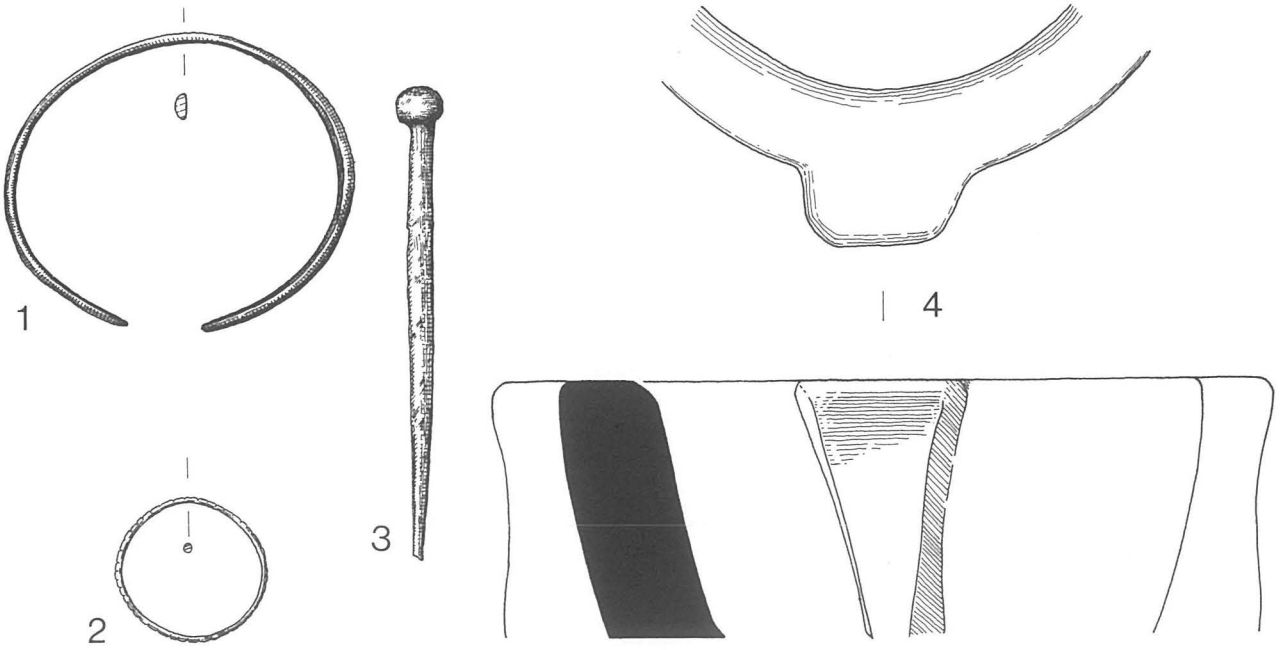


Figure 9. Fordington Old Vicarage: Nos. 1 and 2 bronze at life size; no. 3 bone at life size; and no. 4 limestone at ½ reduction.

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A ROMAN COFFIN-BURIAL FROM THE CROWN BUILDINGS SITE, DORCHESTER: WITH PARTICULAR REFERENCE TO THE HEAD OF WELL-PRESERVED HAIR

CHRISTOPHER SPAREY GREEN, MICHAEL PATERSON and LEO BIEK
with contributions by MARY HARMAN and JOHN PRICE, ERIC FREEMAN, ELISABETH CROWFOOT, ARNOLD LLOYD, JOHN EASTOE, JOHN COX, RICHARD SPEARMAN, GEOFFREY PUGH, IAN DALE and from the NATIONAL PHYSICAL LABORATORY

CONTENTS

SUMMARY

During construction work outside the west gate of Dorchester a lead coffin was discovered, surrounded by numerous unaccompanied inhumations from a Late Roman cemetery. The coffin contained the skeleton of a man packed in plaster and accompanied by a head and pigtail of hair. This burial and its surrounding cemetery are described in relation to similar examples at Dorchester and elsewhere which appear to be of Christian type. The scientific examination of the coffin and its contents is fully reported, the results being collated with the archaeological evidence in the discussion.

INTRODUCTION AND ACKNOWLEDGEMENTS

The suburbs of present-day Dorchester, to a distance of several hundred metres from the line of the Roman defences, were once occupied by the suburban settlements and cemeteries that served the Roman town. Sealed beneath the urban expansion of the Victorian and Edwardian eras, these much neglected areas of the ancient town only rarely become available for archaeological investigation, and they are thus known largely from casual discoveries made in the course of original construction or more recent redevelopment.

It was in the latter circumstances that a Late Roman cemetery was encountered in September, 1971, during the excavation of a cellar and foundation trenches for the new Crown Buildings, then in course of construction on the site of the old barracks parade ground (SY 68709068). With the kind permission and assistance of the landowners, the Department of the Environment, and the contractors, Messrs. Rawlings (Dorchester) Ltd., C. J. S. Green was able to watch the building work and record the archaeological features. The finds were conveyed to the Ancient Monuments Laboratory, and L. Biek was responsible for arranging and collating the scientific specialist work. The joint discussion reflects the views of all contributors.

Figs 3 and 4 were drawn by Margaret Tremayne and Frank Gardiner of Ancient Monuments Illustrators Department. Half the photographs are Crown Copyright: Pls I and II by Christopher Green and Lucia Vinciguerra, others by Ancient Monuments Laboratory – Henry Allera (Pls III-XI, XVII-XXI) and L. Biek (Pls XII-XVI). The central section of the report was typed by the Department of the Environment typing pool, and the introduction and discussion by Dawn Eldridge.

We are also grateful to many friends and colleagues for assistance, helpful information and valuable discussion, in particular to Rodney Alcock, Anne Compton, Joan Cross, Norman Davey, John Lenihan, Roger Peers, Joyce Plesters, Michael Ryder, and Eric Sunderland.

Circumstances of Discovery

The cemetery lies some 200 metres west of the west gate of the Roman town, within the angle formed by the two roads which issued from that gate: one heading north west for Ilchester in Somerset, the other west towards Exeter (Fig. 1). Burials have been noted previously in an area 130 metres to the north west of the present finds, but few details are known (RCHM(E), 1970). Approximately 50 graves were recorded during the course of the excavations for the present building's foundations, most of them being destroyed during the excavation for a large cellar under the west wing (Fig. 2). The absence of burials from the trenches on the east and west sides suggests that in those directions, at least, the limits of the cemetery had been reached. The burials seemed to be confined to a strip 25 metres wide running north-south across the site, and were all aligned almost exactly east-west. The graves were simple rectangular pits that had been cut into the chalk to a

depth of 1.5 or 1.75 metres, backfilled with chalk rubble and sealed by the black topsoil. In those cases where parts of skeletons were observed *in situ,* the bodies were seen to be extended with the head to west. Under the conditions of discovery it was not possible to recover these remains save from the one special burial described below; however, variations in the size of the graves suggested that, while most were of adults, at least two had held children. Two further burials yielded iron angle brackets from substantial wooden coffins and some others, at least, had been furnished with wooden coffins fixed with iron nails. One shallow grave-like feature immediately west of the cellar contained limestone slabs, as if for a cist burial, but no human bones were observed in the portion exposed.

Although many human bones and coffin nails were present in the spoil no objects which could be classed as grave goods were recovered – nor, indeed, was any pottery or domestic refuse noted in the grave fills or the overlying soil. These deposits were also devoid of any building debris which might have derived from mausolea or similar monuments, but it cannot be ruled out that some, at least, may have been marked by less substantial structures.

To east and west of the cemetery, gullies or ditches were noted running approximately north-south. Although undated, they appear to respect and delimit the main group of burials and are therefore most likely a contemporary enclosure to the cemetery. In several places along the line of these boundaries, flint and limestone rubble was noted in the base of the topsoil, perhaps debris from an enclosing wall associated with the ditch. The ditches had been recut on at least one occasion.

The most notable grave was encountered near the centre of the site when the Hy-Mac excavator removed the south side and the west end of the grave in straightening the north side of the excavation for the cellar. This burial consisted of a stoutly constructed lead coffin (Fig. 3) set in a pit 1.7 metres deep by 1 metre wide and 2.3 metres long and filled with chalk rubble. No nails from a bier or outer coffin were noted in the spoil, nor were any found in the fill remaining in the north-east corner of the grave pit. However, the coffin may have been enclosed in a wooden outer casing, perhaps pinned together with dowels rather than the more usual nails, but no evidence for this was seen.

When examined, the coffin retained the now badly crushed remains of an adult inhumation, extended with arms by the side or resting on the pelvis (Plates I and II). The space round the body was found partly filled with a white crumbly material, usually called gypsum in the literature. This had apparently at some stage 'set' in such a way as to take on the shape of at least one coffin angle and area of textile. A head of human hair and a separate pigtail (Fig. 4) were observed to fall from the west end of the coffin when this buckled and burst during removal by a

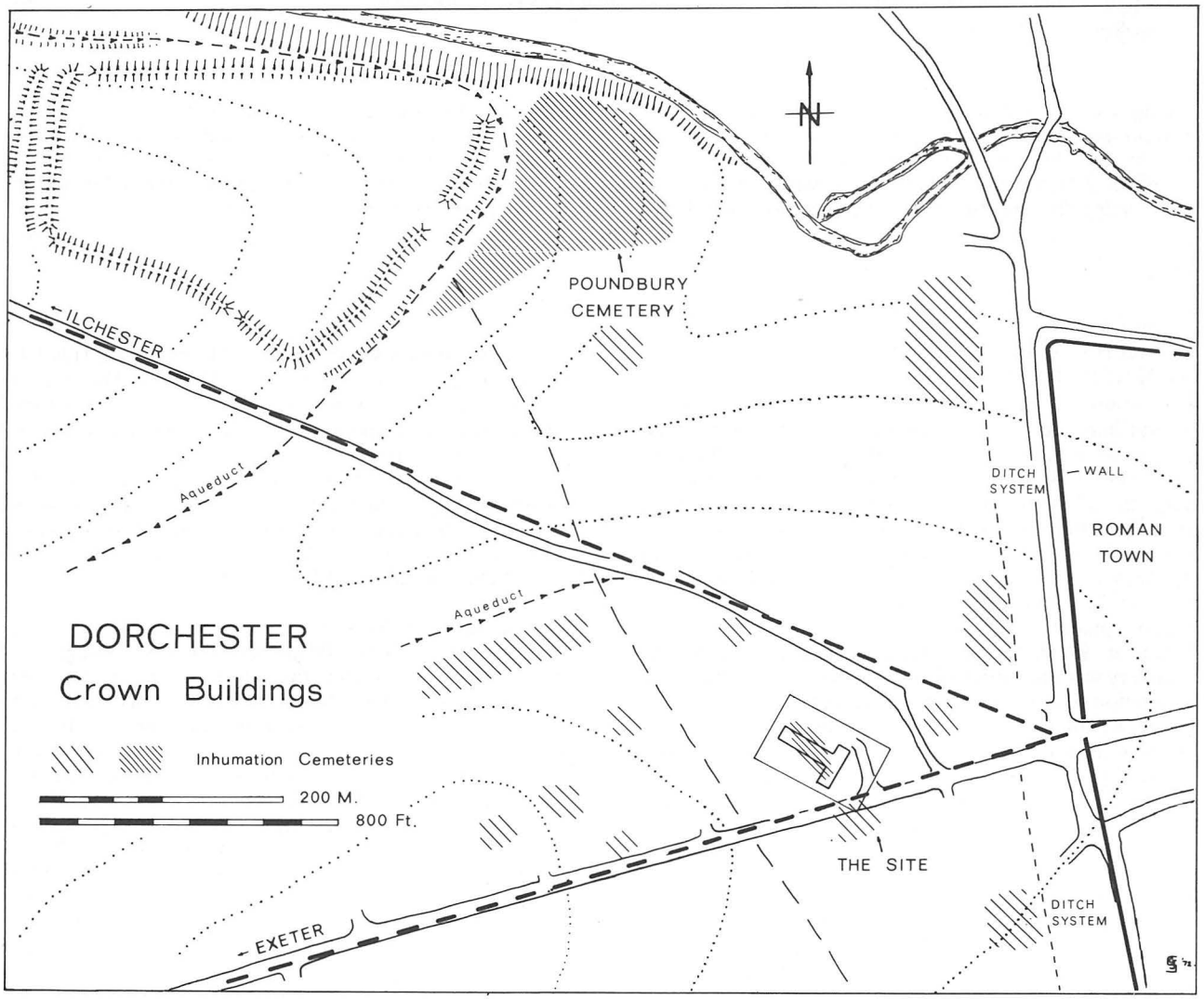


Figure 1. Crown Buildings: General plan of the site.

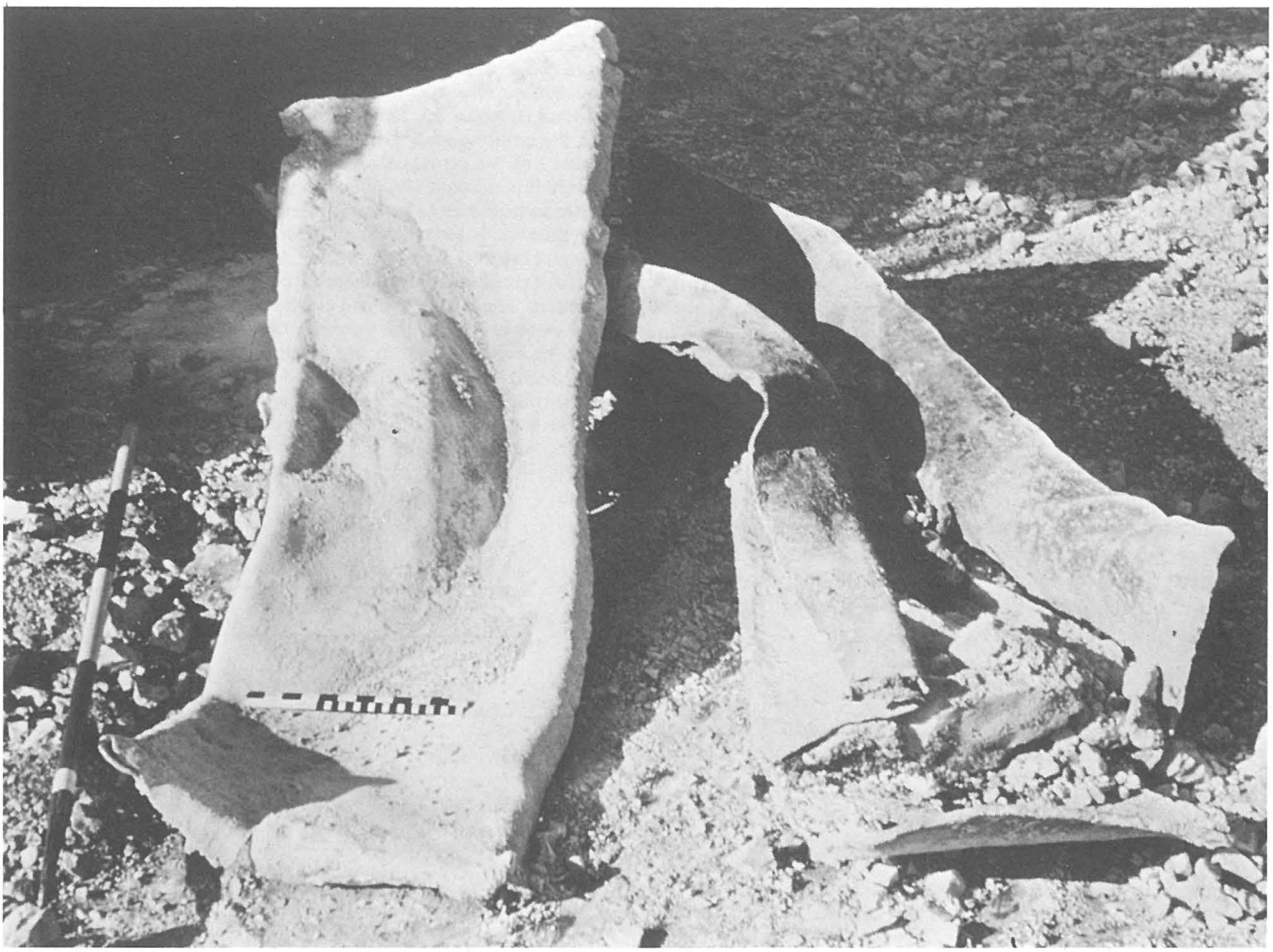


Plate I. The coffin, as first seen by excavator (C.G.); note gypsum 'corner' at near, east end (see Pl. XVII).

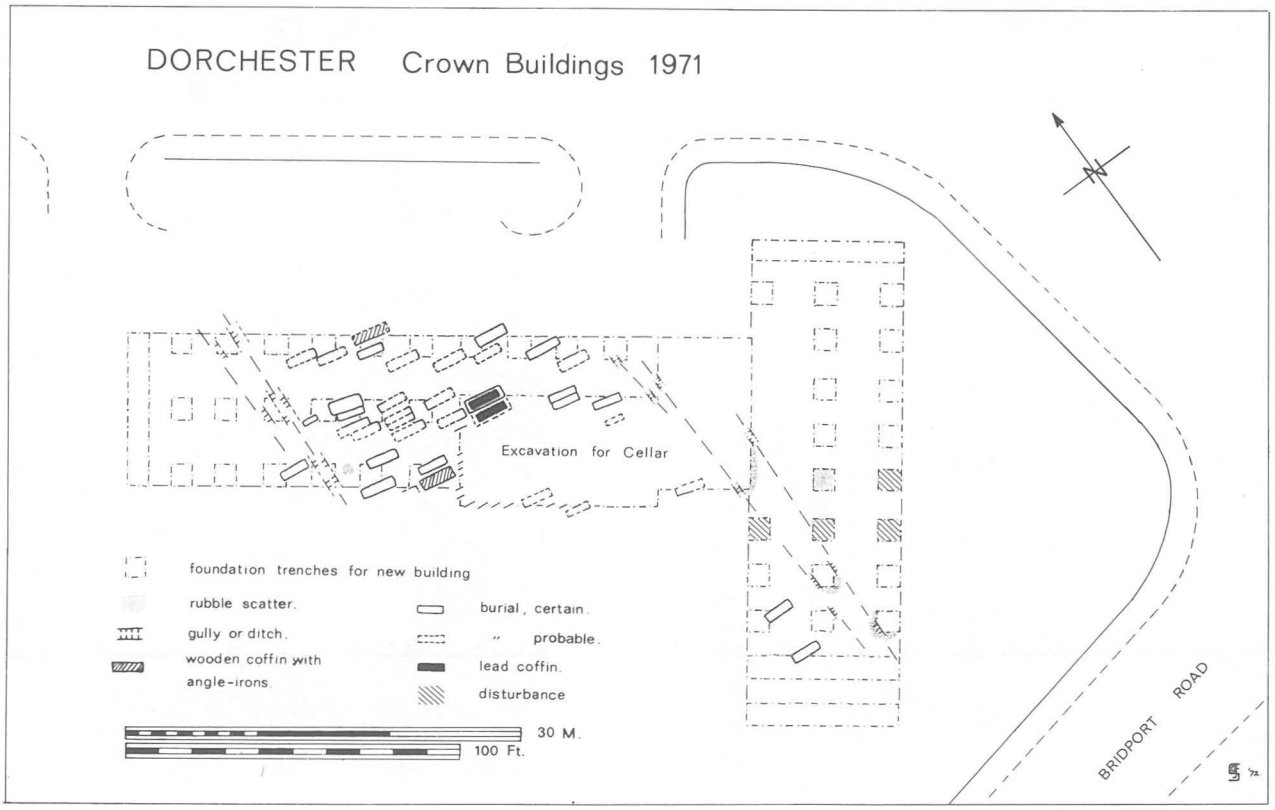


Figure 2. Crown Buildings: Plan of the finds on site.

mechanical excavator.
Finds from the area immediately to the south suggested the presence of another special burial, in this case a wooden coffin with a lead lining. Of this remained only the massive iron nails with wood traces adhering, fragments of decayed lead sheeting and human bones.

LABORATORY EXAMINATION

At the time, the hair represented an isolated and exceptional find, and a full investigation of it and its immediate environment was put in hand. This was clearly valuable despite the lack of field work and comparative material in the circumstances. The main body of reports had been assembled for publication when the 1972 season at Poundbury, in the space of a few days and cubic metres, added half as many again to the number of finds of preserved hair recorded hitherto in this country, thus completely transforming the situation.
The scientific findings are in themselves unaffected and are therefore published now, but all far-reaching interpretation has been deferred until the work on the Poundbury material is complete. The archaeological discussion, on the other hand, has now been able to profit from the Poundbury discoveries up to 1979.

THE LEAD COFFIN by Dr. A. Lloyd, then at Associated Lead Manufacturers' Research Laboratories

Although very badly buckled and extensively crushed, the remains of the coffin provided a remarkable amount of significant information. The coffin had clearly been made from one sheet of cast lead, suitably cut, folded and beaten into shape, and soldered along the four edges. The two long edges had been double-folded, almost crimped, for strength, giving a decorative 'beaded' effect to a purely functional piece of work. Its original dimensions would have been 182 cm long by 47-54 cm wide and 40 cm high. Its thickness was substantial, 5-7 mm, if one allows for a slight increase due to corrosion, putting it into the 15 lb range. For an area of 2.17 square metres, this gives a weight of nearly 158 kg for the coffin. The weight of the lid, which is only slightly lighter (5-6 mm), would have added another 67.5 kg, giving some 225 kg for the empty lidded coffin.
Table 1 shows various analyses carried out on the metal. Unfortunately it is difficult, except in some special cases, to relate composition to source of lead at this level, principally because most of the potentially valuable 'tracers' do not finally enter the metallic phase (Tylecote, 1963). Arsenic, and particularly bismuth, are useful exceptions but by themselves insufficient to give adequate pointers. The coffin lead had clearly been effectively de-silverised and was suitable for the purpose. One might be inclined to question the economics of its use in this way, but it must be remembered that the Romans mined lead ores for the silver, and that in those times and in this sense lead was a plentiful by-product. The solder is a tinny lead best described as 'plumber's solder' and is, again, suitable for the purpose, having a melting range of 180-255°C, best worked some 100 degrees lower than the 327°C of lead.

TABLE 1
Spectrographic* analyses of coffin lead.

(%)	Sheet	Solder
Silver	0.005	0.007
Copper	0.03-0.04	0.08
Antimony	0.02	0.02-0.03
Tin	0.05	30*
Bismuth	0.05	0.08
Zinc	n.d.	n.d.
Nickel	tr.	tr.
Cobalt	tr.	tr.

* = The amount of tin in the solder was determined chemically, the figure representing the mean of five samples from different areas.
n.d. = less than 0.0001, if any.
tr. = about 0.0001.

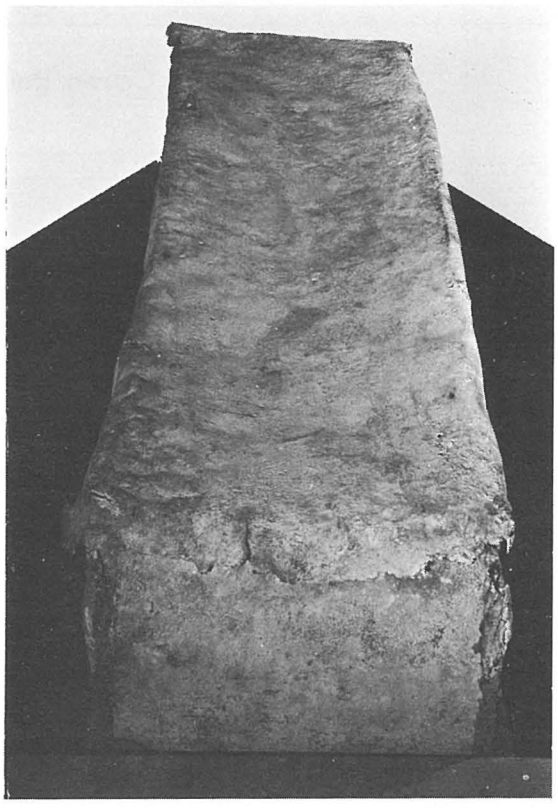


Plate II (left). The coffin as first seen from the west end; note disordered remains of upper part of skeleton in foreground. Plate III (right). Coffin as restored, from the east end.

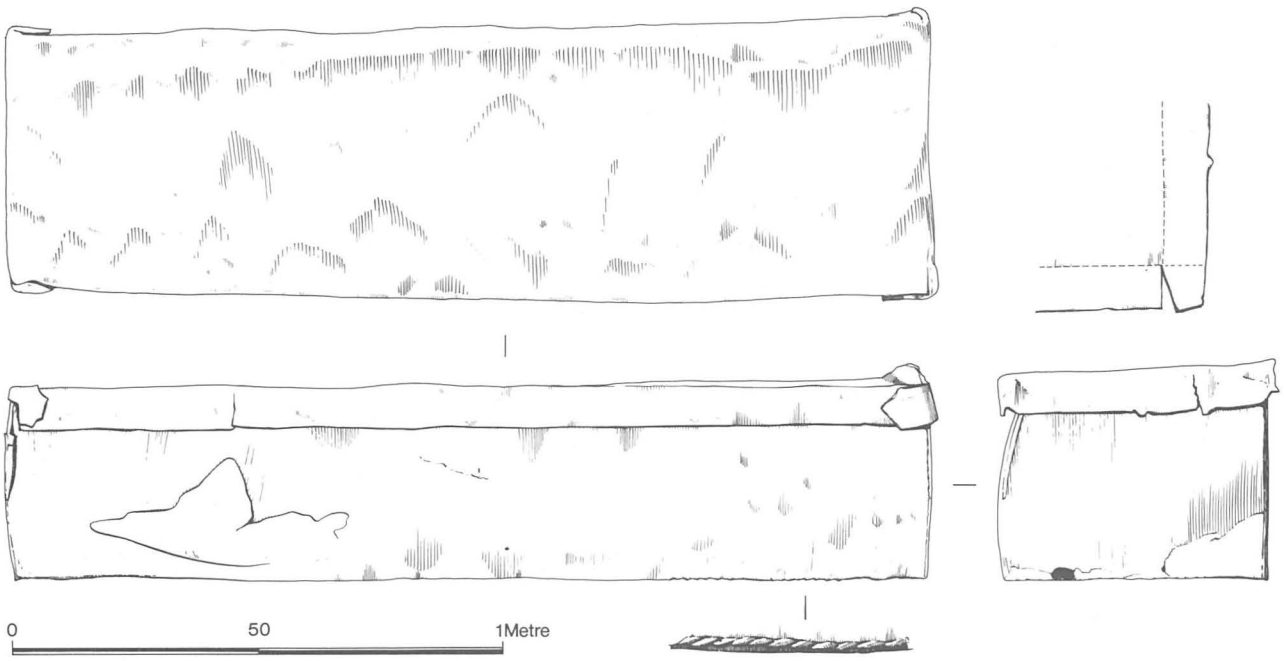


Figure 3. Crown Buildings: The coffin as reconstructed by Rodney Alcock of the Dorset County Museum; at 1/12 life size.

Plate IV. Coffin as restored; the damaged, south side.

Various tests were carried out to try and interpret the different patches of corrosion product and stain, particularly on the coffin bottom, but with little success. The white material generally adhering to the surfaces was found by X-ray diffraction to be basic lead carbonate containing a little calcium but somewhat surprisingly no sulphate. The yellowish part of the stain (Pl. IX) in the area where the head would have rested was found to contain lead oxide. Traces of lead nitrate, though not visible in the X-ray pattern, were also detected (microchemically) but infrared analysis failed to reveal any organic residues in quantities greater than about 0.1 per cent.

Several points deserve special comment. First, the microstructure indicates that the metal is in the as-cast state and has thus not been extensively hammered or otherwise worked. Although corrosion of the surface has evidently obscured any sign of flow-back, there can be little doubt that the sheet of lead for the coffin was produced by the traditional method of pouring the molten metal from a long ladle sideways into a suitably prepared sand mould; this would also account for the slight but definite variation in thickness which was observed. Such work is commonly done 'on site' for obvious reasons which stem from the weight and nature of the metal.

Secondly, all the leadwork, and particularly the double-folding, has been skilfully executed and all joints have been beaten into perfect seals. Again, the solder itself virtually corresponds to the 1 tin:2 lead composition which is still in use today, and has evidently been known at least since Roman times – if not earlier – to have just the right working range of temperature and properties for 'pushing the solder around' on the job. This is as against 'tinman's solder', the reverse alloy of 2 tin:1 lead, which was also known and used in the different way the name imples. Our plumber's solder, here, showed a similar trace impurities pattern to the lead, and can thus be expected to have been made from it.

Opposed to this high level of competence, in choice and use of the materials, is the actual soldering job itself. The soldering action only extends part of the way down the joints, and although the solder has run and set a little way further, the lower third of the joints shows no solder at all. The surface of the solder (Pl. VIII), where it is present, is ridged, imperfect and altogether 'rough'; it gives the impression of having been applied under difficulties – either quickly or awkwardly, or both.

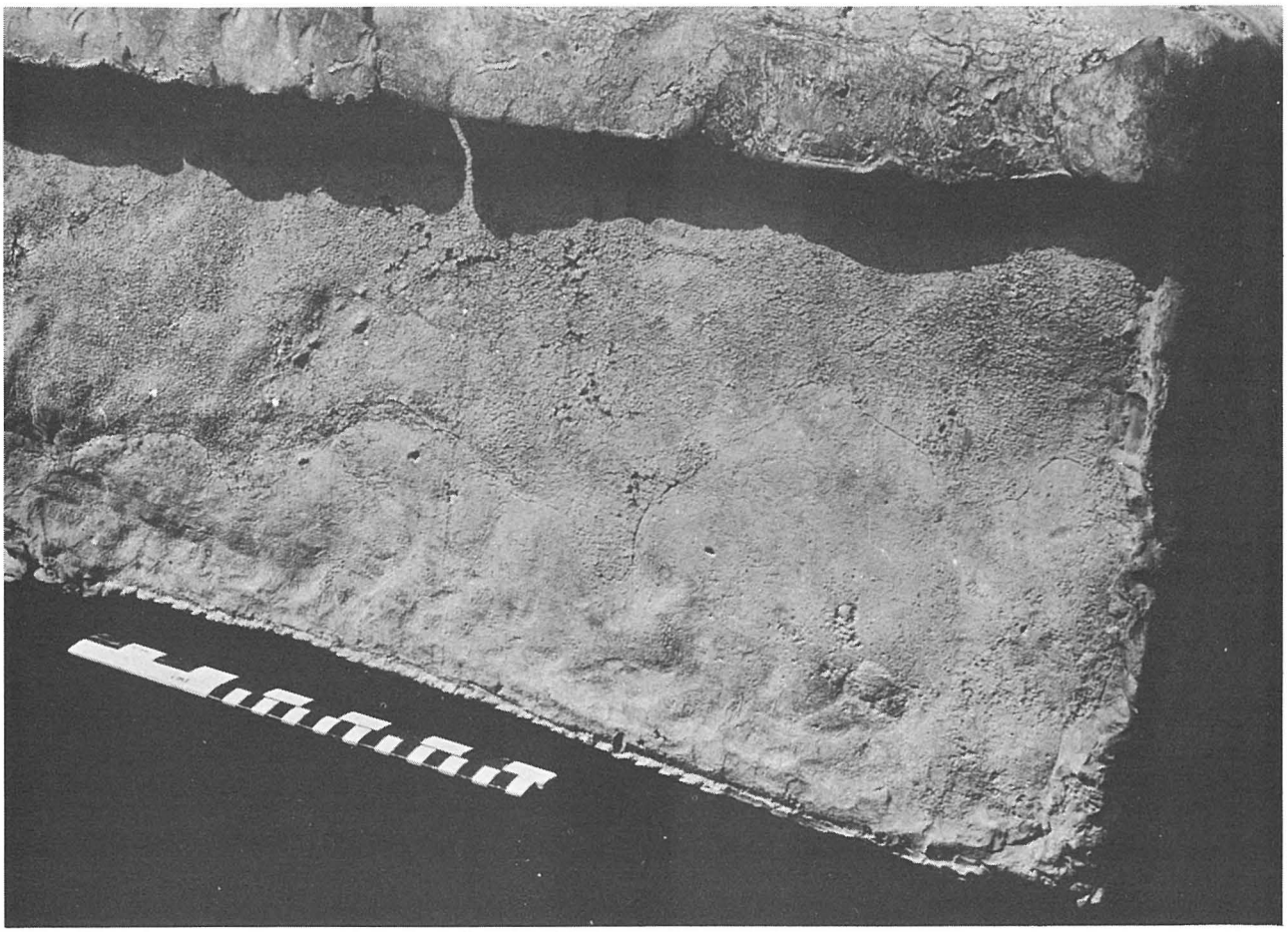
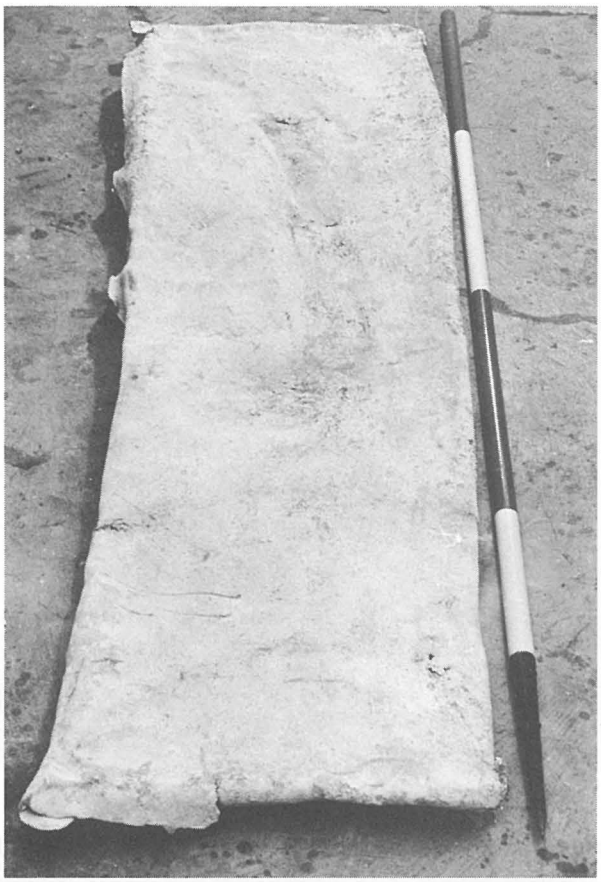


Plate V. Detail of south side of coffin, showing 'cable moulding'.



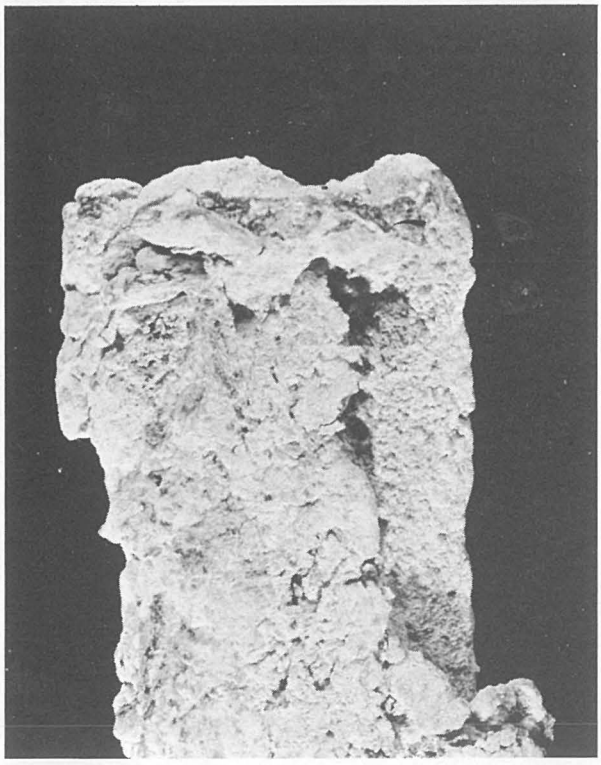
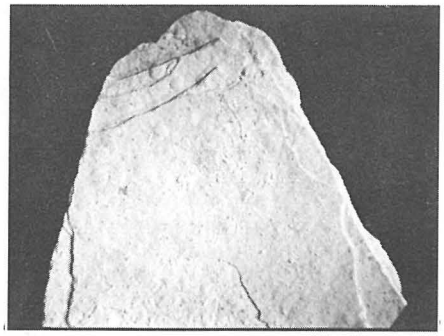
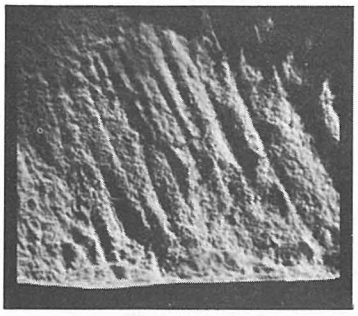
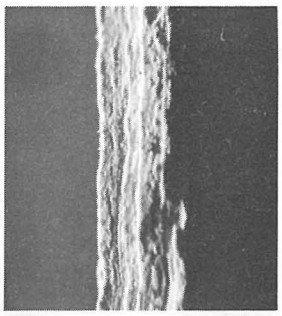


Plate VI (top left). Top surface of coffin lid. Plate VII (top right). Underside of coffin lid. Plate VIII (bottom left). Detail of solder surface. Plate IX (bottom right). Inside of coffin, showing head stain, west end of coffin to left.







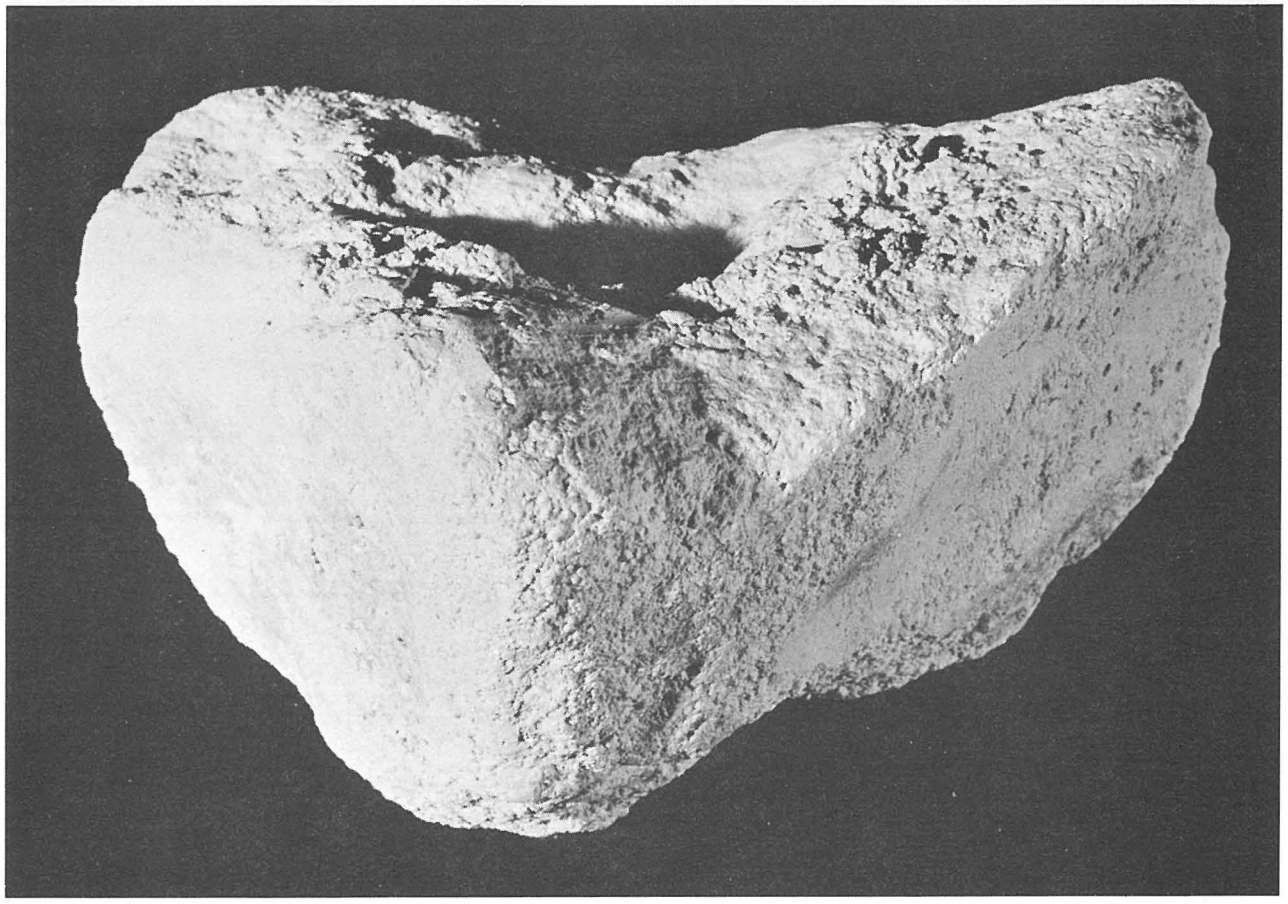


Plate X (top left). 'Plaster' flake from coffin filling (AM No. 710051) ×4.5. Plate XI (top right). As Pl. X (×9). Plate XII (middle left) 'Plaster' flake showing 'brushmarks' (×4.5). Plate XIII (middle centre) as Pl. X, in section, showing laminations ×18. Plate XIV (middle right) as Pl. X (×9). Plate XV (bottom) corner at base of gypsum packing (see Pl. I).

THE GYPSUM AND OTHER FILLING by E. F. Freeman, Ancient Monuments Laboratory

AM No. 710052

The material submitted for examination consisted for the most part of rehydrated microcrystalline gypsum ($CaSO_4.2H_2O$) – set 'Plaster of Paris'. However, after gentle crushing the plaster gave a weak effervescence with dilute hydrochloric acid, indicating the presence of carbonate (probably $CaCO_3$). The plaster was also found to contain small angular relatively hard, white opaque fragments (*c.* 1-2 mm diameter) which by their behaviour upon firing at 200-300°C, their hardness (less than 7 on the Moh scale), general inertness towards acid, and microscopical appearance under 'crossed nicols', seem to consist of particles of incompletely burnt gypsum. Some of these particles, after washing in water, did fizz weakly with acid, showing the presence of a small amount of carbonate. This suggests that the original source of the gypsum contained carbonate, rather than a deliberate addition of lime to the plaster before use.

Since only a small fraction of the plaster originally present in the coffin was recovered, it was not possible to reconstruct the external mould of the body. However, two distinct textile impressions, 710052X and 710052Y (Pls. XVI and XVII) were preserved, and from the larger of these (710052Y) it is clear that some of the recovered plaster fragments retain 'body–contact' surfaces. These are characterised by an irregular texture and a slight discolouration (to very pale yellow). They contrast with the white, more irregular surfaces of the fresh breaks and with the relatively smooth, slightly undulating surfaces of the 'coffin–contact' surfaces. Three of the latter occur on one large piece (Pl. XV) representing a corner, and indicating a minimum original height of 15 cm for the plaster filling in the coffin. Although all the surfaces are rough and friable the lumps are basically denser, harder and more compact than their surfaces would suggest.

One fragment with textile impressions was recognised in the field (AM No. 710052X). The other was found during the examination of the filling (AM No. 710052Y): it is roughly triangular in shape and measures approximately 4 × 4 × 2 cm. It is slightly concave and shows clear signs of one major wrinkle in the original textile. The impression forms part of a general 'body–contact' surface.

AM No. 710050-1

Portions of the coffin filling from regions that might contain any residue of the 'abdominal contents' were forwarded in two samples: Sample 1, 'sample from upper abdomen, handled, taken 8.9.71', AM No. 710050; and Sample 2, 'sample of fill from abdomen ?untouched by hand, sample taken 9.9.71', AM No. 710051. Both samples were sorted by eye, care being taken to avoid contamination, especially of sample 2. Both samples consist basically of a mixture of soil(?) and fragments of plaster and bone.

Sample 1 (wt. 314.6 g) also contained two incisor teeth (probably adjacent lower 1st and 2nd incisors – Miss R. Powers) showing pronounced wear. No caries were observed, but both teeth showed evidence of extensive calcareous deposits at crown level, i.e. 'calculi'. A 30 g sample of the finer grade material (the 'soil') was examined by dispersion and flotation methods for vegetable matter, etc. Two erupted seed or egg cases were found, together with fragments of either grass or fine bark.

Sample 2 (wt. 667.4 g) contained no microscopic biological remains of any interest, except for a small terminal phalange (?finger rather than toe – Miss R. Powers).

Both sample 1 and sample 2 contained abundant worm casts; this indicates that the burial was contaminated from the overlying soil before discovery, and thus severely restricts any conclusions reached on the biological materials present in the burial (except the human bones, of course).

The fragments of plaster (Pls. X-XIV) found in both samples were of considerable interest as this largely consisted of thin flakes frequently showing up to 23 laminations and 'brush marks' on both surfaces. Tests with acid showed that the flake plaster contains considerably more carbonate than the bulk of the plaster in the coffin. An examination of this main bulk of plaster failed to discover any flakes of plaster enclosed within the main body of the material; it would therefore seem that the flake plaster was not employed as a 'filler', but had a discrete function in its own right: possibly 'whitewash' of insides of coffin and lid or a seal between coffin and its lid?

Dr. Susan Limbrey (then at AM Lab.) has suggested that there may be a different explanation: 'The main laminae which make up some of the fragments of plaster-like material are in places each composed of numerous very fine laminae, which suggests deposition from water by a natural process. The surfaces of the fragments show some nodular or pitted encrustation, suggesting a changing environment of deposition, or a process of dissolution and redeposition at a later stage. The striations interpreted as brush marks could be formed by an irregular "flow" of the depositing water or by some other non-uniform chemical effect'.

We are grateful to Miss R. Powers (British Museum, Natural History) for commenting on the teeth, which should be seen in conjunction with the rest of the human material.

THE FINE STRUCTURE OF THE GYPSUM

by J. S. Cox, BPB Industries (Research and Development) Ltd.

Microscopical examination of this sample (AM No. 710052 T) confirms that it is mainly composed of gypsum. The presence of hemihydrate and anhydrite was not detected. Calcium carbonate has been found in small amounts in the form of calcite.

The sample was examined in the scanning electron microscope when a somewhat unusual crystal structure was observed (Pl. XXI). The crystallites were very much less elongated than one would normally expect from a set plaster body, at first suggesting that the material may have been natural gypsum. This is also indicated by the general friable nature of the sample. The considerable period of time that has elapsed and the damp conditions may well have caused subsequent recrystallisation of the sample, thus making accurate prediction of the original form very difficult. The small, relatively hard fragments, mentioned by Mr. E. F. Freeman in his report, have also been detected in the sample examined here and I would like to endorse his conclusions that they are particles of incompletely burnt gypsum. Their structure was more massive than the fine crystallites in the bulk of the sample. The nature of the striations within the crystal and its general appearance again point to natural gypsum origin, in fact this may be material that has not recrystallised. One of these 'nibs' was heated to convert it to the hemihydrate, which was subsequently identified. On rehydration several gypsum crystals of more normal length to breadth ratio were formed.

During the examination of the sample in the electron microscope trouble was experienced with build-up of electron charge on the surface of the sample. Prior to examination, a two-stage metal coating process was used. This is normally satisfactory for the most difficult of plaster samples, so preparation faults can be discounted. This charging may indicate the continuous breakdown of the sample, under vacuum, during the coating process resulting in a non-continuous surface film. This might be due to the presence of organic material, or to loss of water.

In addition small opaque black specks have been detected. These vary in size from about 0.5 mm down to a few microns in diameter. There is a possibility that these are carbon (charcoal) from a calcination process although they may be of organic origin. I am unable to verify this point, but think it highly likely that the material was deposited in the coffin as hemihydrate rather than gypsum.

The bulk density of this sample is 960 kg/m^3, somewhat low compared with the more normal 1,350 kg/m^3 of a conventional plaster (Pl. XIX) and compares with a plaster like our Carlite 'metal lath' (Pl. XX) which has a lightweight aggregate added to the plaster (normally vermiculite) to give a bulk density between 850 and 900 kg/m^3.

Chemical analysis of the sample gave the following composition:

free water	0.2 per cent	calcium carbonate	2.4 per cent
gypsum	92.0 per cent	acid insoluble	3.0 per cent
anhydrite	2.6 per cent		

The presence of anhydrite could not be detected microscopically; this may be due to it existing as sub-micron crystals below the limits of detectability using optical microscope techniques.

In addition a trace of iron was detected but this is not thought to be significant. No lead was found.

THE TEXTILE IMPRESSIONS (in gypsum filling AM No. 710052) by Elisabeth Crowfoot

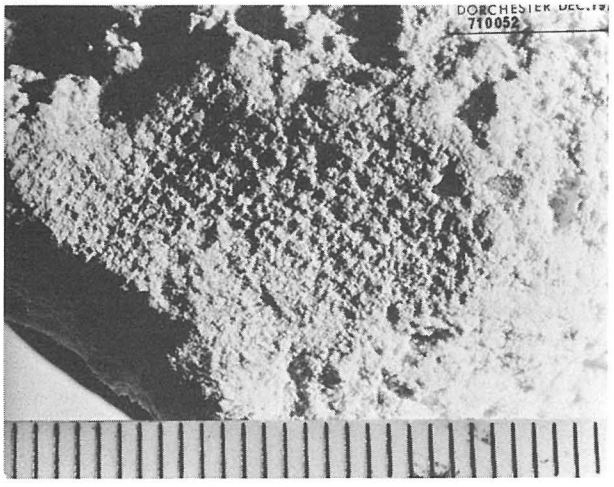
Two areas of textile impression were found in the gypsum packing from the lead coffin. The best preserved, (X), *c.* 2.0 × 1.5 cm overall (Pls. XVI and XVIII) shows a fine tabby weave, Z spun in one system, the other system almost concealed, count *c.* 26/10 threads per cm; in the other area, (Y), *c.* 2.1 × 4.0 cm (Pl. XVII) the surface is not clear enough for count or spinning direction, but the impression is probably of the same textile. Here there appear to be definite folds in the fabric.

Actual textiles preserved in Roman gypsum burials from England, all of vegetable fibre, probably flax, Z spun tabby weaves, have been described by Wild (1970), one at Malton, E. Yorks., two from York, the pieces of cloth from the latter lying in layers. These are all slightly coarser than the Dorchester fabric, which is likely to have been a fairly fine linen.

Impressions of textile from other similar burials, one at Keston, Kent, and eight from York, are again all of tabby weaves, mostly fine, counts ranging from 40-50/20-22 to 14/8-10 per cm; one shows part of a sewn-on coloured band, which has left traces of dark red on the gypsum.

All these fabrics have been described as shrouds or wrappings, and the fold-marks on the Dorchester impression also suggest that the cloth was wrapped around the body. In two cases from York more than one fabric has been used – one fine, with a coarser one outside, from a burial in the railway excavations, and four different types of cloth from a coffin containing the bodies of a mother and child in Bishopsgate Street. Henshall (1970) noted that in this case all four were used for wrapping the bodies, and their original purpose, perhaps as towels or clothing, could not be established. In one of the Continental gypsum burials catalogued by Wild a towel with fringe and bare-warp band was used to wrap the body of a child.

It seems likely that the shrouding practice in the gypsum burials of the northern Roman provinces was similar to that of the Roman Near East. When studying remains of mummified burials at Palmyra (1st-3rd centuries AD) Pfister (1934) found that the earlier Greco-Roman method of wrapping the corpse tightly in narrow bandages had been abandoned, and the embalmed bodies were swathed in layers of linen, much of it already well-worn, and fragments from wearing apparel, not in lengths of new material woven specially for shrouding.



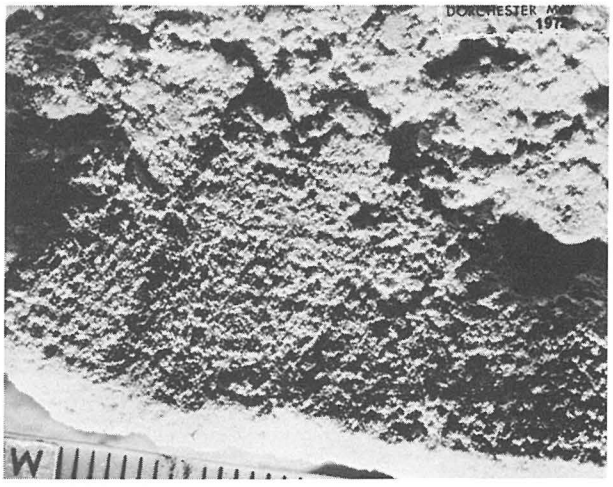
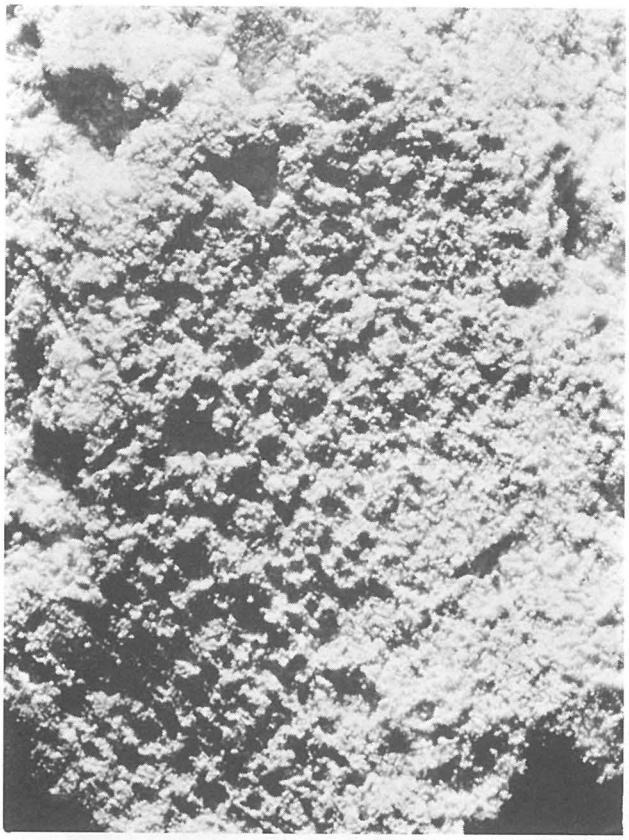


Plate XVI (left). Textile impression (AM No. 710052 X) in gypsum packing (see Pl. XVIII). Plate XVII (right). Textile impression (AM No. 710052 Y) in gypsum packing.



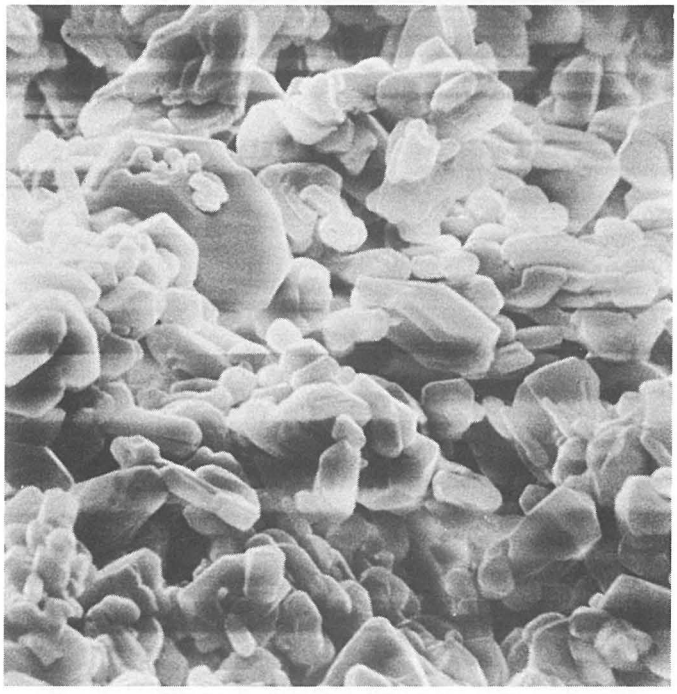


Plate XVIII (top left). Detail of textile impression *c.* ×4 (AM No. 710052 X) (see Pl. XVI). Plate XIX (top right). Scanning electron micrograph (SEM: *c.* ×1.5k) of conventional gypsum plaster (normal East Lake). Plate XX (bottom left) SEM of Carlite (Browning) plaster *c.* ×2k. Plate XXI (bottom right) SEM of gypsum packing (AM No. 710052 T) *c.* ×1.8k.

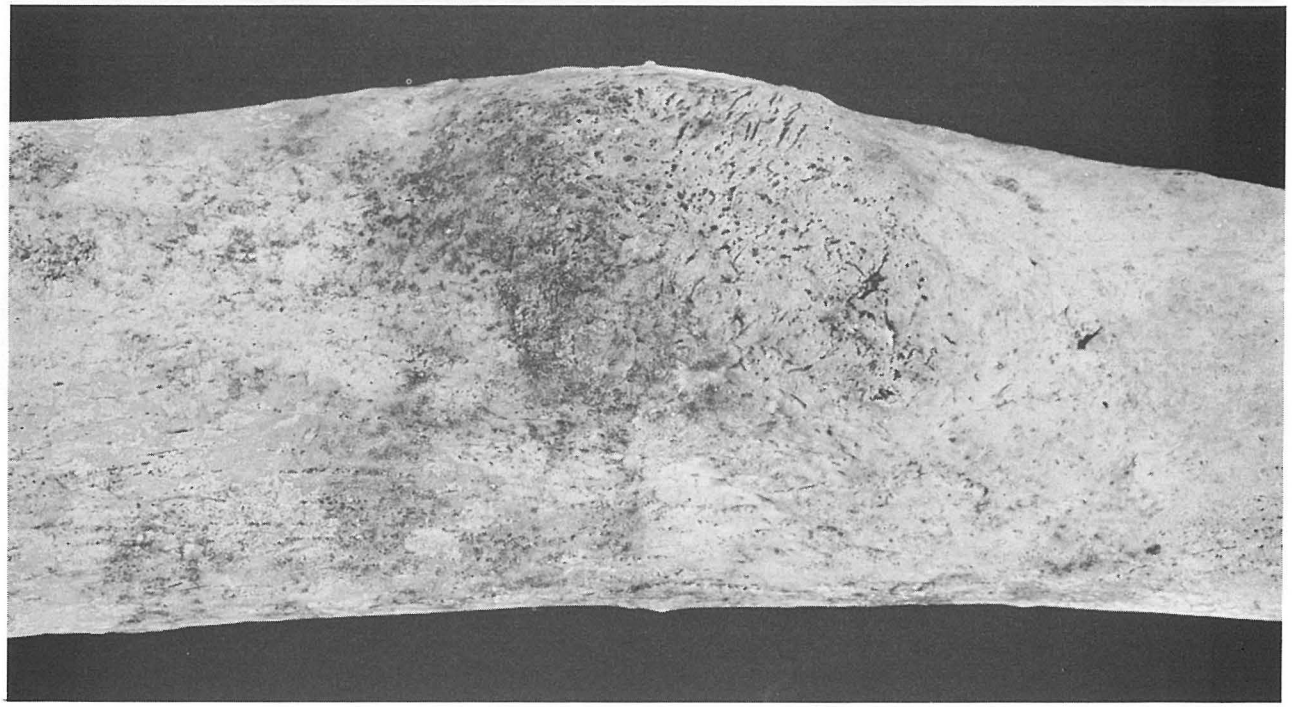


Plate XXII (top). Left clavicle and right tibia of skeleton, showing fractures. Plate XXIII (bottom). Detail of protuberance on left tibia, *c.* ×3.

THE SKELETAL REMAINS by Mary Harman

The bones are in good condition, though brittle, and the skeleton is nearly complete: the cervical vertebrae, two thoracic vertebrae, many ribs and the right clavicle are missing. The skull is represented solely by a fragment of bone from the vault and the left malar and maxilla.

The size of the bones and the marked muscular attachments suggest that the skeleton is that of a male; the small angle of the sciatic notch and the large sacro-iliac articulation support this: while there is not enough of the skull available to provide further evidence, it is almost certain that the individual was a man. Calculations based on the total length of the humerus (329 mm) and of the radius (253 mm), using the formula worked out by Trotter and Gleser (1952), give a height of 1.75 metres (5 ft. 8 in.).

The number of teeth found is shown in the dental formula below. None are known to have been lost during life. There are no caries. Light wear on the first molars indicates that the man probably died between the ages of 20 and 25 years.

							UPPER								
8	7	6	5	~~4~~	~~3~~	~~2~~	1		1*	2*	3	4	5	6	~~7~~ ~~8~~
RIGHT															LEFT
~~8~~	~~7~~	~~6~~	~~5~~	~~4~~	3	~~2~~	1		1	2	~~3~~	4	~~5~~	6	~~7~~ ~~8~~
							LOWER								

– = Jaw missing; / = Tooth lost after death; * = ?Recovered from 'abdominal contents' (AM No. 710050).

The lower thoracic and lumbar vertebrae have varying degrees of osteophytic growth on the margins of the bodies; a small overlap of this originally joined the thoracic vertebrae 9 and 10, on the ventral surface. The articular facets for the ribs show signs of degenerative disease and there is a slight osteophytic growth around the edges of the femoral condyles. This evidence of osteoarthritis is unusual in such a young individual and might suggest the upper end of the age range.

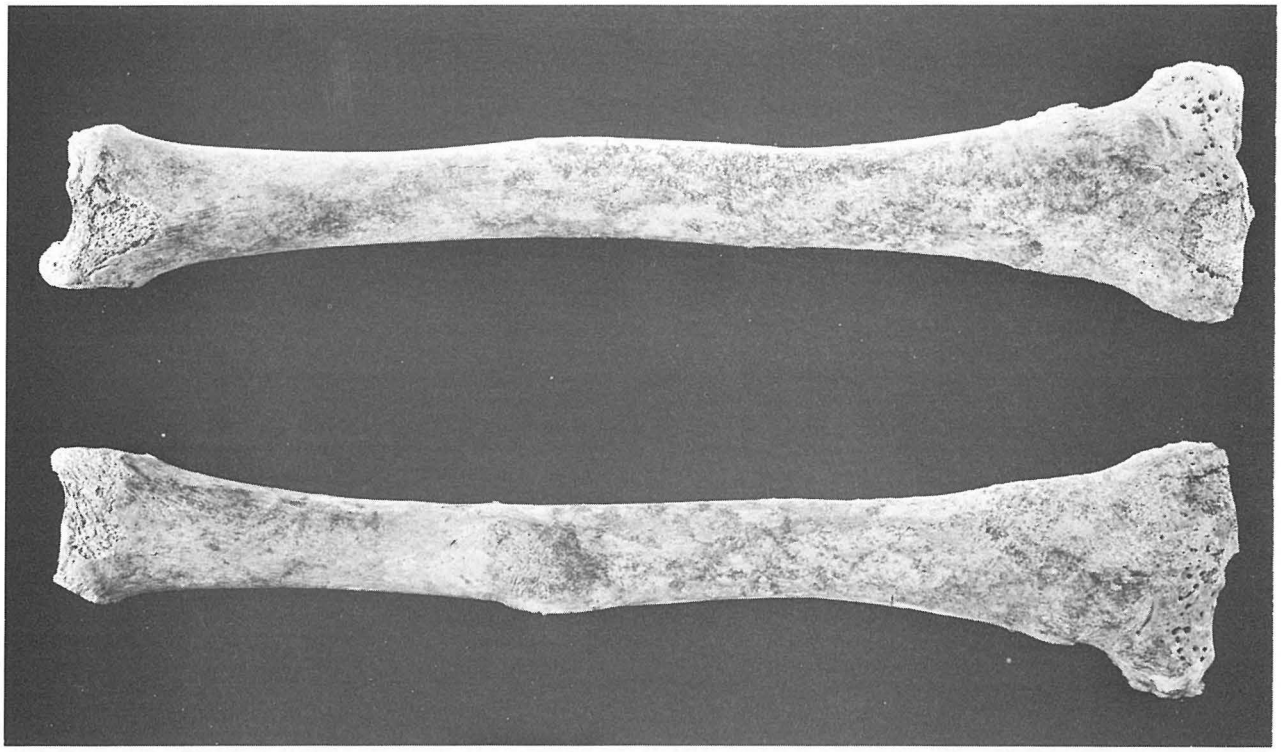
The left clavicle has suffered a total fracture (Pl. XXII) about halfway along the bone, and has malunited, with a callous around it. Five healed fractured ribs indicate an injury on the right side of the chest, below the arm.

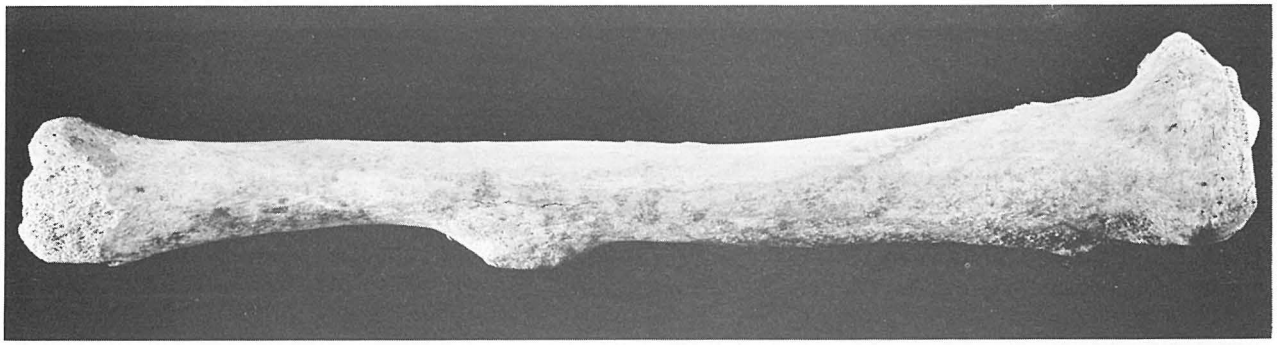
The left tibia has a protuberance on the anterior surface (Pls. XXIII and XXV) slightly towards the distal end of the shaft, on the medial side of the crest, which is slightly displaced laterally. Radiographic examination (Pl. XXVI) of the bone indicates that the bump, though part of the bone and not detachable, lies on the surface, which can be detected beneath it. The protuberance has a slightly pitted surface (Pl. XXIII). It does not appear to be a healing callous, the tibia showing no signs of fracture, and is probably traumatic in origin, possibly the result of repeated blows on the same area.

Conclusion

The skeleton is that of a young man aged between 20 and 25 years, perhaps more likely older than younger, about 1.75 metres (5 ft. 8 in.) tall, with incipient osteoarthritis. Earlier in his life he had fractured his left clavicle, and received an injury to the right side of the chest which resulted in several broken ribs. A bony excrescence of the shaft of the left tibia is probably a response to superficial injuries in that area.

I am grateful to Mr. D. R. Brothwell for his comment on the sex of the skeleton; to Miss T. Molleson who radiographed the left tibia, and to Dr. J. L. Price who commented on the injured bone as follows: A smooth margined dome of cortical bone on the anterior aspect of the tibial shaft. There is a plane of cleavage between it and normal cortex. This is a localised area of periostial new bone formation and on its medial aspect a shallower area of periostial new bone merges with the lesion. The bone is not dense enough for an osteoma and the lack of change in the underlying cortex rules out a sclerosing infective process. I suspect that this is an organised and ossified subperiostial haematoma.





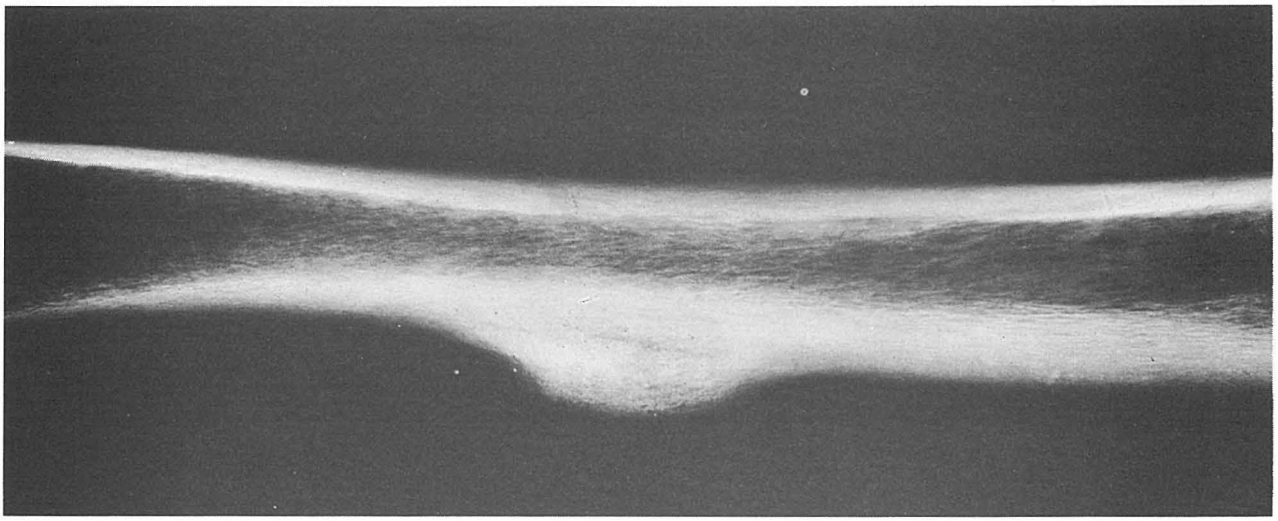


Plate XXIV (top). The tibiae, for comparison. Plate XXV (middle). Left tibia, showing protuberance. **Plate XXVI (bottom).** X-radiograph of protuberance, showing superficial character.

Figure 4. Crown Buildings: The plait, at life size (AM No. 710048 B).

THE HAIR by M. D. Paterson,
Metropolitan Police Forensic Laboratories, London

A 'head' (Pl. XXVII) of reddish-brown hair was received and stored in liquid nitrogen (AM No. 710048 A). A fragment of human skull (AM No. 710264), received at the same time, was examined for any evidence of hair attachment, with negative results. Scrapings were spectrographically analysed along with the hair.

A plait (Pl. XLIV, Fig. 4) of hair (AM No. 710048 B) similar to the 'head', and which had been freeze-dried at the British Museum (Natural History) and stored dry at room temperature, was received later and is reported on separately (see B, below).

A. The 'head' (Pl. XXVII)

This appeared to be loosely plaited and it was thought wise not to disentangle the whole specimen. Accurate measurement of all the hair was impossible owing to its coarse and brittle condition but some strands, selected for measurement, were found to be 15 cms long and over. The large quantities of dirt and gypsum were then removed from the sample by ultrasonic washing in a weak solution of detergent and in feel and appearance the hair was then similar to modern hair. Appropriate samples were extracted for examination.

Microscopy

After cleaning the scale pattern was studied by replication. The hair was pressed onto a cellulose acetate slide moistened with acetone and then removed. The imprint showed that, although the scales had been eroded over a large area, some scale patterns still remained in a remarkable state of preservation (Pl. XXVIII).

Cross-sections were then made by embedding the hair in methacrylate resin (HT cement, Hopkin and Williams) and curing for five hours at 70°C. The cured block was then cut on a sledge microtome. The resultant sections were found to be of a variety of shapes: oval, round, dumb-bell and triangular, etc. (Pls. XXXII and XXXIII). In contrast, modern head hairs are usually round or oval in section and moustache or beard hairs, in general, triangular, although an occasional triangular hair may be found in head hair. This variation in cross-sectional appearance may be natural but it is more likely to have been caused by some kind of organic breakdown over the years.

Where continuous medullation occurred the medulla showed radiating fissures, penetrating the cortex, possibly caused by bacterial or fungal attack from within (Pl. XXX). This was also supported by examination of the longitudinal view. Continuous medullation appeared damaged whereas interrupted medullation appeared to be quite normal and undamaged (Pls. XXXIV-XXXVII). This may be due to its lack of contact with the outside air. The cuticle in the majority of cross-sections appeared to be in good condition and this was also borne out by the scale pattern replication.

In the longitudinal view the majority of hairs were continuously medullated or a mixture of continuous and interrupted medullation. The unmedullated hairs were in the minority on the sample examined. Thin black lines were commonly seen running from the medullas to the outside of the hair (Pl. XXXIV). This damage, like the damaged medullas could have been due to fungal or bacterial action or to an unknown agent eroding outwards from the medulla. In unmedullated hairs, where the pigmentation is easily seen, melanin granules still retain their normal appearance (Pls. XXXVIII and XXXIX).

Hair diameters were taken from 40 1.5 cm lengths of hair. These were selected at random from a tuft taken part way along a strand and approximately 15 cms long. Readings were taken at opposite ends of the hairs and the diameters recorded as graticule divisions.

The arithmetic mean was found to be 23.875 divisions or 89.53 μ. The standard deviation was calculated for the full set of 80 figures and found to be 16.38 μ. Since three standard deviations is 49.1 μ, 99.7 per cent of the Roman hairs are predicted to fall within the range of 40.4 and 138.5 μ (Table 2).

Work had been done at the Home Office (1971) Central Research Establishment at Aldermaston on hair shaft diameters. This gives the results of random shaft diameter measurements for 38 males and 12 females. The shaft diameters varied between 20 μ and 130 μ for males and between 20 μ and 140 μ for females. Therefore, this shows a distinct similarity between the Roman and modern hair (Figs. 5-7).

The tips of a number of hairs were examined, the majority of which were found to be badly damaged. Only one hair was found which had a very pointed tip, consistent with its being an uncut distal end, and none of the hairs examined had any roots (Pls. XL-XLIII). Roots, in general, are liable to early decomposition. The sample submitted to tests, however, undoubtedly had all the appearances and characteristics of human hair.

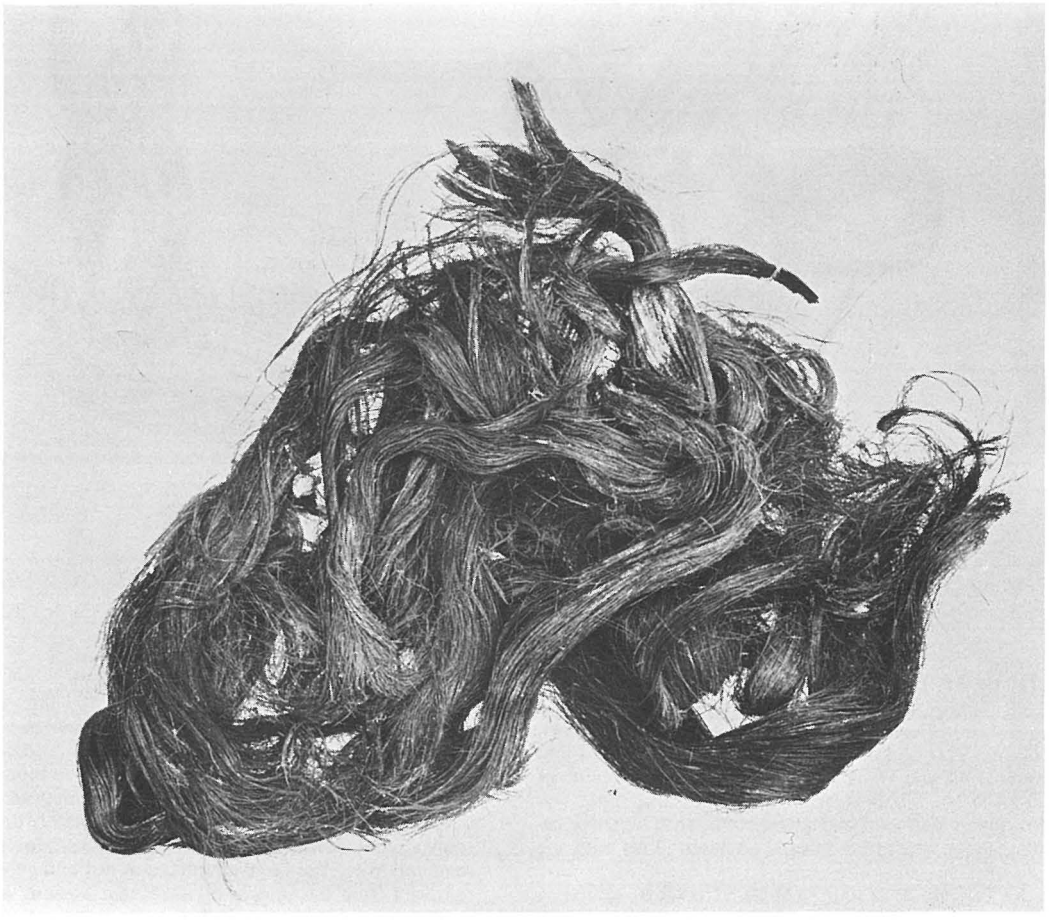


Plate XXVII. The head of hair (AM No. 710048 A), at *c.* 3/5 life size.

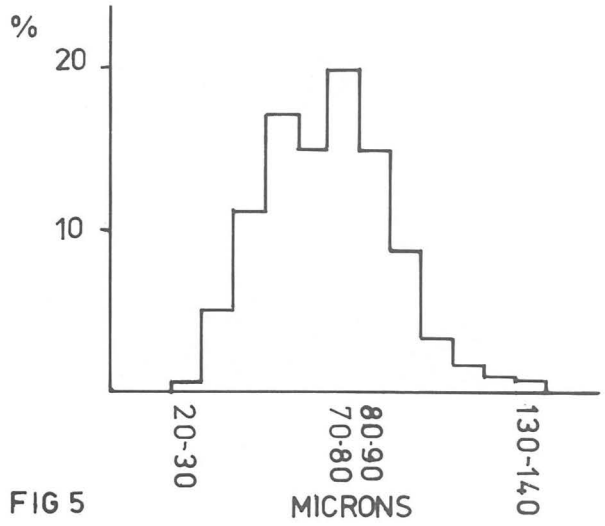


FIG 5

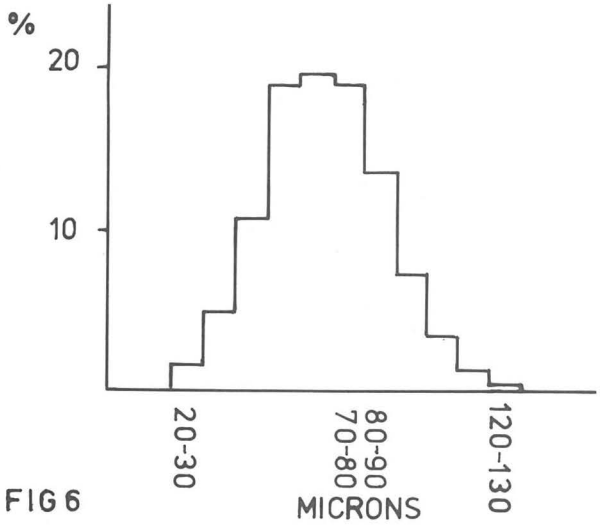


FIG 6

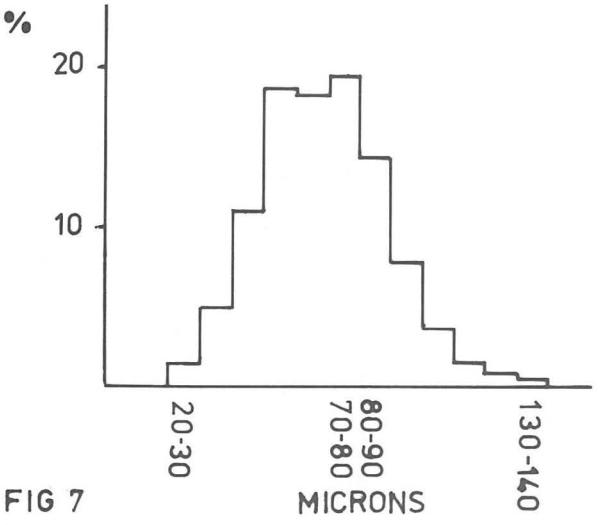


FIG 7

Figure 5. Random measurements of shaft diameter of modern hair from 12 females.

Figure 6. Random measurements of shaft diameter of modern hair from 38 males.

Figure 7. Grand total of 2,300 measurements of shaft diameter of modern hair of both sexes.

TABLE 2

Random measurements of shaft diameter of the Roman hair (AM710048A) in graticule divisions. 1 division = 3.75 μ.

Hair Number	1st Reading	2nd Reading	Hair Number	1st Reading	2nd Reading
1	25	28	21	32	35
2	21	15	22	28	25
3	26	28	23	26	31
4	15	16	24	25	18
5	25	28	25	22	25
6	15	20	26	28	27
7	27	28	27	26	20
8	25	22	28	23	25
9	22	20	29	25	25
10	25	25	30	30	20
11	20	22	31	28	27
12	18	24	32	23	24
13	28	15	33	29	25
14	31	24	34	23	25
15	14	19	35	21	22
16	24	24	36	28	20
17	20	12	37	28	26
18	20	22	38	27	28
19	25	28	39	24	24
20	25	24	40	22	25

Spectrographic Analysis

A sample of Roman hair, some scrapings from the skull, and a sample of modern hair were then submitted for spectrographic analysis and comparison.

There was found to be a trace of lead in the skull scrapings, possibly derived from the lead coffin, but none was detected in the sample of hair.

The Roman hair sample contained a medium quantity of calcium, presumably due to the gypsum packing, and the only unusual element detected was a weak trace of nickel. A reason for this could not be found (Table 3).

This spectrographic analysis was done in order to determine the element to analyse on the electron probe.

TABLE 3

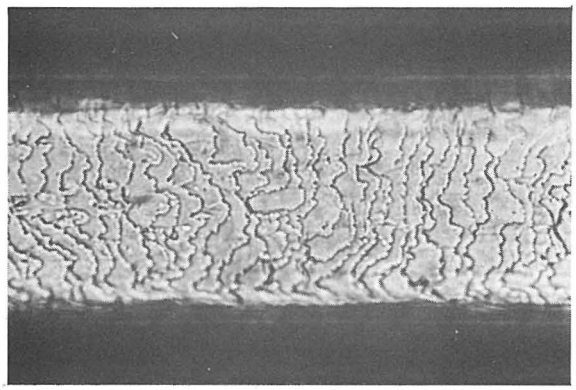
Condensed results of spectrographic analysis.

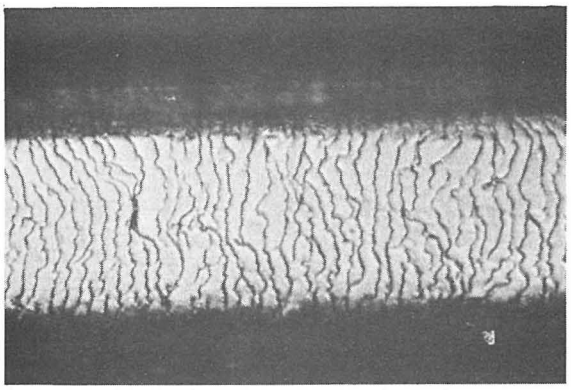
Elements	Roman Hair	Roman Skull	Modern Hair	Blank
Fe	t	t	vft	–
B	–	–	vft	–
P	vft	vft	–	–
Mn	vft	vft	–	–
Pb	–	t	–	–
Mg	w	w	w	vft
Si	w	s	t	vft
Al	t	t	ft	–
Ti	–	–	vft	vft
Cu	vft	vft	vft	vft
Zn	–	–	vft	vft
Ni	w	–	–	–
Ca	m	vs	w	vft
Sr	vft	w	–	–
Na	–	–	vft	–

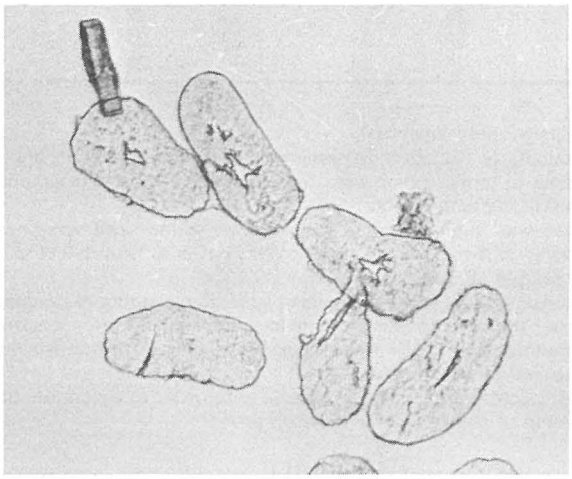
Key: vs = very strong; s = strong; m = medium; w = weak; t = trace; ft = faint trace and vft = very faint trace.

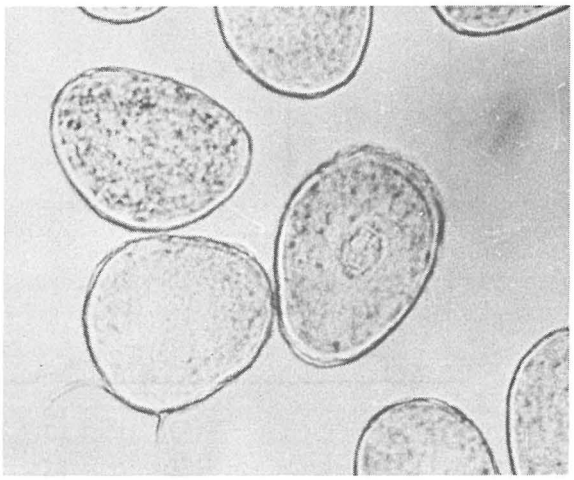
Electron Probe Analysis

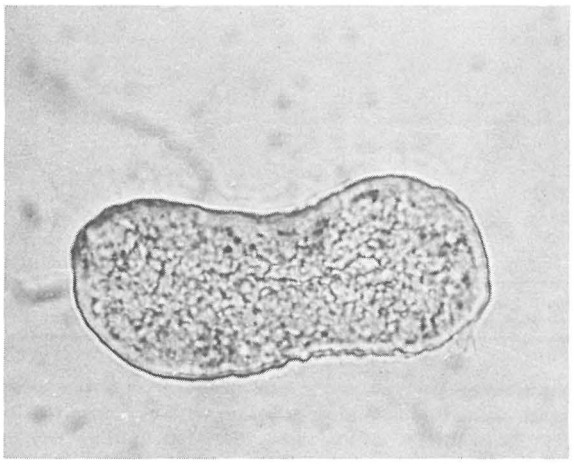
Samples of the Roman and modern hair were examined by electron probe analysis to estimate the concentrations of calcium and nickel present. This estimation was made by timing a fixed number of counts. Calcium was timed for 10,000 counts and nickel, being at a much lower concentration, was timed for 100 counts. The ratio of calcium to nickel was found to be 7.85 to 0.23. On the cleaned hairs both the calcium and nickel were found to be surface contaminants. However, the uncleaned hairs gave readings for calcium slightly higher than the cleaned hair, but no nickel readings. In conclusion it appears that nickel must have been











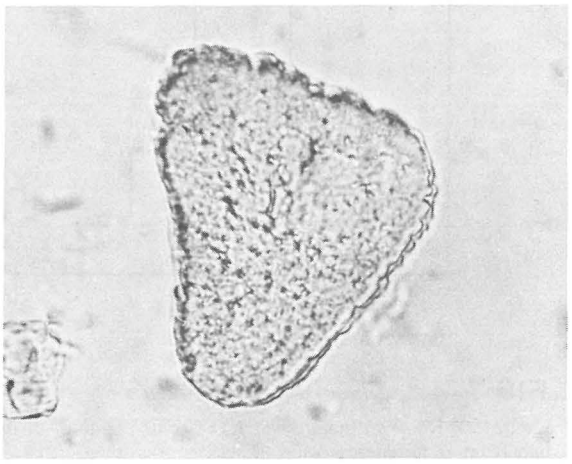
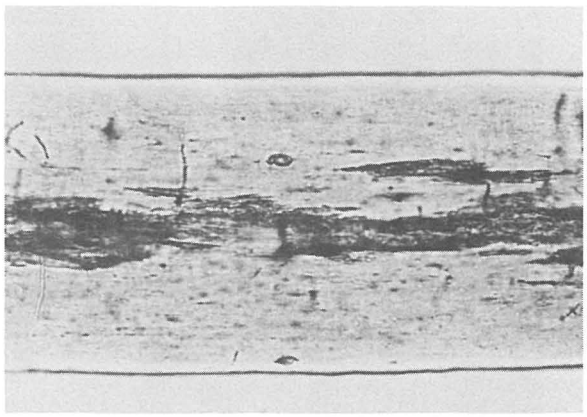
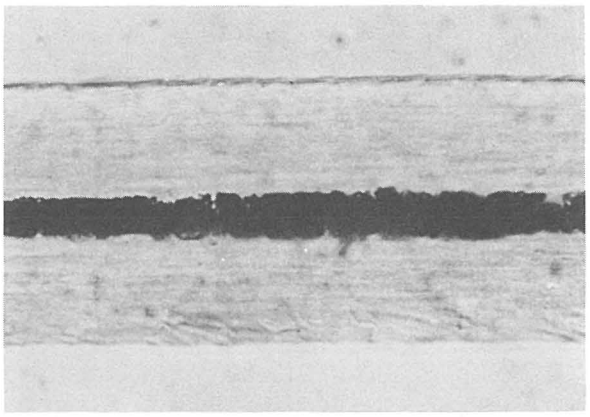
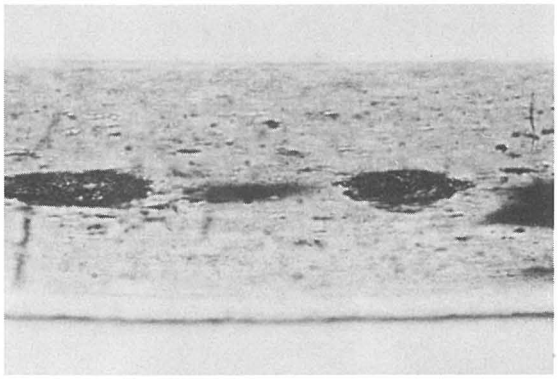
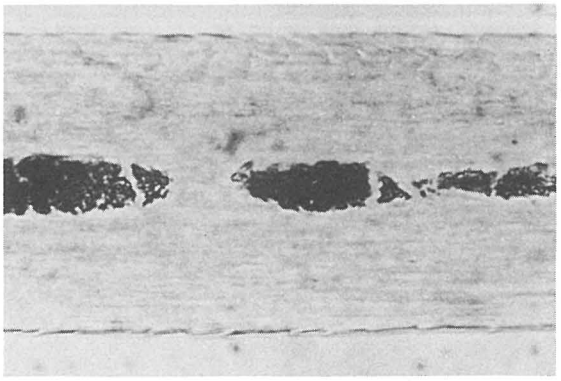


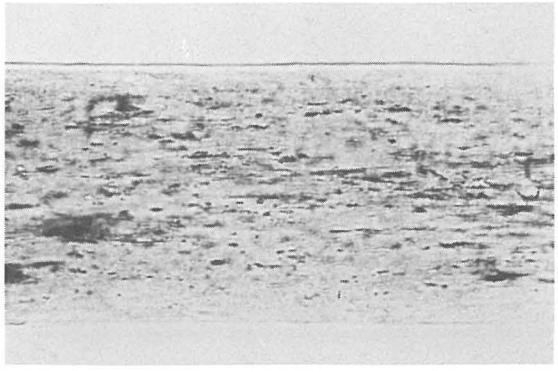
Plate XXVIII (top left). Replica of the scale patterning on sample of head of hair (AM No. 710048 A). Plate XXIX (top right). Replica of scale patterning on modern hair. Plate XXX (middle left). Cross-section of Roman hair showing radiating fissures. Plate XXXI (middle right). Cross-section of modern hair showing normal appearance. Plate XXXII (bottom left). Dumb-bell shaped cross-section of a Roman hair. Plate XXXIII (bottom right). Triangular cross-section of a Roman hair.











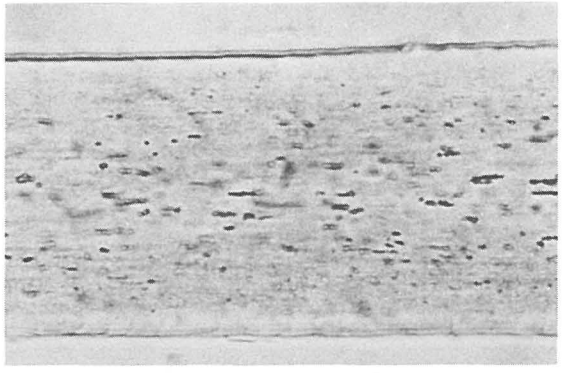
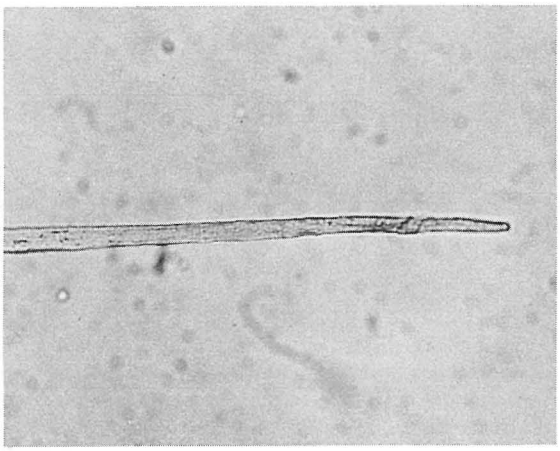
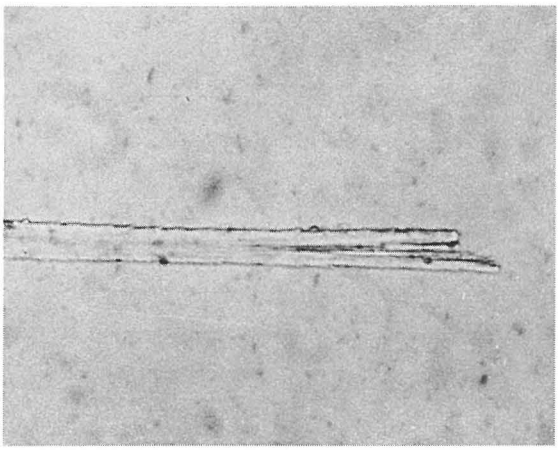
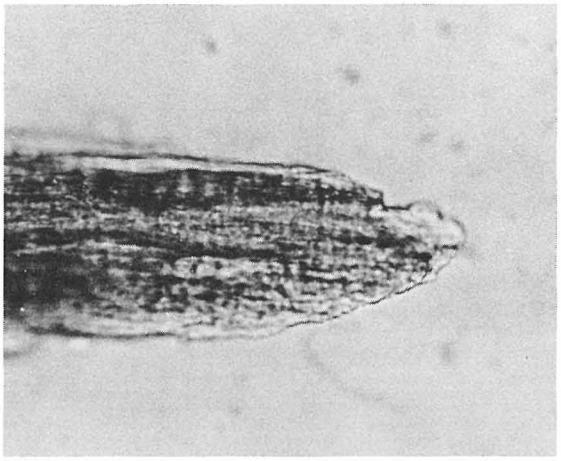


Plate XXXIV (top left). Damaged Roman hair showing black lines running from the medulla into the cortex. Plate XXV (top right). Normal continuous medullation in modern hair. Plate XXXVI (middle left). Interrupted medullation in Roman hair. Plate XXXVII (middle right). Typical interrupted medullation in modern hair. Plate XXXVIII (bottom left). Pigmentation granules in Roman hair. Plate XXXIX (bottom right). Pigmentation granules in modern hair.







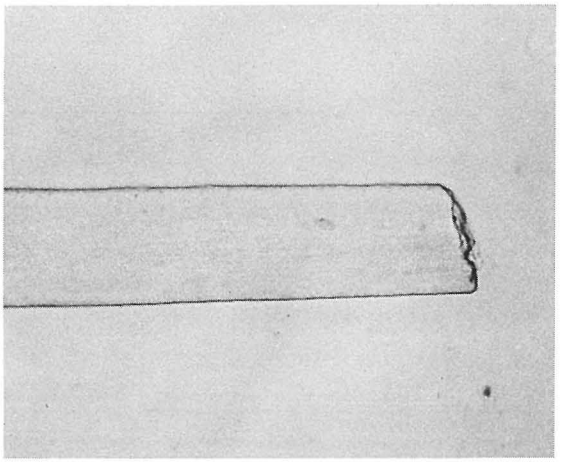


Plate XL (top left). Uncut distal end of a Roman hair. Plate XLI (top right). Uncut distal end of a modern hair showing splitting. Plate XLII (bottom left). Broken Roman hair. Plate XLIII (bottom right). Cut end of a modern hair.

present in the hair before the gypsum covering was introduced. Screening was also carried out to discover the presence or absence of arsenic or lead. No signal was detected for either.

Stereoscan Microscopy

The longitudinal view of the Roman hair was examined under the stereoscan electron microscope. The hairs were coated with a 400 Ångstrom-thick layer of gold and examination in the secondary electrone missive mode was made at 90°, 70°, 10° and 0° incident to the surface. Photographs were taken of both cleaned and uncleaned hairs (Pls. XLV and XLVI).

Comparisons were again made between modern and Roman hairs. The scales on the Roman hairs were seen to be thinner but still in good condition (Pls. XLV-L). This was possibly due to the number of years that had elapsed since burial. The surface of the hair was pitted in a way that is normally associated with hair that has undergone bleaching or treatment with curling tongs (Pl. L).

Colour

The colour of the Roman hair was reddish brown. The next step was to discover whether this was natural or dyed. A sample of Roman hair was then submitted to the action of dye stripping agents. (Natural hair will keep its colour in spite of stripping agents.)

The Roman hair was placed in dimethyl formamide and formic acid solution (1:1) and it coloured the solvent red brown. Modern hair previously dyed with a paste made from henna and water also coloured the solvent in a similar manner. This led to the assumption that the henna colourant lawsone was present. However, after spotting on a thin layer chromatography plate and running in a solvent made from methanol, butanol, ammonia and pyridine, the extract from modern, henna-treated hair migrated successfully but the extract from the Roman hair remained at the origin. Chromatography, therefore, seems to disprove the presence of henna in the sample. However, these hairs may have been henna-dyed 1,600 years ago and chemically changed since then. It is known that henna was used at this period in history (Thorpe) but also that the Romans are reputed to have favoured lightening their hair with goat's fat and ashes.

Information from the Unilever Laboratory tends to suggest that the red-brown appearance is due to melanin oxidation, and the result of age.

An idea was put forward that natural dyeing in the lead coffin may have occurred due to the presence of lead oxide, sulphur and oil. This had to be ruled out, however, as no lead was actually found in the hair. The hair might have been dyed with an inorganic dye, a pigment dye, or vegetable colouring but not oxidation dyes as these were not introduced until 1888.

The most likely explanation is that organic breakdown resulted in the red-brown colouration.

Infrared Analysis

Comparisons were then made by infrared analysis between the Roman hair and modern hair. Infrared spectra were produced for the Roman hair and two samples of modern hair, run with potassium bromide. Each sample was pressed into a 2 mm lead disc and the resultant spectra were overlaid on the same chart. Although slight differences appeared the samples, in general, were similar (Figure 8).

Bacteriology

Isolation of the micro-organisms associated with the Roman hair was effected by culture. Only two organisms were grown on the culture: Haemolytic *Streptococcus* and what is most likely to have been *Stephylococcus albus*. Both bacteria are common and air-carried. They are most likely a product of modern contamination.

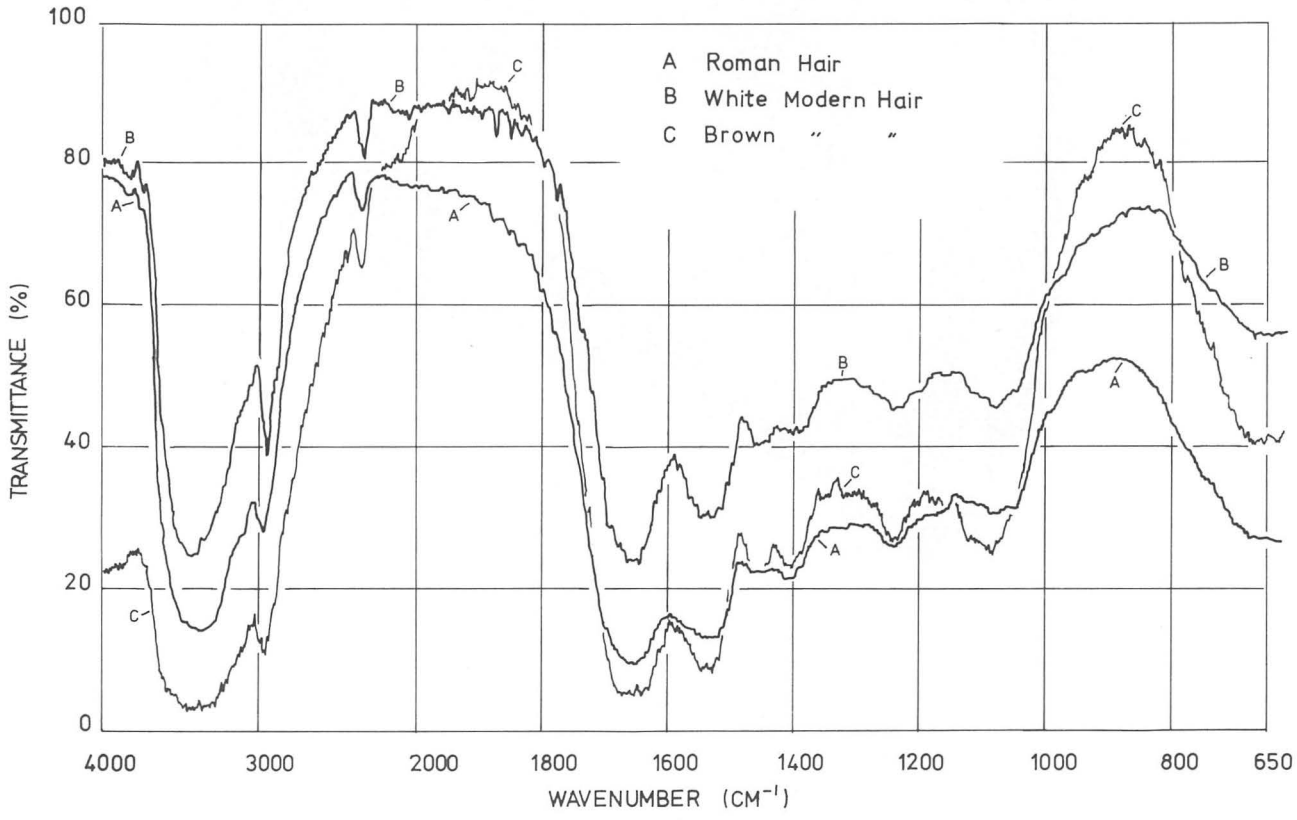


Figure 8. Infrared absorption spectrum of a specimen from the head of hair (AM No. 710048 A) compared with the spectra for white and brown modern hair (in KBr).

B. The Plait (Pl. XLIV, Fig. 4)

This was made up basically of a three-ply braid measuring approximately 28 cms in length. This hair was covered in what appeared to be dirt and gypsum, and was similar in external appearance to the 'head' previously received.

Microscopical comparison between the plait and the 'head' showed close similarities in colour, medullation and internal damage. The thick end of the plait exhibited macroscopic and microscopic damage consistent with having been cut with a knife. Similar damage was found on the 'head'.

Summary

In conclusion, it can be stated, with certainty, that this was human hair. In feel and appearance, and before washing, it was found to be coarse and brittle. It was reddish-brown in colour and 15 cm long or more. Under the microscope the hair was seen to have retained its scale pattern; the scales, however, seemed eroded compared with normal scales. The cross-sections were found to be of a variety of shapes due, presumably, to organic breakdown. The medullas showed definite signs of fungal or bacterial attack. In spite of this the medullation was still in a very good condition for the age of the hair and the pigment granules appeared to be quite normal. The theoretical range of hair diameters showed a marked similarity to the experimental results gained at Aldermaston. Unfortunately no roots were found, most ends being broken. The hairs contained large amounts of calcium which was to be expected and a small amount of nickel for which a reasonable explanation could not be found. The hairs examined under the electron microscope, when compared with modern hairs, showed a thinning of the scales already mentioned and surface damage such as is due to cosmetic treatment of hair. The hair was analysed for the presence of dyes, and the conclusion reached was that the hair had become red-brown over the years since burial. The infra-red analysis showed no fundamental differences between the Roman and modern hair and microbiological culture produced none of the original bacteria or fungi, only present-day airborne contaminants.

The plait and 'head' were macroscopically and microscopically indistinguishable. It is my opinion that both probably came from the same person, but one cannot exclude the possibility that they came from separate individuals.

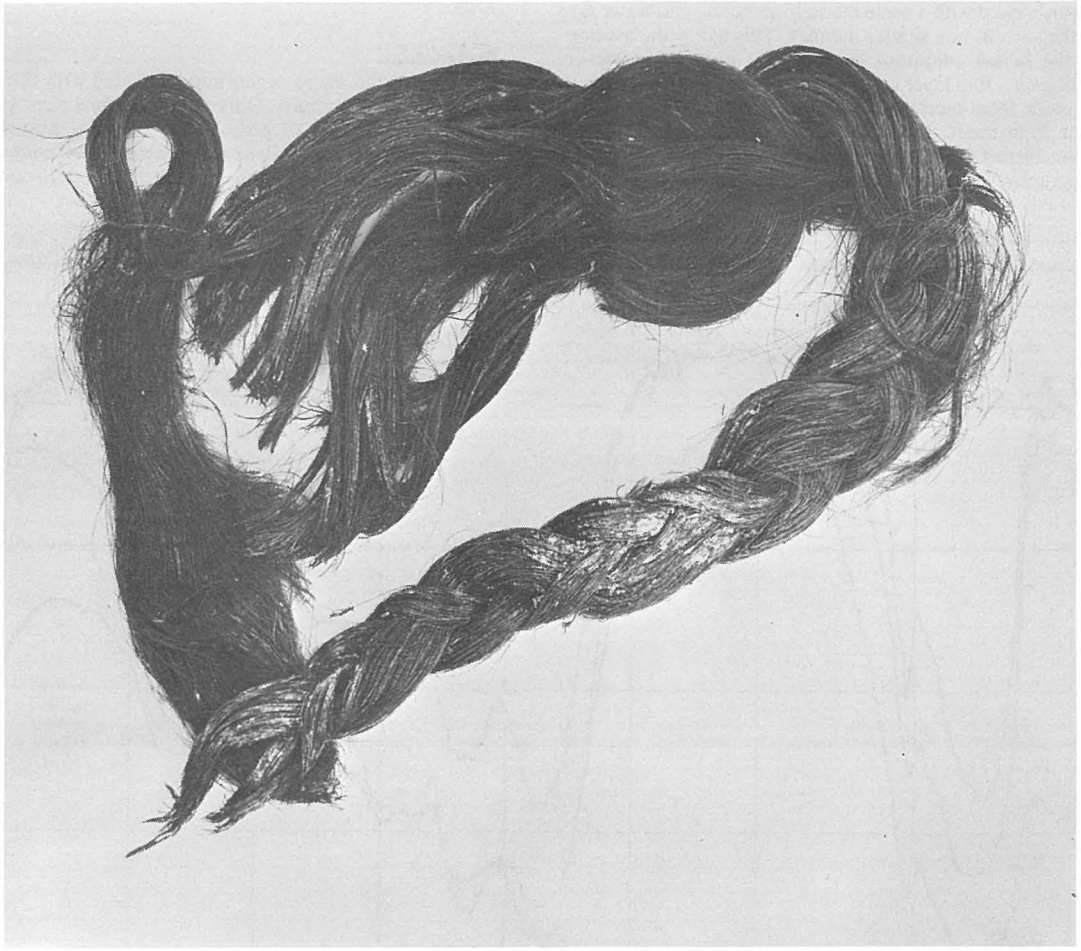
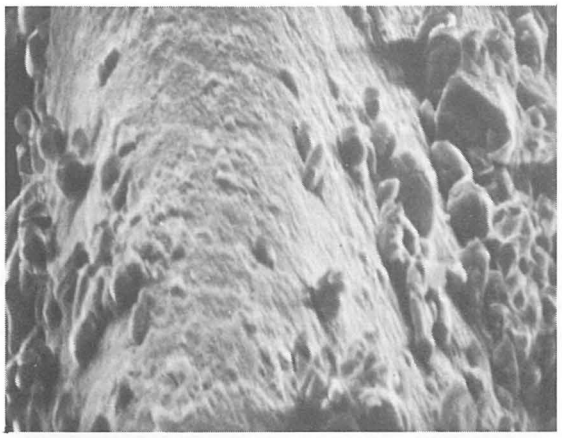
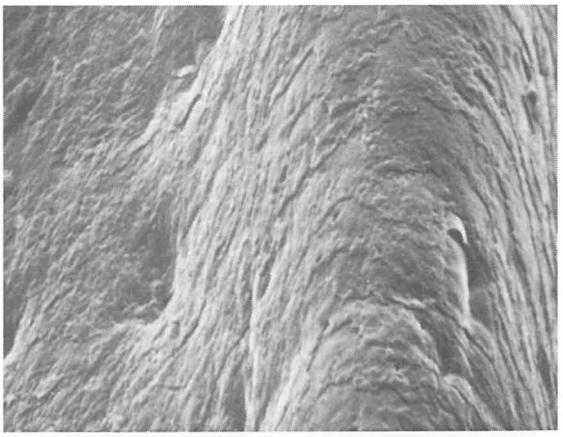
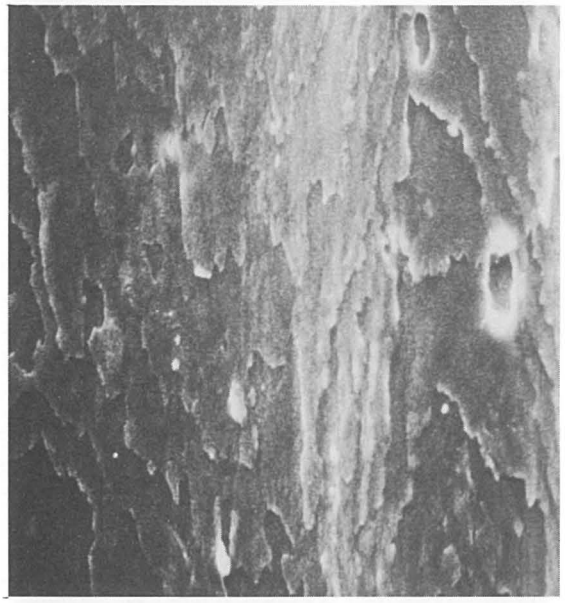
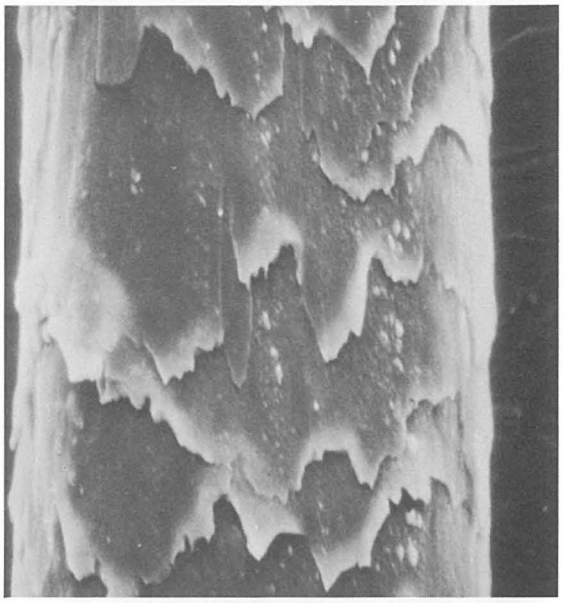


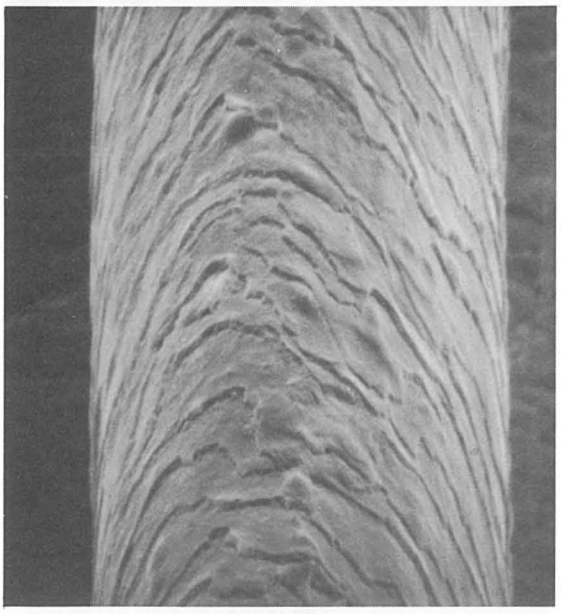
Plate XLIV. The plait (AM No. 710048 B), at *c.* 6/7 life size.











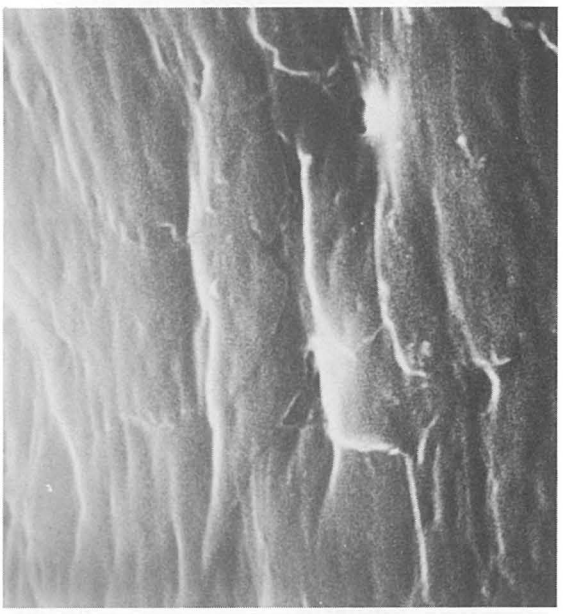


Plate XLV (top left). An uncleaned Roman hair (SEM: 70°X 0.9k). Plate XLVI (top right). A cleaned Roman hair (SEM: 70°X 1k). Plate XLVII (middle left). A Roman hair (SEM: 0°X 0.9k). Plate XLVIII (middle right). A modern hair (SEM: 0°X 0.9k). Plate XLIX (bottom left). A modern hair (SEM: 70°X 0.9k). Plate L (bottom right). A Roman hair showing pitting (SEM: 0°X 4.5k).

THE AMINO ACID CONTENT OF THE HAIR by Dr. J. E. Eastoe, (then at) Department of Dental Science, Royal College of Surgeons

A small portion of sample AM No. 710048 G was hydrolysed in 6 N HCl at 105°C for 48 hours *in vacuo* and loaded on to the column of the amino acid analyser.

The results are shown in Table 4 and compared with modern hair in Fig. 9. The agreement is good and indicates that the results are fairly typical for hair (with the high level of cystine) but close comparison of the fine details, which has become more profitable with the excavation of similar material at Poundbury, will be incorporated in the report on that site. In the circumstances, the analysis was very successful as almost 80 per cent of the dry weight was recovered as protein.

A peak corresponding to cysteic acid was observed in the amino acid chromatogram, despite the fact that hydrolysis was carried out *in vacuo* to prevent oxidation of cystine to cysteic acid during this step. Gillespie (1970) has reported a number of differences in composition between woolly mammoth hair, which has survived in ice for 33,000 years, and recent elephant hair. Thus the mammoth hair contained cysteic acid, accounting for 5.2 per cent of the total cystine present, but cysteic acid was completely absent from the elephant hair. The present specimen of human hair had a somewhat higher proportion of cysteic acid, which accounted for 7.1 per cent of the total cystine and is included in the half-cystine values reported in the table. The presence of cysteic acid would account for differences in fluorescence after staining with acridine orange or thioflavine t, compared with similarly stained recent hair, as reported by Spearman below.

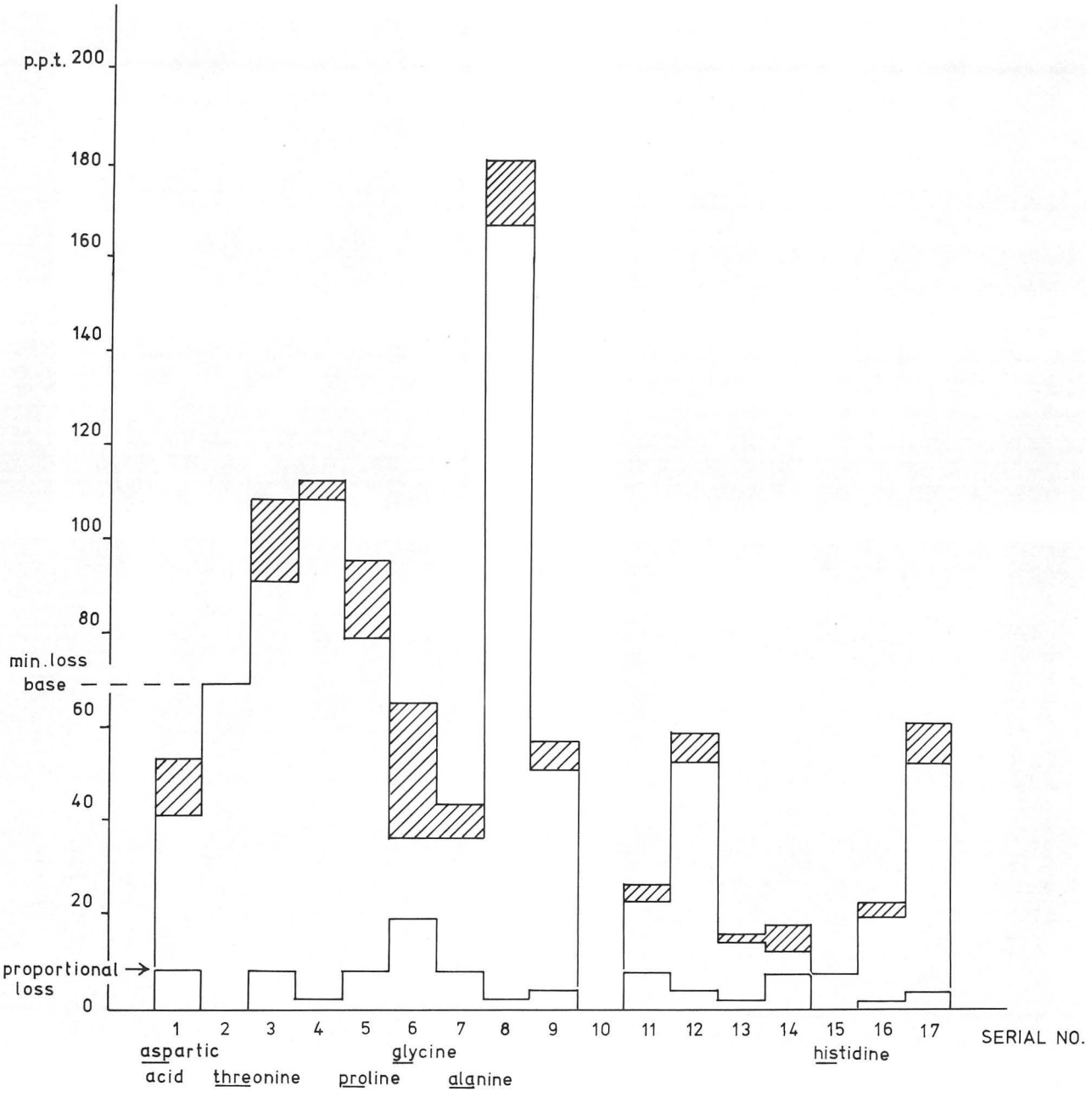


Figure 9. Histogram of amino acid composition of modern hair compared with a sample from the head of hair (AM No. 710048 G: bottoms of hatched portions). Hatching shows extent of loss, and proportional loss is represented by secondary histograms at base. Constructed on basis of minimum loss (loss of threonine = 0). (L.B.)

TABLE 4

Amino acid analysis of hair sample AM No. 710048 G (Chromatogram No. 205).

	Millimoles per 100 g	Grams amino acid per 100 g	Grams amino acid residue per 100 g	Residues per 1000 total residues AM No. 710048 G	Modern*
1 Aspartic acid	35.2	4.69	4.05	47.7	52.7
2 Threonine	58.4	6.96	5.91	79.4	68.8
3 Serine	77.2	8.11	6.72	104.8	108.0
4 Glutamic acid	92.3	13.58	11.92	125.3	112.4
5 Proline	66.9	7.70	6.50	90.8	95.6
6 Glycine	30.7	2.30	1.75	41.8	65.0
7 Alanine	30.7	2.74	2.18	41.7	43.8
8 Half-cystine	142.0	17.04	14.48	192.7	180.5
9 Valine	43.1	5.05	4.27	58.5	62.2
10 Methionine	3.8	0.45	0.38	5.2	–
11 Isoleucine	19.8	2.60	2.24	26.9	26.9
12 Leucine	45.1	5.92	5.10	61.2	58.9
13 Tyrosine	12.5	2.26	2.04	16.9	16.0
14 Phenylalanine	10.4	1.72	1.53	14.1	18.2
15 Histidine	6.7	1.04	0.92	9.1	7.9
16 Lysine	16.9	2.47	2.17	23.0	22.6
17 Arginine	44.8	7.80	7.00	60.7	60.4
TOTAL	736.5	92.43	79.17		

*Simmonds (1958).

FLUORESCENCE OF THE HAIR

(AM No. 710048 M) by Dr. R. I. C. Spearman, (then at) Department of Dermatological Histology, University College Hospital Medical School, London

After staining in 0.1 per cent Acridine orange, with one of my own scalp hairs, the specimen fluoresced an overall orange, and the modern hair blue, and after staining in 0.1 per cent thioflavine t, the specimen fluoresced an overall yellow and the modern hair a blue-green. These differences are only seen by microscopy under a source of UV light. They are typical of old samples of hair (Spearman, 1963).

Probably the staining is due to autoxidation of cuticular cystine to cysteic acid which then stains with these basic fluorochromes.

No splitting was found and, apart from variation in diameter and a less smooth border to the cuticle, there was little damage.

THE HAIR AND KERATINOPHILIC SOIL FUNGI

by Dr. G. J. F. Pugh, (then at) Department of Botany, University of Nottingham

An attempt was made to answer these questions in the ways described (Sample AM No. 710048 C):

1. ARE THERE ANY HYPHAE PRESENT?

Method A

Small pieces of hair (2 cm long) were placed on several slides and a 10 per cent solution of NaOH was added. The slides were warmed for 15 minutes over a microscope lamp and then when the hair had all dissolved the residue was studied in lactophenol.

Results

No hyphae were observed in the hair.

Method B

Short pieces of hair 2 cm long, were planted out onto Sabourauds agar, malt agar and PDA – five replicates of each – and the plates were incubated at 25°C.

Results

No fungi grew from the hair.

2. WILL KERATINOPHILIC FUNGI GROW ON THE HAIR AND DECOMPOSE IT?

Method

Short pieces of the hair 1 cm long were cut and sprinkled over a soil which was known to contain keratinophilic fungi. Five replicates were assembled. The controls were sprinkled with degreased sterile wool (five replicates). The soils were kept moist with sterile distilled water.

Results

After three weeks incubation the control plates were all fully colonised by *Keratinomyces ajelloi* and *Chrysosporium* whereas those of the experiment had only 14 per cent colonisation with *Keratinomyces ajelloi* and 28 per cent with *Chrysosporium keratinophilum* (Vanbreuseghem, 1962).

Thanks are due to Miss Ruth Ibbotson for laboratory assistance.

TRACE ELEMENT ANALYSIS OF THE HAIR

by Dr. I. M. Dale, Department of Clinical Physics and Bio-Engineering, West of Scotland Health Boards, Glasgow

A sample of the plait (AM No. 710048 N) was analysed for arsenic, antimony, mercury and bromine by neutron activation, and cadmium, copper and lead were determined by anodic stripping voltammetry.

The results (Table 5), presented with values for modern hair, indicate that arsenic, bromine, cadmium and copper are comparable with present-day levels. Lead and antimony are considerably higher but this is almost certainly due to contamination from the coffin. The mercury concentration is on the high side of normal and could represent dietary intake or absorption from cosmetics. Fig. 10 shows comparative levels for all the above elements, Fig. 11 (Dale, 1974) the detailed distribution within the range of results on which the data given for mercury in modern hair are based.

TABLE 5

Trace element concentrations in the plait (AM No. 710048 N) and modern hair (parts per million*).

	AM No. 710048	Modern Hair Range	Average
Arsenic	0.22	0.03- 0.53	0.13
Cadmium	0.45	0.05- 2.27	0.20
Antimony	12.6	0.08- 2.54	0.62
Mercury	6.1	0.37- 16.5	2.41
Bromine	34.7	10.9 - 61.6	32.0
Copper	42.0	7.6 - 54.5	23.1
Lead	760	10 -150	30

*N.B. 1 p.p.m. is equivalent to 1/28 of an ounce in 1 ton.

SPECTRAL REFLECTANCE AND COLOUR OF THE HAIR (AM No. 710048 B; Fig. 12)

by The National Physical Laboratory, Teddington

The hair had a reddish colour appearance and minute pieces of plaster were still adhering to it. In view of its delicate and brittle condition, no attempt had been made to unplait it except at one extremity where one strand had been gently combed out for divers tests. No cleaning procedure was applied at NPL except gently prodding and tapping the combed test portion to remove remaining traces of plaster powder which would have jeopardised these measurements. The test portion was wrapped round a frame of blackened stiff card about 35 mm square, the aperture in the frame (of about 15 mm square) covering the actual area of the measuring port. This permitted two layers of the hair strand to be gently pressed home against the port by means of a spring-loaded black card backing piece. The double layer of hair was almost totally opaque when held up against sky light, as packed and wrapped around the frame, so that the full reflectance could be measured.

Measurements (Clarke, 1972)

A Cary 14 recording spectrophotometer fitted with type 1411 reflectance attachment was used to make measurements of total reflectance over the spectral range 770 nm to 300 nm (visible and near-ultraviolet regions). Mean results were obtained from four sets of measurements, made with the combed hair direction vertical, horizontal and at 45° in the two diagonal directions, so as to average out any effects of orientation with respect to the integrating sphere geometry. The sphere was of symmetical double-beam design and was properly fitted with screens to prevent the radiation from test and comparison samples passing directly to the photocell port and thereby being overweighted with respect to radiation reflected in other directions. Measurements were made by substitution relative to white opal standards, which had previously been standardised against fresh pressings of Hopkin and Williams 'AnalaR' grade MgO.

Results are given relative to fresh MgO, all computations and corrections being carried out with an on-line data system. Chromaticities (x, y) and luminous reflectances (Y per cent) are given in Table 6 in terms of CIE Standard Illuminants A, C and D65, which represent incandescent light, a laboratory simulation of average daylight, and average daylight respectively. Spectral reflectances are given in Table 7.

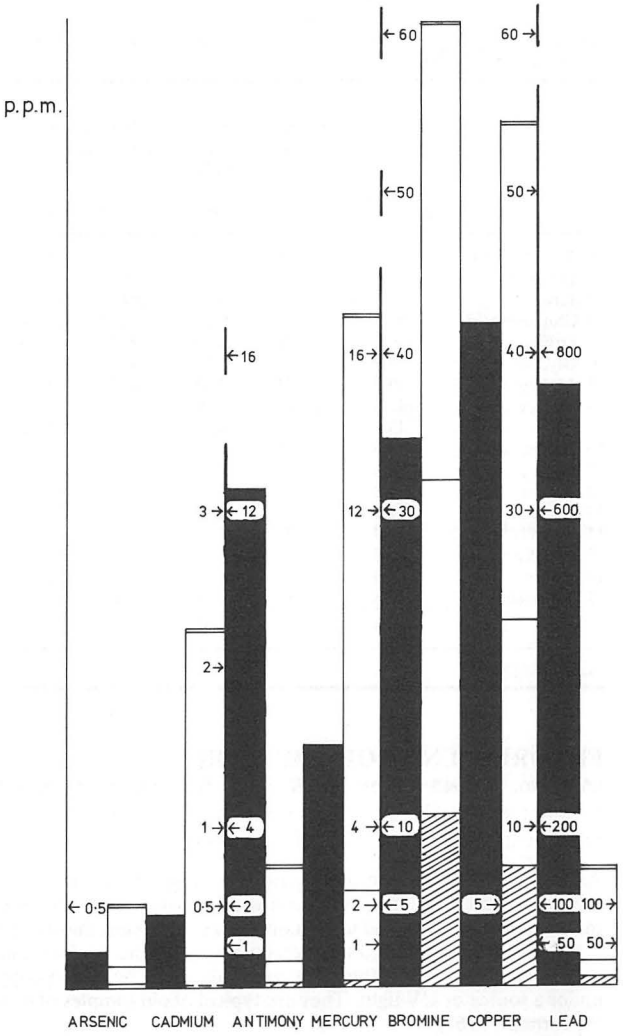


Figure 10. Histogram of trace elements in sample of plait (AM No. 710048 M) shown solid, compared with modern values (maximum, average, and minimum, the last shown hatched). (L.B.)

TABLE 6

CIE colour specification for CIE standard illuminants

Quantity	Illuminant A	Illuminant C	Illuminant D65
x co-ord.	0.528	0.404	0.406
y co-ord.	0.400	0.361	0.370
Y per cent	6.2	5.6	5.5

Accuracy

The accuracy of measurement routinely achieved on the equipment used is around ± 0.2 per cent for spectral reflectance values, ± 0.1 per cent for luminous reflectance and ± 0.0005 for x, y co-ordinates. However differences in the runs at different orientations range from ± 0.6 per cent in the deep red to ± 0.1 per cent in the ultraviolet, and the mean data quoted have therefore a probable error varying from ± 0.4 per cent in the deep red to ± 0.1 per cent in the ultraviolet for spectral values, ± 0.2 per cent in luminous reflectance and ± 0.001 in x, y co-ordinates.

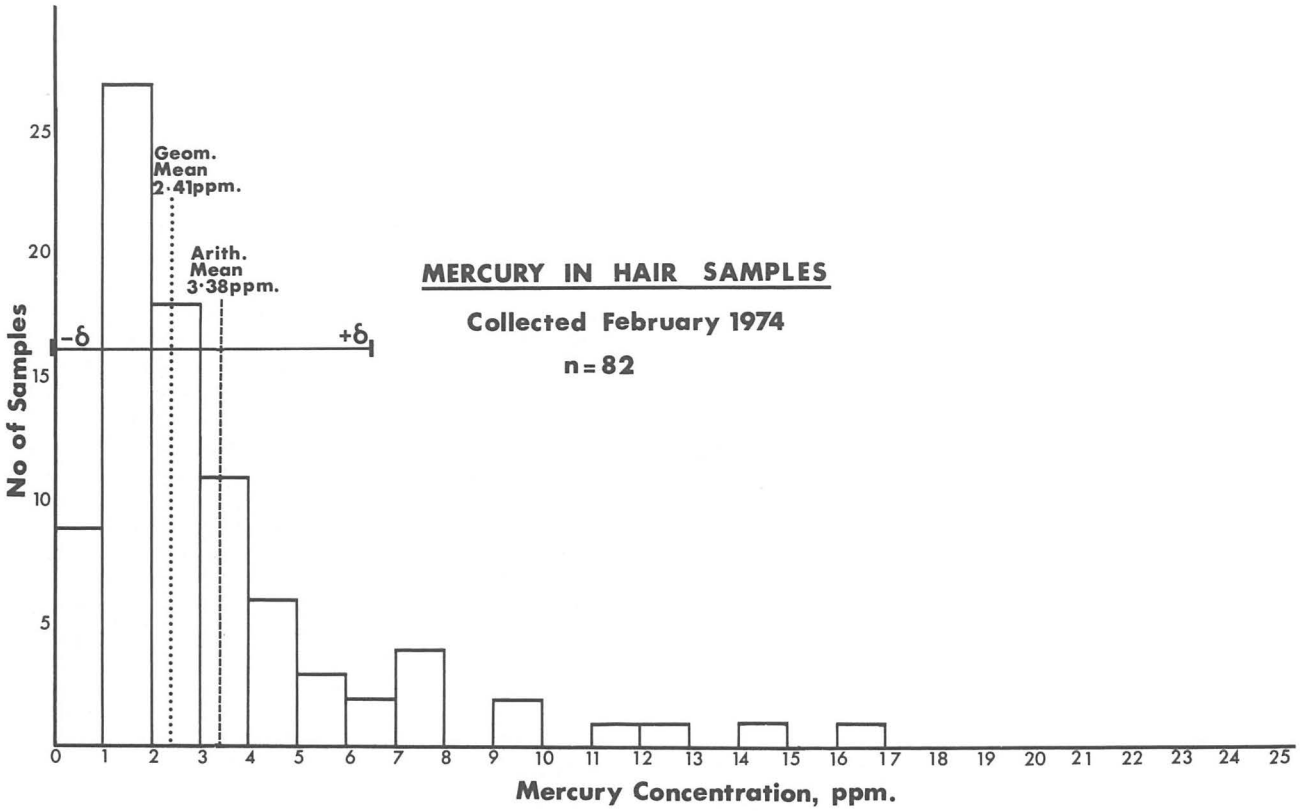


Figure 11. Mercury concentrations in 82 samples of modern hair.

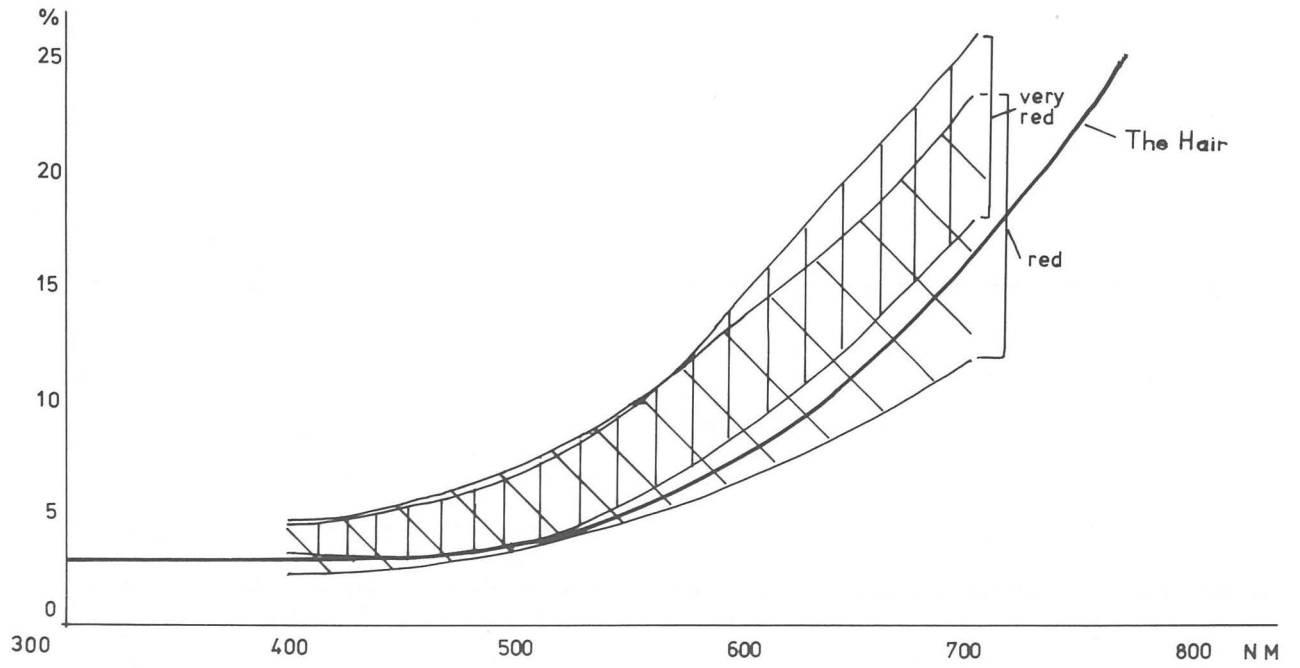


Figure 12. Spectral reflectance of the plait (AM No. 710048 B) compared with typical bands for modern red hair (after Sunderland, 1956).

TABLE 7
Reflectance of AM No. 710048 B.

Wavelength nm	Reflectance factor per cent	Wavelength nm	Reflectance factor per cent
300	2.78	550	4.95
305	2.77	555	5.14
310	2.75	560	5.35
315	2.74	565	5.54
320	2.74	570	5.75
325	2.74	575	5.94
330	2.73	580	6.19
335	2.73	585	6.44
340	2.72	590	6.70
345	2.72	595	6.97
350	2.71	600	7.25
355	2.70	605	7.54
360	2.70	610	7.85
365	2.70	615	8.16
370	2.70	620	8.47
375	2.70	625	8.82
380	2.70	630	9.19
385	2.72	635	9.56
390	2.73	640	9.94
395	2.73	645	10.33
400	2.74	650	10.77
405	2.76	655	11.20
410	2.77	660	11.63
415	2.78	665	12.09
420	2.79	670	12.58
425	2.83	675	13.08
430	2.85	680	13.60
435	2.88	685	14.13
440	2.92	690	14.65
445	2.95	695	15.19
450	2.98	700	15.77
455	3.01	705	16.35
460	3.08	710	16.94
465	3.12	715	17.56
470	3.18	720	18.17
475	3.24	725	18.78
480	3.31	730	19.42
485	3.38	735	20.08
490	3.46	740	20.73
495	3.53	745	21.39
500	3.64	750	22.05
505	3.75	755	22.75
510	3.85	760	23.44
515	3.95	765	24.17
520	4.08	770	24.87
525	4.20		
530	4.33		
535	4.46		
540	4.61		
545	4.78		

DISCUSSION

The Cemetery

No dating evidence was recovered for this cemetery, but it is certainly of a type elsewhere dated to the Late Roman period. Furthermore, no Saxon or medieval church existed in this area which lay well clear of the settlement in those times, while the regular layout and care taken over the manner of interment rule out the possibility of this being an unrecorded battle or plague cemetery. A very similar burial ground, securely dated to the Late Roman period, has been excavated in recent years only a quarter of a mile away at Poundbury; elsewhere others have been found at York, London, and at major Roman cities in the Rhineland and North Africa (Ramm, 1971; Green, 1977 A).

The discoveries at Poundbury are particularly relevant, since this site is both close at hand and the only one of this type to have been extensively excavated. In the Late Roman part of the cemetery, designated cemetery 3 in the Poundbury complex, the majority of the burials were inhumations of the same simple character as those from the Crown Buildings site, but a greater variety of special burials were present. The cemetery can be divided into four sections on the basis of the typology of these burials and their variations in date. In the earlier part (areas 3A and 3B) the special burials, very similar to those on the present site, were 'plaster burials' usually contained in lead-lined wooden coffins but apparently not marked on the ground surface in any way. Wooden coffins fitted with angle brackets and packed with plaster also occurred.

The original area, 3A, was contained within a rectangular enclosure 66 metres by 30 metres at the centre of which were grouped seven lead-lined and one stone coffins. Area 3B was similar in character but lay within a small annex to the east. The major extension, areas 3C and 3D, lay to the west; there the special burials were in stone coffins grouped beneath rectangular masonry mausolea. Wooden coffins fitted with lead linings or angle brackets only rarely occurred in this area. Shallow uncoffined burials or cist graves were found in most regions but seemed everywhere to belong to a late phase in the use of the burial ground. These changes in burial custom seemed to relate to the site's development, cemeteries 3A and 3B producing finds of the Constantinian period, 3C and 3D finds of the middle or late 4th century. The uncoffined or cist burials may be as late as the 5th century (Green, 1976).

The Crown Buildings cemetery compares, then, most closely with area 3A, the earliest phase, being similar certainly in the character of the graves and possibly also in size and layout. The two central 'lead-coffin' burials may have acted as a focus, pre-dating many or most of the ordinary burials, as seems to be the case in Poundbury cemetery 3A. By analogy, therefore, a date in the first half of the 4th century can be suggested for the Crown Buildings site.

No late extension to the present cemetery was encountered but it could lie to the north or south outside the area of the modern building. The one possible instance of a cist grave may hint at some continuance in use to a later date.

In comparison with Late Roman burial sites this cemetery, and others of the Poundbury type, display several distinctive features. In these inhumation cemeteries the burials tend to be laid out according to a regular pattern, the bodies aligned with head west and rarely accompanied by grave goods. A peculiar characteristic, on which their identification rests in many cases, is the presence of special plaster-packed burials, usually contained in stone or lead-lined coffins. The original purpose of this rite must remain uncertain in the absence of specific references to its use in the literary sources. However, as indicated below, the packing could have been intended to act as a desiccant or preservative agent, surrounding a corpse contained in as waterproof a container as ancient technology could provide (see p. 96). Interpreted thus, as a form of embalment, plaster packing and other features of this burial type form a coherent rite in which the dominant theme is respect for, and preservation of, the physical remains of the deceased. Furthermore, the association of such cemeteries with Late Roman Christian sites in Germany and Northern Africa, and their similarities to the cemeteries established throughout the Christian World in the post-Roman period, clearly invite their interpretation as the burial places of early Christian communities. The ascetic character of the burials would accord with the teachings of the religion, while the desire to preserve the physical remains of at least some members of the community, could stem from the literal view of the Resur-

rection that was held by many early Christians (Green, 1977 B).

Such an interpretation raises some further questions: who might be of sufficient status and wealth to warrant special burial, and how would this kind of cemetery be organised? The ratio of special to ordinary burials suggests that, as at Poundbury, this was not simply the private burial plot for the immediate members of a rich urban family, but contained such a family with at least all its clients, if not a large number of ordinary townspeople as well. Alternatively, if burial had been organised on communal lines, there is the interesting possibility that the administering body might in fact be the Church, which elsewhere in the Empire is recorded as owning cemeteries staffed by full-time grave-diggers, pall-bearers and other employees (Zwisa). In such cemeteries the special burials might conceivably be those of patrons of the Church or, as on some of the German sites, leaders of the Church or even martyrs. However, where identified from topographical and documentary evidence the latter figures have usually had their graves marked by some mausoleum or monument (Green, 1977 C).

In Britain there is no such evidence from this type of cemetery, the status of special burials being indicated only by inscriptions on stone coffins at York (RCHM(E), 1962). These show that the original occupants of such grave furniture were in three cases centurions or members of their families, in two cases a decurion and a relative of a decurion, and in one case an important figure in the imperial cult, a *Sevir Augustalis*. This might therefore suggest that, at a cantonal capital far removed from the military zone, a special burial might be that of a decurion or religious leader; but it must be noted that at York the decorated coffins had originally been above ground and probably enclosed within elaborate mausolea where their qualities could be better appreciated. At a later date they had been reused in dug graves of the Crown Buildings type but the status of their new occupants is unknown; the change in the burial rite may reflect changes in belief and fashion rather than in status.

Interpretation of the present site must, then, inevitably remain limited in anticipation of results from the current work on the better preserved and more fully investigated sites such as Poundbury. Had controlled excavation and analysis of the skeletal material been possible, this important social document – almost the only kind of source for such study – would have added much to our meagre knowledge of the social structure, health and living conditions at all levels of Late Roman urban society.

Collation of Evidence: The Principal Burial

(a) Method

The opportunity was taken to run a small low-order data processing scheme which is fully described elsewhere as part of a wider investigation (Biek, 1974). It utilised conventional edge-punched cards, and programming was step-by-step by direct decision, implemented by manual clipping in the normal way. However, selection of predetermined characters, though again manual, was semi-automatic, instantaneous and unbiased by any criteria beyond the primary selection in each case. The scheme was designed to test the idea that the process of 'mechanising' (in this sense) the early stages of collation would provide 'checklists' and pointers to further progress with much reduced effort, and that the imaginative and creative aspect of this kind of interpretation could be reserved – indeed, conserved – for the selection, guidance and short-cutting during the later phases of the process.

Briefly, a primary card was made out for each statement, in its essential form, *viz.* 'Impression in gypsum of fine fabric weave textile (size and count, etc.) with folds'. This information was classified by clipping under three main headings, **Material** (here, gypsum, fibres), **Type** of data (i.e. present evidence – as against present inference, or others' evidence), and various **Key Concepts** involved and reflected in the statement (i.e. size and numerical data, preservation, cultural, technological, etc.). Apart from serial and group numbers, for back reference to origin, the card also carries some more refined codes for levels of confidence or precision ('high') and of appraisal (primary: visual – as against secondary, analytical or more complex investigations).

All these first-order cards were then analysed in groups, first by material within a specialist report, then by material across reports, and ultimately by various selected key concepts. Although not essential, it was found useful to combine a group of related cards onto one fresh, second-order card which carried a logical sequence of statements, and was clipped for all the codes of its source cards: 'Textile impressions suggest fine shroud wrap similar to general Roman practice in NW European and N African gypsum burials'. In this way the number of cards which has to be handled for any given approach is soon considerably reduced without 'losing' any information. The process becomes a selective mini-matrix analysis which ensures that *all* 'connections' are presented for appraisal of significance; this in turn establishes 'new' connections that are similarly analysed. For example, the *fineness* of the textile impression (Pl. VII, upper left) is seen to reflect the state of the setting gypsum plaster; and the lead oxide in the head stain on the coffin is set, however fleetingly, beside the lead oxide in the putative 'natural' hair dye.

At a certain stage depending on the purpose of the exercise – in the present case, a limited development of the present evidence – the collative report is found to have written itself. All the cards remain source material in a classified form that can be used easily and directly with a new set of evidence, whether similar or only related in some aspects, and the whole process remains infinitely flexible and cumulative.

(b) Results

To consider first the coffin itself, there is no positive indication of a source for the lead, but there is nothing in the composition which would argue against its most likely origin – the Mendip Hills, little more than 60 kilometres to the north by Roman road and full of well-developed workings by this time (Rahtz, 1977). Nor would the generally high standard of materials and craftsmanship give rise to any problems or surprise, though the special work needed in making such a shaped coffin perhaps deserves mention. One noteworthy detail of the coffin's construction is the hasty and awkward soldering of the corners. This is, however, a feature repeated on all the similar coffins at Poundbury where in every instance the lead seems to have been simply an inner lining to a nailed, wooden container. This similarity might suggest that here also there had been a wooden outer casing which masked the imperfections of the metal lining. But the thickness of the lead would have rendered the coffin strong enough to have been used without any casing and the question is therefore best left open.

Turning next to the contents of the coffin, the precise nature of the gypsum, and therefore the exact implications of its presence, must remain ambiguous at this stage. Basically there are three possibilities: (a) crushed gypsum (rock) was sprinkled over the corpse; (b) gypsum was dehydrated ('burnt'), at least to hemihydrate (powder), which was then sprinkled over the corpse; (c) hemihydrate, i.e. 'gypsum plaster', mixed with water was cast

around the corpse, and set as Plaster of Paris. The apparent nature of the coffin filling, especially on grounds of particle size distribution, bulk density and texture, would seem to argue quite strongly against both (a) and (c). The available material evidence accords best with (b), i.e. the use of a substance that was neither a relatively inert powder nor a flowing paste.

Nothing is known, for obvious reasons, about the fine structure of any gypsum plaster which has set under conditions similar to those presumed to have existed in our coffin. It is feasible that the method by which gypsum was dehydrated in Roman times, and the conditions of burial, together mean that the setting of the resultant 'plaster' involved the recrystallisation of some unchanged grains of gypsum rock over the years. This might be taken, in the limit, to obscure any distinction between (a) and (b), above. However, the presence of anhydrite, in substantial amount and submicroscopic size – though it occurs with gypsum naturally in massive form (Read, 1971; Gettens, 1952) – is virtually certain proof of burning. In general terms, it links up well with both the records of ancient practice (Bailey, 1932; Forbes, 1955A) and the rest of the present evidence: 'over-burnt gypsum, and particles of "carbon" '.

Temperature control is critical in gypsum burning (e.g. Sherlock, 1938). The optimum for hemihydrate is quite low, 150-160°C. By 200°C it is already 'overfired' (to anhydrite), by modern standards, and the product of heating to 600°C will no longer set at all, unless finely ground and mixed with an accelerator. Such delicate control at low temperatures would have been difficult under relatively primitive firing conditions, and it would not be at all surprising to find both underfired and overfired material side by side. What is remarkable is the quantity and size of anhydrite remaining. This is one of the finer points it is hoped to elucidate by the comparative work on material from Poundbury and other sites, and it may well provide the basis for some form of time scale.

The whole question of 'gypsum burials' is clearly far more complex than might at first appear. More immediately, the present evidence gives no clue to the setting time of the material with which the coffin was filled. It is reasonable to assume that most of it was in fact hemihydrate; but any significant quantities of anhydrite could have taken days, months or even years to set. One would expect the original users of gypsum for this purpose to have been concerned – whatever the depth of their understanding – to achieve a setting time of a few days, rather than hours or months, if indeed, they had intended that the plaster should set and not simply act as a desiccant. They also may not have known that any form of gypsum plaster would, in the circumstances, be considerably affected by the presence of microbiologically active body fluid and tissue.

Finally, one needs to remember that the customary behaviour of set plaster is somewhat deceptive and that it is in fact fairly soluble in water (0.2 per cent). This means that, depending on drainage, it could either be moved about quite appreciably, and/or recrystallise freely, over a period such as we are considering. Indeed, it can be calculated that in a freely draining deposit the quantity filling a lead coffin could be completely removed several times over, even at a very slow rate of percolation. In fact this situation can be used in reverse here to exclude any appreciable movement of water inside the coffin during burial, because this would have left a permanent mark especially on 'contact' surfaces, and fine textile impressions would not have been preserved. Taking this in conjunction with the presence of 'soil' and worm casts in the coffin, the 'natural' explanation of the special plaster flakes might be extended to suggest that they reflect fluctuating humidity with small amounts of water collecting on the coffin base from time to time.

The only other scientific investigation of gypsum from a Roman burial, appropriately also found at Poundbury (Evens, 1940), had results very similar to the present one, down to the platy nature of the crystals, the presence of carbonate, and the difficulty in deciding about the state of the material when it was placed in the coffin. Evens, from his evidence, felt he had to leave the matter open. In the present case, (b) is the favoured alternative mainly because of the contact surfaces with coffin sides, 'body' and especially textile. The setting of the plaster is seen as most like the physical process resulting in the imprints on the surface of a bag of cement, which has been allowed to get damp, or of a clayey fine 'sandbag' from which the bag has weathered. We are grateful to Dr. F. W. Anderson for suggesting this simile.

This overall conclusion is supported by our knowledge that crushed gypsum rock would not perform the function which is regarded as the most likely reason for its original use (in North Africa) – that of mopping up body fluids – while plaster would – either when set and dry, or as a powder which would clearly be far more effective. But this is a different consideration, since we can only guess at both the purpose and the understanding in the originators' minds. As noted by Drew (Evens, 1940) gypsum occurs only a few miles away near Weymouth (Wacher, 1968). But there appears to be no known record of Roman gypsum burning in Britian although – or perhaps because – the simple 'beehive' kilns are so easily made – and 'lost' (Davey, 1965).

Instances of preserved hair from Roman contexts in Britain are rare, only 18 cases being known, 16 certainly from gypsum burials. Of the latter, seven were discovered at Poundbury in the eastern half of the cemetery and are now undergoing examination. Portions of two brown six-strand plaits were recovered from one woman's grave, and another contained dark brown hair which showed signs of plaiting; in the rest only disordered locks survived, both brown and blond.

At York two gypsum burials, both of women, had their hair preserved, in one case auburn hair in ringlets, in the other auburn hair fastened in a bun with two jet pins (RCHM(E), 1962 B). At Dartford in Kent two female burials in stone coffins were accompanied by remains of hair, in one case described as 'long', in the other as apparently 'clubbed on the crown of the head and fastened with a brooch or bandeau of pearls' (Wheeler, 1932). Of two male inhumations at Milton-next-Sittingbourne and Chatham, Kent, little detail is recorded save that in the former case remains of a white beard were present (Roach Smith, 1867; Arnold, 1878). Further finds of hair are reported from Poppleton, Yorks.; Ware, Herts.; Great Chesterford, Cambs.; and Duston, Northants.; but no details are recorded.

The present find is unique in two respects. First, it is the only one in this country, so far, to have been the subject of exhaustive scientific investigation. Secondly, we appear to be dealing here with an adult male with his hair in a pigtail, a surprising hair style for a presumably wealthy Romano-Briton of the Late Empire.

In looking at the evidence from the human remains all together one is struck by a remarkable duality. The skeletal remains suggest an active and robust young man who has suffered and survived a number of injuries. At first sight this would appear to be contradicted by the hair: over 40 cm long, plaited, possibly bleached, curled and dyed; the range of cross-sectional diameter, the fact that the nickel (Harry, 1962) or even the arsenic, antimony or mercury (Forbes, 1955B) could have some cosmetic signifi-

cance – and if not any of these, then perhaps the lead oxide in the head stain – all this might persuade one that it could be female hair.

We need to note, at least in passing, that the lack of full cranial and pelvic details makes the sexing of the skeleton difficult, and it is just conceivable that the whole assemblage is in fact female. Alternatively, there is no really firm evidence linking the hair to the skull, and one might at least postulate a female head or wig of hair from a female relative – in a male grave.

But closer inspection makes it clear that, on all the significant points, data are either ambiguous or inadequate. The surface pitting of the hair could be the result of enzymatic rather than cosmetic attack – just as the colour is more likely to be due to oxidation than henna. In any case we know, on the one hand, that Roman male hair dressing often included lavish use of cosmetics; on the other hand, pigtails might not be out of place in this region as a male hair style. Finally, it does seem far less likely to be a completely female burial, though the evidence does not permit a more definite statement.

Overall, the simple and obvious explanation is hard to resist. If the reported association of hair and skeleton in the coffin is accepted – the presence of someone else's hair would, after all, in these circumstances of preservation imply a hairless corpse – the other findings cluster into place. The relatively light wear of the teeth might suggest a diet less 'rough' than normal at that time. When taken together with the fineness of the shroud, and the position of the burial in the cemetery by analogy with Poundbury, it all adds up to an elite male.

In the Roman world pigtails seem out of place as a male hairstyle but in the north-western provinces they could be a continuation of, or a revival of, a pre-Roman custom. At Les Martres de Veyre in France two pigtails very similar to that from the Crown Buildings site have been recovered, but they are from female burials, and of the 2nd century AD (Audollent, 1921). However, amongst the nomads and in the Celtic world men did sometimes wear pigtails. Most of the men recovered from the bogs of Denmark and North Germany seem to have had very short hair, but in one case, that of the man from Osterby dated to the 1st century AD, the hair was plaited and twisted into a knot on the top of the head, a custom, so Tacitus records, of the Suebi of E. Germany (Tacitus, Germania, 38; Glob, 1969A). Another instance of this hair style comes from the Greenwich Park Barrow; but this must be dated to the Pagan Saxon period to judge by the associated gravegoods (Douglas, 1793). The Dorchester plait appears to have been straight and is more closely paralleled by a bog burial found in 1938 at Tollund in Denmark, not far from the spot where later the more famous Tollund Man came to light. The earlier find was of a man with his hair gathered in a tightly plaited pigtail at the back of the head (Glob, 1969 B).

For further information on the treatment of hair and especially the custom of wearing pigtails amongst the Celts we are indebted to Dr. Anne Ross. Diodorus Siculus (V, 28) refers to the Celts washing their hair in lime water and brushing it back so that they resembled satyrs. The lime would have the effect of lightening the colour and stiffening the hair but whether it was used on pigtails is unknown; there is no clear evidence of its use on this pigtail. Pliny (LI 191) incidentally mentions the use of soap, 'an invention of the Gallic provinces for making the hair red'. Made from suet and ash, it was used among the Germans, 'more by men than by women' (Jones, 1963). On the Gundestrup cauldron of the 2nd century BC several of the men wear their hair in single pigtails, while on the Marlborough Vat profile heads with pigtails can be discerned (Klindt-Jensen, 1961; Fox, 1958). Charioteers with single pigtails are depicted on Celtic coinage, while the literary sources of the early Irish period make it clear that both men and women wore their hair braided, sometimes simply, at other times elaborately, in several plaits.

There is, then, clearly a good Celtic ancestry for the wearing of pigtails by men and in this context it could be seen as an indication of the extent to which Celtic customs survived Roman cultural influence, even – or perhaps especially – amongst the wealthier classes. The longevity of Celtic tradition, particularly in the area of the Durotriges, is well demonstrated, as Dr. Ross has pointed out, by linguistic evidence for Brittonic Welsh still being spoken in this area as late as the 7th and possibly 8th centuries AD (Jackson, 1956).

The hair itself also carried another piece of information that may well be equally or even more important, and is certainly more definite. Although it is impossible to prove a common source on the basis of the scientific examination, the circumstantial evidence – particularly the 'unravelled pigtail strands' on the 'head' – strongly suggests that head and pigtail belong together. It was at first supposed that they came to be separated at the time of 'excavation'. The appearance of the 'damaged knife-cut' ends might have been due to a shearing-chopping action of the lid against the coffin at the moment of buckling. It is clear from the examination, however, that there is no difference between any of the ends in respect of the biodegradation which was noted. Certainly there is no suggestion that the severed ends are 'fresh'. There can thus be little doubt that the pigtail was cut off before burial.

Three intrinsically important aspects of the chemical change in the hair are noteworthy. First, the (presumed) oxidation of melanin, which is thought to be responsible for the colour of the hair, has evidently not affected the shape of the granules which remain clearly recognisable. In contrast, the variation in cross-sectional shape is most probably the visible effect of organic breakdown as no known defect of modern hair presents this appearance. Secondly, it may be seen from Fig. 9 that the difference between the various amino acid losses are quite considerable. Even on the assumption of minimum overall change (about 15 per cent) made in constructing Fig. 9, loss of glycine appears to have been great compared with only moderately large losses in six of the other amino acids including aspartic acid, proline and alanine, other changes being relatively quite small.

Thirdly, the differences in amino acid composition between ancient and recent human hair (Table 4) are on the whole considerably less than those between mammoth and recent elephant hair, as reported by Gillespie (1970), for amino acids other than cysteic acid. Moreover, these differences are sometimes seen to appear in opposite directions in the two groups. Glycine, however, shows almost identical differences in both human and elephantine hair, accounting for some 65 residues per thousand in the present specimens of both species and 42-44 residues in the ancient samples.

Gillespie suggested that the mammoth hair may have been extensively degraded by proteolytic enzymes during decomposition of the bodies soon after death and before they were frozen. If this were so, the smaller differences in overall composition (apart from glycine) between ancient and recent human hair suggest that proteolysis after death was less extensive than in the mammoth, perhaps because of the smaller bulk of the decomposing body, the conditions of decomposition or the relative isolation of the plaited hair from the body – not forgetting the gypsum. However, the human hair had been in existence for only one-twentieth of the period endured by the mammoth hair

and this may be the main reason for the smaller changes in its amino acid composition. Yet it is difficult to imagine any enzymic oxidation or degradation occurring in the mammoth once within the ice block.

The only other data available for comparison refer to wool (Andrews, 1966). The cuticle of wool is evidently rich in cystine, cysteic acid, serine and proline. The cysteic acid occurs in the exposed, weathered tip of the fibre, and the work deals especially with conditions in Australia involving a high level of sunlight and 'bleaching'. The results therefore relate to material which is already altered. Experimental oxidation was found to modify the cuticle more than the rest of the fibre, and cystine, tyrosine and methionine were changed most.

The stringent method of oxidation used on the wool bears little relation to our conditions of burial, and by comparison our chemical results confirm the physical observation that, in general, erosion of the cuticle on our hair was relatively slight. Only cystine appeared to be similarly affected, in both wool and hair, and it is known that modern hair, after oxidation in peracetic acid, simulates the appearance of ancient hair when stained with fluorochromes. It is clear that cysteic acid – an abnormal oxidation product of cystine due to *auto*xidation – is the most important single marker of ancient hair requiring investigation.

The colour of the hair remains difficult to interpret. The spectral reflectance curve (Fig. 12) places it ambiguously within the overlapping bands of 'very red' and merely 'red' modern hair (Sunderland, 1956). There would appear to be a slight minimum around 370 nm but no comparable data are available below 400 nm to permit any inference. By general agreement it is not a 'natural' colour, though a fairly distinctive one.

The pigment granules in melanocytes of red hair differ from others, mainly in size (0.5 μ or less, as against 0.8 μ for dark melanin), and this has been thought to confer the 'red' colour (Birbeck, 1959). The so-called 'unnatural red colour of ancient buried hair' is held to be the result of 'melanin oxidation', in the widest sense. In view of the preponderance of brown hair among the recent Poundbury finds, however, it seems now that we need to confine such 'oxidation' effects to hair that was originally already red.

It has been known since 1878 that a pink pigment *trichosiderin* can be extracted from human red hair. Subsequently it was found that, although its complete extraction caused no appreciable change in the colour of the hair, *trichosiderin* appeared to be specific to red hair. More recently Barnicot (1956) reported a yellow/orange precursor, easily convertible to *trichosiderin* and absent from brown hair. No work has as yet been done on *trichosiderin* in ancient hair and it remains to be seen whether the 'unnatural' red colour is in any way related to its formation or alteration during burial.

Another set of evidence that is of interest in all its aspects involves the nature and distribution of the non-metallic lead. In electron probe analysis, the limits of detection can be disappointingly high compared with other methods such as were used here in determining the trace elements. Also, probe analysis is sensitive only to the actual surface examined. But this can be valuable, since those other methods only give total concentrations across the whole sample. In our case, nickel was clearly present on the surface of the hair – and lead on the surface of the skull but not of the hair – at levels greater than 1,000 p.p.m. Yet 760 p.p.m. of lead were found by voltammetry for the whole hair thickness. Until further work has localised the lead, and indeed other elements, more precisely, no firm inferences about dietary intake or surface absorption will be possible in this case, except for the nickel. However, recent work on bone lead levels at York, Poundbury and Henley Wood shows significantly high levels in these populations (Waldron *et al.*, 1976 and 1979).

No lead was found in the gypsum but traces were present in the surface of the skull; conversely, there was no sulphate, and only a very little calcium, in the corrosion products on the coffin bottom which were almost entirely basic lead carbonate. In view of the great sensitivity of lead to organic acids, on the one hand, and the insoluble nature of lead sulphate, on the other, one is led to conclude that no layer of gypsum could have been interposed between the (shrouded) corpse and the coffin bottom; and one is confirmed in the belief that the burnt gypsum went in dry. Taken together with the apparent minimum height of gypsum, this would agree with a deposit of burnt gypsum heaped around the body and covering it up to about the plane of the face, at least – almost half-filling the coffin. The detection of lead nitrate (water-soluble to the extent of 50 per cent) lends further support to the gypsum's evidence for minimal drainage through the coffin, if any. The lead oxide in the head stain might be seen as the end product of a specialised breakdown process, involving plumb-organic complexes rather than the normal path through carboxylic acids and salts oxidising to the basic carbonate. In the circumstances it is noteworthy that there was no trace of the easily formed and stable sulphide.

Preservation and Deterioration

The most significant feature here is, of course, the state of the hair. In appearance and feel, after washing, it seems 'unchanged'. Close study shows that the scales have been thinned but some of the scale pattern, at least, is remarkably well preserved. By analogy with other experience, the colour is taken to have changed from a darker red; it has become soluble in stripping agents but is immobile under conditions favourable for chromatography, at least of relevant dyestuffs. A minimum loss of about 15 per cent in amino acids is indicated, with a whole spectrum of preferential attack. There is no direct evidence of the specific agents or processes involved. We only have some indirect information about conditions of burial. They were clearly never anaerobic. Except locally during the early stages, there would seem to have been little scope for the development of extremes of acidity or alkalinity inside the coffin. There is some indication of a change in relative humidity, possibly even a fluctuating amount of water movement; this need not imply free passage of liquid water in or out – on the other hand there is no evidence for a seal between coffin and lid.

The question of contamination will need to remain open in view of the forcible excavation of the coffin. One would expect the lid, and the nature and thickness of the overlying material, to exclude gross admixture of 'foreign' matter. The texture of the 'soil' found in the coffin is of little value since it could equally well have penetrated by percolation or 'inundation'. It has been assumed that it got in, together with the worm casts, etc., through a fault in the lid, over a period of time before discovery. But it is conceivable that it fell in at the moment of excavation, much as the hair was seen to fall out. If this is accepted, we need at least to consider the possibility that the plaster flakes – and even the small bone and teeth in the 'abdominal' samples could be similarly intrusive. It would appear, in any case, that the 'excavated' coffin stood 'open', and thus vulnerable, for some little time before it could be examined.

Cursory analysis of the known details (Ramm, 1971) shows that only about 10 per cent of all gypsum burials in Britain contained preserved hair. About 75 per cent of all

the coffins were of stone, 15 per cent of lead alone, 12 per cent of lead with other materials, and 17 per cent of wood with other materials. The only factor common to all cases of preserved hair is a country rock of chalk or limestone – but this applies equally to the other burials, most of them in Yorkshire. In most of the instances, again, lead figures significantly either as coffin material or lining, but some hair is preserved in stone coffins, and in one of the two York cases, it was actually found in a wooden coffin – but this was in a brick vault. At the same time, nearly twice as many lead or lead-lined coffins have been found without hair.

Pending a full multivariate analysis of these and other factors it is only possible at this stage to point in two directions where further search would seem most profitable. Accepting that hair, being 'dead from the roots up', is intrinsically very resistant compared with other organic materials, and remembering that our hair is attacked by soil fungi – the only positive (if indirect) evidence we have – it is worth looking closely at the conditions favouring such attack, and for specific inhibitors of it in this case. It is known that nickel compounds have fungicidal and bactericidal properties which may well have been effective here; this or other similar action could have been responsible, quite simply, for sufficiently slowing down degradation in the instances where hair has been found preserved.

Lead, copper and mercury, and even antimony and arsenic, could all have contributed, whether they arrived by cosmetic (Forbes, 1955B) or corrosive paths at the surface of the hair; although clearly any cosmetic residues would already be in position, while corrosion would need to build up a high enough concentration quickly to be effective. But as little as 10 p.p.m. of copper or mercury in soil would reduce growth of keratinophilic fungi.

There may have been additional barriers originally present on the hair. It is known, for example, that oils and fats on the surface of wool, and preening gland oils in birds' feathers, are differentially inhibitory to the growth of such fungi (Pugh, 1970), especially at the early stages in colonisation (Pugh, 1971).

It is interesting to note, in this connection, that even the most meticulous excavation, as at Poundbury, although recovering some possible tissue fragments not previously detected, has so far failed to produce any residues of finger or toe nails. Nails (like hoof and horn) are larger and tougher keratinous structures than hair, and would be expected to be more persistent. It is true that their more intimate association with soft tissue might make them more vulnerable. The fact remains that, unlike hair, they carry no oily or waxy cover.

Furthermore, there is almost twice as much cystine in hair as there is in nails (Eastoe, 1963). While cystine is a poor indicator of 'stability' (see p. 000), it is reasonable to suppose that this implies more sulphur bridges between polypeptide chains – and hence more cross-linking – in hair which is, in that sense, often considered a 'harder' keratin than nail.

It is more than likely, however, that conditions of burial have played a decisive role. Steady, moist aerobic environments favour growth of such fungi; up to a point a slightly raised temperature further encourages activity. All this needs clearly to be considered here in isolation from the tremendous surge of microbial attack which initially decomposes the soft tissue. It is possible that the rate of this first phase could be slowed down considerably, if only by the drying action of the setting gypsum which, in turn, would be retarded by the organic colloids and other substances present.

At the same time the extent to which the system remains 'closed' will determine the course of events. Even if the coffin had been hermetically sealed before burial it is unlikely to have remained so in the circumstances – lead 'creep' and corrosion, combined with the weight of overburden, and thermal oscillation would almost certainly have broken such a seal in time. To the extent that a pressure could build up inside the coffin, however, this would further inhibit both range and degree of microbial activity, especially during the initial phase. At this stage one might expect competition between various organisms; this, and the production of volatile organic acids, would in effect further tend to protect the hair.

To some extent, at least, all this would depend on the disposition of the gypsum. Where the apparent aim of 'enclosing' the whole body, except the face, was achieved this would restrict activity in the most vulnerable, lower abdominal, regions. Evens (*loc. cit.*) talks of a 'typical sample taken from above the trunk', other accounts (Ramm, 1971) of casts of a shoulder and even of a 'face'. Generally it seems probable that in many cases and places the gypsum had time to set before the body yielded beneath it.

The next phase would see the more gradual disappearance of less susceptible tissues and organs. One would expect this to be linked more firmly with a dominance of aerobic conditions. It is only towards the end of this second phase, when bones and hair alone are left, that the situation would seem to become favourable to degradation of hair, mainly owing to lack of competition and possibly to some 'opening up' of the structure by other organisms. Even so the process would normally take a very long time, unless encouraged by special or accidental circumstances.

One is left with the impression of a slow and uniform, largely erosive deterioration of keratinous material under these conditions. The point in time at which we happen to come across this 'linear' process may ultimately depend not on any enhanced intrinsic resistance, or even on the environment during most of the burial period, so much as on the microbiological population at the specific time and place of burial and the climate of activity during the initial phase. This would be in accord with two different sets of evidence: the variety of materials and conditions (Ramm, 1971) involved where hair is sometimes found, and more often not found; and those many incredible and quite unsubstantiable stories of hair, bodies and even 'features' being found 'perfectly preserved', only to 'fall to dust' as soon as they were exposed (Biek, 1963). (There is an interesting link here with preserved material from both very dry and very wet locations.)

In this connection it is worth noting that one of us (C.G.) felt the colour of the hair had changed, between the time he first saw it in the field and the time he looked at it again a few days later. There is no objective measure of any such change and it may have been due simply to drying out: a lightening and reddening in hue. But it is possible that the supposed melanin oxidation in these circumstances takes place at least partly on exposure to light, and this would need to be borne in mind during excavation. Douglas (*loc. cit.*) described his find in 1793 as containing 'its natural phlogiston' and 'of an auburn colour'. Elisabeth Crowfoot now sees it as 'dark brown'. Any colour change in buried hair may be more complex than it appears.

On the whole, pH and degree of protection from air – and directly relevant determining soil conditions – would seem to be the most significant factors affecting colour. It is unlikely that any detectable oxidation of the hair occurred on removal from the ground but it could have suffered from exposure to sunlight.

Reconstructive Summary

As a result of critical study of all the foregoing evidence we believe that the following sequence of events took place.

The relevant parts of the Discussion should be consulted for the comparative levels of confidence which have been attained on specific points, but which have for the sake of clarity been ignored below.

Sixteen-and-a-half centuries ago an important native of 25 died a natural death. He had led an active life and at some time broken a collar bone and several ribs – but latterly he had been conscious of some stiffness in the joints. He was of medium height and robust yet slender build. His hair was dark red, some 45 cms long when plaited into a normal pigtail, and dressed in the appropriate fashion. Though active, his life had been generally comfortable and peaceful. He was buried in accordance with early Christian customs as observed by the local community and required by his position in it. In the existing cemetery a fresh pit was dug into the chalk, 1.7 metres deep and some 1 metre by 2.3 metres, oriented east-west. A thick sheet of lead was cast onto a nearby surface of smooth sand. This was suitably cut and skilfully worked into a coffin shape 1.83 metres by 40 cms by 50-75 cms wide, the long edges being strengthened by double-folding. The body was wrapped tight in a fine linen shroud, with hands over the abdomen; the pigtail was cut off and placed with the body on the base of the coffin. Burnt gypsum, in the form of a fine powder, was poured around and over the body except the face, half-filling the coffin. The lid was fitted on and tapped tight. The coffin was lowered into the pit, with its broader 'shoulders' at the west end. Finally the pit was back-filled with chalk rubble.

The corrosion of the lead coffin was slight but definite, intensified in places by the decay of the corpse. The humidity inside the coffin fluctuated but the contents were never either saturated with water or quite dry. The burnt gypsum set to a weak, porous yet fairly fine moulding plaster in time to capture the shape and texture of the shrouded body surface, and then remained largely unaltered. The particular conditions of burial slowed down the initial decomposition of the body, and the hair remained largely unaffected by it and by the passage of 1,600 years.

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AN HISTORICAL SURVEY OF THE LANDSLIPS OF THE AXMOUTH–LYME REGIS UNDERCLIFFS, DEVON

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INTRODUCTION

In an earlier paper (Pitts, 1974), the present author indicated how basic research questions could be posed by a survey of existing literature referring to one landslide event, namely that at Bindon, south-east Devon in 1839. General histories of landslipping within the region of which the Axmouth-Lyme Regis Undercliffs are part have been presented by several authors, most notably Arber (1940, 1973). A detailed history of the landslips of the Undercliffs Nature Reserve is presented here. Much of the landslipping in the Reserve is of considerable antiquity, and it is fortunate that the area is of great geological interest since much of the published information, although not necessarily directly related to the landslips, has yielded clues which are of relevance to them. The erosion subsequent to major landslipping, and the development of a luxuriant vegetation over the landslips, have masked much of the detail requiring study. It is the purpose of this paper to show that extremely valuable detail on processes and form may be accumulated from historical documents pertinent to small and large scale studies of mass movements. The whole of the Nature Reserve is landslipped and Figure 1 indicates the locations of the sites referred to in the text.

HISTORY OF LANDSLIPPING

1. Ware Cliffs

Ware Cliffs have been particularly active during the past decade. In 1968 and 1969, Ware Lane near the entrance to the Reserve slipped, severely damaging a bungalow which was eventually demolished (Arber, 1973). The bungalow has subsequently been rebuilt. Slips also occurred early in 1972, in the fields bordering Ware Lane to the south, leading to the formation of a series of ridges and fissures. Attempts by local farmers to regrade the slopes have generally been frustrated by further slippage and the redevelopment of the landslip relief. In 1968, the western end of Ware Cliffs slipped, resulting in damage to the public footpath through the Reserve. A small cliff about 2 metres high developed which necessitated a re-routing of the footpath. During the spring of 1981, renewed landsliding occurred at Underhill Farm very close to the eastern entrance to the Reserve. This led to damage to the house, to garden walls and to the garden, and resulted in a series of minor scarps of up to about 2 metres displacement.

2. Pinhay Bay

The long history of landslipping at Pinhay indicated by the reports of Chapel Rock being used as a place of worship during the religious persecutions at the time of Mary Tudor (1553-58). If this is the case, then the slip of Chapel Rock must predate this (Macfadyen, 1970). The Pinhay Undercliffs are greatly disturbed. The dense overgrowth and the planting of orchards in shallower parts led Jane Austen, in *Persuasion* (1818), to comment upon their apparent great age.

Slips from Pinhay to Ware are reported to have occurred in 1828 (Macfadyen, 1970). During the wet season of 1839-40, many minor fissures opened in the lower part of the undercliff, usually ranging from 8 to 10 feet (Conybeare *et al.*, 1840). The Great Cleft, a large fissure running parallel to the face of Pinhay Cliff, cutting off a large slice of rock in the backscar of the Pinhay Bay slip, first opened in 1886. 'Since the crack started, it has widened year by year, but rather more rapidly of late than at first' (Woodward and Young, 1906).

In November, 1960, the whole cliff below (seaward) of Lynch Cottage shifted downwards, disrupting the water supply pipes from the pumping station of the East Devon Water Board to Rousdon Reservoir. The pipes, carrying 10,000 gallons per hour, were ruptured, threatening the local water supply (Wallace, 1966). Slipping has recurred in the lower parts of the cliff ever since. In March, 1961 and in 1962, slips made the shore at Pinhay Bay inaccessible by the old steps near the fault. A large tension crack, 2 feet wide and checked to 11 feet in depth opened in 1963 in the Chalk of the undercliff (Macfadyen, 1970).

In 1966, a large slip occurred destroying the footpath to the beach and resulting in the formation of a large mudslide (Arber, 1971). Further damage to Water Board property resulted when the ram in the pump house was ruined. During the winter of 1976-7, large scale re-slipping of the lower part of the Pinhay Undercliff occurred, seaward of the public footpath. The scarp in slipped Chalk, about 80 metres seaward of the footpath was reactivated, with a downward movement of almost 5 metres. This caused considerable rifting in front of the scarp and reactivation of the mudslide at the toe on top of the Blue Lias cliffs. Many trees were moved forward and slipped over the edge of the cliff.

3. Whitlands and Humble Point

This part of the Reserve probably has the most complicated history of landslipping. The earliest accounts of slope movements at Whitlands refer to those of 1765, although the extensive slips of 1689, described simply as being 'West of Lyme' (Roberts, 1840), may well have been in this area. A description of the effects of the 1765 slip is attributed by Wanklyn (1927) to William Pitt The Younger, who is reported to have described the area as one of 'several romatic spots in the vicinity of Lyme, where the shock of an earthquake in some preceding centuries was supposed to have produced a wild and beautiful singularity of appearance in the face of nature'. At the time of the Bindon landslip of December, 1839, there was talk of earthquakes being a contributory factor in the slipping. However, no earthquake was recorded on 24th December, 1839. The nearest date is 2nd September, 1839 when, 'Bristol, Newport, Cardiff and all the West of England were shaken by this rather severe shock' (Parfitt, 1884). Between 1661 and 1883, 32 earthquakes were recorded for the South-West region (Parfitt, 1884), only three of which seem to have affected the immediate area in question (Anon, 1868 (i); Anon, 1868 (ii); Parfitt, 1835). The so-called earthquake at Lyme in 1689 is usually recorded in terms of 'great convulsions to the west-ward where considerable changes took place in the range of cliffs' (Roberts, 1840), and it therefore seems more likely that a landslip and not an earthquake occurred. Attributing slips to earthquakes was common in the 18th century, but does exist much later, for example when Cameron (1908) suggests that an earthquake led to the slip east of Lyme on 10th June, 1908.

Wanklyn (1927) also mentions an excursion led by Pitt to a 'petrifying spring' at Whitlands, an early comment on the

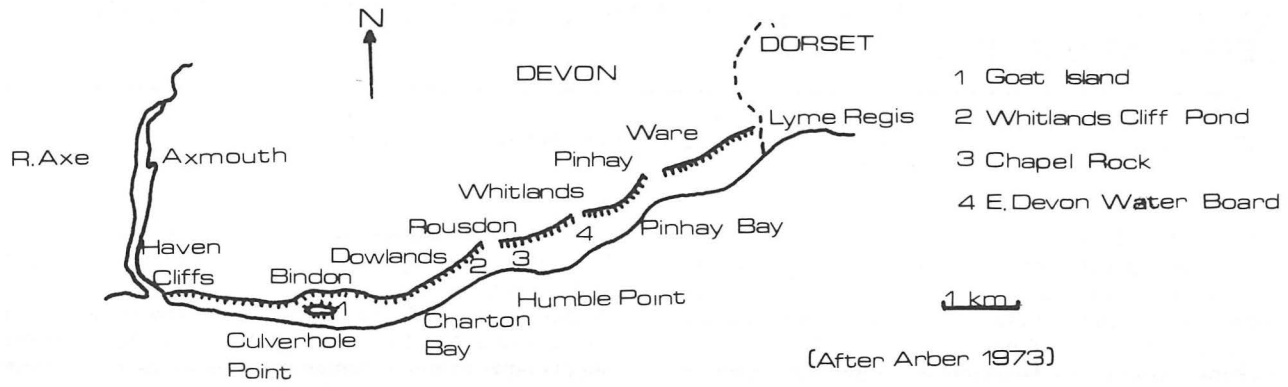


Figure 1. Sketch map of the coastline and inland cliffs, from Axmouth to Lyme Regis.

issuing of groundwater from this unstable area of juxtaposed permeable and less-permeable strata. The role of groundwater in landslip activity is important, and records show the period 1764-5 to have been a particularly wet one (Roberts, 1840). This is the case also with the best recorded and possibly the largest slip at Whitlands, namely that of 3rd February, 1840. This also followed a particularly wet period in the latter half of 1839, which contributed notably to the Bindon slip of Christmas Day of that year. At least 50 per cent more rainfall than average was experienced during that period (Arber, 1839). The high cliff was not affected, but the undercliff, a mass of Chalk and greensand 'which had descended in former ages, began gradually to sink downwards' (Buckland, 1840). The scar was over 60 feet high and over a quarter of a mile long (Conybeare *et al.,* 1840) and the slipped material was split into a series of 'irregular ridges and furrows like the undercliff at Axmouth' (Bindon) (Buckland, 1840). Houses on the slipped mass experienced upward squeezing of floors and inclination of walls. A nearby garden was converted into a pond of water (Plate 1). This is a frequent feature of the negative slopes characteristic of the slipped masses of rotational failures. Two reefs close to the shore were seen to 'rise slowly and simultaneously with the slow descent of the subsiding portion of the adjacent undercliff' (Buckland, 1840). This extended for approximately 0.8 km and 30 metres seaward of and parallel to the old seacliff. It was also suggested that 'the bottom of the sea, for a great distance from the present shore, is composed of large fragmentary masses of subsided strata of Chalk and cherty sandstone brought thither by the destructive action of the sea and of land springs in former ages upon ancient undercliffs' (Bucklands, 1840). Conybeare's description of the seaward of the two reefs would tend to support this by pointing out that it was capped by 'a stratum of chalk capped with angular flint gravel, exactly as would be found on the summit of the chalk downs above the undercliff' (Conybeare *et al.,* 1840). Before the main landslip on 3rd February, the undercliff at Whitlands was 'broken up into great cracks and fissures' (Roberts, 1840) at Christmas, 1839. Mary Anning, the 'fossilist' of Lyme Regis, 'perceived the effect of pressure on the beach, where a little ridge of about a foot high was upheaved' (Roberts, 1840). After the 'continued rains of January 1840', the main slip occurred on 3rd February, and Humble Green moved forward, to be seen for the first time from the Cobb at Lyme Regis (Roberts, 1840). Prior to the slip, Seven Rock Point obscured the view from the Cobb (Figure 2).

The last major landslip at Humble Point occurred in 1961, starting on 28th February and continuing until about 7th March. A mass of black plastic clay, Lias (Macfadyen, 1970), was squeezed under the beach for a distance of about 500 yards eastwards of Humble Point. The cobbles disappeared from the foreshore, which was upraised by 10 to 15 feet. The larger boulders formed a soft cliff varying between 6 and 15 feet on the foreshore (Wallace, personal communication).

Fifty to two hundred and fifty yards inland from the shore, in the area of Whitland Cliff Pools, the cliff was found to have subsided by 20 feet (Macfadyen, 1970) and the pools to have lost their water. During the succeeding months, the reef was eroded, but the foreshore boulders were left unstable and in disarray for a long period afterwards (Wallace, personal communcation). If the 1689 event does refer to Humble Point, then the rate of progress of events leading to a renewal of major landslipping at this locality seems to have been fairly steady for three centuries. The lifetime of Roberts may have coincided with the later stages of coast erosion shortly before the slipping recurred. If so, then Humble Point may 'normally' be in view. When the profile of the Humble Point slip was surveyed in 1973, it was found to be approximately 75 metres longer than shown on the 1:2500 Ordnance Survey Plan of 1959. This was the result of the 1961 slip, although following 12 years of marine erosion with the toe of the slip at its most vulnerable. The large extension of the land may therefore be expected to be quite sufficient for visibility from Lyme Regis to Humble Point to be unimpaired, and not, as Roberts suggests, masked by Seven Rock Point.

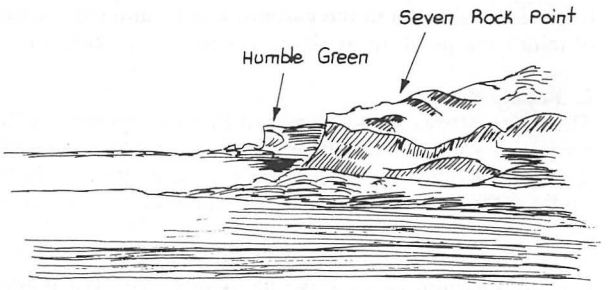
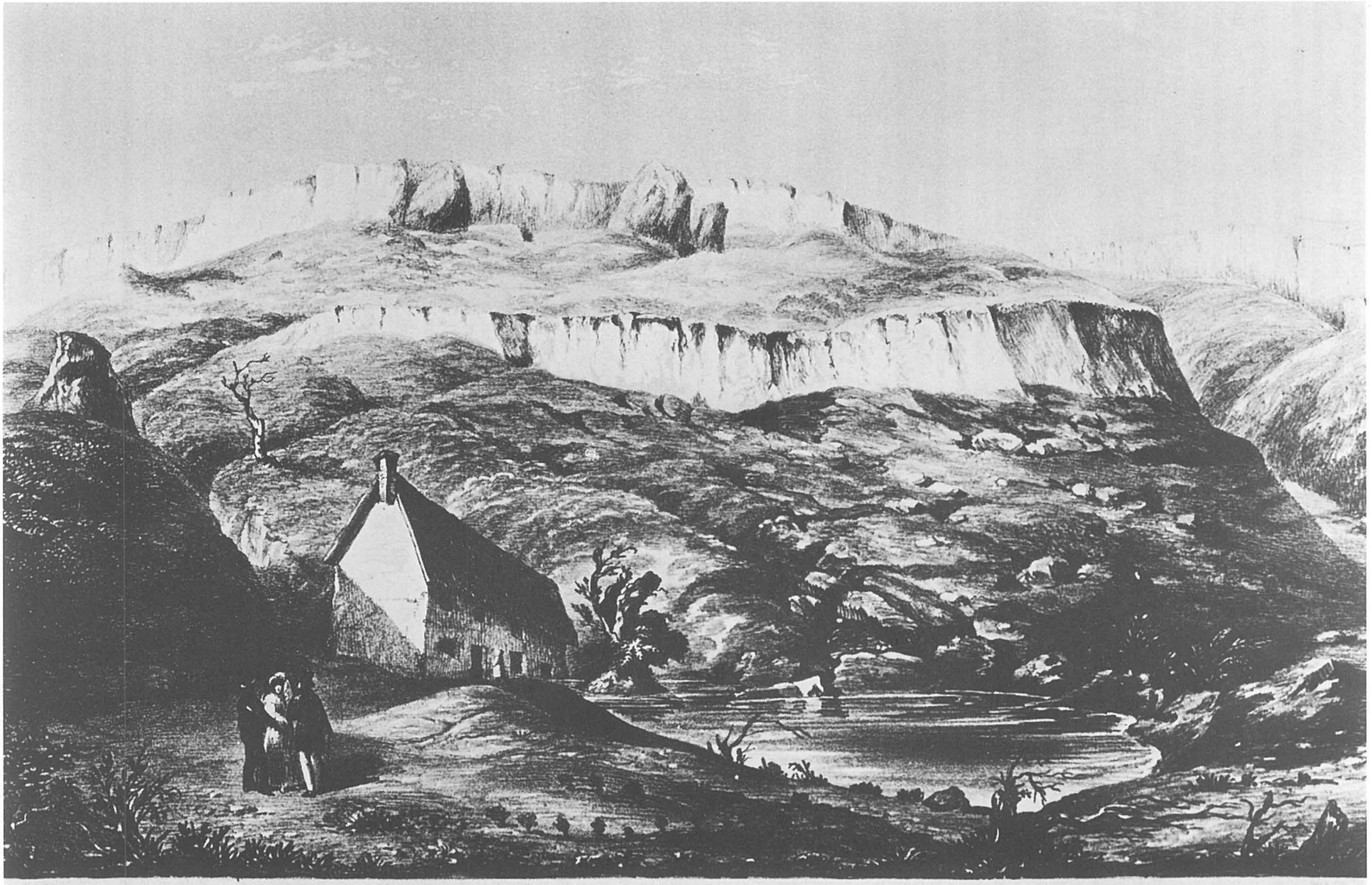


Plate 1. A view of the Whitlands slip of 3rd February, 1840, showing disruption of property and formation of ponds. Note the backtilting of rock masses and the cottage. From Conybeare *et al.*, 1840.



VIEW OF THE LANDSLIP AT WHITLANDS,

about one mile to the Eastward of the great Chasm at Dowlands which took place on the 3rd of February 1840

4. Charton Bay

On 22nd June, 1969, the road to the shore at Charton Bay was destroyed by a slip which displaced the undercliff by 14 metres (Arber, 1973). Walls of White Lias (Rhaetic) were formed, the seaward one resembling a small-scale version of the ones seaward of Goat Island at Bindon, in that it has a knife-edged top, and flat lying strata forming it. The slip occurred on a shear plane above the bone bed at the base of the Westbury Beds since this and the underlying formations form *in situ* sea cliffs below the undercliff. The shear surface is confidently believed to exist within the Rhaetavicula contorta Shales, which no longer form an *in situ* exposure in Charton Bay. This slip was the last major failure in the Reserve. Considerable disruption of Rhaetic and Jurassic strata in the toe area of the slip occurred, and it is now extremely difficult to discern details of the original succession within the undercliff. It is therefore of great value to have records of the details of the Rhaetic succession as it existed in Charton Bay (Woodward, 1889; Richardson, 1906; Smith, 1957, etc.).

5. Rousdon

The name Rousdon is derived from 'roused or rouged down' (Roberts, 1840), probably a reference to slippage at that site in the past. The family of Ralph de Doune or Downe, whose family was in possession there during the reign of Henry II (1154-1189), may well have been named thus by Lysons knowing that the land was prone to landslipping.

A landslip occurred just east of Rousdon on 26th September, 1911 on the Rousdon Estate just in front of the Gamekeeper's (Mr. Edwards) Cottage (Anon, 1911). The backscar was over 300 yards long and up to 150 feet high. Signs of the impending failure had been visible for several months, and finally occurred at about 1.00 a.m. The mass slipped down about 30 feet and was at least 30 yards from front to back. There was very little disturbance of the slipped mass (Anon, 1911).

The slip in the lower part of the Rousdon undercliff reslipped during the winter of 1976-7 taking many trees down the cliff on top of a steep mudslide.

6. Dowlands

The large slip at Dowlands is of unknown date, though it truncates the eastern parts of the Bindon slip (Pitts, 1981), and so some major movement must post-date December, 1839 when the Bindon slip took place. Slips at Dowlands have been recorded for 1790-1800 (Macfadyen, 1970) and January, 1961 in the cliff top (Wallace, personal communication).

7. Bindon

The history of the landslipping at Bindon has been dealt with elsewhere (Pitts, 1974; Brunsden and Pitts, 1973), although new sources have been discovered since then. Bickley (1911) explains that the slip occurred during the whole of the night of Christmas Eve and Christmas Day, and as the disturbances developed, movement over the area became increasingly difficult. A party out shooting rabbits experienced many problems extricating themselves from an increasing network of gullies.

One result of the slip was damage to two cottages which were built on a site described by Hutchinson (1840) as 'a terrace or undercliff extending about a quarter of a mile broad, and sloping down towards the sea, running along immediately under the perpendicular face of the cliff'. The cottages with their gardens were built upon this relatively level terrain. From about 3.00 a.m. on Christmas morning, 'the gardens and the surrounding district were sliding, as it were on their foundations. Large fissures were opening in the earth, and it was subsiding in terraces towards the sea'. Bickley (1911) states that, 'the landslip cottages . . . performed the difficult descent . . . and arrived unharmed at the bottom'. Harper (1907) estimates that the cottages had dropped by about 170 feet during the landslip.

In his description of the massive changes wrought by the landslip at Bindon, Hutchinson (1840) accounts that, 'this gigantic furrow' (the Chasm) 'cuts off a portion of the once united mainland, stretching one mile in length by half a mile in width and the mass has been moved many yards in a southerly direction on its foundations by the violence and pressure of the subsiding debris: it has also sunk considerably lower than its former position'. In the toe area of the slip, Hutchinson notes the downward movement of the large pyramidal rock above Culverhole Point by 150 feet, with a lateral movement of 90 feet.

Rogers (1869) describes the area in front of Goat Island (the main slipped block at Bindon) as occupying about 150 acres of land sloping down towards the sea, and traversed by many fissures and small cliffs. Interestingly, he also notes the remains of small blocks in the eastern part of the slip, the results of older, smaller movements caught up in the 1839 failure.

Norway (1919) records the eye-witness accounts of two coastguards on Culverhole Beach who maintained that 'the beach where they stood surged up and down beneath their feet'.

Most of the early writers also proffer their theories on how the landslip originated, although Hutchinson (1840) also reviews some of the initial views expressed at the time. For example, he recounts a letter written by a person whom he refers to as an 'ingenious writer'; 'the springs which issue at the foot of the cliffs would not, by the earth they carry out, in a thousand centuries undermine the cliff sufficiently to admit of the subsidence which has taken place: nor could they have washed away the earth below the level of the ocean'.

Hutchinson himself, in taking this argument further, considers that the reef, which was thrown up offshore during the landslip, may have been formed by lateral pressures induced by subsidence in the Chasm into a bed of, 'soft quicksand or mud, or quagmire', the great mass in the Chasm leading the 'liquid' material to find a line of 'least resistance' for relief, and he claims that this would be, 'under the ocean and not under the solid hills'. Hutchinson described what he believed to be the analogy of this, namely, water levels in two connected perpendicular tubes, into one of which a heavy object is dropped, to produce a lateral pressure and therefore a higher level in the other tube. Despite his long description of fluid motions in accounting for the landslip, Hutchinson also recognised the role of sliding in that he says, 'the great mass cut off by the Chasm' (Goat Island) 'appears notwithstanding, to have slipped towards the sea'.

The possibility of the rear of the Chasm being fault-bounded has been considered in the past. The relatively soft and erodible nature of the Chalk and Upper Greensand have ensured that the rear scar is now irregular. Rogers (1869) may give a clue as to whether the fault-bounded scar theory is applicable by describing the morphology of the scar before subsequent erosion modified it. He states that it was 'broken and serrated on either side into butting recesses and jutting promontories'.

Hutchinson (1840) refers to a letter published in the *Exeter Gazette* concerning the theory, widely promoted at the time, that the Bindon slip was earthquake induced, although Buckland (1840) perhaps best assesses the likelihood of this in saying that, 'after the demonstration afforded by the repetition of the same phenomena at Whitlands, it seems worse than peurile to talk of an earth-

quake, where no such cause is wanted and where its interference with other causes, themselves full adequate to produce all the effects that have taken place, is superfluous'.

The farms of Bindon and Dowlands suffered losses of land and crops from the slip and from trampling by the many visitors who came to view the spectacle. As a result, each levied a charge of sixpence to pass through their lands to visit the slip, and the revenue from this more than compensated for their losses. Harper (1907) takes up the argument which ensued concerning this charge accounting that 'in the deeds for Bindon and Dowlands Farms are clauses which suggest that there is no right of way to the landslip, although on payment of sixpence, entrance can not be refused'. The clause, in the form of a footnote says that, 'the present tenant has the right to admit people to visit the cliff and the landslip, but is under an obligation not to allow them to do so without their first having obtained a ticket by payment, and to do his best to prevent visitors trespassing over the cliffs'. Harper also comments that, 'a charge of sixpence is attempted at a farm at the Seaton end. The attempt is an impudent and illegal imposition, for the question of free access was fought out successfully some years ago by the Lyme Corporation'.

Finally, Wanklyn (1929), quotes from a letter, written by William Dawson in the summer following the slip (28th August, 1840) referring to the celebrations held on the landslip during August, 1840, when the wheat which was on the land which had slipped, was reaped. 'It was a really beautiful sight – the day warm and bright – and I should think a full six thousand spectators. They got up a procession which was in my humble opinion not in good taste – a committee with Blue Ribands around the neck – six lady reapers in white kid gloves and wreaths of artificial flowers, the sickles tied with blue, and six gentlemen to match in blue vests and white trousers. They had however a good Band of Music, the effect as they wound down the Zig Path into the valley of the chasm with the banners, and the assembled thousands lining the cliffs on both sides was picturesque and fine. Sir W. Pole was there and furnished a battery of four guns from Shute. I heard of no accident whatever and all looked pleased and happy – the young ladies were however a failure – with the first stroke of the sickle, one of them cut her hand and they were so crowded upon that they soon gave over and the corn was consequentedly reaped by the labourers'. A painting of these festivities hangs in the Phillpot Museum in Lyme Regis.

8. Haven Cliffs to Culverhole Point

An anomaly exists in the accounts of the landslipping at Haven Cliffs. Arber (1940) contends that it is of relatively recent age. This does not conform to the account of Griffiths (1967) who considers the decline of Axmouth as a port in the 12th century as a result of landslipping in Haven Cliffs, blocking the mouth of the estuary and harbour. A reference to an Axmouth landslip in 1830 may well refer to Haven Cliffs (Lang, 1927).

'Step-slipping' at the top of Culverhole Cliffs occurred in January, 1961. This stretched for about 200 yards west of the stile on the public footpath leading into the Reserve (Wallace, personal communication).

The slipped material overlying and obscuring much of the Keuper Marl cliffs re-slipped extensively during the wet winter of 1976-7, exposing much of the Keuper Marl. Seepage was very much in evidence with the rapid development of gullying of the upper surface of the Keuper, and much standing water accumulating in the undulations on the slipped material at the cliff foot. Large earth flows were developing at the toe in parts of Haven Cliffs, displaying highly disturbed and wet Cretaceous material from the higher parts of the cliffs. Slippage of the colluvium at the toe clearly exposed the unconformable junction of the red and variegated Keuper Marl and the Gault, the Tea-Green Marls of the Keuper, the Rhaetic and the Jurassic strata having been lost to pre-Albian planation. Arber (1940) had suggested that the top-most Keuper and the Rhaetic were present but were obscured by slipped debris.

Conclusions

In areas with a long history of landslipping, it is often difficult to obtain sufficient information from modern field studies to carry out detailed analyses of individual slips. Even basic data on the stratigraphic succession may be difficult to accumulate because of the erosion or burial of critical exposures. By surveying the existing literature, valuable information may be derived from work undertaken either before a slip occurred or when the features of the slip were fresh. As a result, a much clearer picture of past conditions can be built up, and in some cases, of how these conditions may vary with time.

An important feature of landslip activity is the return period or periodicity. Since in the Axmouth-Lyme Regis Undercliffs Nature Reserve the periodicity of large-scale slips is often well in excess of 100 years, such historical surveys may be invaluable. In addition, the precise dating of an individual landslide event and its accurate description may permit the recognition of fresh features. This enables approximate rates of processes to be determined from subsequent depositional features, for example scree slopes, and therefore by implication, rates of slope retreat.

A frequent result of landslip activity is the obscuring of deposits beneath debris, and it may be difficult after a landslip has occurred to detect critical planes upon which sliding took place. The Charton Bay landslip of 1969 is certainly a case in point.

There is little doubt therefore that a literature search is a necessary pre-requisite for any geomorphological research whether of a process oriented nature, or primarily a study of form and its evolution. The survey of existing material on the landslips of the Reserve proved both interesting and extremely fruitful.

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AN ECOLOGICAL SURVEY OF SLEPE HEATH – SUMMER, 1980

B. P. PICKESS

INTRODUCTION

Lowland heath is one of the most threatened habitats in Britain today. It forms on poor, free draining, acid soils on sands and gravels and is dominated by *Calluna* and *Erica* species together with *Ulex* species, especially *U. europaeus*. The (free draining) heaths are very dry but with their free draining, give way to wet heath and valley bog systems.

In recent years the loss of heathland in Dorset has been rapid, with destruction of the heaths for urban development, mineral mining, afforestation and marginal farming. This has resulted in fragmentation and isolation of what little remains. The disappearance of these heathlands is well documented by Moore (1962); Rippey (1973); Bibby (1977); and Webb and Haskins (1980). As areas are destroyed every piece that remains becomes increasingly important as a reservoir for heathland wildlife. Today any piece of heath over 25 acres (10 hectares) must be considered as important for nature conservation. Nevertheless, smaller areas, especially if adjacent to large tracts of heath are also of considerable value. Experienced workers can rapidly assess the diversity of habitat and probability of finding rare animals and plants on an area of heathland, but detailed survey work is needed to substantiate their impressions.

In 1980 it was learnt that part of Slepe Heath was being considered for afforestation (Fig. 1) The Royal Society for the Protection of Birds felt it was necessary to organise an ecological survey to assess its scientific interest since it was suspected that Slepe Heath may form a link between Arne and Hartland/Stoborough heaths. It is included in the Arne SSSI and is part of the Hartland Moor and Arne Heath Grade I site (Ratcliffe, 1977).

Study was made during the summer and early autumn of 1980, when a number of experts examined the site at very short notice. The major contribution to this study was a botanical survey which included the bryophytes and lichens. A breeding bird census was undertaken, but no other vertebrates were studied. The invertebrate orders Arachnida, Coleoptera, Lepidoptera, Odonata and Orthoptera were recorded but the results were affected by the cold, damp weather which was not ideal for invertebrate sampling.

The authors responsible for the various sections are given with their contributions.

THE VEGETATION OF SLEPE HEATH

R. J. GIAVERINI

The triangular site is located to the north of the coniferous plantation (Fig. 1). At no point along its length does the height of the land exceed 50 feet above sea level. The area rests on Bagshot Sands, a fluviatile Tertiary (Eocene) deposit comprising course sands and gravels, with thin seams of clay. Despite the shallow contours, topography plays a

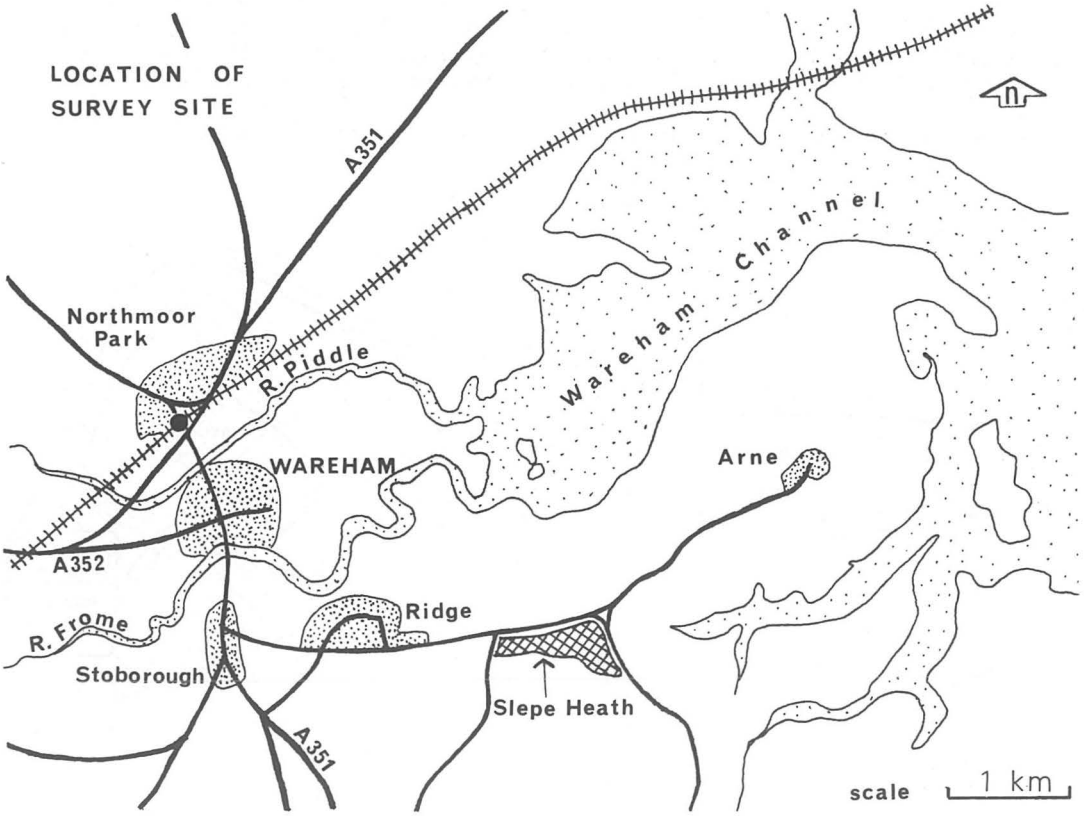

Figure 1. The location of Slepe Heath.

key role in determining the composition of the main plant communities. At higher levels on the heath, drainage is facilitated by increasing slope, but lower down deep pockets or basins cause the formation of peat bogs.

The vegetation of Slepe Heath presents a dynamic pattern altered not only by the natural forces of colonisation and succession, but also by the intervention of man, whose management practices of planting and burning over the years have developed and shaped this landscape. The survey site is roughly central to the better known heathland SSSI sites in south Dorset; it is no coincidence that key elements of these are found at Slepe providing an important bridging point. Of particular interest is the high frequency of *Erica ciliaris* (Chapman, 1975).

It is from the southernmost vantage points that subtle differences in vegetation shade and colour can best be seen, such observations play a large part in subjective sampling since they mark distinct floristic boundaries between one plant community and the next. An assessment of the status of the heathland vegetation follows the Braun-Blanquet school of phytosociology. In each releve the spermatophyta, bryophytes and lichens were recorded. The Braun-Blanquet scale was used for cover abundance recording.

The status of the woodland epiphyte groups was examined by the subjective sampling strategy of James *et al.* (1977). Rose and James (1974) was followed in evaluating the Index of Ecological Continuity (IEC) of the woodland environment.

Heathland

The flora of this area can be divided into two distinct plant communities each with a sub-class or order:

Class: *Nardo-Calluneta* Order: *Calluno-Ulicetalia*
Class: *Oxycocco-Sphagneta* Order: *Ericetalis-tetralicis*

The class *Nardo-Calluneta* is the smaller of the two classes represented, and lies to the south-east at a higher elevation than the rest of the area (Fig. 2). Dryness is reflected in the absence of species of *Sphagnum* and peat. The ground layer is dominated by communities of terricolous lichens, and mosses belonging to the genera *Campylopus* and *Polytrichum.*

The order *Calluna-Ulicetalia* is composed of Atlantic and sub-Atlantic dwarf shrub heaths, dominated by ericoids, especially *Erica cinerea.* The releves have strong affinities with the above order, although these show a strictly transitional community. *Ulex minor* occurs spasmodically across the south-east plateau but enters into this classification.

At the northern limit of the *Nardo-Calluneta* this community becomes less easy to define as it interdigitates with wetter facies belonging to the *Oxycocco-Sphagneta.*

Of particular interest are the long narrow gullies which run eastwards. These provide ideal conditions of shade and humidity for the regeneration of birch. Both birch bark and twigs have good epiphyte communities: *Fuscidea lightfootii, Arthonia radiata* and *Lepthoharpis epidermis* are well represented. The north-west corner of the heath supports a distinct variant of the *Nardo-Calluneta* due to the presence of *Agrostis setacea.*

The class *Oxycocco-Sphagneta* included the greater part of the vegetation at the site (Fig. 2) comprising oceanic valley mires and marginal wet heath. Peat is present across the west and south. A marked basin lies beyond the *Nardo-Calluneta* in the south-east corner. *Sphagnum* lawns and bog polls scattered across the heath are flushed by ground water of low mineral content. The pH is less than 5.

The order *Ericetalia-tetralicis* contains wet heath vegetation of the Atlantic sector of north-west Europe. Usually developed in shallow acidic peats over nutrient-poor substrata, with ericoids forming the predominant plant components. Mosses may be well developed, and species of *Sphagnum* such as *S. compactum* and *S. tellenum* are often characteristic. The *Erica-tetralicis* is widespread in south Dorset, but threatened because of drainage and land development. Canford Heath was a prime example before 1974. Releves collected from major wetland localities, together with those from Slepe, show this order represents a distinct structural and ecological identity.

Of special interest within this order is the local occurrence of the Marsh Gentian, *Gentiana pneumonanthe,* which was noted at three places across the heath in association with *Sphagnum pulchrum.* This is a unique assemblage as *S. pulchrum* is generally rare being restricted to only a few localities in the British Isles. According to distribution maps it is only in south Dorset that the two species can

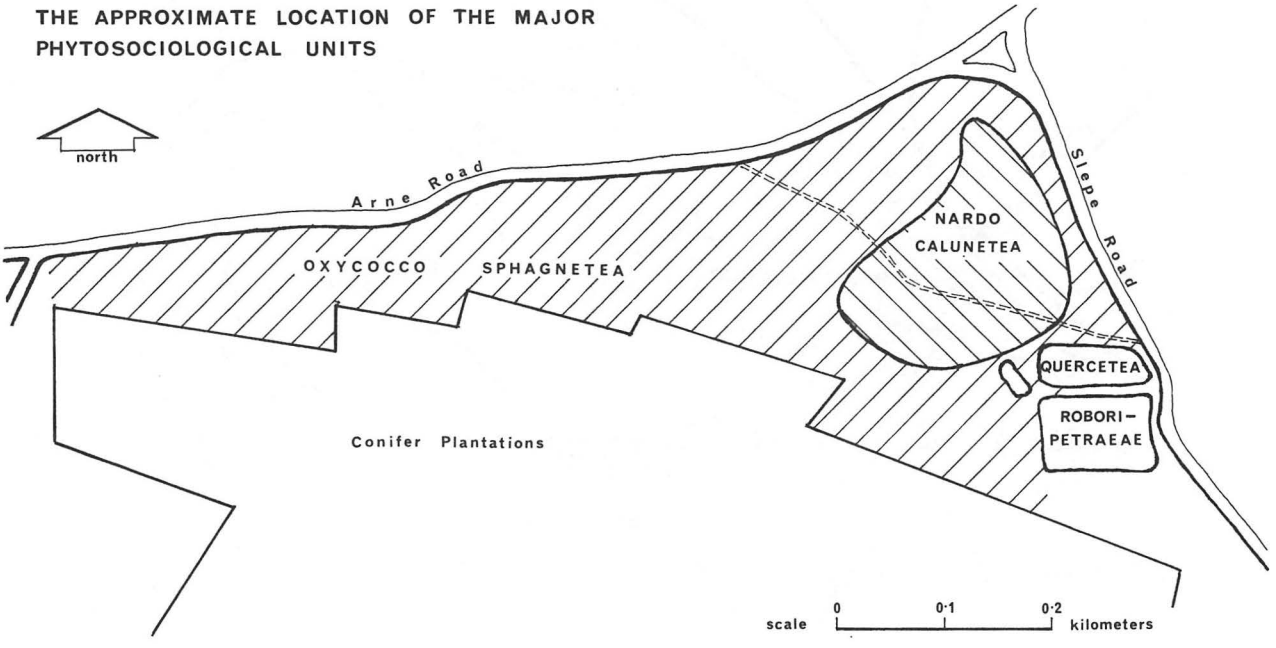

Figure 2. Slepe Heath: the approximate location of the major phytosociological units.

occur together, *S. pulchrum* being absent from the New Forest. *Schoenus nigricans* is absent, implying little movement of ground water across the heath. Invasive communities of no special phytosociological rank, flank the *Ericetalis-tetralicis* to the north and south. Transitional facies between dry heath, wet heath and bog can be identified within the orders.

Terricolous lichen communities are a widespread feature of both classes of vegetation. Here they form an ubiquitous assemblage of species, most of which belong to the genus *Cladonia; C. portentosa, C. pityrea, C. fimbriata, C. uncialis, C. floerkeana, C. furcata, C. coccifera, C. squammosa, C. cervicornis* sub-sp. *verticillata* and *C. gracilis*. A similar assemblage can be identified within the *Oxycocco-Sphagneta* – a wetter unit, with the additional attraction of different species: *Cladonia ciliata, C. arbuscula, C. strepsilis, Coelocaulon aculeatum* and *Pycnothelia papillaria*. The richest site lies to the west of the first small entrance to the heath along the Stoborough-Arne road. The communities have been allowed to develop between mature *Calluna*. In the far western corner of the heath is a small patch of burnt heath but since this is a recent feature little in the way of pioneer communities have yet developed.

Altogether 115 taxa were recorded from the heath, spermatophytes 63 (including 20 'weedy' species), bryophytes 25 and lichens 27.

Broad marsh woodland

The woodland is dominated by the regular distribution of old oak *Quercus robur*. Its deliberate introduction along boundary banks and ditches probably once served to define ownership and management of these areas. An examination of the associated trees and shrubs suggests that the coppice with standards system was once practiced, though this was many years ago. Pollarding of oaks is evident along the raised banks by the road. This is a fairly common feature of old woodland boundaries. The underlying soil is a Brown Forest Earth of low base status though far richer than that of the adjacent heathland.

Dominant Species
Quercus robur

Associated Trees and Shrubs

Betula pendula	*Corylus avellana*
Ilex aquifolium	*Ulex europaeus*
Sorbus aucuparia	*Frangula alnus*
Fagus sylvatica	

Drier Soils between Drainage Ditches

Lonicera periclymenum	*Calluna vulgaris*
Teucrium scorodonia	*Anthoxanthum odoratum*
Erica cinerea	*Holcus lanatus*
Digitalis purpurea	*Pteridium aquilinum*
Potentilla erecta	*Carex pilulifera*
Hyacynthoides non-scripta	

Damp Peat of the Boundary Banks

Molinia caerulea	*Hypnum curpressiforme*
Luzula multiflora	*Polytridum formosum*
Blechum spicant	*Thuidium tamariscinum*
Dryopteris austriaca	*Dicranella heteromalla*
Dryopteris filix-mas	*Lophocolea bidentata*
Athrium felix femina	*Dicranium scoparium*
Polypodium vulgare	*Isothecium myrum*
Agrostis tenuis	*Pleurozium schreberi*
Festuca ovina	*Pseudoscleropodium purum*
Mnium hornum	*Eurychium praelongum*

Wet Sites between Boundary Banks

Juncus effusus	*Polystichum setiferum*
Osmunda regalis	

The woodland is very rich in cryptogramic epiphytes. These comprise lichens, mosses and liverworts although some ferns, e.g. *Polypodium vulgare* grow luxuriantly on the boroughs on some tall oaks. Apart from the 52 lichens recorded from the woodland the following bryophytes were noted as epiphytes:

Dicranoweisia cirrata	*Isothecium myurum*
Hypnum mammillatum	*Frullania dilitata*
Isothecium myosuroides	*Lejeunea ulicina*

A list of 20 'old forest' lichen epiphytes were used to calculate the Index of Ecological Continuity of the woodland. This was achieved by expressing the number of species present at Slepe as a percentage of the listed 'faithful' taxa. Three of the old forest indicators were found, namely – *Arthonia vinosa, Enterographa crassa* and *Lecidea cinnabarina* giving an IEC of 15 per cent, a good figure for old coppice woodland with oak standards. The number of lichen taxa recorded, i.e. 52 species is high for such a small area, considering its nearness to a recently major operating source of pollution – Poole Power Station, whose sulphur dioxide emissions would cause serious deterioration in the epiphyte flora were it not for prevailing south-west winds.

A checklist of plants recorded on Slepe Heath (excluding road verges and broad marsh woodland).

Bryophyta

Aulocomnium palustre	*Sphagnum cuspidatum*
Calliergon cuspidatum	*Sphagnum papillosum*
Campylopus brevipilus	*Spaghnum pulchrum*
Campylopus introflexus	*Sphagnum recurvum*
Campylopus paradoxus	*Sphagnum subsecandum*
Ceratodon purpureus	*Sphagnum tenellum*
Hypnum ericetorium	*Calypogeia muellerana*
Leucobryum glaucum	*Cephalozia bicuspidata*
Pohlia nutans	*Cephalozia connivens*
Polytrichum juniperinum	*Gymnocolea inflata*
P. pilferum	*Lepidozia setacea*
Riccendia pinguis	*Odontoschizma sphagni*
Sphagnum compactum	

Lichens

Arthonic radiato	*C. furcata*
Hypogymnia physodes	*C. macilenta*
Rhizocarpon obscuratum var. *reductum*	*C. pityrea*
Lecidea macrocarpa	*C. portentosa*
Cladonia arbuscula	*C. squammosa*
C. cervicornis subsp. *verticillata*	*C. strepsilis*
C. chlorophaea	*C. uncialis*
C. ciliata	*Coelocaulon aculeata* var. *muricata*
C. coccifera	*Fuscidea lightfoobii*
C. crispata var. *cetrariiformis*	*Lecidlea granulosa*
C. fimbriata	*L. uliginosa*
C. floerkeana	*Lepthoharpis epidermis*
C. fluitans	*Pycnothelia papillaria*
C. gracilis	

Spermatophyta

Pinus sylvestris	*P. major*
Salix atrocinerea	*Pulicaria dysenterica*
S. repens	*Achillea millefolium*
Myrica gale	*Solidago virgaurea*
Betula pendula	*Senecio jacobaea*
Quercus robur	*Taraxacum officinalis* agg.
Rumex obtusifolius	*Hypochaeris radicata*
Drosera rotundifolia	*Potomogeton polygonifolius*
Drosera intermedia	*Narthecium ossifragum*
Rubus fruiticosus agg.	*Dactylorhiza maculata*
Potentilla erecta	*Juncus acutiflorus*
P. anserina	*J. articulatus*
Crataegus monogyna	*J. bufonius*
Ulex europaeus	*J. bulbosus*
U. minor	*J. effusus*

Medicago lupulina
Trifolium repens
Polygala serpyllifolia
Frangula alnus
Epilobium montanum
Rhododendron ponticum
Calluna vulgaris
Erica tetralix
E. cinerea
E. ciliaris
Gentiana pneumonanthe
Cuscuta epithymum
Solanum dulcamara
Euphrasia officinalis agg.
Pedicularis palustris
Pteridium aquilinum
Plantago lanceolata
J. inflexus
J. squarrosus
Luzula campestris
Eriorphorum angustifolium
Scirpus cespitosus
Rhynchospora alba
Carex panicea
Molinia caerulea
Sieglingia decumbens
Dactylis glomerata
Brachypodium sylvaticum
Agropyron repens
Holcus lanatus
Agrostis stolonifera
A. setacea
A. tenuis

THE BREEDING BIRDS OF SLEPE HEATH

B. P. PICKESS

The scientific interest of a particular piece of land can often be indicated by its breeding bird population. During the spring and summer the area was censused using the techniques employed by the British Trust for Ornithology and described by Williamson (1964). Nine visits were made to the census area between 10th April and 25th June, 1980 – four in early morning, four in the evening and one during late morning. Further to these visits, several others were made at dusk to census Nightjars.

The study area is long and thin, and the species recorded have been divided into the following categories:

(a) those whose territory was wholly or at least 75 per cent within the census area;
(b) those with at least 50 per cent of their territory within the census area;
(c) those with less than 50 per cent of their territory within the census area.

It will be seen from Table 1 that 18 species were recorded under groups (A) and (B). To these must be added Teal breeding on the heath near one of the ponds, Sparrow Hawk and Kestrel were also noted over the heath, which formed part of their much larger breeding and feeding territories.

The data show the population to be typical of similar heathland areas. A comparison can be made with the nearby nationally important Arne Nature Reserve where a plot of 107 acres (43 hectares) has been censused annually since 1966. The latter differs from Slepe Heath by being nearly twice its size and containing some patches of Scots Pine, *Pinus sylvestris*. Here the average number of territories for the past 15 years has been 122 per annum (2.84 per hectare). The Slepe Heath plot based on only one season's figures for the 60 acre (24 hectares) was 49 territories (2.04 per hectare). The differences in the number of territories per hectare between the two sites is a reflection of the area involved and slightly differing habitat. Without those species associated with the pines on the Arne plot the species composition of the two sites is almost identical. All 18 species recorded at Arne also occurred at Slepe Heath. The only other species that might have occurred at Slepe were Greenfinch and Blackcap.

The presence of one pair of Dartford Warblers, which successfully reared two broods is indicative of the value of this piece of heathland. The Dartford Warbler population in Dorset reached its peak in 1974, where Purbeck alone held 127 pairs (Pickess, 1976). Due to the severe winters of 1978 and 1979, the Dartford Warbler population in Purbeck crashed to 15 pairs. Of the pairs remaining 10 were situated on one group of heaths, whilst the remainder were scattered over the northern heaths of Purbeck. In both of these years a pair managed to survive in Slepe Heath. Even at Arne, with its extensive heathlands only a single pair remained in 1979. The ability of a pair to survive on Slepe Heath, despite the severe conditions shows just how important this site is for the species' future survival.

Two Nightjar territories were found. This species like the Dartford Warbler has declined considerably over most of its breeding range in Britain and the presence of at least two territories is therefore significant.

As would be expected, the distribution of Willow Warbler, Robin and Blackbird was associated with the perimeter of the area, where there was woodland or scrub birch and gorse. Rather surprisingly there was only one Chaffinch territory in Category A but at least six in Category C just over the boundary.

Of the other species directly associated with the heathland, a pair of Stonechats held territory over a large part of the central area and another pair occupied a part of the eastern area. The single pair of Whitethroats were found in an area of scrub birch and gorse. It is a little surprising that there were just two pairs of Meadow Pipits. Whether the Cuckoo frequenting the area was parasitising these was not known.

Yellow Hammers were very much associated with the gorse *Ulex europaeus* clumps. The presence of seven territories compares more than favourably with Arne, where over the past six years the survey plot has averaged only nine. On the other hand more than three Linnet territories could have been expected.

TABLE 1

Bird census results for 1980 for Slepe Heath showing number of territories in three classifications.

Species	Percentage of territory in study area: Group A 75% or more	Group B between 50%-75%	Group C Under 50%
Pheasant	1	–	–
Nightjar	2	–	–
Green Woodpecker	1	1	–
Cuckoo	1	–	–
Blackbird	2	–	1
Stonechat	1	1	–
Robin	3	–	4
Whitethroat	1	–	–
Dartford Warbler	1	–	–
Willow Warbler	5	6	5
Chiffchaff	–	–	1
Wren	5	–	6
Long-tailed Tit	1	–	1
Meadow Pipit	2	–	–
Hedge Sparrow	–	–	1
Linnet	3	–	–
Redpoll	2/3	–	–
Yellowhammer	7	–	–
Chaffinch	1	–	6
Bullfinch	–	1	–
Totals	40	9	25

(Single Teal nest found near a pond on study area.)

BUTTERFLIES

B. P. PICKESS

A total of 12 visits were made to the survey area between June and September, 1980. Warm sunny days were needed; these were at a premium in 1980, otherwise the site would have received fuller coverage.

Fifteen species were recorded, of these 11 were thought to be resident, two probably breeding nearby (Small Tortoiseshell and Comma) and two immigrants (Red Admiral and Painted Lady). The full list of species recorded is given in Table 2.

The number of species is not large but this was a reflection upon the poor summer and late start to census work due to the wet spring. The two species which were most numerous and widespread on the heath, the Silver-studded Blue and Grayling, are also the most significant. Both these species are declining nationally, because of habitat loss (Skelton and Heath, 1975 and J. A. Thomas, *pers. comm.*). The presence of both in such good numbers is most encouraging and these are the most important butterfly species on the site.

TABLE 2
Butterflies recorded from Slepe Heath.

Small Skipper	*Thymelicus sylvestris* Poda
Large Skipper	*Ochlodes venata* Brem. and Grey
Brimstone	*Gonepteryx rhamni* L.
Small Copper	*Lycaena phlaeas* L.
Silver-studded Blue	*Plebejus argus* L.
Common Blue	*Polyommatus icarus* Rott.
Red Admiral	*Vanessa atalanta* L.
Painted Lady	*Vanessa cardui* L.
Small Tortoiseshell	*Aglais urticae* L.
Comma	*Polygonia c-album* L.
Speckled Wood	*Pararge aegeria* L.
Grayling	*Hipparchia semele* L.
Gatekeeper	*Pyronia tithonus* L.
Meadow Brown	*Maniola jurtina* L.
Small Heath	*Coenonympha pamphilus* L.

MOTHS

B. P. PICKESS

The moths of the heath were sampled between 27th June and 30th September, using a portable battery-operated light trap, with a 6-watt Actinic tube controlled by a solar switch. Further species were collected by net during the day. An attempt was made to identify all species caught. The Actinic light trap caught surprisingly few micro-lepidoptera. A total of 166 species were identified during the survey of which only 26 (15 per cent) were micro-lepidoptera. I am indebted to J. Day for determining most of the micro-species. A list of species recorded is given in Table 3.

The light trap was operated at two different sites for one or sometimes two nights each week during the study period. At each site the trap was operated for 19 nights. The two sites chosen differed from each other as follows:

Site 1. A dry heath area dominated by *Calluna* with some *Betula* scrub to 3 m tall. There were also some areas of *Agrostis setacea* and *Erica cinerea*.

Site 2. A damp site with a mixture of *Calluna, Erica tetralix, Molinia* with *Ulex europaeus*.

At the two trap sites 138 species of macro-lepidoptera were caught, of these 66 species (53 per cent) were common to both sites. 26 species (19 per cent) were recorded at Site 1, but not at Site 2. Conversely 39 species (28 per cent) were noted at Site 2, but not at Site 1. The greater richness of Site 2 would be expected as it is much more vegetationally diverse than Site 1.

Of the species recorded several are worthy of special note. Of the open heathy species *S. brunnearia, G. osbcuratus* and *S. anomala* are all very local species. *N. genistella* is associated with gorse *U. europaeus* and has a very restricted British distribution. *P. suspecta* is also a local species preferring the heathy/birch areas.

Of the wet heath/bog species the discovery of *I. muricata* represents the first record for Dorset for nearly 20 years. Other local species noted include *S. immutata* and *M. pudorina*.

On two dates in mid-July a MV light trap was operated by a local lepidopterist and a total of 95 species of macro-lepidoptera were recorded. Although most of the species recorded with the Actinic light trap were noted, there were three species of considerable interest. The most notable was *C. cribraria* which must be now one of Britain's rarest breeding species, being confined to just a handful of sites in Dorset. *A. limacodes* which is an oak feeder and *E. clorana* a sallow *Salix* sp. feeder can nowhere be called common species.

Of the species trapped during the period *I. muricata* and *C. cribraria* must be considered the two most important. Undoubtedly Slepe Heath is a very rich area for lepidoptera and given two years of full light trapping would produce a formidable list of species.

TABLE 3
Species of moths recorded on Slepe Heath.

Hepialidae
Hepialus hecta Linn.

Oecophoridae
Agonopterix nervosa Haw.

Cochylidae
Agapeta hamana Linn.
Euroecilia angustana Hb.

Tortricidae
Argyrotaenia pulchellana Haw.
Archips xylosteana Linn.
Clepsis consimilana Hb.
Cnephasia incertana Treit.
Cydia succedana D.&S.

Pyralidae
Calamotropha culmella Linn.
Crambus pascuella Linn.
Crambus silvella Hb.
Crambus perlella Scop.
Agriphila straminella D.&S.
A. tristella D.&S.
A. latistria Haw.
Catoptria falsella D.&S.
Eudonia mercurella Linn.
Nymphula nymphaeata Linn.
Opsibotys fuscalis D.&S.
Udea ferrugalis Hb.
Nomphila noctuella D.&S.
Endotricha flammealis D.&S.
Aphomia sociella Linn.
Oncocera palumbella D.&S.
O. genistella Dup.
Phycita roborella D.&S.

Lasiocampidae
Malacosoma neustria Linn.
Macrothylacia rubi Linn.
Philudoria potatoria Linn.

Dreanidae
Falcaria lacertinaria Linn.
Drepana binaria Hufn.
Drepana falcataria Linn.
Cilix glaucata Scop.

Thyatiridae
Habrosyne pyritoides Hufn.

Geometridae
Pseudoterpna pruinata Hufn.
Geometra papilionaria Linn.
Jodis lactearia Linn.
Cyclophora albipunctata Hufn.
Timandra griseata Peters.
Scopula imitaria Hb.
S. immutata Linn.
Idaea muricata Hufn.
I. dimidiata Hufn.
I. aversata Linn.
Scotopteryx luridata Hufn.
Epirrhoe alternata Mull
Cosmorhoe ocellata Linn.
Eulithis testata Linn.
E. pyraliata D.&S.
Chloroclysta truncata Hufn.
Thera obeliscata Hb.
Colostygia pectinataria Knoch.
Hydriomena furcata Thunb.
Euphyia unangulata Haw.
Eupithecia nanata Hb.
Gymnoscelis rufifasciata Haw.
Aplocera plagiata Linn.
Pterapherapteryx sexalata Retz.
Lomaspilis marginata Linn.
Semiothisa alternaria Hb.
S. liturata Cl.
Petrophora chlorosata Scop.
Pachycnemia hippocastanaria Hb.
Opisthograptis luteolata Linn.
Epione repandaria Hufn.
Ennomos alniaria Linn.
E. erosaria D.&S.
Selenia tetralunaria Hufn.
Crocallis elinguaria Linn.
Biston betularia Linn.
Peribatodes rhomboidaria D.&S.
Selidosema brunnearia Vill.
Ematurga atomaria Linn.
Bupalus piniaria Linn.
Cabera pusaria Linn.
C. exanthemata Scop.
Campaea margaritata Linn.
Gnophos obscuratus D.&S.
Aspitates ochrearia Rossi.

Sphingidae
Sphinx ligustri Linn.
Hyloicus pinastri Linn.
Smerinthus ocellata Linn.
Laothoe populi Linn.

Notodontidae
Phalera bucephala Linn.
Stauropus fagi Linn.
Eligmodonta ziczac Linn.
Pheosia gnoma Fabr.
Ptilodon capucina Linn.
Pterostoma palpina Cl.

Lymantriidae
Euproctis similis Fuess.

Arctiidae
Thumatha senex Hb.
Miltochrista miniata Forst.
Cybosia mesomella Linn.
Eilema griseola Hb.
E. complana Linn.
E. deplana Esp.
E. lurideola Zinck.
Arctia caja Linn.
Diacrisia sannio Linn.
Spilosoma luteum Hufn.
Phragmatobia fuliginosa Linn.

Noctuidae
Euxoa tritici Linn.
Agrotis vestigialis Hufn.
A. segetum D.&S.
A. exclamationis Linn.
A. ipsilon Hufn.
A. puta Hb.
Ochropleura plecta Linn.
Noctua pronuba Linn.
N. comes Hb.
N. fimbriata Schreb.
N. janthina D.&S.
N. interjecta Hb.
Paradiarsia glareosa Esp.
Lycophotia porphyrea D.&S.
Peridroma saucia Hb.
Diarsia rubi View.
Xestia c-nigrum Linn.
X. triangulum Hufn.
X. baja D.&S.
X. castanea Esp.
X. xanthographa D.&S.
X. agathina Dup.

Hadeninae
Anarta myrtilli Linn.
Lacanobia oleracea Linn.
Ceramica pisi Linn.
Tholera cespitis D.&S.
Tholera decimalis Poda.
Mythimna ferrago Fabr.
M. pudorina D.&S.
M. impura Hb.
M. pallens Linn.

Cuculliinae
Brachionycha viminalis Fabr.
Aporophyla nigra Haw.
Dryobotodes eremita Fabr.
Parastichtis suspecta Hb.
Omphaloscelis lunosa Haw.
Xanthia togata Esp.
X. icteritia Hufn.
Acronicta rumicis Linn.

Amphipyrinae
Amphipyra tragopogonis Cl.
Dypterygia scabriuscula Linn.
Rusina ferrunginea Esp.
Thalpophila matura Hufn.
Phlogophora meticulosa Linn.
Cosmia trapezina Linn.
Apamea monoglypha Hufn.
A. lithoxylaea D.&S.
A. remissa Hb.
Mesapamea secalis Linn.
Photedes pygmina Haw.
Luperina testacea D.&S.
Amphipoea oculea Linn.
Gortyna flavago D.&S.
Rhizedra lutosa Hb.
Arenostola phragmitidis Hb.
Hoplodrina alsines Brahm.
H. ambigua D.&S.
Caradrina morpheus Hufn.
Stilbia anomala Haw.

Plusiinae
Autographa gamma Linn.

Ophiderinae
Scoliopteryx libatrix Linn.
Phytometra viridaria Cl.

Hypeninae
Schrankia costaestrigalis Steph.
Hypenodes turfosalis Wocke

ORTHOPTERA

B. P. PICKESS

Only eight species of Orthoptera were recorded but given a better summer several other species would probably have been noted. Three of the species were found in light traps put out for a moth survey (*Ectobius pallidus, E. panzeri* and *Tetrix undulata*). Species recorded are given in Table 4. Of these it is the two cockroaches which are the most important. Both of these species are confined to southern Britain, where they have a very restricted distribution and are nowhere widespread.

TABLE 4
Orthoptera recorded from Slepe Heath.

Tawny Cockroach	*Ectobius pallidus*
Lesser Cockroach	*E. panzeri*
Bog Bush Cricket	*Metrioptera brachyptera*
Common Green Grasshopper	*Omocestus viridulus*
Common Field Grasshopper	*Chorthippus brunneus*
Meadow Grasshopper	*C. parallelus*
Mottle Grasshopper	*Myrmeleotettix maculatus*
Common Groundhopper	*Tetrix undulata*

ODONATA

B. P. PICKESS

The heathlands of Purbeck are recognised as holding nationally important populations of dragonflies. The Odonata populations of the Arne Peninsula have already been described (Moore, 1964 and Pickess, 1980). The species recorded from Slepe Heath are very much representative of the Peninsula's population and despite the small number of ponds, it holds a wide variety of species. The recent addition of two fire ponds to the site can be expected to enhance the present dragonfly populations.

Of the 13 species so far recorded, it is thought that 11 species are breeding on the site. The two *Orthetrum* sp., although regularly encountered are probably breeding in areas adjacent to the site, although the heath forms an important part of their habitat.

The most important species present are *Ceriagrion tenellum* and *Ischnura pumilio,* which have very restricted distributions in Britain and are two of our rarest species. *C. tenellum* was found at two sites but *I. pumilio* at only one. As an illustration as to the fragile hold that these rare species have, within three days of the discovery of *I. pumilio* their breeding site was filled in by a digger. Fortunately the species moved to an adjacent pond but had there not been one to hand the species could have become extinct on the site.

TABLE 5
Odonata recorded from Slepe Heath.

Zygoptera	
Ceriagrion tenellum	*Ischnura elegans*
Coenagrion puella	*I. pumilio*
Enallagma cyathigerum	
Pyrrhosoma nymphula	*Lestes sponsa*
Anisoptera	
Anax imperator	*Libellula quadrimaculata*
Orthetrum cancellatum	*Sympetrum scoticum*
O. coerulescens	*S. striolatum*

ARANEAE

R. SNAZELL

The spiders of Slepe Heath were sampled over the period 14th May to 13th October, 1980 by pitfall trapping and occasional sweep netting of the vegetation. This yielded a total of 105 species. These represented a fauna typical of both wet and dry heaths in the Poole Basin, and corresponded closely with that of the adjacent Hartland Moor NNR which has been studied in detail by Merrett (1967, 1968, 1969, 1976) and Snazell (1982, in press). Although the survey was of limited duration some interesting species were taken.

Zora armillata Simon is a spider of considerable rarity. All previous records have been from wet heath or bog on Hartland Moor and Morden Bog NNR and from two sites in East Anglia.

Pirata tenuitarsis Simon has only recently been identified as a British species (Kronstedt, 1980) and its status in

Britain is, as yet, unclear. It has been taken in Dorset on Hartland Moor and at Warmwell.

Dolomedes fimbriatus (Clerck) is a very large and attractive species which, although widespread in Britain, is only found in any numbers in a few southern counties. It is a semi-aquatic species and, on Slepe Heath, seems to be associated with the bog pools to the east of the area.

Table 6 represents a far from complete picture of the spider fauna of the site as the sampling period was so short. In fact all the winter active species are missing. However, the list does suggest that the fauna of Slepe Heath should be comparable with that of Hartland Moor NNR which has approximately 200 recorded species.

TABLE 6

Spiders taken on Slepe Heath between 14th May and 13th October, 1980.

Fam Dictynidae

Dictyna arundinacea (Linnaeus) *Lathys humilis* (Blackwell)
D. latens (Fabricius)

Fam Dysderidae

Dysdera erythrina (Walckenaer)

Fam Gnaphosidae

Drassodes cupreus (Blackwall) *Zelotes pusillus* (C. L. Koch)
D. pubescens (Thorell) *Z. latreillei* (Simon)
Haplodrassus signifer (C. L. Koch) *Gnaphosa leporina* (L. Koch)
Micaria pulicaria (Sundevall)
H. dalmatensis (L. Koch)

Fam Clubionidae

Clubiona compta C. L. Koch *Scotina celans* (Blackwall)
C. trivialis C. L. Koch *S. gracilipes* (Blackwall)
Agroeca proxima (O. P.-Cambridge) *Phrurolithus festivus* (C. L. Koch)

Fam Zoridae

Zora spinimana (Sundevall) *Z. armillata* Simon

Fam Thomisidae

Xysticus cristatus (Clerck) *X. kochi* Thorell
X. audax (Schrank) *Oxyptila atomaria* (Panzer)

Fam Salticidae

Heliophanus cupreus (Walckenaer) *Evarcha falcata* (Clerck)
Aelurillus v-signitus (Clerck)

Fam Lycosidae

Pardosa monticola (Clerck) *A. accentuata* (Latreille)
P. palustris (Linnaeus) *Trochosa terricola* Thorell
P. pullata (Clerck) *Arctosa perita* (Latreille)
P. prativaga (L. Koch) *A. leopardus* (Sundevall)
P. nigriceps (Thorell) *Pirata tenuitarsis* Simon
P. lugubris (Walckenaer) *P. hygrophilus* Thorell
Alopecosa pulverulenta (Clerck) *P. latitans* (Blackwall)

Fam Pisauridae

Pisaura mirabilis (Clerck) *Dolomedes fimbriatus* (Clerck)

Fam Agelenidae

Agelena labyrinthica (Clerck) *H. nava* (Blackwall)
Antistea elegans (Blackwall) *H. helveola* Simon
Hahnia montana (Blackwall)

Fam Mimetidae

Ero cambridgei Kulczynski *E. furcata* (Villers)

Fam Theridiidae

Anelosimus aulicus (C. L. Koch) *Enoplognatha thoracica* (Hahn)
Theridion sisyphium (Clerck) *Robertus lividus* (Blackwall)
T. simile C. L. Koch *Pholcoma gibbum* (Westring)
T. varians Hahn

Fam Tetragnathidae

Pachygnatha degeeri Sundevall *Meta mengei* (Blackwall)

Fam Araneidae

Araneus quadratus Clerck *Z. atrica* (C. L. Koch)
Zygiella x-notata (Clerck) *Mangora acalypha* (Walckenaer)

Fam Linyphiidae

Walckenaera acuminata Blackwall *Erigone dentipalpis* (Wider)
W. antica (Wider) *E. atra* (Blackwall)
W. nodosa O. P.-Cambridge *E. promiscua* (O. P.-Cambridge)
W. nudipalpis (Westring) *Aphileta misera* (O. P.-Cambridge)
W. cuspidata Blackwall *Agyneta subtilis* (O. P.-Cambridge)
Metopobactrus prominulus (O. P.-Cambridge) *A. decora* (O. P.-Cambridge)
Gonatium rubens (Blackwall) *Meioneta rurestris* (C. L. Koch)
Peponocranium ludicrum (O. P.-Cambridge) *Centromerita concinna* (Thorell)
Sintula cornigera (Blackwall)
Pocadicnemis pumila (Blackwall) *Saaristoa abnormis* (Blackwall)
Oedothorax gibbosus (Blackwall) *Bathyphantes gracilis* (Blackwall)
Oe. fuscus (Blackwall) *Floronia bucculenta* (Clercki)
Oe. retusus (Westring) *Stemonyphantes lineatus* (Linneus)
Trichopterna thorelli (Westring) *Lepthyphantes alacris* (Blackwall)
Mecopisthes peusi Wunderlich *L. obscurus* (Blackwall)
Tiso vagans (Blackwall) *L. tenuis* (Blackwall)
Jacksonella falconeri (Jackson) *L. zimmermanni* Bertkau
Gongylidiellum vivum (O. P.-Cambridge) *L. mengei* Kulczynski
Savignya frontata (Blackwall) *L. ericaeus* (Blackwall)
Diplocephalus permixtus (O. P.-Cambridge) *Linyphia triangularis* (Clerck)
L. furtiva O. P.-Cambridge
Araeoncus crassiceps (Westring) *Microlinyphia pusilla* (Sundevall)

COLEOPTERA

W. E. RISPIN

The following species list has been annotated to indicate beetles which are typical of heathland (H), those which are phytophagous (P) and those which are ubiquitous (U). The beetles caught were mostly species which are typical of heathland but a number of species were typical of predominantly moist habitats. This habitat represented by the *Erica tetralix* and *Erica ciliaris* communities was well represented in the study area. A number of species were caught which feed on carrion.

The species of Coleoptera recorded from Slepe Heath:

Carabidae

Cicindela campestris L. *Pterostichus cupreus* (L.)
C. sylvatica L. H *P. lepidus* (Leske)
Carabus granulatus L. *P. niger* (Schaller)
C. problematicus Herbst. H *P. nigrita* (Paykull)
C. violaceus L. U *P. strenuus* (Panzer)
Leistus ferrugineus (L.) *Calathus erratus* (Sahlberg R)
Nebria salina Fairmaire *C. fuscipes* (Goeze)
Notiophilus aquaticus (L.) *Olisthopus rotundatus* (Paykull)
N. biguttatus (Fab.) *Amara aenea* (Degeer)
N. germinyi Fauvel *A. equestris* (Duftschnid)
Loricera pilicornis (Fab.) *Harpalus rufitarvus* (Duftschmid)
Dyschirius globosus (Herbst) *Acupalpus meridanus* (L.)
Bembidion lampros (Herbst) *Metabletus foveatus* (Fourcroy)

Dytiscidae

Hydroporus nigrita (Fab.) *A. unguicularis* (Thompson)
Porhydrus lineatus (Fab.) *Rhantus bistriatus* (Bergstraeser)
Agabus bipustulatus (L.)

Hydrophilidae

Laccobius sinuatus (Motschulsky)

Histeridae

Saprinus semistriatus (Scriba)

Leiodidae

Amphicyllis globus (Fab.) *Sciodrepoides fumata* (Spence)
Ptomophagus medius Rey *Catops fuliginosus* (Erichson)

P. subvillosus (Goeze)
Choleva agilis (Illiger)
C. morio (Fab.)
C. nigrita (Erichson)

Silphidae
Nicrophorus vespillo (L.)
N. vespilloides Herbst
Aclypea opaca (L.)
Silpha atrata (L.)
Silpha tristis Illiger

Scydmaenidae
Stenichnus collaris (Muller P.J.W.)

Pselaphidae
Pselaphus heisei (Herbst)

Geotrupidae
Typhoeus typhaeus (L.)

Scarabaeidae
Onthophagus fracticorne (Preyssler)

Byrrhidae
Byrrhus pustulatus (Forster)

Elateridae
Athous haemmorhoidalis (Fab.)
Actenicerus sjaelandicus (Müller O.F.)
Sericus brunneus (L.)

Cantharidae
Rhagonycha fulva (Scop.)
R. lignosa (Muller)

Cryptophagidae
Cryptophagus setulosus Sturm

Coccinellidae
Chilocoris bipustulatus (L.)
Coccinella hieroglyphica L.
Propylea 14-punctata (L.)

Lathridiidae
Enicmus transversus (Olivier)
Corticaria crenulata (Gyllenhal)

Tenebrionidae
Cylindrinotus laeviochostriatus (Goeze)

Chrysomelidae
Lochmaea suturalis (Thompson O.S.) H
Luperus longicornis (Fab.)
Crepidodera ferruginea (Scop.)
Chaetocnema hortensis (Fourcroy)

Apionidae
Apion ulicis (Forster)
A. striatum (Marsham)
A. assimile Kirby

Curculionidae
Caenopsis waltoni (Boheman)
Phyllobius pyri (L.) U
Strophosomus melanogrammus (Forster) H
S. sus (Stephens) H
Sitona humeralis (Stephens) H
S. regensteinensis (Herbst) H
Micrelus ericae (Gyllenhal) H
Smicronyx jungemanniae (Reich)

Staphylinidae
Anthobinum unicolor (Marsham)
Olophrum piceum (Gyllenhal) H
Anotylus rugosus (Fab.)
A. tetracarinatus (Block)
Stenus clavicornis (Scop.)
S. geniculatus Gravenhorst H
S. impressus Germar
Euaesthetus bipunctatus (Ljungh)
Lathrobium brunnipes (Fab.)
Lathrobium longulum Gravenhorst
Othius myrmecophilus Kiesenweffer
O. punctulatus (Goeze)
Xantholinus linearis (Oliver) U
Philonthus cognatus Stephens U
P. laminatus (Creutzer)
P. splendens (Fab.)
Staphylinus caesareus Ceder hjelm
S. compressus Marsham
S. olens Muller, O.F.
Quedius aridulus Jansson H
Q. fuliginosus (Gravenhorst)
Q. nigriceps Keatz
Mycetoporus angularis Mulsant & Rey
M. clavicornis (Stephens) H
M. lepidus (Gravenhorst) H
M. rufescens (Stephens)
M. splendidus (Gravenhorst)
Bolitobius sp.
Sepedophilus marshami (Stephens)
S. nigripennis (Stephens)
Amischa analis (Gravenhorst)
Dinaraea angustula (Gyllenhal)
Atheta clientula (Erichson)
A. fungi (Gravenhorst) U
Drusilla canaliculata (Fab.)
Zyras cognatus (Märkel)
Aleochara curtula (Goeze)

CONCLUSIONS

Although the surveys carried out were but brief, their findings have enhanced the original views as to the importance biologically of this area of lowland heath. There is no doubt that this is an extremely valuable piece of lowland heath linking the Arne series to the Hartland/Stoborough series. Its loss could seriously jeopardise the existing bridging zone which this heath at present provides.

Every effort should therefore be made to maintain this very important piece of lowland heath, together with the old woodland – Broad Marsh. It is to be hoped that the owners will view favourably the possibility of conferring protection upon the site to retain its present biological status. Ideally an association with one of the existing conservation bodies which manage adjoining land ,would be the most practical.

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A PATTERN OF CHANGE: OBSERVATIONS ON PLANT HABITAT CHANGE IN NORTH-EAST DORSET SINCE 1931: PART 3, 1981

A. HORSFALL

SUMMARY

Professor Good's botanical sites in north-east Dorset have been revisited to observe the extent of habitat change which has occurred since his survey of Dorset in the 1930s.

INTRODUCTION

This is a short account of a third survey based on Professor Good's numerous and precise records of plants and places. The Wimborne District was selected this year and observations made at the 814 original sites in an area of about 325 km^2. The district extends from around Wimborne Minster and north of Bournemouth to the Hampshire and Wiltshire borders. It includes several different soil types such as chalk, tertiary clays and gravels, and the acid sands of the heathlands, as well as chalk streams and a part of the Stour Valley. The areas near Christchurch which were formerly in Hampshire were not included.

The botanical interest is considerable. The flora is varied and includes several plants absent or very uncommon in other parts of the county. Every site where Good had listed plants was observed and the habitat and flora compared with his original records. The sites were described as *totally changed,* where the habitat was different, *partly changed,* where the area or a part of the flora had been significantly reduced, or *unchanged* if the habitat was the same and the original plant species could still be found. Only a few comparative plant lists were compiled because the main purpose of the present survey was to find the general pattern of habitat change.

The results showed that 35 per cent of the original 814 sites were totally changed and 13 per cent partly changed. The main reasons are summarised in Table 1. The extent of change in the different habitats is given in Table 2.

TABLE 1

Reasons for change in plant habitats since 1931: present status of changed sites in the Wimborne district of Dorset in 1981.

	285 sites totally changed	
Per cent	Reason for change	Present status
55	Agriculture	Arable and improved grassland
25	Forestry	Conifer plantations and mixed plantations
14	Development	Roads, fences, houses and other buildings
4	Ecological	Gorse, rhododendron and rank vegetation
2	Ecological	Trees, especially birch and pine
	109 sites partly changed	
Per cent	Reason for change	Present status
30	Agriculture	Arable and improved grassland
26	Development	Roads, fences, houses and other buildings
21	Forestry	Conifer and mixed plantations and clearings
18	Ecological	Trees: pine, birch, sallow and oak
5	Ecological	Gorse, rhododendron and rank vegetation

HABITATS

All possible habitats were represented in Professor Good's original survey and in this area included: rivers and streams, ponds and ditches; marshes and marshy meadows; chalk pastures and other grassy places; hedgebanks and thickets; woods of all kinds: tallwood with oak, ash or beech; oak in hazel coppices; shelter belts; a few firwoods; and finally a group of minor habitats such as fallow fields and cornfields, chalkpits, roadsides, old walls, warrens. His plant lists for every clearly defined site give an indication of the botanical interest at every place he selected nearly 50 years ago.

TABLE 2

Wimborne district in 1981: pattern of change since 1931.

Main habitat group	Number of sites observed	Sites unchanged	Sites partly changed	Sites totally changed
		Per cent	Per cent	Per cent
Hedgebank	208	77	15	8
Aquatic	59	75	8	17
Woodland	238	60	13	27
Minor habitats	49	37	10	53
Heathland	76	34	12	54
Marsh	29	24	28	48
Thicket	53	23	15	62
Grassland	102	8	14	78
		52	13	35
All types of habitat	814 sites	(420 sites)	(109 sites)	(285 sites)

The survival of a large number of the **hedgebank** sites is encouraging because in these 'linear woods' the plant life may also include the relic flora of adjacent land which has totally changed.

The flora of **aquatic** habitats usually survives periodic dredging and fluctuations in water level but on unfenced river banks is vulnerable to grazing animals. Changed sites were mostly ponds which had been filled in.

The many **woodland** sites showed less change, from a botanical point of view, than was expected in an area where there is extensive woodland clearance and re-planting with conifers or mixed stands. All the types of woodland and their characteristic flora may still be found in north-east Dorset but the methods of clearing old woods and coppices and subsequent afforestation have caused a substantial reduction of woodland plants.

Among the **minor habitats** the flora of old walls is still plentiful and may include a few new additions. Elsewhere the flowers have succumbed to change as chalk pits have been filled in and arable fields cleared of 'weeds'.

Heathland sites have mostly fared badly from urban development or forestry or agriculture and most of the remaining sites including the interesting boggy heaths are in conservation areas. **Marshes** including marshy meadows have been transformed through drainage into seeded pastures. **Thickets** are even more vulnerable because the sites are small and are readily cleared.

Finally, the **grassland** sites. Most were on chalk downland, some were meadows and hayfields, a few were grassy banks. Only eight of the original 102 sites throughout north-east Dorset can be now described as botanically unchanged: two are rough grass by old woodland, one is a hay meadow, just four are chalk downland sites which

have survived because they are on ancient trackways or ramparts, and the last is grazing land scheduled for development. Nearly all the grassland sites are now arable fields or improved pastures and although relic plants may still occur sparsely around these places, as well as others not surveyed by Professor Good, the loss of grassland flora resulting from agricultural improvements is extensive and probably irreversible.

CONCLUSION

The results of the survey give some indication of change in the countryside in the past five decades. A comparison with the Purbeck surveys (Horsfall, 1981 and 1982) show that overall change was greater in the Wimborne district. Although these results refer only to places selected for their botanical interest nearly 50 years ago it is probable that the general pattern of change may be applied to the whole of south-east and north-east Dorset.

TABLE 3

Habitat change in the Purbeck and Wimborne districts.

All habitats	Unchanged	Partly changed	Totally changed
	Per cent	Per cent	Per cent
South-east Dorset Purbeck district in 1979 and 1980	62 (1065 sites)	11 (195 sites)	27 (475 sites)
North-east Dorset Wimborne district in 1981	52 (420 sites)	13 (109 sites)	35 (285 sites)

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HAMBLEDON HILL

In 1981 the total excavation of the 2-acre Stepleton Enclosure was completed and a further length of the timber reinforced Neolithic outwork was excavated. A complex sequence of constructional phases has been identified with use of the enclosure continuing over, apparently, a long period of time. Successive periods of re-fortification culminate in the destruction of the site in a single catastrophic event accompanied by the presence on the site of a number of intact human skeletons – one with a leaf-shaped arrowhead within the thorax. All the available evidence would appear to indicate that the Stepleton enclosure had been used for at least part of its life as a settlement site – albeit, possibly, of a somewhat specialist nature – and that use largely ceased at the point of destruction.

The timber framed outwork rampart has produced two gateways, one of some 4 m width which, it may be suggested, is a form of 'pedestrian' access, while the other, some 12 m in width with incurving ditch terminals, would appear to be more readily interpreted as an access for animals. Abutting the Stepleton Enclosure on its north-west flank are indications of the existence of, as yet only partially understood, massive timber structures.

R. J. MERCER

CULVERWELL MESOLITHIC HABITATION SITE

Due to ill-health and family problems a full excavation was not carried out in 1981. Some volunteers spent a week tidying up the site, surveying and doing some conservation work.

SUSANN PALMER

POOLE (SZ 0308 9756)

A fairly substantial Late Neolithic/Early Bronze Age (settlement?) site is indicated by a group of worked flints collected by Mr. R. Hemley at Whitecroft, Arrowsmith Road. The finds consist of 2 arrowheads, 11 scrapers and 11 flakes. One arrowhead is of leaf type 3B (Stephen Green, 1980, 1, Fig. 28) whilst the other is of British oblique type (Stephen Green, 1980, 1, Fig. 38e). Current dating evidence suggests that these arrowheads could be contemporary in the period *c.* 2000-1500 BC. The scrapers are strictly classified as short end scrapers although they are nearly circular and are almost classifiable as disc scrapers. Other flakes were also present but were not collected. On the basis of the artefacts to flake ratios of other sites an assemblage of well over 1000 flints would be indicated if all flakes had been retained. Collecting is to continue and the finds will be deposited at Poole Museums.

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K. JARVIS

INTERIM REPORT ON THE EXCAVATION OF AN UNRECORDED POND BARROW AT DOWN FARM, GUSSAGE ST. MICHAEL

A shallow circular feature, containing dark humic topsoil, *c.* 18 metres in diameter, had first been noted during fieldwork by the author in 1968. It lies less than 30 metres from the northern bank of the Dorset Cursus at SU 0006 1454. Because of its proximity to the Late Bronze Age settlement excavated between 1976-79,[1] it seemed possible that this feature could have been related to it, and may have been a contemporary pond. Later fieldwork produced several Late Bronze Age sherds from the area of the feature, making this even more likely. Excavation to test this hypothesis started in February, 1981.

Up to the time of writing half the feature has been completely examined, together with an area of *c.* 140 square metres outside its southern and eastern perimeters. Initial excavation some 4 metres outside the eastern perimeter revealed a pit (2 metres by 1 metre) containing the complete articulated skeleton of an ox. Close by were two post-holes and a hearth. No pottery was found in these features, but the flint flakes found probably indicate a prehistoric date. These features were very close to the edge of the trench: further excavation will examine the extent of features in this area. Four further pits were discovered, one at 1 metre from the eastern edge of the feature, one at 2 metres and two on its very edge. All four contained cremations, three of which were in inverted Early Bronze Age urns: the fourth was only accompanied by a bronze awl. No trace of an external bank was discovered, but if one had existed it could have covered these cremations.

The interior examination of the feature itself revealed a stratified soil varying in depth from 3-8 cms. This soil contained abraded sherds of Beaker, Deverell Rimbury, Iron Age and Romano-British pottery. This soil probably represents a very slow silting phase after this area had gone out of use. Inside the eastern edge and close to the four cremations, six further pits were uncovered. Two of these contained cremations in inverted collared urns, one accompanied by a bronze and two bone awls. The other four pits contained child inhumations, two of which were accompanied by Food Vessels. Another unaccompanied cremation was revealed placed on the chalk surface beneath the stratified soil. All these features cluster around the eastern edge of the feature, and seem to form a small family cemetery grouped within an area only 5 metres by 6 metres. No further features have been uncovered in the interior despite stripping an area of 130 square metres.

Although this feature had distinct differences from the only other pond barrow scientifically excavated,[2] its morphology and burials must place it in the category, and thus it is the first such example recorded on Cranborne Chase.

[1] *Dorset Proceedings*, Vol. 101, 1979, pp. 135-7.

[2] R. J. C. Atkinson *et al.*, 'A Pond Barrow at Winterbourne Steepleton, Dorset', *Archaeological Journal*, CVIII, 1951, pp. 1-24.

MARTIN T. GREEN

BATTLE-AXE FROM HENGISTBURY HEAD

The implement shown in Figure 1 was found in July, 1981, after the excavation of a bird-pond in the Nursery Garden at Hengistbury Head, Dorset. Shortly after the work had been completed one of the authors (RNEB) went to investigate the site of the pond with Mr. R. Powell, an amateur archaeologist from Southbourne. The discovery of the battle-axe fragment was made during the visit, near the south-eastern corner of the pond at Nat. Grid Ref. SZ 17269082, by Mr. Powell, who noticed the stone object protruding out of loose sandy deposits from the digging fill.

Description of Implement. The battle-axe has been broken across the shafthole. The half that remains could be described as the blade end of the implement, though it may never have possessed an actual cutting-edge (Fig. 1, c). Unbroken, the axe would have been approximately 12 cms (4⅝ ins.) long and at its greatest depth would probably have measured about 4 cms (1½ ins.) across. The greatest depth would have occurred at the missing butt end of the implement and can be estimated from the angle of the top and bottom surfaces of the side profile (Fig. 1, a).

It will be observed that the top and bottom surfaces of the implement are slightly dished or hollowed out in appearance. Another less usual feature of the axe is a circular concavity that occurs on one of the faces (Fig. 1, b). This is assumed to be a deliberately manufactured feature, but secondary, since it has been noticed only on broken implements, all of which are blade end fragments (see below). Thirteen further broken battle-axes with this feature have been recorded.

Petrology. The battle-axe is light brown in colour with darker brown pheno-crysts, and presents a weathered appearance. The texture of the surface suggested a medium grained basic rock-type. A thin section of the axe was made for one of us (FESR), to which the petrological number DORS 159 (R 113) has been assigned. The rock-type was identified from the thin section as being as olivine dolerite (B. C. M. Butler, *pers. comm.*). It is perhaps also of interest to note that the freshly cut rock would not be of the same colour as the present weathered find. To the original owner of the battle-axe, the implement would have appeared as blue/grey in colour.

Stratigraphy. At the time of the discovery no section through the deposits was visible, as the pond had already been lined, using an imported white clay with red mottles, and filled with water.

Although the axe was found out of stratigraphic context, it was still felt that a section through the deposits of the pond area might contribute some additional information to the circumstances of the find.

A rectangular hole about a metre in size was therefore cut 4 m outside the eastern edge of the pond, and excavated to a depth of approximately 1 m. Beneath the present grassy surface and its cover of sandy fill left from the pond's excavation, lies a band of grey clay 10 cms thick. This clay is compact and exudes a highly sulphurous smell. It cannot be confused with the white clay used for lining the pond. Below the grey clay is a deposit of fine grey/buff sands, penetrated by modern roots. About 20 cms down the buff sands grade into coarse orange sands also with roots. The sands, which are loose at the top, become progressively more compact as they descend and what appears to be a hard iron/manganese pan occurs 1 m below the grey clay level. A small number of flint artefacts was found scattered widely throughout the sands. These consisted mainly of waste flakes and blades, but included several microliths, a bladelet core, an assortment of scrapers and a flake core. The assemblage almost certainly represents a mixture of Mesolithic and Neolithic or Bronze Age artefacts. The pieces appear to be randomly patinated and cannot be separated into industries using this criterion alone. All the artefacts from the pond area, including the battle-axe and other surface finds have been deposited in the Russell-Cotes Museum, Bournemouth.

Discussion. From the size and morphology of the Hengistbury battle-axe fragment it is possible to place it with considerable confidence within the Woodhenge Group. This is also the group for which there are the earliest known associations with pottery and other artefacts. The slightly concave or dished appearance on the top or bottom of the implement is a diagnostic feature, and one similar to other battle-axes supposedly found in Late Beaker/Food Vessel horizons (Roe, 1966). Less usual is the circular depression that occurs on one of the faces (Fig. 1, b). This presumably secondary feature has been observed on other broken blade end halves where, in most cases, the new boring has been made from both the top and bottom surfaces. In three instances, the opposed borings have joined up to make an hour-glass shaped hole. Although it is more usual to find shallow or conical hollows on both sides of the piece, one further example of a battle-axe with only one hollow has been documented: the implement concerned, which is unprovenanced, is in the British Museum Collections (FESR).

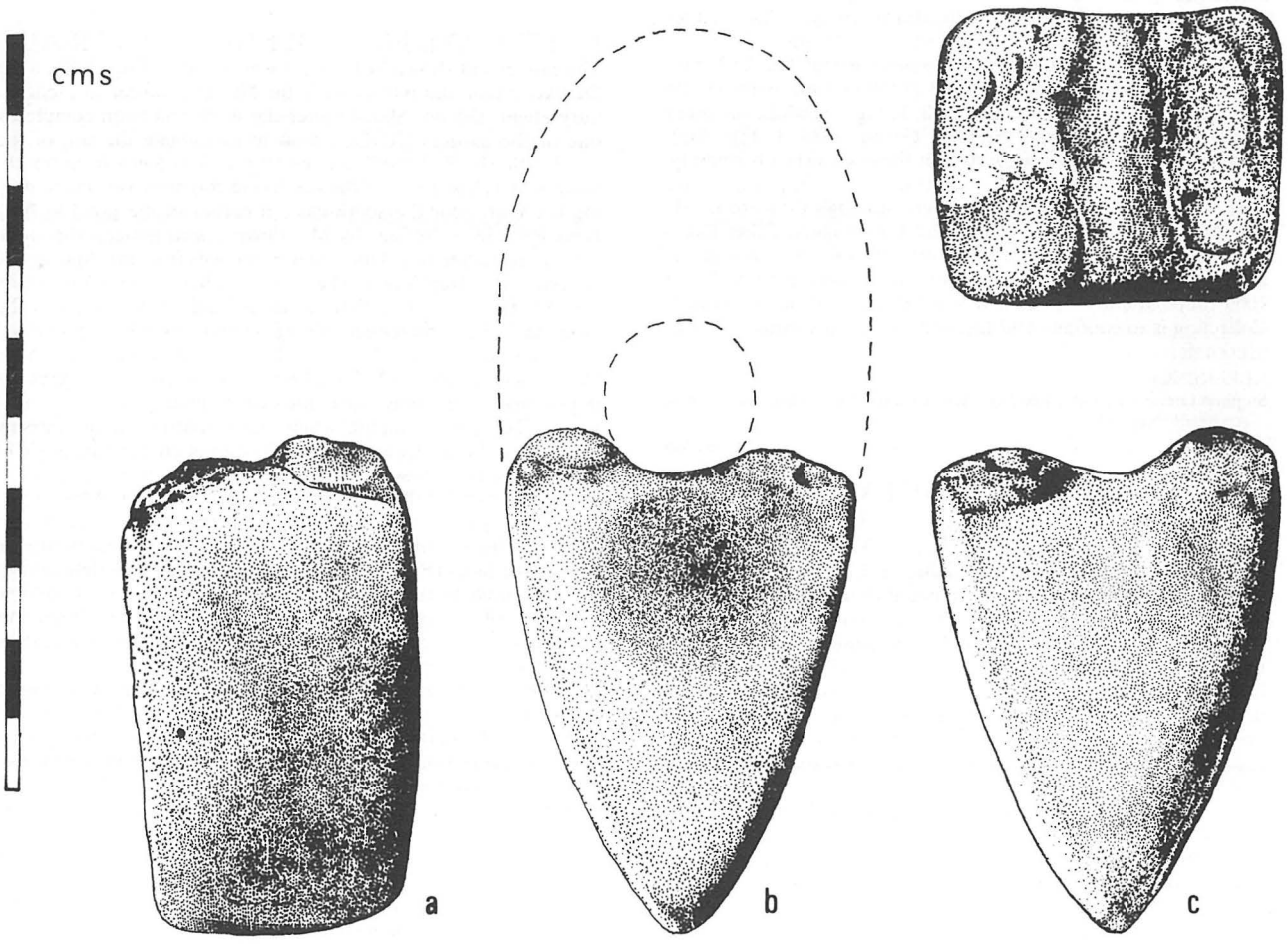

Figure 1. The battle-axe from Hengistbury Head, at life size.

It seems that there may be some significance in the fact that it is the blade ends of battle-axes that receive secondary boring treatment, since amongst the European material in the British Museum there are broken battle-axes that have been re-bored or partially re-bored in precisely the same manner as the Hengistbury fragment. Noteworthy examples are a fully bored blade end from Denmark (Den 672, unprovenanced) and another Danish end fragment in which the conical holes nearly meet (Den 673, from Jutland). In both these examples the type of battle-axe is one that can be compared directly with the British implements similarly treated.

The stratigraphic position of the Hengistbury find is not known, but it seems likely that the battle-axe derives from the sands in the pond area. A superficial layer of sands covers much of the Headland today, often characterised by strong podsol formation (Barton and Collcutt, 1980). The sands in the Nursey Garden are likely to be no exception, although the horizons of the podsol are here not well-marked; they could have been disturbed by more modern root action. It is also possible that part of the covering sands derive from a higher area of the Headland (S. Collcutt, *pers. comm.*), which was devastated by quarry-working in the 19th century (Cunliffe, 1978).

Evidence that Hengistbury was used as a cemetery in the early part of the Bronze Age derives from the presence of 13 barrows which still survive on the Headland. Eight of them are situated on the higher ground of Warren Hill, whilst the rest, including a rich 'Wessex burial', are located on the narrow isthmus that connects Hengistbury to the mainland. Most of the barrows were examined by excavators in the early part of this century and are well documented elsewhere (*c.f.* Cunliffe, 1978). It is sufficient here simply to note that many of the barrows yielded pottery grave goods (including five with Collared Urns) which consistently date to the first half of the second millenium BC (Cunliffe, *ibid.*, 23). Large quantities of flint flakes were also reported in many of the barrows.

The Nursery Garden is less than 150 m from the nearest barrow and it is conceivable that the battle-axe originated from the same mound or a similar barrow, since destroyed, on the northern side of the Headland. However, it would seem more probable that the battle-axe was discarded some time after it had been broken and may not have been deliberately interred at all, since very few broken battle-axes are known from burials.

That Hengistbury was perhaps settled in the Early Bronze Age is suggested by the discovery of numerous surface finds, including that of a flat Bronze axe. The axe is of a type found in the EBA and was discovered close to one of the barrows on Warren Hill (Cunliffe, *ibid.*, 23). Other finds in the Christchurch area indicate dense Bronze Age occupation and it is entirely possible that Hengistbury was settled throughout much of this period (Calkin, 1969) as well as being extensively used as a burial ground.

Acknowledgements. Thanks are due to Dr. B. C. M. Butler of the Department of Geology and Mineralogy, Oxford University for discussing the thin section. We are also grateful to Mr. M. H. R. Cook for producing the line drawing of the battle-axe. Dr. D. A. Roe, Mr. S. N. Collcutt and Mr. M. H. R. Cook read through earlier drafts of this paper and added many useful comments; to them we also owe our thanks.

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R. N. E. BARTON AND F. E. S. ROE

EXCAVATIONS AT 'ROWDEN', WINTERBOURNE STEEPLETON, 1981, SY 616891: AN INTERIM NOTE

The unit of settlement earthworks at Rowden, lying within a larger ancient field group, has been described in detail by the Royal Commission.[1] The excavation of four elements of the settlement complex was undertaken in June/July, 1981,[2] as a result of proposed farming developments, changes of land use and of ownership.[3] The objectives of the excavation were to: establish the functional and chronological development of the settlement within the context of land exploitation from the Mesolithic through to the present, and to evaluate the site's state of preservation and its archaeological potential. A total of about 455 m^2 was examined in a series of trenches over a site area of about 12 hectares.

The site comprised a series of depressions varying from 6-12 m in diameter (possibly representing huts), set within fields of about 0.2-0.8 hectares defined by banks and lynchets. These were connected by a double lynchet-way to a droveway running east-west across the slope of the Down, and marking the southern limit of the fields. To the south of the droveway was a barrow cemetery in which a sinuous and irregularly-shaped enclosure was located. These earthworks were set on a west facing slope above the 450 ft. contour and above a steeply scarped coombe, on the edge of a remnant clay-with-flints cap. To the west of this earthwork site a rectilinear cropmark on the crest of the hill had also been recorded.

Excavation comprised the total examination of one of the hut depressions (A), slit trenches across the double-lynchet way and field boundaries (B, C and E), a quadrant of a possible barrow (C), and simple trenches across the interior of the southern enclosure and a section across its bank and ditch (D). These trenches, together with the morphological character of the complex and systematic field walking in adjacent ploughed lands, demonstrated that the site was an homogenous mixed farming unit inserted onto an area of downland whose soil was already severely reduced and downgraded by man's intensive exploitation: i.e. woodland clearance and poor farming practice. This marginal land was used as a barrow cemetery during the Bronze Age. The majority of habitation huts appear to have been located singly within the small arable fields or allotments, and the surrounding land exploited for grazing, with the southern enclosure constructed for animal penning within the surviving barrow cemetery.

The excavation of the hut and its surrounding area produced the primary dating evidence for this farming unit. The hut was constructed of a single skin of drystone flint and sarsen walling, revetted into the slope of the hill, with an internal post-ring, and a four-posted entrance facing south. The internal arrangements were defined by three storage pits (containing grain and broken quern fragments) opposite the entrance, and by concentrations of broken burnt flint. The latter was particularly concentrated west of the entrance. A large quantity of flakes were recovered across the floor of the hut, but no particularly diagnostic 'tool-types' were recorded. The composite function of this assemblage will only be possible from detailed analysis. The small quantity of pottery recovered from the hut could be firmly set within the Deverel-Rimbury tradition; thick-walled globular urns, straight-sided jars, and smaller upright pots with pronounced shoulders. The vessels were designed with pointed and flat-topped rims, and often decorated with fingertip impressions, primarily on and above the shoulder and around the rim. Although carbon dates are not yet available the hut can be dated to the Later Bronze Age on structural and material grounds. The location and organisation of the fields and open pasture would also fit well with this dating. This settlement can be seen to have close similarities with one at Black Patch, East Sussex. Both sites can be viewed within a context of upland regeneration with improved agricultural expertise and technological innovation. The site at Black Patch can be dated to *circa* 1000 BC.[4]

No contemporary cemetery was found with the settlement at Rowden; the possible barrow (C) proved to be the downgraded remnants of a geological solution hollow. However it is likely that the cemetery may be located in association with the barrow to the north-west of the penning enclosure, which was probably inserted into the barrow cemetery.

The preservation of this complete Later Bronze Age complex was probably ensured by its lack of success, in an 'upland' area on the borders of a territory, where the soils had been already severely down-graded. Reversion to upland grazing in the Iron Age is likely, and return to arable has only occurred in the last 20 years. The location outside the medieval open fields of Winterbourne Steepleton can be shown by documentation, earthwork survey and excavation. However, despoilation of the hut depressions and their concentrations of flint walling did occur. These were clearly

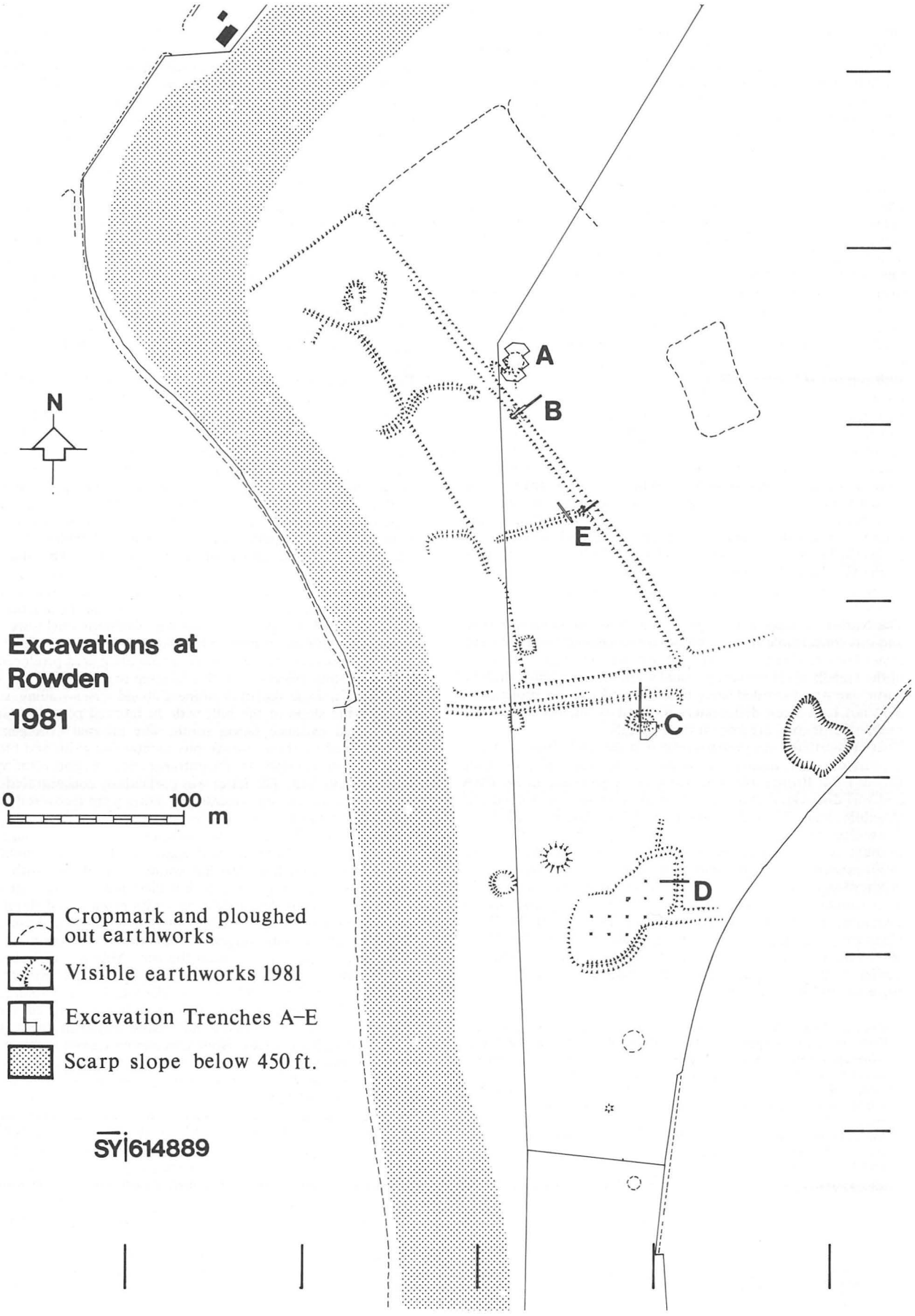

Figure 2. Excavations at 'Rowden', Winterbourne Steepleton, 1981.

rich areas from which to quarry building material with little expenditure of energy, in a parish whose stone resources for new buildings was limited. The excavation of the hut (A) showed that it had been badly damaged by removal of walling, and possible use (medieval pottery occurred) for shepherding. This also led to the severe damage of the earlier hut occupation levels. Damage to the evidence was not entirely confined to human activities; the solution of the chalk, particularly in the hut-hollow, by soil derived from an Eocene cap and clay-with-flints led to poor survival of organic materials, bone artefacts, and floor levels. Environmental evidence (land snails) was also confined to locations close to the chalk bedrock where local conditions made survival possible. However these limitations to the evidence do not preclude all interpretation of the site's function, nor its chronological and social development.

The 1981 excavations have in general confirmed the Royal Commission's earthwork interpretation of this site, apart from Site (C) which has to be ruled out as a barrow, although natural mounds have been shown to have been used as funary sites in other parts of the country.[5] The excavations have also now made it possible to begin to place this field unit in a chronological position, and to interpret its origins in terms of land development and agricultural innovation. However these excavations have not realised the full potential of this extremely important and well preserved archaeological site. More extensive excavation would be able to define functional variation within the farming unit, and its social organisation. The site's relationship to the hilltop enclosure to the north-east, its relationship to the more extensive ancient field group to the west, and the barrow cemeteries of the South Dorset Ridgeway are also not yet fully understood.

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1 Royal Commission on Historical Monuments, *An Inventory, Dorset,* Vol. II, Part 3, pp. 511 and 624, HMSO, 1970.

2 The excavations were funded by the Department of the Environment, and directed by Peter J. Woodward for the Wessex Archaeological Committee.

3 The site at Rowden is now divided between Loscombe Farm and Winterbourne Steepleton Farm, and the major portion of it still survives as an earthwork, having only been ploughed twice since it was taken in for lay pasture in the 1960s.

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5 Martin, E. A., with Denston, C. B., 'The Excavation of Two Tumuli on Waterhall Farm, Chippenham, Cambridgeshire, 1973', *Proc. Cambridge, Antiq. Soc.*, LXVI, 1975-6, pp. 1-21.

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Wessex Archaeological Committee
South Dorset Ridgeway Project

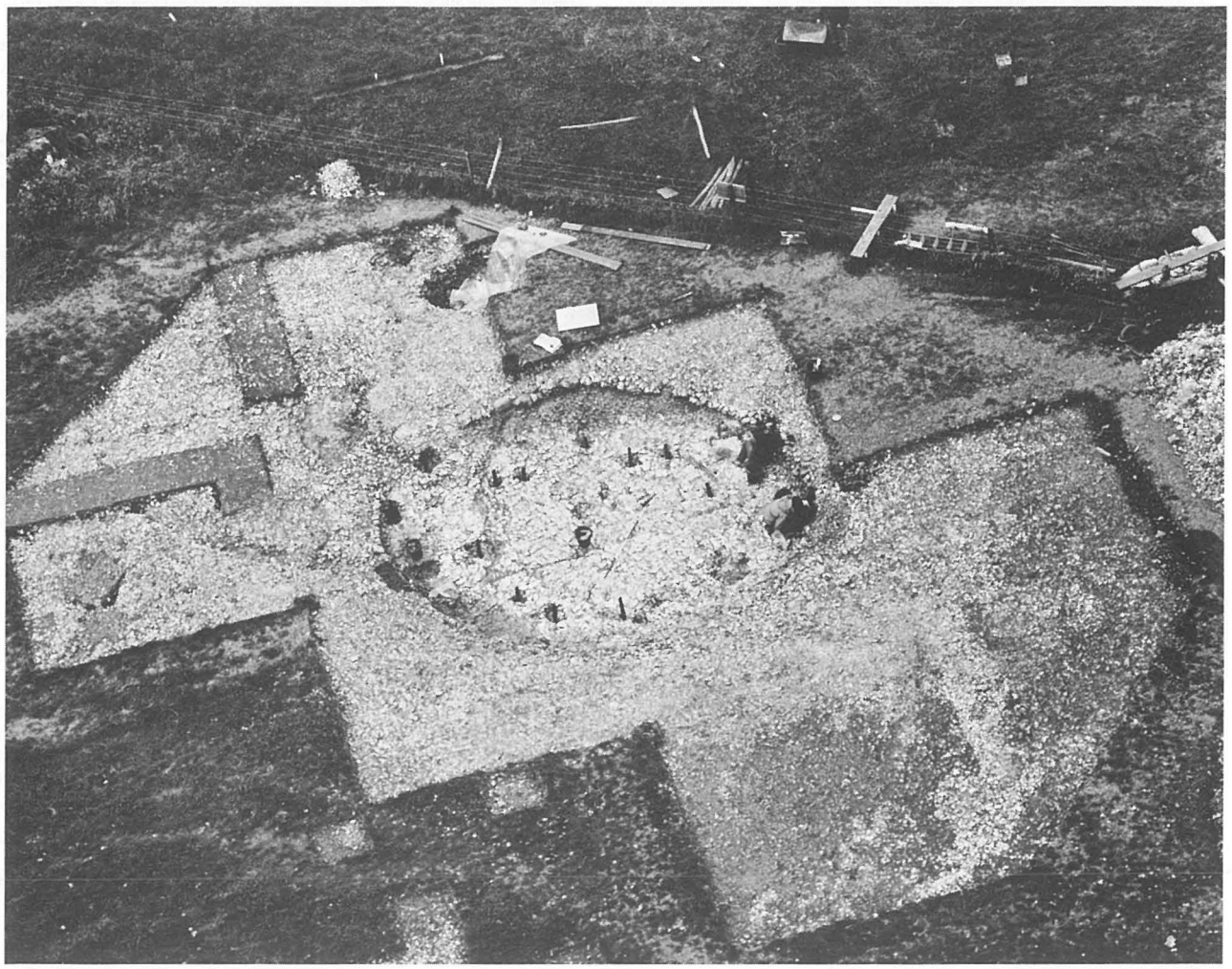

Figure 3. 'Rowden', Winterbourne Steepleton. Aerial view from the north-east. The structural posts of the hut are marked with pegs.

BLACK HILL, CERNE ABBAS

Limited excavation was undertaken at a site of possible Later Bronze/Early Iron Age date to examine differential plough damage and the state of preservation of the monument.

In addition a series of related field boundaries and an unrecorded round barrow were surveyed.

DERMOT BOND

HENGISTBURY HEAD, DORSET: IRON AGE PROJECT 1981

The third season of excavations at the Iron Age site on Hengistbury Head took place from 5th to 30th July, 1981, after a preparatory week during which the topsoil was removed mechanically. As in previous years the work was organised by the Institute of Archaeology, University of Oxford, with the active co-operation of Bournemouth Corporation.

Efforts were concentrated upon site 1 which lies on the north side of the Head, on the south shore of Christchurch Harbour, close to Bushe-Fox's sites 36 and 44 and to the area trial trenched by David Peacock in 1970-1. In 1979-80 approximately 500 square metres of the Iron Age settlement was excavated. The 1981 session added a further 760 square metres immediately to the west of last year's site. The excavation was preceded by a geophysical survey.

A limited programme of core-boring work was undertaken in one of the nearby areas of marshland (site 3) by the National Maritime Museum. This work is in preparation for the first stage of an excavation which it is hoped to carry out next year.

The area excavated this year was almost twice as extensive as that examined in 1980; it divides naturally into two zones. Over the southern part of the site the surface of the natural gravel lies at about 0.4 m below the present surface and is sealed only by a disturbed ploughsoil. Towards the north, however, the land falls away and up to 1 m of stratified soil survives beneath the ploughsoil. It can now be shown that the natural profile was created as a beach line in the prehistoric period, the 'bed rock' grading from shingly gravel to sand as the 'between tide zone' is crossed. Three original land-forms can be recognised: the tidal zone of sand and sandy gravel; the upper beach of loose shingle and the soil covered land surface. Each zone was differently utilised in the Iron Age.

The high tide limit of the old beach line is about 0.67 m above the present beach. It had evidently been raised to some unknown degree by the beginning of the 1st century BC but there is some evidence to suggest a lowering, leading to inundation, in the second half of the 1st century BC.

The archaeological evidence demonstrates occupation from the 8th century BC to the 4th century AD during which time postholes, pits, gullies, ditches and quarries were dug, a road was constructed and maintained, ovens were built, and ploughing created a deposit of lynchet material which sealed earlier occupation levels over the northern part of the area. Of particular value was the fact that this year's excavation allowed the northern and western limits of the Early and Late Iron Age settlement area to be defined with precision, adding considerably to our understanding of the features excavated in 1979-80. In addition the closely stratified sequence has enabled the cultural and chronological development of the settlement to be more closely refined.

The early settlement, represented culturally by coarse finger-impressed jars and haematite coated bowls, extended into the eastern part of the excavation. The gully of circular plan which presumably surrounded a house was the westernmost of the major structural elements of the settlement, but beyond it were short lengths of fence or palisade trenches which may have delimited ancillary enclosures. The settlement can now be shown to have extended down to the edge of the old shore line. The total absence of early occupation in the raised between-tide zone may indicate that the sea level was higher during the period of the early settlement than it was in the Later Iron Age.

The apparent hiatus in the settlement sequence spanning the middle part of the Iron Age, which was noted last year, seems to be further confirmed by this year's work. It could, however, be that occupation was continuous but that minor shifts in location and the limited nature of the present excavation have left the middle phase settlement still beyond the limits of the area explored. The problem will only be resolved by more extensive work.

Late in the 2nd century or early in the 1st century BC the settlement area seems to have been organised according to an overall scheme of layout. This entailed the creation of a road line, along the upper edge of the raised beach, with fenced enclosures on either side. The enclosure to the south appears to have been long lived with four successive fence lines. Fence slots found in the 1980 area and then incompletely understood, can now be more fully interpreted in the light of the new evidence. It would appear that the earliest enclosure (of two phases), approximately 14 m wide east to west, was replaced by a larger enclosure, also of two phases, slightly realigned. During this period an extensive gravel quarry some 10 m across was dug along the road side. The quarry, excavated in 1980 and 1981, produced a fine sequence of stratified pottery including local types, imports from north-western France and Dressel la ware amphorae of Italian design. The upper levels yielded a classic Durotrigian assemblage associated with Spanish amphorae of Pascual I type.

The roadway which flanked the northern side of the enclosure was originally nothing more than on open strip along the old raised beach, but throughout the 1st century BC and 1st century AD discontinuous patches of gravel metalling and ironstone rubble were laid to consolidate the surface. Later metalling layers sealed the filling of the quarry hollow and the road continued to be repaired into the early Roman period.

To the west of the main series of enclosures it appears that in the late Iron Age that area was totally devoid of occupation but the road continued in use. The northern edge of the road was delimited by gullies and fence slots beyond which, on the old sandy beach, a series of irregular holes and scoops had been dug into the sand. These contained occupation debris including quantities of imported Dressel amphorae, briquetage salt containers and some iron working debris. Several large postholes suggest that substantial buildings may once have occupied the shore line but no convincing building plans could be made out, largely because the area uncovered was of restricted extent: it had also been disturbed by Bushe-Fox's excavations the limits of which could clearly be traced. The primary occupation of this zone, dating to the first half of the 1st century BC, was sealed by a water-lain deposit of fine gravel grading up to gritty sand, measuring some 10 cm thick, implying a minor inundation. Above this was a thick soil deposit, containing much blown-sand, and yielding Durotrigian and early Roman pottery.

The Late Iron Age road continued in use into the Roman period. A series of gullies were dug parallel to it some 15 m to the south perhaps to delimit fields. In support of this it may be noted that a number of plough ruts running parallel to the gullies have been found on various parts of the site. Later in the Roman period, in the late 3rd or early 4th century, a new system of more substantial ditches was dug at right angles to the natural slope but ending on the edge of the road line. They appear to have delimited plots of varying widths within which traces of occupation were found including postholes and ovens together with gravel spreads and areas of ironstone paving. Building plans are, however, elusive.

Core-boring across the marshy area known as site 3 defined a gravel bottom at about 2 m below the present surface. Samples have been taken and the boreholes levelled in. The rectangular shape of the marsh and its comparatively steep sides strongly hint that it may be a man-made feature. Trial excavation of the edge may throw some light on the problem.

BARRY CUNLIFFE

A QUERN FROM ENCOMBE OBELISK IRON-AGE/ROMANO-BRITISH SITE

Most of the upper stone of a quern was found at the Iron Age/ Romano-British site at Encombe Obelisk (SY 944752) in 1981 in a ploughed field. The quern is similar to one from Maiden Castle (Wheeler, 1943, p. 325, fig. 114, no. 9), but the Encombe quern has a less concave lower surface, and not such a clear internal ring. Prof. P. Allen of Reading University has thin-sectioned a sample from this quern, and he writes: 'This sample of feldspathic conglomerate is quite unlike any of the conglomerates or conglomeratic sandstones I know in the Wealden of the Isle of Purbeck, or indeed elsewhere in southern England or northern France. In my opinion it came from rocks older than Wealden, sited further afield'.

Wheeler, R. E. M., 1943, *Maiden Castle, Dorset.*

TONY BROWN

ROMAN ROAD AT LAKE FARM, NEAR WIMBORNE (SY 99669893)

The Roman road from Poole Harbour to the fortress at Lake was sectioned by Wimborne Archaeological Group and others before destruction at this point by a link to the new Wimborne by-pass. Evidence was forthcoming of three phases of road-build (*c.f.* East End, ⅓ mile, south: *Britannia,* ix, 1978, p. 462) and finds included coins, stamped samian and gallo-belgic wares.

N. H. FIELD

LAKE FORTRESS, POOLE (SY 998990)

A fluxgate magnetometer survey (by A. David of the AM Laboratory) succeeded in defining the south and south-east defences, so enabling a more accurate assessment of the size of this vexillation fortress – *c.* 29 acres (area within ditches). A small research excavation (for the Borough of Poole of 60 m^2 was designed to test one of the internal linear features recorded by the survey. This proved to be a regular V-shaped ditch of the military period measuring *c.* 1 m deep by *c.* 1 m wide, cutting the foundations of a timber building apparently belonging to the main phase of occupation. For earlier work see *Dorset Proceedings,* Vol. 101, 1979, p. 139.

I. P. HORSEY AND K JARVIS

REDCLIFF, ARNE

Excavation during the spring holiday sufficed to show that the remains of the black-burnished ware factory are more complex than had been appreciated. The westerly gully, hitherto thought of as perhaps a major boundary of the industrial site, has proved short and inconsiderable, although it continued to yield substantial portions of underfired cooking-pots and dishes of the later 3rd or early 4th century AD. The sleeper-wall construction overlying the debris of the early firing-floor is likely to belong broadly to the same late phase of activity, but the divergent alignments of its two long-axis walls make it difficult to interpret it any longer as a roofed structure. Moreover no sign has appeared of any associated floor.

About 7 metres further north, part of an evidently contemporary feature, of identical construction, has appeared in the same stratigraphical horizon; this is presumably a separate unit, since its alignment does not match that of its neighbours.

R. A. H. FARRAR

THE ROMAN VILLA AT BUCKNOWLE FARM, CORFE CASTLE – 1981

Annual excavation at Bucknowle Farm began in 1976 and has revealed a tripartite villa-range occupied on coin evidence from AD 270 to AD 370 or so. The verandah fronting the building range connected eastwards with a neighbouring bath-suite. In 1980 the cold-room was identified with an adjoining cold-plunge in *opus signinum.* There were indications of the tepid- and hot-rooms close by to the north. In 1981 it was confirmed that at a late stage a larger plunge-bath was constructed, some 6 m long, width at present unknown. Its *opus*-faced walls still stood 0.5 m high, while wall-angles retained their ovolo-moulding.

From the other end of the villa-range the verandah became an open corridor communicating with a third group of buildings to the south. The first of these was tentatively taken to be a barn, measuring 15 m by 6 m overall. There was some evidence that timbers had been set in its walls, and at the northern end it had a major subdivision into two small rooms, one of which possessed a tesselated floor. Against its walls were found separate burials of two infants and several sheep. Details continue to emerge of the earlier occupation before and immediately after the Roman conquest. An important architectural find came in the shape of a column base in Purbeck stone of a type recorded at the Colliton Park town-house in Dorchester.

N. H. FIELD

HALSTOCK ROMAN VILLA – EXCAVATION, 1981

During 1981 an area of 552 m^2 east of the 1979 excavation was excavated. The Roman levels were very shallow, with building foundations between 15 cms and 20 cms below the modern surface. Natural erosion and ploughing had removed all the Roman floor levels so that it was impossible to determine the true function of the two buildings uncovered, though without doubt they are farm buildings both of which were partially excavated in 1979.

The southerly of these two buildings is single-aisled with internal measurements of 25.4 m east-west and 10.5 m north-south. The aisle is on the south side with part walls projecting into the building from north-south walls: that from the west wall 2.9 m long and that from the east wall 3.15 m long. Between these part walls is a line of four pillar bases with a probable fifth unexcavated. From the south-west corner the foundations of the south wall consist of limestone nodules for approximately half the length of the wall, then the normal type of foundation of pitched flat Forest Marble in a shallow trench.

Outside this building, near the south-west corner, is the peculiar structure of channels with flagstone bottoms and stone sides described in the 1979 report, and tentatively interpreted as a latrine. This structure is earlier than the aisled building whose foundations traverse the ends of the two north-south channels. Inside the aisled building near the north wall is a keyhole-type oven. Its function could not be determined as floor levels within the building had been eroded.

On the outside of the north wall there were six postholes with possibly two more unexcavated. These were on average 1.02 m from the wall and might be considered to be for scaffolding when building the wall, but there are no similar postholes adjacent to other walls of the building, apart from a series by the east wall. In this case the postholes are too near to the wall to serve as scaffolding.

This second building is orientated approximately south-west/ north-east from the north-west corner of the aisled building and is earlier than the latter. The north wall of the aisled building cuts across the foundations of the south wall of the second building hence this latter wall must have been demolished when the aisled building was erected. It is probable that this second building was completely demolished at this time as this would explain the very ephemeral remains of the northern end of the building. The internal measurements of this building are 18.85 m north-east/south-west and 7.4 m north-west/south-east. Again, the function of the building could not be determined as erosion had removed the floor levels.

To the west of both buildings there is a ditch that may be contemporary with the second building, but is earlier than the aisled building. This may run into a ditch excavated at the northern end of the area excavated in 1981 a short section of which was excavated further to the east in 1978 and from which section a quantity of 2nd century material was retrieved including the base of a samian bowl with potter's stamp, dated AD 130-170.

In 1982 the area north of the 1981 excavation will be examined to see whether there is an east wing to the villa complex in line with the earlier of the two buildings excavated in 1981, and linking up with the passageway to the north.

R. N. LUCAS

INTERIM REPORT ON THE EXCAVATIONS AT BARTON FIELD, TARRANT HINTON, 1981

Excavation at Tarrant Hinton continued, on Sundays, from April until August, 1981. An area approximately 76 ft. square was opened to the north of the well: excavation of the well continued. It was hoped to complete the exploration of the building complex on site I, but since there was standing corn in this area, only a limited excavation was possible until after the harvest. This excavation demonstrated that the eastern wing of building II was 113 ft. long, the final 34 ft. being found this year.

The flint walls of building II had been destroyed, leaving only the very bottom layer of the chalky mortar used in their construction. In several places the walls of the building crossed over depressions in the chalk which were filled with soft material. These, where necessary, were bridged by trenches filled with small flints to make firm foundations for the walls. For one Iron Age pit (pit B6/1) a more elaborate method, previously found at Tarrant Hinton beneath building I, was employed. Wooden stakes, some squared off and pointed, were driven into the soft fill of the pit, and then alternate layers of flint and mortar were laid across the top.

The floors of this part of the building had been completely destroyed, and due to the singular lack of building debris over the whole area their nature is uncertain. A small quantity of wall plaster was found in room VI, the predominant colours being pinks, reds and purples. It is not possible to reconstruct the patterns. The window or door openings in the building must have had splays of 125 degrees since two fragments of red painted plaster had adjacent faces at that angle. The three coins found in room VI this year bring the total to 19. With the exception of one coin of Commodus they all fall within the period AD 276 to AD 350. Room VI proved to measure 23 ft. square internally. The eastern end of building II terminated in a room measuring 8 ft. 6 ins. by 14 ft. internally, again only indicated by its foundations. No floor remained and the function of this small room remains uncertain.

The scant remains of a hitherto unknown, and unexpected, building were found during the exploration of the eastern corner of the courtyard. This building (VII) like building II, had been completely destroyed and only the foundations of part of two of its walls were found. These indicated that the building was at least 50 ft. long and 20 ft. wide. It was not on the same alignment as any of the other buildings on the site, and was most probably pulled down when the major complex was built. Within building VII were the remains of a well-constructed oven. This was set into a cutting in the chalk and was built of flints packed with chalky mortar which had fired to red. No associated pottery was found, only a quantity of charcoal.

Partly underlying the eastern corner of building II were the remains of an Iron Age hut circle some 41 ft. in diameter. It was outlined by a round-bottomed ditch approximately 1 ft. wide and deep. The ditch had been recut at some time suggesting that the hut had been repaired or rebuilt at least once. The area within the hut was very disturbed by the later buildings, making it very difficult to understand the layout, but a badly damaged hearth near its centre may be part of its internal fitments. Excavation of this hut will continue.

Work also continued on the excavation of the well at the eastern corner of the Bath House (building VI). When the coverings were removed at the start of the season there was 8 ins. of water in the well but this soon dried up. At a depth of 61 ft. 9 ins. water began to reappear but it was possible to continue digging until a depth of 73 ft. was reached when heavy rain caused the water to rise until it was over 7 ft. deep. Pumping proved ineffectual. It is hoped to continue the excavation of the well during 1982 when waterlogged levels should be reached.

A. G. GILES

PARSONS STORE SITE, DURNGATE STREET, DORCHESTER, 1981 (SY 69429068)

Development of this site for housing was observed with the kind permission of the contractors Ricardo Ltd. during July and August. The existing building, originally a Non-conformist Chapel, had previously been recorded by students of the Dorset Institute of Higher Education. Below the floor level of the demolished building up to 2 m of archaeological deposits survived over a plot 10 m wide by 27 m long north-south.

Three major features could be identified. Firstly at the north end of the site was a well preserved metalled road crossing the site on an approxiately east-west alignment and continuing the line of a major street of the Roman town grid, previously recorded to the west in South Street and Church Street. The metalling was approximately 5 m wide and up to 75 cm thick, the original construction consisting of a cambered gravel surface with a flint foundation sealing sterile natural loam. Traces of two remetallings survived. To the north, black soil and building debris adjoined the road edge.

The second observed complex lay on the east side of the site, south of the road, where two parallel robbed foundations running east-west and 13 m apart marked the site of a building beside the road. The area between the walls was either unobserved or disturbed but superimposed chalk floors did occur north of the southern foundation, presumably within the structure. Material of the 2nd century AD was recovered from amongst the floor makeup. South of this structure in the south-east corner of the site two large ovens were identified and deposits of ash. On the frontage with Durngate Street to the west of this, a steined well shaft 2 m wide overall had been filled with chalk in the Roman period and sealed with ash and building debris.

In the centre of the site and 12 m south of the road, the third major find occurred. No trace of the building existed here but a local disturbance at least 3 m deep crossed the contractors trench on an east-west line. In the base, tumbled blocks of limestone and 1st century AD pottery were exposed in a narrow trench cut into apparently natural Coombe rock to a depth of 1.2 m. The latter deposit, however, sealed man-made deposits and contained pottery of the 1st century AD and thus must have filled a larger feature the limits of which were not visible. On the western side of the contractors trench the upper 1.8 m consisted of ash and occupation levels below black soil and rubble but the opposite section revealed a broad hollow 2.3 m deep filled with similar material. On analogy with other road side sites in Dorchester this problematic feature could be upper fill of a main drain running parallel to the street and presumably continuing east under the building.

No trace of post-Roman activity was identified: black soil sealed all Roman levels.

CHRISTOPHER SPAREY GREEN

DISCOVERIES DURING BUILDING WORK AT ST. PETER'S CHURCH, DORCHESTER, 1981 (SY 69239076)

During November and December, 1981, construction of the foundations for a new church room in the north-west area of St. Peter's Churchyard provided a rare opportunity to examine the archaeology of a prime site in the heart of the old town.

The site occupies an area of 132 square metres north of the western end of the north aisle and west of the existing vestry, the new work abutting these structures. The site had been disturbed to a depth of approximately 90 cm by the graveyard but Roman levels survived almost intact, even the base of the late, black soil remaining.

The major feature lay on the north side beneath the new store room extension of the main hall. Here an area of substantial gravel metalling was revealed immediately below the graveyard. The 28 cms of metalling consisted of a gravel surface on a flint foundation over a layer of chalk. A layer of sterile brown loam intervened between these artifical deposits and the natural chalk. The metalling was exposed for at least 9 m along the north side of the building and was at least 2.7 m wide, bounded on the south by a ditch at least 60 cms wide filled with soil, metalling, and pottery of the 2nd century AD. This metalling is very similar to that of roads elsewhere in the town and lies on a road line postulated by the writer as crossing the town to the west gate. Such a line is parallel to the certainly identified road 120 m to the south which has been observed at Parson's Store Site, Durngate Street; Church Street; the junction of South Street and Durngate; and further west; these two parallel roads are probably the main east-west routes within the town grid.

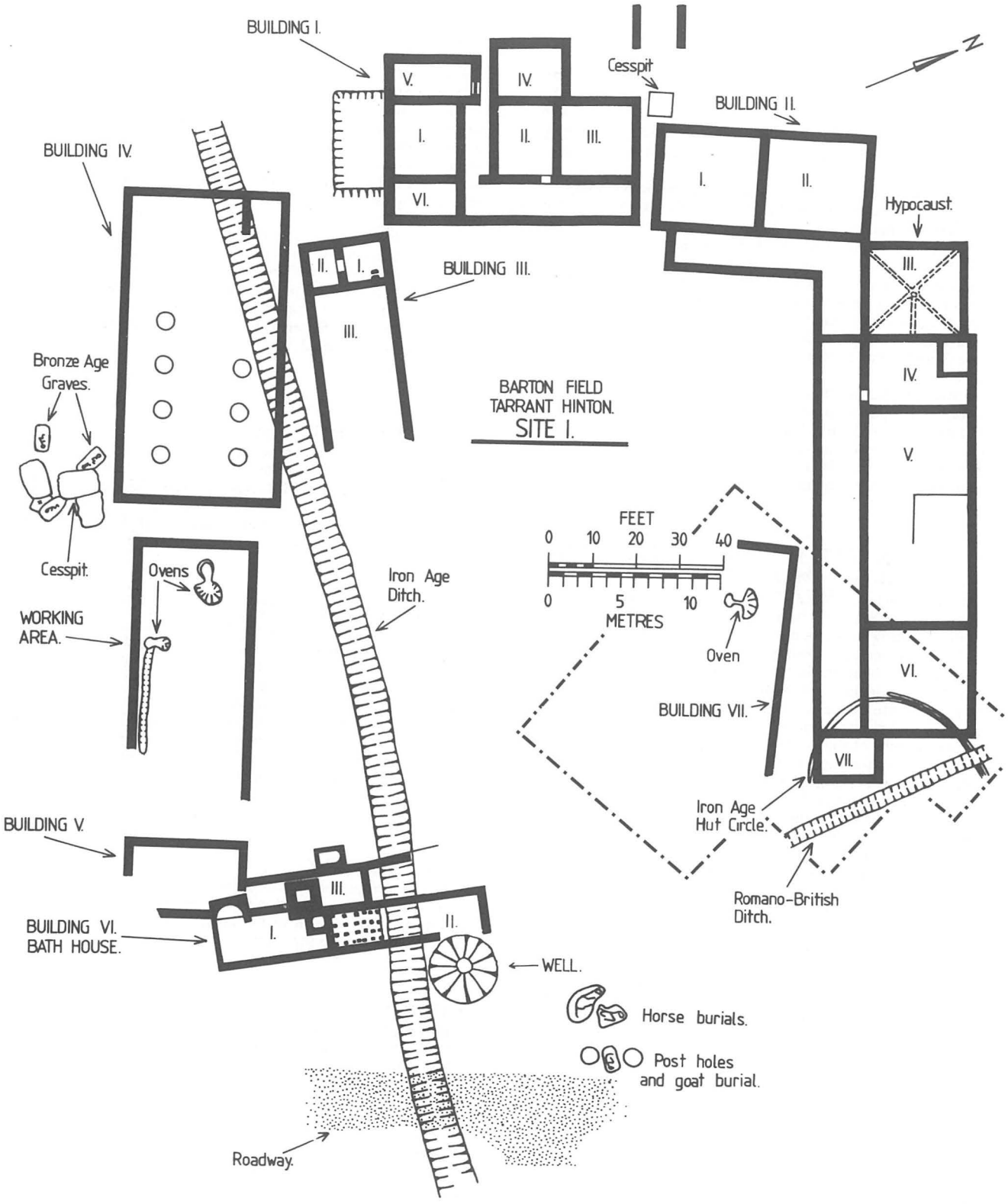

Figure 4. Tarrant Hinton: the edges of the 1981 excavation are shown thus: — · — · — ·.

The area 5 m by 10 m south of the metalling lay within the new building and was not disturbed but trenches on the west and south, where the new structure abutted the church, revealed Roman structures. The curving trench for the apsidal west end revealed in its north-west sector the metalling cut by a large pit. The southern and eastern sides of this feature suggested a pit at least 3 m wide on both its north-south and east-west axes. This feature was at least 2 m deep from the base of the churchyard soil and filled with grey soil, mixed rubble and medieval pottery. The south edge of the pit, approximately on the centre line of the apse, cut an east-west trench 80 cm wide filled with building debris and mortar. This possible robbed wall trench lay 2.5 m south of the metalling.

On the south side of the site and 6 m from the metalling, the trench for the hall's south wall cut tangentially across an east-west foundation. This 80 cm wide flint foundation was traced for 6 m until cut by a rectangular pit filled with black soil. Grey-brown soil and Roman debris sealing the foundation suggested that it was part of a structure levelled within the Roman period. To the south a patch of chalk floor sealed the early Roman levels which included a stamped amphora handle of 2nd century AD Spanish-type. The late Roman black soil over these features contained little sign of debris from any major building in the central area of the town.

The two trenches abutting the north aisle wall revealed no traces of any early church structure but the foundation of the existing wall included large burnt Hamstone blocks and one reused block with shallow concave moulding. In the base of the graveyard soil skeletons, some with 18th century coffin fittings, survived besides fragments of others and many loose bones.

CHRISTOPHER SPAREY GREEN

NOTES ON WATCHING BRIEFS CARRIED OUT ON ROAD IMPROVEMENTS IN THE DURNGATE AREA OF DORCHESTER

The first watching brief was carried out during road improvements to Durngate Street north of Wollaston House in the spring of 1980. It revealed a Roman cobbled surface and wall; also the Roman street beneath the present-day Durngate Street was sectioned. These features were found on the south side of Durngate Street opposite the entrance to Church Street, 10 m east of the junction of Durngate and Charles Streets at a depth of 0.40 m below the level of the modern road surface.

The cobbled surface extended eastwards from the wall until truncated by later levelling of the site, an area of 4.5 m by 3.5 m of cobbling being exposed. The cobbles were small rounded pebbles of limestone tightly set into an underlying layer of mixed limestone and chalk fragments. The surface was very even, showing little or no sign of wear. The wall, of which three courses survive, runs north-south and is cut at the southern end by a post-medieval well. The northern end runs underneath the present-day road surface. The wall is 3.5 m long and 0.70 m wide where exposed, and was faced only on its east side by small dressed limestone blocks, the core being made up of a mixture of limestone, flint and *opus signinum* fragments laid in roughly horizontal courses and cemented by a hard white mortar. Adjacent to the wall and covering the cobbles were two layers, the upper one consisting of pink crushed *opus signinum* and the lower one of crushed white mortar. These layers extended 1.2 m eastwards from the wall. Both the wall and the cobbled surface were terraced into the top of the natural chalk surface and rested directly upon it.

The digging of an access hole to the main sewer running down Durngate Street cut a small length of longitudinal section of the Roman street and make up that underlies the modern road. This section showed that the modern road foundations lie directly on the Roman street surface, 0.30 m below the present-day surface. The Roman street was made up of compacted layers of small flint pebbles together with a larger pebble foundation layer to a depth of 0.30 m. This was set on the levelled surface of the natural clay above the chalk. The insertion of the large diameter sewer pipe and a gas pipe with their associated pipe trenches has destroyed the Roman street to the south of the road centre. A small amount of Roman wall footing remained in the base of the gas pipe trench, probably running east-west, parallel to the road alignment. It was also noted in this trench that the cobbles were continuing northwards under the modern boundary wall and pavement, though modern disturbance had removed all traces of any possible relationship to the wall line or Roman street. (For further references to Roman wall alignments in Durngate Street see C. J. Green above.)

The watching briefs were continued in the autumn of 1980 and the spring of 1981 when road improvement work was undertaken in Charles Street and Church Street respectively. The improvements in Charles Street revealed a large build up of post-medieval material underlying the road and the demolished outbuildings alongside Wollaston House. The road improvements to Church Street involve widening the road on its east side, so that the Women's Institute building on the corner of Durngate and Church Streets was demolished. The subsequent trenching to build the footings for a new boundary wall cut through post-medieval build up. The area to the north of the builder's yard up to High East Street was also investigated. The cellars of the 19th century building on the corner of High East and Church Streets had removed all archaeological remains for 25 m southwards along Church Street. Beneath the area of the former egg packing station archaeological remains were preserved. These consisted of an early 19th century cottage scullery, various post-medieval wall alignments, and the upper surfaces of two Roman walls. At the time of writing the widening of Church Street is incomplete and the watching brief remains to be completed.

DAVE BATCHELOR
Central Excavation Unit

SCEATTAS FROM HANFORD

ST 86321058. 8th-century silver sceatta, Metcalf series D of 'porcupine' group. No. 443 in Sotheby's sale of 21st July, 1981. ST 86291048. Silver sceatta, BMC type 32a, Rigold Series K. No. 445 in same sale. Reported to HM Coroner for Central Dorset, from field to east of Hod Hill, a silver sceatta, North 48/49, BMC 5/6, with degraded radiate bust right, rev. standard.

L. J. KEEN

BRADFORD PEVERELL (SY 66119278)

A thirteenth grave has been excavated. It lay immediately adjacent to grave 7 at the south-west end of a row of seven graves. The grave was very shallow being cut into the chalk only 0.03 m at the foot end and 0.12 m at the head end. A small pit, 0.22 m deeper than the floor of the graves, was at the head and extended as a slot in the chalk beyond the head end of the grave. The grave was 2.11 m long and graded from 0.5 m wide at the head end to 0.35 m wide at the foot end. An iron knife, a bronze buckle and a second iron object were between the knees. The skeleton appeared to be of a young adult male.

JOHN HAWTHORNE

SHAFTESBURY

Two 11th-century architectural fragments, a capital and a base, located in a rockery at Barton Hill House, have been deposited by Dorset County Council in the museum of Shaftesbury Abbey, from which they are presumed to have come.

L. J. KEEN

CHEDINGTON

Following the redundancy of the parish church of St. James, the 17th-century bell is now at St. Francis' School, Hooke, and the 12th-century architectural fragment, originally loose in the porch, will be deposited in the Dorset County Museum.

L. J. KEEN

CORFE CASTLE

L. J. Keen observed laying of new drains through *outer gate* and over bridge. A cobbled surface was seen at about 25 cms below present ground level.

WYNFORD EAGLE (SY 573963)

Track widening by the Forestry Commission allowed a section across the bank and ditch of *Wynford Wood* medieval deerpark to be examined. Environmental sampling was undertaken by Dr. Helen Keeley and Dr. R. Scaife. Detailed note in preparation.

L. J. KEEN

SHERBORNE

Recent work to the *Manor House, Newland,* has removed details of the trefoiled-headed panels of the corbelling of the oriel window, as well as the partly restored angel which held a shield with arms, thought to be those of Chaldecot.

BRIDPORT (SY 472928)

During work by Wessex Water Authority to the River Asker, remains of a bridge earlier than the present *East Bridge* of 1784 were examined. One pier, 1.10 m wide and 5 m (minimum) long with remains of a watercut on the north end were located beneath the existing bridge. The axis of the pier was at 26 degrees to the east abutment of the 1784 bridge and indicates that the earlier bridge was built approximately north-west to south-east. Documentary evidence suggests that the pier may belong to a bridge mentioned in 1481.

L. J. KEEN

PORTLAND, OLD CHURCH OF ST. ANDREW

Conservation of this scheduled ancient monument (SY 69687111) and enhancement of the surrounding landscape continued throughout 1981 and finished in January, 1982. Archaeological investigations were carried out throughout this period. Stone-by-stone elevations of all walls, except the tower, were completed. Further excavations were made in the nave and aisle of the church, and a small area adjacent to the north wall was opened. During conservation work in the churchyard further grave memorials were recovered and recorded. The conservation programme was supervised by Simon White and latterly by Andrew Stone. Archaeological work was carried out by Alan Graham and the writer, who directed the project on behalf of the Portland Field Research Group. Funding was provided by the Manpower Services Commission, the Diocese of Salisbury, Dorset County Council and the Dorset Archaeological Committee. Students of the Dorset Institute of Higher Education again participated in excavations as part of their archaeology courses.

A summary of the structural history of St. Andrew's has already been published (*Dorset Proceedings*, Vol. 102) but the 1981 excavations added substantially to our understanding of this church's development particularly its earlier periods of construction. The following summary amplifies, and in some cases amends, the earlier published account.

At three points within the nave the foundations of an earlier church were located. Accurate dating of this earlier building is impossible, given the level of evidence available, but it underlies the 12th-century church, and the use of large stones in the foundations is paralleled in some pre-Conquest churches. A Saxon date seems inherently probable. The plan of this pre-12th century church cannot be drawn from such fragmentary evidence: but the minimum length was 18 metres, and it possibly had a central lantern tower. About a metre to the north of this church was a stone-lined well, possibly but not necessarily in contemporary use. Certainly the filling of the well was sealed by builder's waste associated with the construction of the 12th-century church. Circumstances prevented complete excavation of the well. Its presence seems to indicate that a pre-Conquest settlement was situated immediately to the north of the church, and that this settlement had perhaps shrunk or migrated by the 12th century. A long history of settlement in this sheltered valley, overlooking Church Ope Cove, is hinted at by the presence of residual Roman-British pottery and an Iron Age coin (Durotrigian, 1st century BC) in local clay used as levelling material for the nave floor in the 12th or early 13th century.

Excavations in 1981 also showed that this 12th-century church had a more complex history than was earlier thought. It was well, even elaborately built, with a central lantern tower. Total length was 28.5 metres, the chancel (10.5 metres) being almost the same length as the nave (13.5 metres). Of this first 12th-century building the lower part of the lantern tower with a fine north door, the chancel and the bases of the chancel arch responds survive. In the second period of construction an adjunct (a ?side chapel) was added to the south of the lantern tower, also in the 12th century. Still in the same century this adjunct was extended westwards to form a full-length south aisle to the nave. The arcade was begun, and possibly completed, with Romanesque style columns, and the lowest drums of these columns survive as the bases of compound piers, each incorporating four detached shafts of Purbeck marble. Whether this early English style represents a change of design in the course of building, or a rebuilding, is not clear. No north aisle was built nor was the nave ever vaulted, but the south aisle was vaulted and paved with Purbeck marble. Other details are derived from an examination of materials disturbed and re-used when this aisle was partly demolished in the 17th century. A *mensa,* again of Purbeck marble, and a group of 13th century grave covers decorated with a variety of cross designs, were removed from the aisle and used to pave the nave. Two small covers, perhaps for heart burials, were re-used as masonry. The presence of special burials (perhaps of clerics) and a possibly elaborate, certainly costly, altar in a structurally elaborate aisle indicate that some particular importance attached to it.

Two further phases of construction followed in the medieval period. In the first half of the 14th century (the date is suggested by Geometrical Decorated window tracery fragments) the nave was extended westwards by 9 metres, and a south porch was constructed. In the 15th century a detached west tower was added; a re-dedication is recorded in 1470 and may suggest a date for the completion of this phase.

A geological fissure runs on a south-west/north-east alignment through the churchyard and below the east end of the aisle and the south-east corner of the chancel. At the point where this fissure passed under the aisle wall a buttress, double in size to the original aisle buttresses, was added at some undated stage, indicating that earth movement along the line of the fissure was causing concern or even structural damage. By the 1620s the steeply-battered wall below the churchyard on the seaward side, known as the Church Yard Banks, had been built, either reflecting further concern for site stability or to prevent landslides. In 1675 a major landslip, known from its location as the Southwell Landslip, occurred a short distance along the coast to the south of St. Andrew's. Tremors were evidently transmitted along the line of the fissure, causing considerable disturbance and damage. The east end of the aisle was removed and this section of the church reconstructed and shored up by 1686, as described in the earlier published account (*Dorset Proceedings,* Vol. 102). Abandonment of the church followed in 1756.

Excavations in the area outside the 12th-century north door found a large number of burials, some of which were very disturbed and fragmentary. About 85 individuals could be identified. Burials were begun in this area after the blocking of the north door (in the 14th century?) and continued to *c.* 1766, when the churchyard of St. George, Reforne came into use. The arrangement of burials in this part of the churchyard was substantially re-organised between these dating limits. Later burials were laid out in rows, sharply contrasting with the apparently unplanned digging of earlier graves. A date could not be assigned to this change of arrangement. Within the church were found two multiple burials, perhaps of shipwreck casualties. Unequivocal stratigraphical evidence was lacking, but the probability remains that these burials post-dated the abandonment of the church as a place of worship.

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DORCHESTER

Repairs to the front of *26 High East Street* were observed by L. J. Keen. Removal of the cement rendering exposed the front of a timber-framed building of 15th-century date. The building had originally two jettied storeys. The topmost had been moved back to the line of the first floor front and the ground floor was obscured by a shopfront in the 19th century. The original arrangement of the first floor was of three large windows, each with four small lights. Below the windows were plastered panels on the exterior with nine wooden panels inserted into the timber frame and exposed on the interior face. All three windows had large wooden shutters set in narrow grooves. Substantial remains of the rest of the timber framing survive. A full report is in preparation.

L. J. KEEN

KIMMERIDGE EXCAVATION, 1981

The second season of excavations took place over three weeks at Easter, 1981, continuing work on the glasshouse operated by Sir William Clavell between 1615 and 1623. Work was concentrated on opening up the area around the furnace which was uncovered in 1980, and the main feature discovered was that the furnace lay

within a rectangular building. Large quantities of crucibles were found.

The Air Passages. At the western end of the site, towards the sea, the 1980 excavation had shown that the passage providing air for combustion was ended by a wall of shale blocks. These had been damaged by the digging of a look-out post in 1940, and there was an indication that a feature extended beyond the end wall towards the cliff edge. This has now been shown to be so, for a steep-sided channel, with a porous filling of shale, formed a drain. This took water from beneath the slab floor of the air passage, under the wall and towards the sea.

The end of the eastern air passage was also excavated in 1981, and was shown to be generally similar to its western counterpart, with a flight of stone steps. There was a firm indication that the eastern passage had been lengthened by 50 cm and that the steps had been moved to the new end of the passage. It will be seen from the plan that the existing structure has broken into the line of the exterior wall, that the floor has no slab for the extra length and that the steps would fit between the former line of the interior wall and an obvious straight joint in the north wall of the air passage. There is no certain explanation for such a short extension.

The Outside Wall. The footing of a wall surrounded the furnace. It is virtually certain that this formed the outline of a rectangular cover-building, protecting the glass furnace and the working areas on either side of it. The concentrations of glass waste lay within this wall, as did the great majority of shale roofing slabs. Three breaks in the wall suggested entrances. In the centre of the north wall the absence of footings correspond with a large dump of crucible fragments outside. Ash had been taken to a tip to the north-west of the furnace, and a gap in the wall near the head of the western steps provided a route.

Any evidence for a southern entrance had been destroyed by a large pit; this followed the line of the south wall and lay immediately to the south of the furnace. It appeared to be the result of stone-robbing, and indicated that here the foundations were of unusual depth and quality. They may have formed the bases of piers for the main door of the glasshouse.

Postholes outside the north wall suggested that wide eaves or perhaps some form of porch had been built. Small depressions in the shale outside the south wall were less convincing as postholes.

Constructional Sequence. It was established that the air passages, the outside wall and the furnace wings were built at much the same time, in that order, at the points where sections were dug. A good deal of levelling-up had been done with dumps of shale which produced no finds. This year's work led to the conclusion that the glassworks and its components were purpose-built; there was no evidence that any feature was a modification of an earlier structure.

Finds. As in 1980 there were quantities of glass waste, in the form of vessel fragments and glass discarded during blowing. By far the most important finds were the crucible fragments, whose variety of form is of great interest. The potters' marks on some of the rims have not been noticed at other furnaces. The examination of the finds will be a major task, which will take some time.

Acknowledgements. Thanks are due to all who helped on the excavation and in the work on the finds, notably Peter Brown, site supervisor, Sandy Davison, in charge of finds, and Philip Whatmoor, in charge of supplies, and to Major J. C. Mansel, and David and Joan Brachi for help at all stages of the work.

Funds were kindly provided for the 1981 excavation by the Trustees of the British Museum, British Petroleum Development Company Ltd., the Dorset Archaeological Committee of the Dorset Natural History and Archaeological Society, Major J. C. Mansel, Mr. R. J. Charleston, Dr. D. C. Watts, Mr. P. H. Whatmoor and donations given on site.

Equipment was kindly loaned by The Dorset County Museum; the Galton Garden Centre; Mr. Gillespie, builder, of Kimmeridge; and Major Mansel.

D. W. CROSSLEY

EXCAVATIONS AT THE CONGREGATIONAL CHURCH, DORCHESTER, 1981

During July and August, 1981, contractor's excavations for the new hall at the rear of the Congregational Church, South Street, Dorchester, were observed.

History of the Site. The church was built in 1856-7. In 1894 four cottages behind the church, fronting Charles Street, were purchased.[1] This was the area excavated in 1981, after the hall and cottage erected in the late 19th century had been demolished. The 1888 1:500 Ordnance Survey Map of Dorchester shows that the four cottages purchased in 1894 were at right-angles to the street, and were called 'Munday's Court'. The 1848 manuscript map of Dorchester (DRO D40E/1) shows the area before the church was built: there are two houses fronting South Street, and the rear plot, which runs north up to Bollen's Passage, is described as 'Yard, store and cellar under'. The 1810 manuscript map (DRO 0E1) shows similar buildings, but those fronting Charles Street (then Back Lane) are described as 'Coachhouse, stables, cellars, counting house and old barracks'. This is very odd – no reference to any barracks in Dorchester, apart from those on the west of the town, which were started in 1794 (Hutchins, 3rd ed., 1861, p. 374), can be located.

The Excavations. The contractor's excavations comprised trenches along the north and south sides of the plot, and smaller holes in the centre. These all showed massive late 19th century disturbances down to the natural chalk, which was found *c.* 2.50 m deep below present ground surface at the west end, and *c.* 3.70 m deep towards the east end. The eastern part of the site was cellared: presumably these are those mentioned in the 1810 and 1848 surveys. A blocked door at the northern end of the cellars suggest they continued in that direction: since the plot to the north and the plot at the back of the church were one at these periods, the cellars presumably ran right across the frontage. A small brick lined soakaway dug to the natural chalk was discovered, apparently dating from the later 19th century. The footings for the post-1894 hall, and massive disturbance of the whole area of a similar period were the only features seen. The boundary walls to the north and south of the site, the latter apparently that shown on Hutchins' map of 1772, and the former late 19th century, were bedded into the chalk. This suggests that the level of the chalk has not been lowered since the middle of the 18th century.

Photographs of some of the trenches have been deposited in the Dorset County Museum.

[1] *The Story of the Congregational Church in Dorchester,* W. Densham (ed.), 1898.

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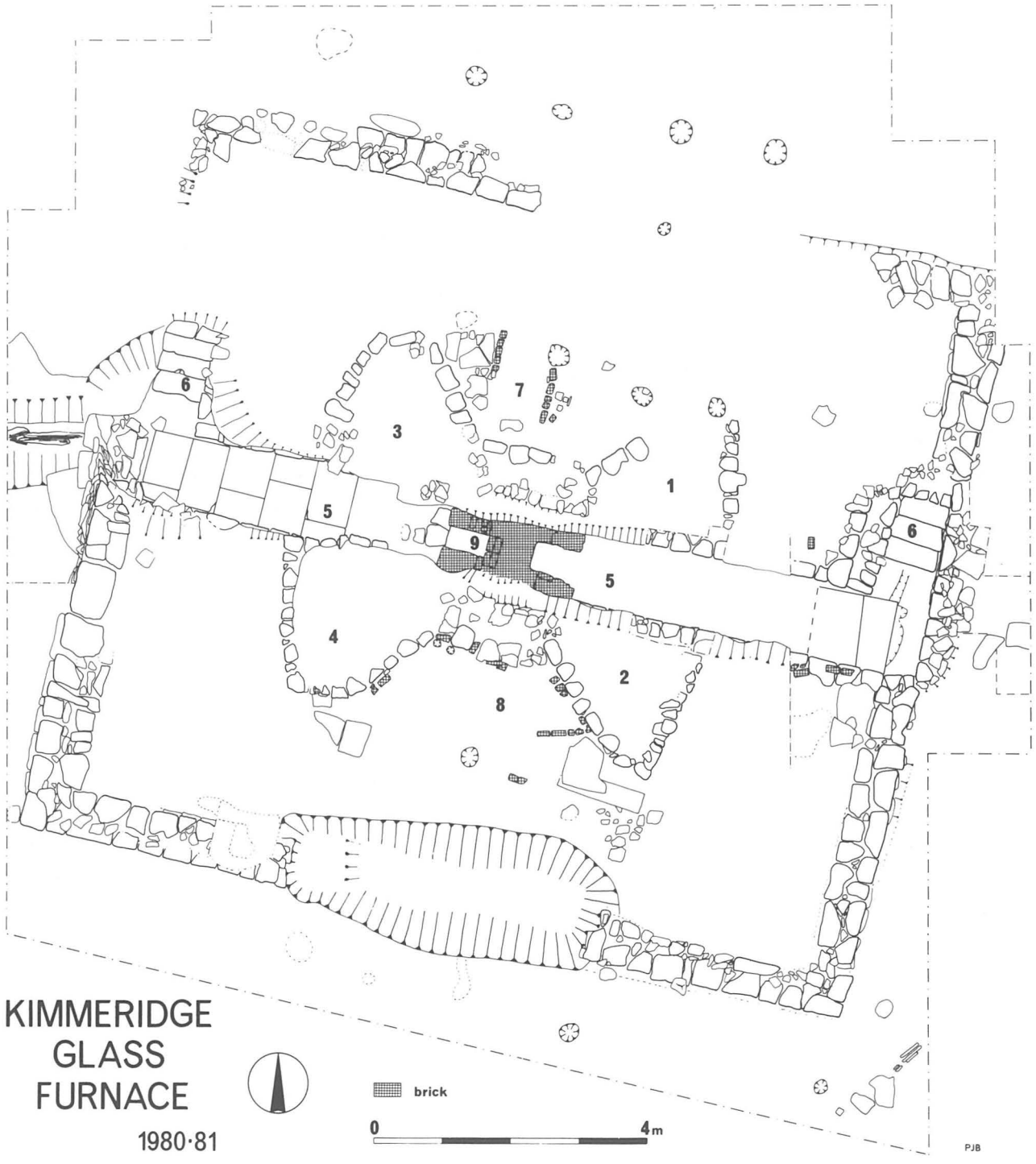

Figure 5. Kimmeridge excavation, 1980: plan of the features excavated 1980-1. 1-4: wings. 5: air passages. 6: steps giving access to air passages. 7-8: working areas. 9: fire-box.

'A Comparison of Coin Groups from Romano-British Settlements in Purbeck – A Reflection of Their Contrasting Status?', by P. J. Woodward, *Proceedings,* Vol. 102, pp. 102-104.

Erratum: The Editor and printer regret that Table 1 in the above article had the column headings wrongly positioned, so that the first column had no entries: in fact the last column should have had no entries. The correct version is printed below.

Table 1. The Incidence of Coins on Romano-British Settlement Sites in Purbeck.

Data Range	AD 41	41-54	54-69	69-96	96-117	117-138	138-161	161-180	180-193	193-222	222-238	238-259	259-275	275-294	294-317	317-330	330-348	348-364	365-378	378-388	388-402	
Coin Group (Reece)	I	IIa	IIb	III	IV	V	VI	VIIa	VIIb	VIII	IXa	IXb	X	XI	XII	XIIIa	XIIIb	XIV	XVa	XVb	XVI	
Site																						Site type/status
WOODHOUSE HILL				1						1			5		2							– Rural settlement
BUCKNOWLE													6	5	1	2	16					– Villa
ROPE LAKE HOLE													1	1			1	1				– Rural settlement with specialist industry
OWER	2										1		3	1		3	7	1	2			– Industrial/trading settlement
NORDEN excavation	2	2		4		1		1					2	1	2	1	4		4			– Industrial/trading
field	61		2	1				2	1	1			5	2	1	2	1	3	2			settlement
WEST HILL 1													1			5	8	3	5	2		– Settlement and coin hoard
2					1	1	3						7	2	11	5	6	5	21	1		
TOTAL	65	2	2	6	1	2	3	3	1	2	1	0	30	12	17	18	43	13	34	3		– All Purbeck sites

– – – – – – – o Latest coin date.
...../..../... Progressive change in relative site status.

A LATE IRON AGE AND ROMANO-BRITISH SITE AT WYKE REGIS, DORSET

S. J. DOCKRILL

In November, 1975, during the digging of service trenches for a new housing estate west of Lea Road, Wyke Regis (SY 65957788) human bones and pottery were disturbed. Workmen reported the discovery to Mrs. J. B. Johnstone who, together with Mr. H. Bates and the writer, carried out salvage excavation and recording. The disturbed remains of four human skeletons were recovered. Graves 1 and 2 were identified only in the service trench section. Two more individuals buried close together were excavated as carefully as possible within the limited time available, the location being referred to for convenience as grave 3.

Grave 1. This grave appeared to be almost totally destroyed by the service trench. The skeleton was that of a female, aged between 35 and 50. No complete long bones survived; height therefore cannot be established. One hip joint showed some signs of osteoarthritis. Pottery sherds of a Durotrigian bowl were found with the skull.

Grave 2. This consisted of a concentration of human bones, again badly disturbed by the service trench. The skeleton was that of a young person of indeterminate sex. Height, using the length of the femur as the basis for calculation would be about 158 cms if male; or about 154 cms if female.

Grave 3 (Fig. 1). Two skeletons A and B were excavated, although disturbed by service trenches to the north-west and north-east.

Burial A. Skeleton A was identified as probably male, about 174 cms in height, and between 20 and 40 years of age. The skeleton was associated with two large tabular stone fragments, forming a cist.

Burial B. The upper body and skull of this individual lay upon its right side in a contracted posture with its head to the west. The lower body and legs had been destroyed. Disarticulation of the skull, lower jaw and neck suggested that the corpse had been deposited under a solid and fairly durable covering, allowing decomposition and separation to take place in a void. A number of iron nails and other amorphous iron objects were distributed around the bones; possibly these were attached to a wooden cover laid over the corpse, or at least part of it. The pronounced frontal ridges of the skull suggest that the bones were those of a male whose age was estimated at between 20 and 35 years. The lengths of the ulna and humerus indicate a height of about 156 cms. Sherds of typical late Iron Age pottery were found stratified in the grave.

Apart from the burials, no other stratified archaeological features were excavated. However, unstratified pottery sherds observed in the spoil of the service trench parallel to Beachview Close may indicate Romano-British settlement to the south of grave 1.

Discussion

Two phases of activity in the area of Beachview Close can be identified from the unstratified finds and excavated burials. The finds to the south of grave 1 suggest a Romano-British context, while the burials themselves suggest an early 1st century AD date, based on the pottery associated with graves 1 and 3. Grave 3 also exhibits the late Iron Age Durotrigian characteristic of burial upon the right hand side (Whimster, 1977, 320). Grave 3B seems to be later than 3A, disturbing the stone cist and bones of the earlier burial.

These graves may possibly be associated with a cist burial containing a contracted adult at Overlands Road some 70 metres to the north of grave 3. (RCHM, 1970, p. 615). Other burials of a simi-

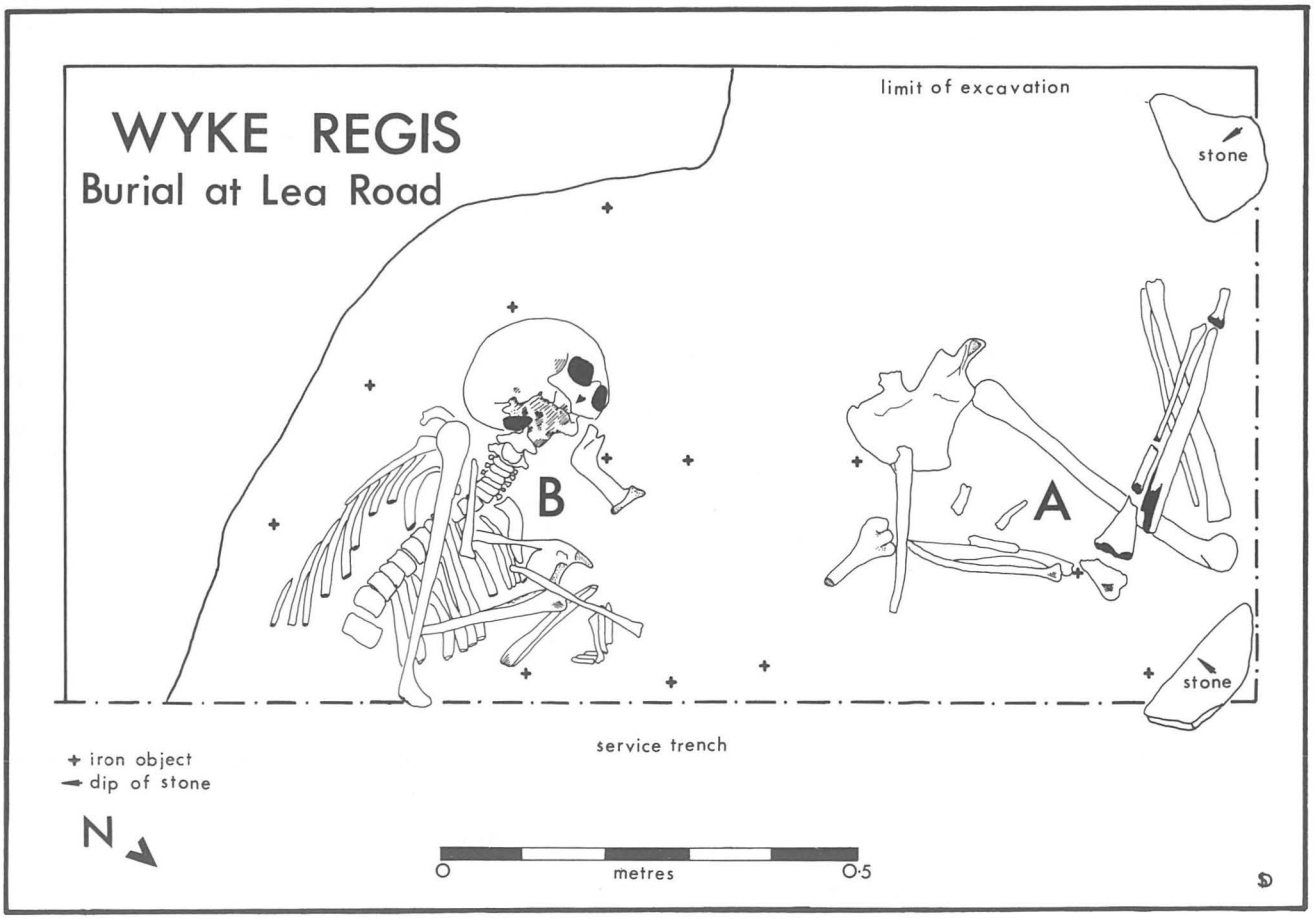

Figure 1. Wyke Regis: grave 3.

lar nature were discovered in 1858 and 1936 at Wyke Regis Reservoir (SY 66307784) where again cist burials were present (RCHM, 1970, p. 615). One of the 1936 burials appears to have had iron nails associated with it. This may be a parallel to grave 3B (DCC, 1936, p. 12).

Figure 2. Wyke Regis: the pottery.

Pottery

The pottery recovered along the pipe trench is unstratified, except for that recovered from the excavation of grave 3. Three sherds are described in detail, owing to the apparent lack of parallels in this area. All are from grave 3, nos. 1 and 2 are associated with burial B, no. 3 is associated with burial A.

1. Jar: diameter 14 cms, slightly everted rim, fairly hard light grey fabric, exterior weathered. Inclusions included 25 per cent submitted calcite grits 1 mm in diameter and 5 per cent less than 5 mm in diameter.
Colour Exterior Green/Brown A6 to A7, Interior Brown A5 to B5.[2]
2. Jar: diameter 16 cms, vertical up-turned rim exterior unevenly oxidised, with traces of burnish, colour dark grey; interior vesicular fairly hard, dark grey paste, 15-20 vesicular inclusions. Hand made.
Colour Exterior Brown B5-A2, Interior Neutral 5.
3. Jar: diameter 26 cms, very slightly everted rim with very slight abraded bead rim, strong marks of wiping on exterior oxidised throughout.
Colour Exterior Yellow/Brown A5.

Also recovered from grave 3 were three sherds of haematite coated ware and 20 miscellaneous sherds of black burnished ware. Pottery located by a workmen at the initial discovery of grave 1 included unstratified sherds of a bead rimmed bowl paralleled by a Durotrigian vessel from Broadmayne (Young, 1973, p. 45, fig. 5, no. 6).

Unstratified Roman pottery included Samian and mortarium sherds as well as Black Burnished Category 1 coarse ware. These sherds suggests a date of the mid-2nd century AD for the Romano-British activity.

Acknowledgements

I would like to thank Miss E. Cox for her report on the skeletal material. Mr. A. M. Hunt and Mr. J. Beavis for their help in the preparation of the report and Dr. J. R. Hunter for his comments on the final draft.

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FOOTNOTES

[1] Skeletal materials from the site were examined by Elizabeth Cox, who provided these descriptions and comments.
[2] Colour from the *Pottery Colour Chart* by the Study Group for Romano-British Coarse Pottery.

THE TOPOGRAPHY OF SHERBORNE, DORSET – *LANPROBUS*

LAURENCE KEEN

David Hinton has put forward (Hinton, 1981) three reasons for questioning Mrs. Katherine Barker's suggestion that the curving lines of Hound Street and the gardens of the tenements to its north perpetuate part of the boundary of the precinct of *Lanprobus,* the British precursor of the 8th century ecclesiastical settlement (Barker, 1980). Hinton writes that none of his observations 'provides a conclusive reason for dismissing a Celtic church precinct as the antecedent of elements of the town plan of Sherborne'. This writer has examined the Sherborne evidence (Keen, 1982) and in view of Hinton's observations it may be useful to elaborate on some of his points and to put forward the reasons why the site of *Lanprobus* is more probably to be found beneath the 12th-century castle, some way to the east of medieval Sherborne (Fig. 3).

Hinton observes that the coloured map, made between 1569-70 and 1574 (BL Add. MS 52522: Harvey, 1965; Tyacke and Huddy, 1980, pp. 56-7), does not show Hound Street and concludes that although a Hound Street existed in medieval Sherborne, as demonstrated by the name of a medieval tithing, 'the line of the medieval street may have been lost in subsequent centuries', its survival being explained by the re-use of the name for a post-medieval street. This view cannot be supported, since at least part of the present Hound Street is demonstrably medieval in origin as No. 16 Hound Street, although cut back from the street frontage, contains two medieval trusses, which, by analogy with other Dorset examples, are probably 14th century in date (a reconstruction is published in Gibb, 1981, 39, but there is no evidence that the building was timber-framed as shown).

The suggestion that *Lanprobus* lies beneath the town of Sherborne, credited by both O'Donovan (1972, p. 37) and Barker (1977, p. 127) to Finberg (1964, p. 98), belongs to Baring-Gould and Fisher (1912, p. 107). Barker's theory that Hound Street is part of the boundary of the *Ian* appears to rest on three factors. First, that the south-west to north-west arc of Hound Street and the curving line of property boundaries forms an enclosure which corresponds closely with other examples of a *Ian* (1980, p. 230); secondly, that Hound Street crosses east to west parallel boundaries which she argues are reminiscent of south Dartmoor reaves and would be consistent with a pre-Roman date (1977, p. 127); thirdly, that the Sherborne enclosure is subtended from The Green, known to have been the site of a chapel dedicated to St. Thomas the martyr, which she suggests may be a rededication (1980, pp. 231-1).

Hinton has questioned the first of these on size alone. Additional points add weight to Hinton's objections: the boundary proposed by Barker does not continue to the west of Cheap Street (although it is possible that such a boundary was obliterated by the medieval monastic precinct); the 'shallow gulley' located in excavations behind 60 Cheap Street is most unlikely to be part of this boundary, indeed only the northern edge of the feature was found (Barker, 1977, p. 127 and fig. 33).

The second piece of evidence put forward by Barker is the relationship between the curving boundary of the proposed *Ian* and the equally-spaced east to west parallel lines. A detailed examination by the writer of these and similar boundaries around Dorchester, and particularly the relationship of the Dorchester boundaries with aerial-photographic evidence for Iron Age/Romano-British field systems and settlements north of Maiden Castle, has lead to the suggestion that both the Sherborne and Dorchester boundaries belong most probably to the Saxon period, and that having regard for the historical evidence for Dorchester, a middle Saxon date might be considered (Keen, 1982). As Hound Street crosses these east to west lines it is most unlikely that the claim for Hound Street being the boundary of *Lanprobus* can be upheld.

Barker's suggestion that the chapel of St. Thomas the martyr on The Green was on the site of an earlier chapel which may have been rededicated is important in her identification of *Lanprobus*, since a significant feature of *Ian* is a chapel or church within the enclosure. Rededication in other urban contexts are well known, an example occurring for instance at Winchester, where the church dedicated to St. Petroc was rededicated to St. Thomas the martyr in the 15th century (Biddle (ed.), 1976, p. 330 and n. 10).

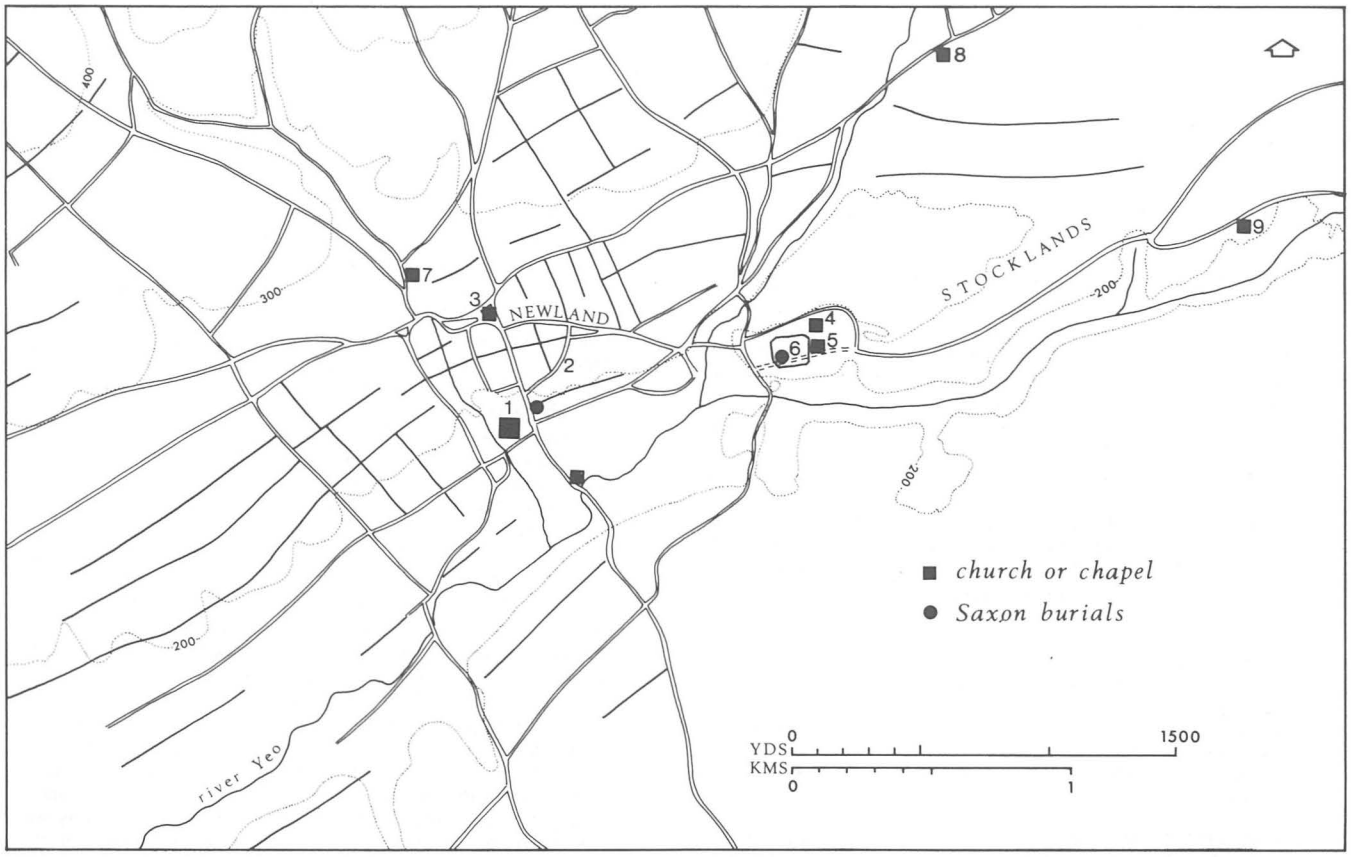

Figure 3. Sherborne and the location of *Lanprobus*. Principal east-west boundaries shown as heavy lines. (1) Abbey, (2) Hound Street, (3) site of chapel of St. Thomas the martyr, (4) possible location of chapel of St. Probus, (5) site of church of St. Mary Magdalene, (6) Sherborne Castle, (7) chapel of St. Emerenciana, (8) St. Cuthbert's church, (9) site of chapel at Pinford.

However, the history of the Sherborne chapel is recorded and suggests that it may have been newly built in the 12th century (Fowler, 1951, pp. 131-3).

If conclusive evidence for the enclosure identified by Barker is lacking, and if St. Thomas the martyr's chapel were an entirely new foundation of the 12th century, the argument that *Lanprobus* lies beneath the town of Sherborne loses much of its force. However, there is evidence, both documentary and archaeological, to suggest that the site of the 12th-century castle has more to commend it as the possible site of *Lanprobus*.

Two papal confirmations of Sherborne Abbey's property, referred to by Hinton, provide a starting point for the consideration of this alternative site. That of Pope Eugenius III, dated 1145, confirms, among other properties 'the church of St. Mary Magdalene near the castle with two chapels . . . *Propeschirche* and Stocland with woods and fields and two mills' (Dugdale, i, pp. 338-9), that of Alexander III, dated 1163, confirms 'the church of St. Mary Magdalene situated near Sherborne castle with the chapels of St. Michael and St. Probus and all their appurtenances' (*Ibid.*, p. 339). The church of St. Mary Magdalene, with its two (internal?) chapels, near the castle, was no doubt the 'chapelle in a little close without the castelle be este' seen by Leland (*Itinerary*, 1, p. 154). The position is confirmed by the map of the manors of north Dorset, referred to above, which shows 'St. Magdalenes' as a church on the south-east side of the castle (BL Add. MS 52522: Tyacke and Huddy, 1980, pl. facing p. 32). The chapel of St. Michael referred to in the 1163 Bull was within the castle (Fowler, 1961, p. 107). It would seem reasonable to propose that *Propeschirche* and the chapel of St. Probus are the same building which was probably connected with *Lanprobus*.

The order in which these buildings are listed gives an indication of the location of *Propeschirche*/St. Probus' chapel. In the 1163 Bull it follows that St. Probus' chapel is near the castle. In the 1145 Bull *Propeschirche* is referred to independently of St. Magdalene's church and its two chapels, after the list of churches and vills. It is linked, however, with 'Stocland' which is mentioned in the 998 foundation charter of the reformed monastery (Kemble, No. 701). 'Stocland' or 'Stockland' is found in several 14th-century documents and in a 1614 survey of the manor of Sherborne (Keen, 1982). The location of this land, which appears to be meadow, is indicated on John Ladd's 1733 map of Lord Digby's manor of Sherborne (Fowler, 1951, pl. facing p. 73). It is a group of fields north of Pinford Lane, immediately to the east of the castle, and the site of an extensive Romano-British settlement.

The name 'Stocland' is of special interest. Smith (1956, p. 154) writes that the element *stoc* had a religious connotation, similar to *stow,* and meant a monastery. He shows that the religious association of *stoc* is also well attested by two Dorset examples: Bindon Abbey, *Bindonestock* in 1236, and Halstock. The element *stoc* is difficult to distinguish from *stocc,* meaning tree-stump (Smith, 1956, p. 156), but Ekwall has suggested (1960, p. 443) that as a first element *stoc* is probably often to be assumed rather than *stocc.* The definite association of 'Stocland' with the ecclesiastical holdings referred to in 998 would seem to suggest that the element *stoc* is involved.

Furthermore, the location of 'Stocland', very close to *Propeschirche*/St. Probus' chapel gives it a direct relationship with *Lanprobus.*

From this evidence it seems certain that *Propeschirche*/St. Probus' chapel may be identified with *Lanprobus,* the site of which is to be found near the castle.

The archaeological evidence from the castle obtained by Mr. C. E. Bean's excavations during the 1950s and more recently by Mr. P. R. White shows that important material lies beneath Bishop Roger's castle of the 12th century. Both Bean (1955, p. 141) and White (*pers. comm.*) have found burials in levels earlier than the castle. They lie mainly to the west of the keep, alongside what is considered to be the main road into Sherborne before the castle was built. All the burials are cut into rock although the tops of the graves were shaved off in Bishop Roger's levelling operations. Also earlier than the castle, but later than

the burials through which it cuts, is a ditch with a maximum depth of 3 metres, found on the north side of the castle, along the west side, turning by an obtuse angle under the south-west block and going underneath the Hall (White, *pers. comm.*). This ditch could have belonged to *Lanprobus*. No occupation debris has been found which can be assigned with certainty to the early settlement, except five grass-tempered sherds (Harrison and Williams, 1979, pp. 91, 98), which do not belong to the 12th century groups and may be considered as residual material from earlier occupation of the castle site.

If this evidence points to the conclusion that the castle site is *Lanprobus,* three other factors might reinforce it. First, the fact that the old highway approaching Sherborne from the east ran through the site later occupied by the castle, so avoiding the marshy ground which the modern A30 crosses (J. H. P. Gibb, *pers. comm.*), secondly, the possibility that St. Mary Magdalene's church belongs to an earlier settlement – by the time the castle was built it lay isolated outside, to the east of the castle, no longer serving the community which by then had moved away, thirdly, the settlement would be advantageously situated on a natural spur (Fig. 3).

Aldhelm's cathedral, almost certainly beneath the present abbey, appears therefore to have been built on a new site. The inevitable conclusion is that by 705 the site of the earlier settlement *Lanprobus* was either deserted or was considered less suitable for the new foundation.

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A MEDIEVAL CEMETERY ON BROWNSEA ISLAND (Fig. 4)

KEITH JARVIS

During alterations to Farm Cottage in 1974 human skeletons were discovered and a small excavation by Mr. A. Bromby and Mr. N. H. Field revealed five graves. In April, 1979, another small excavation was conducted by the author on behalf of Poole Museum to investigate the site and this report combines the results of both excavations. Mr. N. H. Field had also excavated a series of test pits in 1964 which revealed late-medieval and later finds, and notes on these are included in the site archive.

The site (SZ 02863 87611) is at a height of 6 metres Ordnance Datum, in a sheltered position on a small valley with higher ground to the south and west. The island is composed of Eocene Bagshot beds with a capping of pleistocene plateau gravels although the site is on fine white sand. Farm Cottage is located *c.* 155 metres south-east of the Victorian church and the excavations were located inside the cottage around a new partition wall which was *c.* 9 metres from the east end of the cottage. The 1974 and 1979 excavations were to the west and east of this wall respectively.

The excavation revealed minor post-medieval features, which are recorded in the site archive, overlying a 16th-century grey sand layer 0.4 metres thick. This sealed natural sand into which the graves had been cut. The two excavations revealed at least seven graves averaging 0.2 metres deep, all aligned east-west and containing skeletons in an extended position with heads to the west and arms at the side. The cemetery extended at least 6 metres east of the cottages since graves were noticed there earlier when digging a well. The cemetery plan contains inter-cutting graves suggesting that the cemetery continued to be used for some time.

The five skeletons removed were examined by Dr. Astbury and a full report is in the site archive. It was established that adults and children, probably of both sexes, were present although the skeletons were incomplete and in a poor condition. The estimated sex of the skeletons is only probable in all cases and the identifications are: grave 1, elderly female; grave 2, female 7-8 years; grave 3, male over 45 years; grave 5, male over 25 years; and grave 9, female over 20 years. The bone in grave 4 was too fragmentary for identification and the bone in grave 11 was not removed.

The cemetery was not closely dated and extended burials of this type could date from the Roman period onwards. A bone sample from grave 9 was therefore submitted for C-14 dating and produced an interim date of ad 1170±70 (HAR-3865). Although too much reliance should not be placed on a single date this confirms the documentary evidence of medieval occupation discussed later. The confidence limits of the C-14 date are such that there is a 95 per cent chance that the occupant of grave 9 died between AD 1030 and AD 1350, when the range is converted using a tree ring calibration (McKerrell, 1975, p. 118).

Discussion

There are few useful documentary references to Brownsea Island in the medieval period (Hutchins, 1861, 1, pp. 647-8), and a summary compiled from secondary sources is included below. The island is first mentioned in 1015 and Cerne Abbey was granted right of wreck in 1154. Cerne was endowed as a monastery in 987 but may be earlier (Pearce, 1978, p. 100). There was a 'hermit's chapel' on the island in the 16th century. Hutchins believed that it was dedicated to St. Andrew and this name is preserved in the place-names of St. Andrew's Terrace and Hill 550 metres north-north-west of the Victorian church and also St. Andrew's Bay (Mills, 1977, p. 49). The assertion (Kelly, 1939, p. 52) that the chapel was built in the reign of Henry II is not substantiated.

Documentary Summary

1015 MS Life of St. Ethelwald cited in *Leland Coll.,* IV, 65. 'Canute . . . sailed thence to Brownsea' (Hutchins, 1861, 1, p. 648). The remaining comments are additions by Leland. There is no evidence for a church at this date.

1154 Henry II charter grants to the Abbot of Cerne the right of wreck at Brunkery (Hutchins, 1861, 1, p. 648).

— Henry II in an undated charter grants right of wreck at Brownsea (Page, 1908, II, p. 59).

1275 Enquiry mentions Henry II's and III's charter (Page, 1908, II, p. 59).

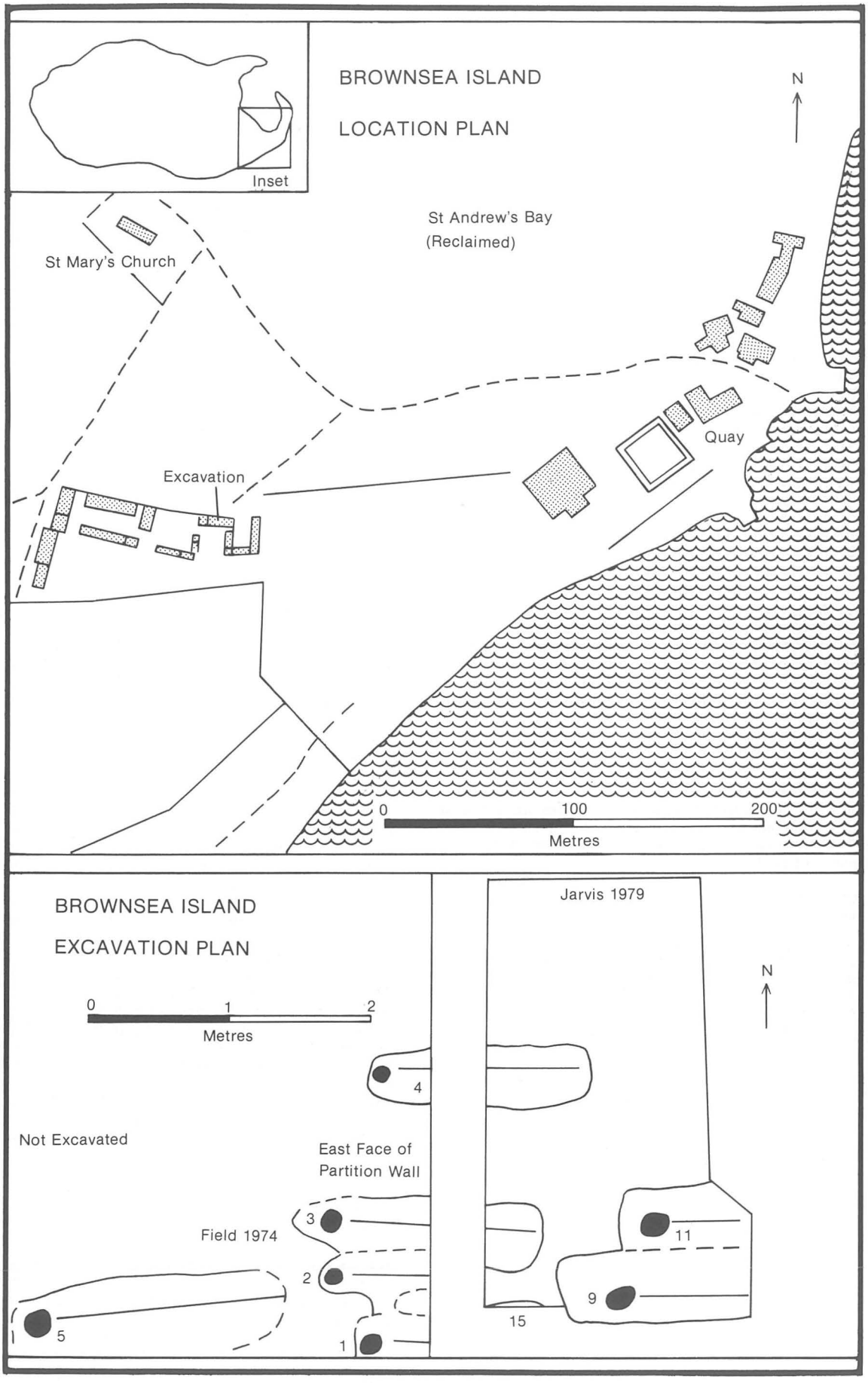

Figure 4. Brownsea Island.

1303 The men of Poole, Wareham and Brunkeseye are requested to supply ships for the King (Smith, 1951, pp. 155-6). This reference suggests the island was populated.

1534 Leland (Hutchins, 1861, 1, p. 648) states 'There ly three isles in the haven of Pool whereof the most famous is Brunkeshey. Sum say that there has been a paroch in it. There is yet a chappel for an heremite. It longith to Cerne abby'. The remainder of the reference is by Hutchins and is misleading since the quotation marks are in the wrong place. This reference shows that there was a hermit's chapel on the island in the 16th century and that there was a folk memory of a parish on the island.
Leland, in another reference (Hutchins, 1861, 1, p. 648) states that there were no buildings except for a chapel on the island.

1547/8 Gun fort constructed and maintained until the 17th century (RCHM, 1970, 2, p. 280).

The archaeological evidence suggests a small medieval cemetery probably with men, women and children. It may be inferred that there was a small church associated with this cemetery since field chapels do not normally have cemeteries (Pearce, 1978, p. 97). A lay population on the island is suggested on the archaeological evidence and this is confirmed by the documentary reference of 1303. Since Leland records a hermit's chapel on the deserted island in 1534 it would seem likely that the postulated church either came to be used as the hermit's chapel or was constructed on a site close by.

There is no evidence of either when the island become depopulated or for how long. Climatic deterioration or the Black Death of 1348 onwards could be causes although the economic fortunes of Poole itself could also be contributory.

Acknowledgements

The author wishes to thank the warden of the island for the National Trust Mr. A. Bromby; the Archaeological Secretary of the National Trust Mr. D. Thackray; Mr. N. Field for allowing access to his site records; and Dr. Astbury for examining the human bone. Financial assistance was provided by the National Trust and the Dorset Archaeological Committee. The assistance of local volunteers with the excavation is also particularly appreciated.

Finds Location and Archive

The finds and site archives from both excavations are deposited with Poole Museums with the exception of the human bone from the 1974 excavations which is in the possession of Mr. A. Bromby on Brownsea Island.

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SWALLAND FARM (KIMMERIDGE) AND THE LOST LOCATION OF CHALDECOTS

ROSEMARY MAW

SUMMARY

This article concerns the location of the original Swalland Farm and Chaldecots below Swyre Head (Kimmeridge). Recent archaeological evidence is used to clarify problems in the interpretation of documentary evidence. The present Swalland Farm is shown to occupy the original site of Chaldecots whereas a newly discovered site is the location of a former Swalland Farm. The development of the farmsteads is traced in order to justify this view.

During a trial excavation of an Iron Age/Roman site on the Smedmore Estate in a field (SY 93157765) below Swyre Head[1] evidence was collected whilst field-walking of a later settlement. In a small valley[2] on the eastern side of the field, pottery sherds dating approximately from the 12th to 17th centuries were discovered and two, or possibly three, house platforms were seen.[3] It then appeared that this archaeological evidence might help to solve several difficulties in interpreting documentary evidence relating to the original location of Swalland Farm and the lost location of Chaldecots.

Hutchins gives a rather ambiguous description of the location of Chaldecots:

'Now only a farmhouse, half a mile east of Smedmore, and near the sea, where are the ruins and foundations of houses'.[4]

Hutchins also quoted Coker:

'Hence on the shore, though the place I cannot preciselie poynt out, wee passe by Chaldcott, nowe onlie a parcell of grounde which nevertheless gave name to the Familie of Chaldcotts, of good note and Antiquitie'.[5]

Hutchins in his account of the land below Swyre describes from west to east: Smedmore, Little Kimmeridge, Chaldecots, Swalland, and finally Encombe. He places Chaldecots in the parish of Kimmeridge and Swalland in the parish of Corfe Castle. Today however the name of Chaldecots has been lost and Swalland farmhouse appears in the parish of Kimmeridge. A. D. Mills in his recent book *Dorset Place Names*[6] has made some interesting suggestions as to the derivation of the name 'Swalland'. It seems to be early associated with 'John,–, Robert Swanland 1376 Pat, "land of the herdsman, –men or peasant(s)".'

The present difficulty in identifying the former settlements accurately is related to the complexities of land ownership over the centuries. Documentary evidence does however support Hutchins' placement of Swalland in Corfe Castle parish and Chaldecots in Kimmeridge. The parish boundary is here a very ancient one recognised by Saxon charters, the grant of land to the east of the boundary to the Abbess of Shaftesbury is recorded in the *Cartulium Saxonicum:* 'Eadred, King of the English and of the other peoples around about, to the religious lady Alfthrith, at the request of her father and in return for a payment of 60 mancuses (of the purest oil) 8 'mansae' in Purbicinga . . .'[7]

The boundary is clearly defined: 'From the sea to a stony tor; from the tor on the cliff upwards to a dyke (or ditch); thence, north along safandune on to the straight highway'.[8]

And in a slightly later document: 'First from the sea to a dyke; along the dyke up on a promontory (swuren), on to the thwart dyke (thwers dick)'.[9]

Safandune and swuren are identified by Hutchins as the down of Swyre thus the boundary can be identified as the present Corfe Castle and Kimmeridge parish boundary running from the coast east of Rope Lake Head north-eastwards to Swyre Head and eventually meeting the old trackway now followed by parts of the road.

After the dissolution of the monasteries the land called Swalland 'consisting of three messuages'[10] was transferred to George Chaldecot by the Crown at a rent of 4s. per annum. Another document records that George Chaldecot already owned the land to the west. This consisted of 'a messuage, one carcucate of land, and ten acres of meadow in east Kimmeridge, called Chalcotes!'[11] Swalland and Chaldecots were part of one estate but probably farmed by different tenants.

Further references to Swalland occur. The name of Swalland appears again in the record of proceedings held at Blandford (1578)[12] to determine the rights over common land known as Swalland Goyle, Swyre Hill, West Croft and Dunhill. Rights to

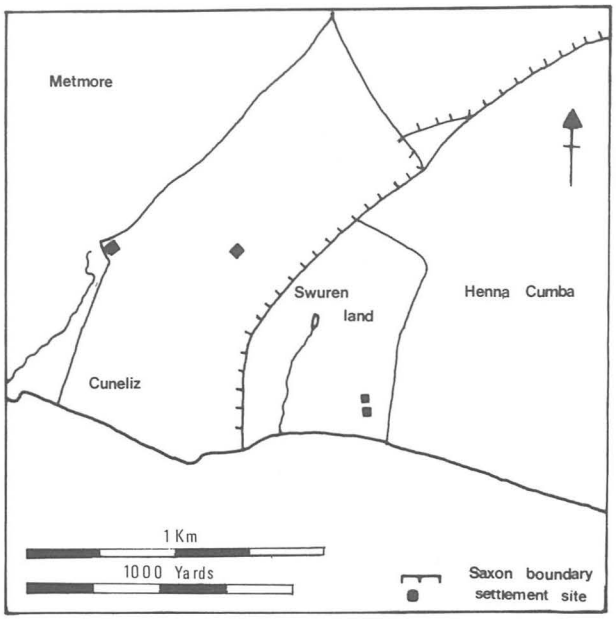

Figure 5. The land below Swyre (Kimmeridge) before 1545.

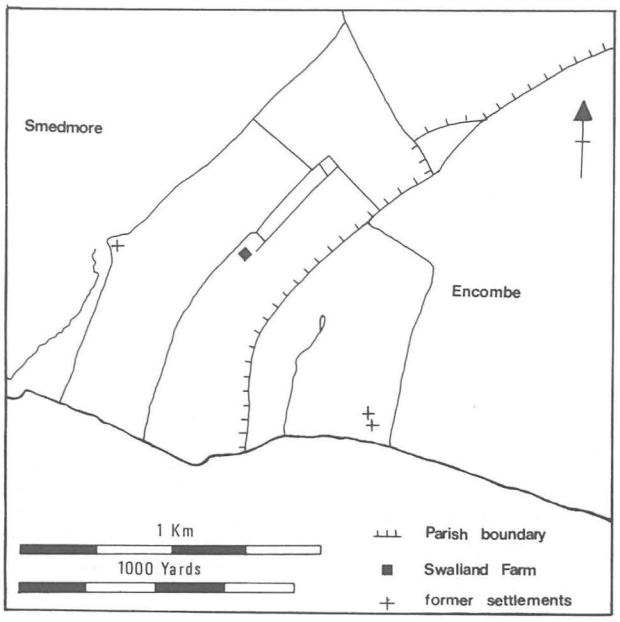

Figure 6. The present Swalland Farm.

the land were claimed by Francis Chaldecott and John Cullyford (Encombe Farm).

The names of the tenants recorded at Swalland Farm are as follows: Robert Gillet; William Gillet and his widow; Richard Coulthurst; William Chaldecot and Frauncis Chaldecott.

Sub-tenants: John Rouse; John Baker; Richard Baker; and Bryant Parrish.

The Court decided in favour of John Cullyford, but he had to pay an annual rent of £5 per annum to Richard Coulthurst and after his death to William Chaldecott and his heirs. A deed dated 1589[13] indicates that the heiress of Chaldecot brought the family lands to the Thistlethwaites of Winterslow in Hampshire and the farm and lands of Chaldecot now seem to be in the tenure of William Vyne. The returns for the Hearth Tax (1662-4)[14] mention William Vyne in the house of Alexander Thistlethwaite but there also appears a name previously associated with Swalland, that of Parris.

Thus is appears that a Swalland Farm existed in the parish of Corfe Castle though it was a part of the Chaldecot estate. The documentary evidence, and in particular the recurrence of the name Parris, sub-tenants of Swalland, suggests that there was continuous occupation of the Swalland settlement until sometime before 1795 when Taylor's map[15] shows Little Kimmeridge and Chaldecots with houses but Swalland without. No pottery sherds of later date have been found on the site. The Smedmore Estate Survey[16] (George Clavell of Smedmore having bought the estate from Alexander Thistlethwaite in 1757) shows the same situation in 1794.

It seems that some time after George Clavell acquired the Chaldecot/Swalland Estate the remaining farmhouse previously known as Chaldecotts became known as Swalland Farm (see Fig. 6) This is why the farm appears to have moved from the parish of Corfe Castle to the parish of Kimmeridge whilst the ancient parish boundary remained unchanged. The present Swalland Farmhouse does not appear to be of great antiquity and is not listed as such in the 'Royal Commission on Historical Monuments' report for this area. However several internal features have recently been revealed by Mr. Vearncombe, the present tenant of Swalland, which suggest an early date for at least part of the building. It seems most probable that this house is in part, or is on the site of, the former Chaldecots and that the small valley in the field below Swyre Head holds the remains of the original Swalland settlement.

Perhaps the most interesting speculation that must await archaeological enquiry, is that there may have been continuous occupation in the area of this settlement from the earliest Iron Age to the 17th century.

FOOTNOTES

1 Interim reports on the trial excavations have appeared in the *Dorset Proceedings*, Vols. 97 and 98.
2 Which may well be 'Swallondes Goyle', see A. D. Mills, *The Place Names of Dorset*, Vol. LII, published by the English Place Names Society, 1977, Part 1, p. 87.
3 See Fig. 5, the settlement furthest east.
4 J. Hutchins, *The History and Antiquities of the County of Dorset*, 3rd ed., 1861-74, p. 563.
5 *Ibid.*
6 A. D. Mills, *The Place Names of Dorset*, p. 87.
7 H. P. R. Finberg, *The Early Charters of Wessex*, p. 170.
8 Hutchins, p. 511.
9 *Ibid.*, Edred to Wihlsige.
10 *Ibid.*, p. 520.
11 *Ibid.*, p. 563.
12 Documents of the Smedmore Estate (Dorset County Record Office), LI.
13 *Ibid.*, p. 12.
14 *Dorset Hearth Tax* (Blandford Division), 1662-1664, p. 72.
15 Original in Dorchester Museum Library.
16 Original at Smedmore House.

AN EARTHENWARE 'BELLARMINE'-SHAPED JUG FROM POOLE HARBOUR

JO DRAPER

About 20 years ago the vessel illustrated was found in the mud of Poole Harbour, at Holes Bay. It has recently been given to the Dorset County Museum by Alan Bromby, who kindly brought it to the author's attention.

Description

The vessel is complete, apart from the handle. There is a large dent beneath the lower handle fixing, and a lesser dent to the side of the same. The neck forms an uneven oval which must have been very difficult to cork. The dents and irregular neck suggest that this is a waster. It is of a pale brick red fabric with some fine sand temper. Almost all the pot externally is glazed, varying from a dark, dull orange with tiny dark brown flecks to dull brown. The unglazed areas are paler orange and oval, and probably represent marks made by other vessels in the kiln. The base has clear concentric part ovals showing that it was cut with a wire from the wheel. There are two small and one tiny areas of melted glass on the sides which were deposited after the vessel was fired.

Discussion

This vessel is almost certainly from the nearby kilns of Verwood.[1] So far as the author is aware this form has not been noted before, and it is of interest as it may be broadly dated by comparison with imported and English stoneware jugs usually embellished with a face mask, called bellarmines. The tall slender profile of the vessel here compares with bellarmines of the later 18th century[2] and it is almost certainly of that date.

It is interesting that a complete earthenware bellarmine with face mask is in the Dorset County Museum,[3] and the mask of another was recently found in Poole.[4] Both these however are 17th century and in a very different fabric to the vessel here.

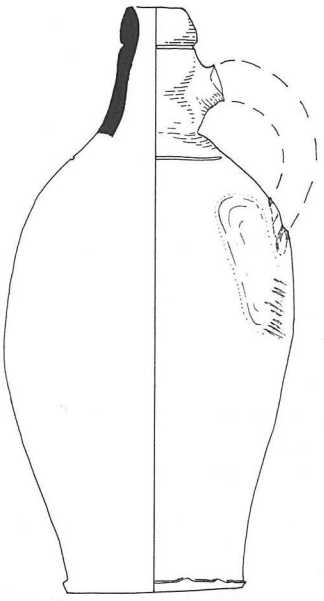

Figure 7. A coarseware bellarmine-type jug from Poole Harbour, at ¼ reduction.

FOOTNOTES

1 'The Verwood Potteries' by Donald Young, *Dorset Proceedings,* Vol. 101, 1979, pp. 103-120.

2 e.g. one dated 1764 illustrated in 'The Chronology of the Bellarmine Jug' by Anthony Thwaite, *The Connoisseur,* April, 1973, pp. 255-262.

3 'A Coarseware Bellarmine from Dorset' by Jo Draper, *Dorset Proceedings,* Vol. 100, 1978, p. 120.

4 *Dorset Proceedings,* Vol. 102, 1980, forthcoming.

DORSET RAINFALL 1981

D. J. PAXMAN, MA

Statistics

The general rainfall over Dorset in 1981 was 37.73 inches, 4 per cent over the 1941-1970 average.

MONTHLY SUMMARY:

	Rainfall in inches	Average for 1941-1970
January	1.8	3.8
February	2.3	2.6
March	6.3	2.5
April	1.8	2.1
May	4.1	2.6
June	1.9	2.0
July	2.0	2.3
August	.7	3.1
September	6.2	3.4
October	4.0	3.6
November	1.8	4.2
December	4.9	4.0

As in 1980 Wraxall was the wettest station and Portland the driest (49.20 and 27.88 inches of rain respectively).

General Report

March was the wettest month of the year and its total of 6.28 inches made it the second wettest March in the Dorset records, exceeded only by the 8.62 inches of March, 1947.

The early months of 1981 saw little in the way of snow until a late fall on April 25th which was accompanied by strong winds. Over much of Dorset the day's precipitation fell entirely as rain, amounts varying but nowhere reaching an inch. In hilly areas inland the rain turned to snow during the evening and night. By morning there was a general cover of 3 or 4 inches at stations such as Cattistock and Minterne, with 3-foot drifts on high ground. This snow had gone by 27th, except for some of the drifts.

The Winter of 1981-82

In September and October rainfall over England as a whole was 165 per cent of average, and in Dorset 146 per cent. This wet autumn marks an earlier than usual southward movement of the jet stream. Such autumns are very rarely followed by a warm winter. They signal either an average winter or one containing cold spells. By December the jet stream was positioned to the south of Britain and this resulted in several vigorous depressions moving eastwards close to southern England and giving some notable snowfalls. Behind these depressions a strong northerly airstream brought intensely cold air by the most direct route from polar regions, and when the pressure gradient slackened in the col between one depression and the next conditions were ripe for intense nocturnal radiation, especially where the landscape was deep under snow, and some exceptionally low minimum temperatures were recorded.

An example was the depression which moved east across northern France on 11th, giving heavy snowfall in central and southern Britain, though near coasts the precipitation fell mostly as rain. In Dorset any snow had all been washed away by the morning of 12th. Some very low temperatures occurred in the clear weather behind this depression. At Shawbury, Salop, the day maximum on 12th was −12°C, followed by a night minimum of −25°C, an English record not only for December but for any month.

One of the most vigorous depressions of the whole sequence reached Britain on 13th, crossing Wales and the Midlands. Although parts of southern England did have heavy snowfall, the more northerly track of the depression meant that milder air was drawn into the south-west. A quarter of the Dorset stations had over an inch of precipitation. If this had all fallen as snow there would have been a 12-inch cover. In fact, except where 3-foot drifts formed in the gale force winds, the cover was only 2 to 5 inches, and this disappeared in a rapid overnight thaw.

The main cold spell lasted from 8th to 27th December and over much of Britain it was the coldest and snowiest December since 1890 or even since 1878. However, as we have seen, Dorset narrowly escaped the full rigours of the time. The lowest Dorset temperatures available to us are −7°C at Corfe Mullen, −9°C at Shaftesbury and −12°C at Beaminster. At the year's end only a few pockets of snow remained in Dorset, mostly drifts on the hills or in hedgerows.

In mid-December, when the cold spell was only a few days old there was the expectation on historical grounds of a prolonged period of cold weather, or of its return after an interval. Cold weather in or near mid-December tends to preface a severe winter, as happened in 1939-40, in 1947, and in 1950-51. This expectation was at least partially justified by what was to happen. The cold air had retreated northwards but was waiting in the wings not far beyond Scotland. In the new year it returned, albeit for only the 11 days from 5th to 15th January, but bringing large amounts of snow to Wales and the Midlands and yet another English record for a night minimum temperature.

Heavy Falls of Rain

March 9th

There were 4 days in March when parts of Dorset had rainfall of more than an inch: 7th, 9th, 10th and 21st. The wettest of these days was 9th, when a warm front crossed the British Isles. In Dorset an inch of rain fell south of a line from Brownsea Island to Minterne, Beaminster and the Devon border, but excluding Portland. The heaviest rain fell along the axis of the South Dorset Ridgeway, particularly in an area south-west of Dorchester where the fall may have reached 2 inches. The nearest station, Queen's Avenue, recorded 1.73 inches. Between Corfe Castle and Swanage the fall was 1½ inches, causing considerable flooding. Dorchester had further heavy rain when the cold front passed through on the following day. The combined fall for the 2 days at the Waterworks was 2.86 inches.

June 1st

At midday a depression of 1,000 millibars lay to the west of Biscay, with a warm front along the north coast of France. During the following 24 hours the depression drifted northwards to a position west of Ireland and the warm front moved north across England and Wales, followed by a cold front which brought severe thunderstorms and outbreaks of heavy rain. In Dorset the heaviest falls were 1.73 inches at Lyme Regis and 1.67 inches at Hurn, which included a noteworthy .71 inch within a period of only 10 minutes. Portland, Weymouth and Upwey had over an inch of rain (1.26 inches at Friar Waddon), as did the country north-west of Dorchester (1.25 inches at Wraxall). However, large areas of Dorset had less than half an inch while Bridport and Bryanston reported no rain at all.

September 19th

Within the circulation of an old depression centered over Iceland a vigorous secondary formed south-west of Ireland. This moved north-east towards Scotland, deepening rapidly and causing severe gales and heavy rain. In Dorset the rain fell during the afternoon and evening and was accompanied by thunderstorms. Almost the whole county had over an inch of rain, and at many stations it was the wettest day of the year. Minterne's fall of 1.92 inches was the highest daily fall at any Dorset station in 1981.

Rainfall Stations

The gauge at Netherbury was moved 250 yards from The Garden House to Virginia Cottage on June 22nd, 1981. The new site is at SY 470991 and is 145 feet above MSL.

The station at Cattistock (Lankham House) is at SY 595996, 384 feet above MSL.

Weymouth (Westham) is at SY 661796, 65 feet above MSL.

Rainfall in Dorset 1981

STATION	OBSERVER OR AUTHORITY	Greatest Fall in 24 hours		Days with .01 in. or more	Days with 1 in. or more	DEPTH OF RAINFALL IN INCHES												Total for Year
		Depth	Date			Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	
Abbotsbury (Rodden Row)	Miss A. M. Hutchins	1.30	19/9	180	3	2.15	2.31	6.26	2.56	3.97	1.74	1.90	.44	5.90	3.66	1.59	4.53	37.01
Beaminster (East Street)	W. A. Stiby	1.28	19/9	169	6	2.04	3.28	6.99	1.85	4.51	2.03	2.66	1.16	7.44	4.50	1.92	6.43	44.81
Blandford (Bryanston)	Miss A. M. Jaques	1.54	19/9	171	2	1.49	1.85	5.94	1.68	4.47	1.28	2.58	1.10	7.35	3.94	1.79	6.08	39.55
Blandford (Tarrant Rawston)	J. H. Cossins	1.62	19/9	180	3	1.68	2.35	6.22	2.14	4.55	1.64	2.49	.60	7.29	4.17	2.01	5.81	40.95
Bournemouth (Alderney Reservoir)	B'mouth & Dist. Water Co.	1.41	19/9	159	1	1.16	2.19	5.31	1.79	4.35	1.74	1.48	.27	5.56	3.38	1.60	4.82	33.65
Bournemouth (Hurn Airport)	Met. Office	1.67	1/6	172	3	1.17	2.15	4.76	1.85	4.06	2.67	1.64	.28	5.90	3.49	1.43	4.71	34.11
Branksome (Bourne Valley)	Southern Gas	1.31	19/9	147	1	1.03	1.61	4.86	1.89	3.64	1.54	1.51	.25	5.34	4.08	1.35	4.08	31.18
Bridport (Bradpole)	G. R. Smith	1.49	26/9	143	4	2.04	3.13	7.01	1.86	4.42	2.02	1.96	1.48	6.66	4.52	1.89	5.45	42.44
Bridport (North Chideock)	H. J. F. Smith	—	—	—	—	1.92	2.84	5.75	1.06	3.61	1.76	2.33	.71	5.65	4.18	1.78	4.87	36.46
Buckland Newton (Brockhampton Gate)	Major A. M. Hall	—	—	—	—	1.51	2.49	5.23	1.45	4.48	1.68	2.51	.54	(6.79)	4.52	1.79	5.02	(37.71)
Cattistock (Lankham House)	J. F. Willows	1.43	19/9	190	6	1.70	3.00	7.31	1.79	4.64	2.52	2.30	.82	6.90	4.98	2.02	5.23	43.19
Charminster (Forston Pumping Station)	Wessex Water	—	—	—	—	1.98	2.04	9.33	2.02	4.23	2.53	1.52	1.04	7.03	4.29	1.94	5.14	43.07
Charmouth (Sewage Works)	Wessex Water	1.41	20/12	153	3	2.29	2.74	6.59	1.88	4.63	1.73	1.48	1.30	4.77	4.27	1.60	5.51	38.76
Dewlish (Parsonage Farm)	M. Britton	1.44	19/9	137	2	2.09	2.93	8.44	1.54	4.67	2.11	2.17	.22	6.81	3.76	2.18	3.73	40.65
Dorchester (Queen's Avenue)	Miss A. M. Yeatman	1.73	9/3	173	3	2.46	2.18	8.02	2.04	4.30	2.65	2.49	.38	6.76	4.65	2.41	4.01	42.35
Dorchester (Waterworks)	Wessex Water	—	—	—	—	2.41	1.80	9.33	2.18	4.70	2.63	1.33	.59	7.40	4.29	2.41	4.55	43.61
Dorchester (Weatherbury Way)	J. R. Oliver	1.65	9/3	175	6	2.36	2.90	7.95	2.13	4.59	2.70	1.67	.34	7.62	4.78	2.34	4.77	44.15
Forde Abbey	G. D. Roper	1.60	5/8	145	6	1.77	3.33	5.72	1.78	5.35	1.88	1.72	1.75	5.66	3.16	1.52	7.51	41.15
Leigh (Denbury House)	Lt.-Col. B. H. T. Barlow-Poole	1.00	27/2	145	—	1.98	3.29	5.23	1.42	4.10	1.68	2.00	.42	5.54	3.83	1.99	5.13	36.61
Lyme Regis (Pinhay), Devon	Mrs. Allhusen	1.73	1/6	169	5	2.65	2.71	6.31	1.99	5.29	2.73	2.51	1.40	5.53	4.74	1.77	5.58	43.21
Maiden Newton (Wraxall, Manor Farm)	Lt.-Col. J. T. A. Wilson	1.63	19/12	171	7	1.70	3.47	7.68	1.52	4.35	2.58	1.33	2.56	7.20	6.56	2.85	7.42	49.20
Mapperton	V. Montagu	1.28	19/9	176	5	2.12	2.98	7.20	1.00	4.46	2.24	2.88	1.39	7.53	4.18	1.85	5.09	42.91
Marnhull (Great Down Lane)	Mrs. E. M. Payne	.94	19/9	197	0	2.18	1.66	5.19	1.37	3.25	1.16	2.61	.63	5.01	3.37	1.93	4.32	32.68
Milborne St. Andrew (Pumping Station)	Wessex Water	—	—	—	—	1.63	1.48	7.66	1.94	3.99	1.85	1.99	.58	7.95	3.48	2.72	5.03	40.31
Minterne	The Lord Digby	1.92	19/9	165	8	1.77	3.07	7.52	1.78	5.04	2.43	2.46	.69	8.26	5.47	2.42	5.52	46.43
Netherbury (The Garden House/Virginia Cottage)	J. K. Newsom Davies	1.16	19/9	178	3	2.08	3.06	6.56	1.65	4.56	2.01	3.06	.80	6.58	4.60	1.85	5.67	42.47
Okeford Fitzpaine (Pumping Station)	Wessex Water	1.71	19/9	184	2	1.78	1.91	5.67	1.76	4.24	1.13	2.49	.44	6.86	3.37	1.97	5.20	36.81
Parkstone (Grammar School)	Met. Society	1.24	19/9	173	2	.83	2.07	6.66	3.74	3.38	.85	1.71	.54	4.45	3.40	1.39	3.93	32.94
Parkstone (Lilliput)	R. J. O. Crew	1.18	19/9	173	2	1.12	1.82	4.01	1.89	3.48	1.58	1.09	.35	4.70	3.73	1.25	4.67	29.69
Poole (Pitwine's Gasworks)	Southern Gas	—	—	—	—	1.02	1.67	5.67	1.99	3.40	1.59	1.59	.39	5.20	3.74	1.50	4.78	32.54
Portland (Royal Naval Air Station)	Met. Office	1.15	1/6	161	1	1.65	1.61	4.04	1.47	3.30	1.83	.98	1.01	4.52	2.65	1.11	3.70	27.88
Portland Bill	HM Coastguard	1.15	1/6	144	1	1.55	1.88	4.60	1.50	3.19	2.00	1.08	.53	3.68	2.74	1.68	4.37	28.79
Shaftesbury (Coombe Hill), Wilts.	P. S. Cooper	1.58	20/12	170	3	1.75	1.80	4.84	1.13	3.46	1.20	3.69	.64	5.01	3.14	1.74	5.45	33.85
Shillingstone (Green Hills)	E. Nimmo	1.74	19/9	175	3	1.58	1.87	5.38	1.68	4.20	1.20	2.80	.35	7.39	3.55	1.77	5.37	37.13
Sutton Poyntz (Pumping Station)	Wessex Water	—	—	—	—	2.09	1.39	7.83	1.98	3.89	2.34	1.74	.90	6.46	4.16	1.73	3.97	38.47
Swanage	K. Moore	1.52	9/3	167	3	1.59	1.86	6.22	1.54	3.43	1.42	2.62	.31	6.25	4.24	1.34	3.67	34.49
Upwey (Friar Waddon)	Wessex Water	—	—	—	—	2.46	1.62	8.17	1.87	4.33	2.66	1.30	.67	6.75	4.16	1.68	5.96	41.63
Wareham (East Stoke, River Laboratory)	J. Morgan	1.59	25/9	184	4	1.63	2.62	6.93	1.56	5.21	2.14	2.07	.28	7.14	4.11	1.67	4.28	39.62
Wareham (Trigon)	G. P. Sturdy	1.48	25/9	—	5	1.36	2.27	6.02	2.02	3.17	1.68	1.61	.30	6.75	4.18	1.55	4.45	35.36
West Knighton (Empool Pumping Station)	Wessex Water	—	—	—	—	2.05	2.64	6.74	1.86	3.94	2.04	2.06	.52	7.07	4.20	1.74	4.20	39.03
Weymouth (Cranford Avenue)	H. F. Middleton	1.19	9/3	152	2	1.92	2.26	5.54	2.02	3.46	2.01	1.09	.54	5.71	3.76	1.18	4.07	33.56
Weymouth (Westham)	C. W. Jarrams	1.13	19/9	172	3	2.15	1.81	5.59	1.79	3.67	2.20	1.06	.61	5.43	3.00	1.32	4.08	32.69
Wimborne (Corfe Mullen, Central Avenue)	A. H. Dunn	1.48	20/9	186	1	1.35	2.26	5.86	1.34	4.36	1.82	1.99	.44	6.45	3.44	1.89	5.16	36.36
Wimborne (Corfe Mullen Pumping Station)	Wessex Water	1.44	20/9	170	1	1.22	2.14	5.66	1.54	3.78	1.65	1.63	.73	5.00	4.31	1.74	5.18	34.56
Wimborne (Stanbridge Mill Pumping Station)	B'mouth & Dist. Water Co.	—	—	—	—	1.45	1.76	4.84	1.99	3.75	1.34	2.01	.45	5.98	3.22	1.83	4.38	32.99
Wimborne (Walsford Bridge Pumping Station)	B'mouth & Dist. Water Co.	1.46	19/9	178	2	1.22	1.82	5.05	1.77	3.92	1.67	2.50	.38	5.76	3.44	1.60	4.87	34.00
Winfrith (Atomic Energy Establishment)	D. C. Fraser	1.44	9/3	161	7	1.80	2.70	7.25	1.79	3.69	1.96	1.99	.33	6.78	4.05	1.68	4.86	38.86
Yetminster (The Mill House)	R. M. Clarkson	1.19	19/9	161	1	1.37	2.27	4.67	1.09	3.75	1.48	1.85	.60	4.90	3.51	1.56	4.44	31.54
AVERAGE FOR THE COUNTY				168	3	1.76	2.31	6.28	1.78	4.11	1.90	1.99	.69	6.22	3.98	1.78	4.94	37.73

DORSET GEOLOGY IN 1981

PAUL C. ENSOM

Dinosaur Footprints at 19 Townsend Road, Swanage

The Purbeck Beds of Dorset are renowned for the variety of vertebrates which have been recorded. Tracks of some groups are also known, especially the heavy dinosaurs. Delair (1960, 1963, 1966, 1982), Delair and Lander (1973), and Walkden and Oppé (1969) have reviewed the occurrence of *Ichnites* spp.

In late July, 1981, dinosaur footprints were discovered on a building site at 19 Townsend Road, Swanage (NGR SZ 0265 7835). The horizon is tentatively identified as 'Laning Vein', Purbeck Limestone Formation. The discoverer and owner of the site, Mr. D. W. Selby, gave permission for a full excavation. An area of *c.* 120 m^2 was cleared of overburden and other debris. This revealed a lower bedding plane with trackways present, and the remains of an overlying surface also with tracks. When excavations on the site were completed, four horizons with tracks had been recognised, and a fifth was hinted at. These were present in a vertical sequence of *c.* 0.332 m. A total of 170 recognisable footprints were recorded. The majority of these prints were tridactyl. Two distinctive species were recognised on the main surface, though the uppermost layer showed variations which at present suggest an additional two species. Further research may well show these to be transmitted prints from a still higher level.

Footprints of *Megalosaurus* sp. and *Iguanodon* sp. are thought to be represented on the site. The trackways formed on layers of waterlaid, bioclastic, calcareous sediments. Periodic dessication is deduced from the presence of mudcracks in the lime-mud. The trackways show no predominant direction. A full account of this discovery will be given in due course.

***Ichnites* spp. from Worbarrow Tout, near West Lulworth**

While examining Mr. P. A. Brown's earlier discovery of dinosaur footprints on Worbarrow Tout (NGR SY 869 796) (Delair and Brown, 1975), Mr. T. Haysom discovered a fallen block of bivalve biosparite with two natural casts of footprints. One, a better formed example, was of a distinctive tridactyl form. Mrs. J. Thomas, Mrs. C. Brown, and the writer examined the section and established with reasonable certainty the horizon from which the block had fallen. The thickness of the block (excluding the footprints) and its lithology correlate well with a group of limestones approximately one-third of the way up the Tout, which showed evidence of being the source of the fresh fall of limestone in which the footprints were found. The limestone is 5.96 m above the top of the 'Cinder Bed'. The casts on the block are similar to prints currently assigned to the carnivorous dinosaur *Megalosaurus* sp. The best-preserved footprint protrudes 0.11 m from the lower surface of the limestone. The preservation leads one to conclude that bioclastic debris filled depressions produced by a dinosaur walking over poorly consolidated shelly sediment, as suggested by Walkden and Oppé (*op. cit.*). The surface upon which the dinosaur walked is poorly cemented thus producing the very clean separation noted on this block. The size of the cast is *c.* 0.26 m (extremity of central digit to heel) and 0.2 m (between tips of lateral digits).

The earlier discovery of footprints (Delair and Brown *op. cit.*) was tentatively but incorrectly assigned to bed no. 6 of Arkell (Arkell, 1947, p. 302), a bed 2.1 m above the Portland Stone Shrimp Bed. This earlier determination is corrected in general terms by Delair (1982) though more specifically these prints should be recorded as 0.92 m above the top of the 'Cinder Bed'. They are different from the prints on the fallen slab, and may have been produced by *Iguanodon* sp. (Delair *op. cit.*). A combined operation by the Army and Navy led to the recovery of the block. It is to be displayed at Tyneham (Acc. No. DCM: G.866).

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BOTANY

J. M. FITZPATRICK

This list of rare, occasionally recorded, or interesting species of plants has been kindly abstracted from the Dorset Environmental Records Centre, at the County Museum, by their staff. They are records, mostly of flowering species, from localities new to the centre in 1981. As in recent previous reports, in some cases these records may not have been fully checked. Grateful thanks are due to the increasing number of contributors but especially to M. E. Barnsdale (M.E.B.), C. Bass (C.B.), Rev. Beddow (Rev. B.), Dr. H. Bowen (H.B.), J. Bowyer (J.B.), R. Burden (R.B.), M. Evelyn (M.E.), A. Horsfall (A.H.), Mr. Hughes (Mr. H.), V. Jesty (V.J.), M. Leadbetter (M.L.), E. J. Lenton (E.J.L), J. Nall (J.N.), B. A. Neal (B.A.N.), A. Newton (A.N.), B. Pickess (B.P.), H. C. Prentice (H.C.P.), B. Robinson (B.R.), R. M. Wallis (R.M.W.), and P. Waton (P.W.).

Azolla filiculoides Lam. (a naturalised water fern)
- Waddock's Cross — V.J.
- Stanpit — J.B.
- West Stafford — E.J.L.

Ophioglossum vulgatum L. (Adder's Tongue Fern)
- Yetminster — A.N.

Juniperus communis L. (Juniper)
- Martin Down — A.H.

Myosurus minimus L. (Mouse Tail)
- Wareham — A.H.

Aquilegia vulgaris L. (Columbine)
- Fiddleford — J.N.

Sagina ciliata Fr. (Ciliate Pearlwort)
- Bindon and Lulworth — H.B.

Illecebrum verticillatum (Knotgrass)
- Last recorded in Dorset 1792 now in east of county — H.C.P.

Atriplex glabriuscula Edmondst. (Babington's Orache)
- Bindon — H.B.

Vicia sylvatica L. (Wood Vetch)
- Buckland Newton — A.H.

Rosa pimpinellifolia L. (Burnet Rose)
- Eight new coastal localities

Callitriche stagnalis Scop. (Mud Water Starwort)
- Cranborne — H.B.
- St. Gabriel's — J.N.

Thesium humifusum DC (Bastard Toadflax)
- Gussage — A.H.

Hippuris vulgaris L. (Mare's Tail)
- Didlington — A.H.

Foeniculum vulgare Mill. (Fennel)
- Bindon — H.B.

Polygonium bistorta L. (Bistort)
- Puddletown — R.B.

Fagopyrum esculentum Moench. (Buckwheat)
- Charmouth and Whatcombe — C.B.

Urtica urens L. (Small Nettle)
- Badbury Rings — A.H.

Myosotis ramosissima Rochel (Early Forget-me-not)
- Knowlton — B.R.

Datura stramonium L. (Thorn Apple)
- Rempstone — M.E.B.

Lathraea squamaria L. (Toothwort)
- Godlington — R.B.
- Ashmore — A.H.

Rubia peregrina L. (Madder)
- Purbeck — R.B.

Bidens cernua L. (Nodding Bur-Marigold)
Melbury H.B.
Bidens tripartia L. (Bur-Marigold)
Stanpit M.E.
Doronicum pardalianches L. (Leopard's Bane)
Halstock Rev. B.
Carduus tenuiflorus Curt. (Slender-flowered Thistle)
Purbeck R.B.
Onopordum acanthium L. (Scottish Thistle)
Forde Abbey H.B.
Platanthera chlorantha (Custer) Reichb. (Butterfly Orchid)
Godlingston P.W.
Ophrys apifera Huds. (Bee Orchid)
Yetminster M.L.
Rhyncospora fusca (L.) Ait. f. (Brown-beaked Sedge)
Holt and Hern H.C.P.
Carex lepidocarpa Tausch.
Moors River R.M.W.
Carex acutiformis Ehrh. (Lesser Pond Sedge)
Tadnoll A.H.
Carex disticha Huds (Brown Sedge)
Woodsford A.H.
Tadnoll A.H.
Carex curta Good (White Sedge)
Arne B.P. & Mr. H.
Agrostis gigantea Roth. (Common Bent)
Weymouth J.N.
Abbotsbury B.A.N.
Apera spica-venti (L.) Beauv. (Silky Bent)
Sherborne Rev. B.

MARINE INVERTEBRATES

J. B. HAWTHORNE

The Wildlife and Countryside Bill completed its passage through Parliament during 1981. As first published by the Government it contained no reference to marine nature reserves, but an amendment passed in the House of Lords led to legislation being included which enables the Nature Conservancy Council (NCC) to establish statutory national marine nature reserves. The inclusion of this provision reflects the effectiveness of the lobbying which took place to convince Government Departments that marine reserves would be of general benefit and need present no responsible user of the sea with any threat. A statutory reserve will only be possible with the agreement of a wide range of users, and any bye-law affecting fisheries will be made by fisheries authorities themselves. It must now be hoped that Government will provide the relatively small amount of finance necessary to establish a few statutory marine reserves, and that NCC will ear-mark sums for marine conservation annually. Dorset continues to contribute to the national scene through the success of the voluntary Purbeck Marine Wildlife Reserve.

The last account in these notes of organisms washed up by storm action on Weymouth Beach was for February, 1976, in Vol. 98. The following records are for 14th December, 1981, and indicate that many of the animals may have been dislodged from rocks near the Stone Pier. Frost action resulted in most of the animals being in poor condition.

Calliactis parasitica – most were solitary and all were moribund.
Sagartia sp. – one specimen recovered when placed in an aquarium.
Amphitrite edwardsi – a single damaged specimen.
Nereis fucata – several present in hermit crab *Buccinum* shells. One collected specimen made a U-shaped tube of mucus between a stone and the side of an aquarium, where it has lived for nine weeks.
Pectinaria koreni – one half-grown specimen.
Pomatoceros triqueter – epizoic on *Buccinum undatum* and *Cancer pagurus*.

Balanus crenatus (?) – epizoic on *B. undatum*.
Cancer pagurus – many dead edible crabs, some of marketable size.
Carcinus maenas – most were dead; the largest was 8.3 cm across its carapace.
Corystes cassivelaunus – many masked crabs were stranded. All were dead and most were adult. Some of the females were in berry.
Eupagurus bernhardus – most were dead. Six live hermits in *Buccinum* shells placed in an aquarium soon expired: one was a male, one of the four females was in berry, and one was a juvenile regenerating its pincers.
Galathea squamifera – many dead specimens. The largest found had a carapace length of 2.3 cm.
Maia squinado – many large spider crabs, all dead.
Pinnotheres sp. – a live pea crab was found in a live cockle, *Cardium edule*.
Portunus depurator – many dead, damaged specimens.
P. puber – many specimens, all dead.

Anomia ephippium – numerous live specimens on *Buccinum* shells. One small specimen was attached to a pincer of an edible crab, *Cancer pagurus*.
Buccinum undatum – a few live adult whelks and one small eggs mass.
Cardium aculeatum/tuberculatum (?) – live specimens of 4 or 5 cm in length with spines or tubercles abraded as is usual at Weymouth.
Cardium edule – one live specimen, 4 cm long. It contained a pea crab, *Pinnotheres* sp.
Chlamys opercularis – one live specimen, 4 cm long, with a pink mottled shell.
Crepidula fornicata – slipper limpets were at the south end of the beach.
Gibbula magus – a single live specimen.
Lutraria lutraria – fresh dead specimens of 3 cm, 8 cm and 12.5 cm length.
Mactra corallina – live specimens 1.8 cm and 5.0 cm long.
Patina pellucida – one juvenile on a fragment of *Ensis* shell.
Solen marginatus – one broken, fresh dead.
Venerupis pullastra – a few live specimens.

Echinus esculentus – one specimen, 10 cm diameter, broken open, fresh dead.

Ascidiella aspersa – very common, mostly alive.
Phallusia mammillata – several live specimens growing in a single mass with other sea squirts, including *A. aspersa*.

Shells, apparently of recent origin, included *Ensis ensis* and *E. siliqua*.

The edible sea urchin, Echinus esculentus, is most noteworthy. The very rich seaweed flora of east Dorset waters reflects the general lack of this species which grazes algae from the sub-tidal rock surfaces. If specimens were able to breed successfully off the east Dorset coast – in the region of warm water effluent from a power station, for instance – numbers may rise dramatically and have widespread effects on the sub-tidal ecology of the area.

LEPIDOPTERA

ALAN T. BROMBY

Fewer records than usual were received for 1981, presumably reflecting the cool and wet summer.

The records of *Danaus plexippus* for 28th September are of particular interest, very possibly plotting the movement inland of a single individual immigrant.

Observations were received from the following field workers: Dr. A. Allen, D. N. Arnold, A. T. Bromby, Miss M. Clay, J. R. Cox, I. Cooper, A. H. Dunn, Milton Abbey School Natural History Society, Mrs. M. Pike and A. J. Wise.

Colias croceus Fourc. Common Clouded Yellow. Bindon Hill, 17.8. and Delcombe, 7.9. (M.A.S.N.H.S.). Brownsea, 12.8. (A.J.W.). Studland, 16.8. (J.R.C.).
Danaus plexippus L. Milkweed. Chapman Pool, 28.9. (I.C.). Studland, 28.9., north-west (J.R.C.). Brownsea, 28.9., flying north (A.T.B.). Very possibly the same individual. Bournemouth, mid-Sept. (M.P.).
Limentitis camilla L. White Admiral. Stour Row, 3 on 17.7. (M.A.S.N.H.S.). Brownsea, 4 records only this year (A.J.W.).
Vanessa cardui L. Painted Lady. Bindon, 18.8. Milton Abbey, 22.8. (M.A.S.N.H.S.).

Polygonia c-album L. Comma. Stour Row, 9.4. Milton Abbey, 26.8. (M.A.S.N.H.S.). Radipole, maximum of 6 per day in early October (D.N.A.). Throop, 9 recorded in late summer (M.C.).
Argynnis paphia L. Silver-washed Fritillary. Stubhampton Bottom, 2 on 17.7. Morden, 9.8. (A.H.D.).
Clossiana selene Schiff. Small Pearl-bordered Fritillary. Stour Row, 17.7. and Milton Abbey, 27.7. (M.A.S.N.H.S.).
Deilephila elpenor L. Large Elephant Hawk. Brownsea, Lavae, 29.8. (A.A.). Radipole, 11 between 1.6. and 16.6. (D.N.A.).
Hemaris fuciformis L. Broad-bordered Bee Hawk. Brownsea, 20.7. (A.J.W.).
Harpyia furcula Clerck. Sallow Kitten. Radipole, 2 between 18.8. and 25.8. (D.N.A.).
Stauropus fagi L. Lobster Prominent. Milton Abbey, 2.6. (M.A.S.N.H.S.). Radipole, 9.7. (D.N.A.).
Odontosia carmelita Esp. Scarce Prominent. Milton Abbey, 7.5. (M.A.S.N.H.S.).
Lymantria monacha L. Black-arched Tussock. Brownsea, larvae on *Quercus ilex* 25.5. (A.A.).
Trichiura crataegi L. Pale Eggar. Stour Row, Sept. (M.A.S.N.H.S.). Radipole, 2 between 6.9. and 9.9. (D.N.A.).
Gastropacha quercifolia L. Common Lappet. Milton Abbey, July (M.A.S.N.H.S.). Radipole, 15.7. (D.N.A.).
Nola cucullatella L. Short-cloaked Black Arches. Stour Row, August (M.A.S.H.N.S.).
Procris geryon Hubn. Cistus Forester. Milton Abbey, 9.7. (M.A.S.N.H.S.).
Agrostis clavis Hufn. Heart and Club. Radipole, 14.7. and 15.7. (D.N.A.).
Agrotis ipsilon Hufn. Dart Dart. Radipole, 30 between 5.4. and 28.9. (D.N.A.).
Diarsia brunnea Schiff. Purple Clay. Milton Abbey, 1.7. (M.A.S.N.H.S.).
Anaplectoides prasina Schiff. Green Arches. Milton Abbey (M.A.S.N.H.S.).
Lampra fimbriata Schreber. Broad-bordered Yellow-underwing. Radipole, 3 between 27.8. and 7.9. (D.N.A.).
Polia nitens Haw. Pale Shining Arches. Milton Abbey, 18.6. (M.A.S.N.H.S.).
Orthosia miniosa Schiff. Blossom Underwing. Milton Abbey, 2.4. (M.A.S.N.H.S.).
Orthosia munda Schiff. Northern Drab. Stour Row, 8.4. (M.A.S.N.H.S.).
Nonagria geminipuncta Haw. Twin-spot Wainscot. Radipole, 13.8. (D.N.A.).
Caradrina ambigua Schiff. Vine's Rustic. Radipole, 8 between 20.8. and 29.8. (D.N.A.).
Cosmia trapezina L. Dun-bar. Brownsea, larvae 25.5. (A.A.). Milton Abbey, 9.8. (M.A.S.N.H.S.). Radipole, 20 between 8.8. and 12.9. (D.N.A.).
Zenobia subtusa Schiff. Olive Kidney. Milton Abbey, 9.8. (M.A.S.N.H.S.).
Apatele alni L. Alder Dagger. Milton Abbey, 2.6. (M.A.S.N.H.S.).
Craniophora ligustri Schiff. Crown. Milton Abbey, several in July (M.A.S.N.H.S.).
Lithophane socia Hufn. Pale Pinion. Milton Abbey, 3.11. (M.A.S.N.H.S.).
Lithophane leautieri Boisd. Blair's Pinion. Brownsea, larvae abundant 25.5. (A.A.).
Brachionycha sphinx Hufn. Common Sprawler. Milton Abbey, 13.11. (M.A.S.N.H.S.).
Eumichtis lichenea Hubn. Feathered Ranuncule. Radipole, 10 between 28.9. and 2.10. (D.N.A.).
Eupsilia transversa Hufn. Satellite. Milton Abbey, 7.3. (M.A.S.N.H.S.).
Dasypolia templi Thunb. Brindled Ochre. Milton Abbey, 2 on 3.11. (M.A.S.N.H.S.).
Tiliacea citrago L. Orange Sallow. Brownsea, larvae, 25.5. (A.A.).
Catocala nupta L. Red Underwing. Radipole, 23.9. (D.N.A.). Corfe Mullen, 15.8. (A.H.D.).
Colocasia coryli L. Nut-tree Tuffet. Milton Abbey, 30.4. (M.A.S.N.H.S.).
Episema caeruleocephala L. Figure of Eight. Milton Abbey, larvae, 23.4. (M.A.S.N.H.S.).
Perizoma flavofasciata Thunb. Sandy Carpet. Milton Abbey, 13.6. (M.A.S.N.H.S.).
Lyncometra ocellata L. Purple Bar Carpet. Milton Abbey, 23.6. (M.A.S.N.H.S.).
Horisme tersata Schiff. Fern Carpet. Milton Abbey, 1.7. (M.A.S.N.H.S.).
Apeira syringaria L. Purple Thorn. Radipole, 2 on 10.7. (D.N.A.).

FISH REPORT 1981

MIKE LADLE

1981 was a rather uninspiring year as far as reports of fish from Dorset were concerned. A number of rivers in the area were apparently blessed with an unusually large run of spring salmon. These are the bigger fish, often of 20 lbs. (10 kg) weight, which have spent three or more years at sea before returning to the river of their birth. As the season progresses the returning fish are (more or less) of progressively decreasing sizes. The survival strategy of the species is based on the principal of not putting all its eggs in one basket.
In Dorset rivers, salmon spawn in the winter. On the lower reaches of the River Frome, at least, the cutting of redds (nest excavation) by the female fish seems to commence just before Christmas and to continue for several weeks. The fish spawn on gravelly shallows ranging from just upstream of the tidal reaches up to quite small tributaries.
The young fish spend one or more years in the river feeding and growing slowly before they become smolts. In the River Piddle the smolts migrate downstream to the sea on sunny warm afternoons in the spring (Solomon, 1978).

MARINE FISHES

Centrachidae
Dicentrarchus labrax (L.). Numerous bass of 8 to 10 lbs. weight were reported from the shores between Chapman's Pool and Lulworth from May to November.

Mugilidae
Crenimugil labrosus (Risso). Once again thick lipped grey mullet were numerous.
Other fish reported included Conger Eel, Smooth Blenny, Black Goby, Pollack, Pouting, Poor Cod, Cod, Flounder and Plaice.

FRESHWATER FISHES

No unusual freshwater fish were reported in 1981.

REFERENCE

Solomon, D. J. (1978), 'Some Observations on Salmon Smolt Migration in a Chalkstream', *J. Fish Biol.*, **12**, 571-574.

AMPHIBIANS

ROBERT V. SKINNER

Smooth Newt. *Triturus vulgaris* L.
A colony of adults seen in a garden pool in Widdicombe Avenue, Parkstone, on 5th June (A. H. Dunn). A strange record from 'The Three Bells' inn at Burton Bradstock on the 18th September where one specimen was observed scrambling over the bar telephone! (Heritage Coast Team).

Palmate Newt. *Triturus helveticus* Razoumoski.
About 60 were counted on Turnerspuddle Heath on the 11th May (Mrs. A. Russell).

Common Frog. *Rana temporia* L.
One specimen observed in a garden pool in Corfe Mullen on 17th January. Several more seen in the same pool on 6th, 8th and 10th March and spawn on 12th March. Good colony seen in a garden pool at Winterbourne Stickland on 10th April (A. H. Dunn). Sightings recorded in a garden at the Old Mill House, Yetminster (596103) during 1981 (M. Leadbetter). Found to be breeding at Kingsbere Crescent, Dorchester (6989) in 1981 (E. Keats). Recorded in a garden pond at Corfe Mullen (9996) in June (D. Lee).

Common Toad. *Bufo bufo* L.
Twenty-four specimens counted in a garden pool in Widdicombe Avenue, Parkstone on 12th March. Colonies and spawn observed in the pools of three gardens in Corfe Mullen/Broadstone area between 23rd March and 1st April (A. H. Dunn). Heard calling on Studland Heath, NNR from at least two different sites on 12th March (J. R. Cox). A small garden pond created at Briantspuddle three years ago has attracted both frogs and toads. Neither had been seen for about 10 years before the pond was built. Frog sprawn appeared in the pond for the first time this year (Mrs. A. Russell). The species was present in a garden pond in June at Corfe Mullen (D. Lee).
Also recored in a garden pond in Dorchester (Rev. K. Sawyer). Twice recorded from map reference 8888 and once from 8989 (P. Sturdy).

Edible Frog. *Rana esculenta* L.
Spawn was introduced into a garden pool in Corfe Mullen several years ago from a garden in Amersham, Buckinghamshire. On the 14th March spawn from this species was found in a garden pond in Corfe Mullen and seven or eight adults were seen on 29th April and the 13th May (A. H. Dunn).

REPTILES

ROBERT V. SKINNER

Viviparous Lizard. *Lacerta vivipara* Jacquin.
One seen on Turnerspuddle Heath on 11th May (Mrs. A. Russell). On Studland Heath NNR the first sighting was of three specimens on 8th March (L. T. Howells and S. M. Guy). Six individuals were recorded on 12th March. This species was very under recorded on the reserve but the numbers noted appear to be similar to those of the previous year (J. R. Cox).
A specimen recorded at Durlston Country Park (0377) on 3rd July (R. W. Small). Also recorded from Puddletown in August (Rev. K. Sawyer). Another observation was from a garden in Bothenhampton (472 918) on 2nd August (M. R. Jellicoe). Three individuals were seen at map references 8988, 8789 and 8989 during the year (P. Sturdy).

Sand Lizard. *Lacerta agilis* L.
A female seen on Corfe Mullen Common on 13th May, again on 28th May and another on 8th July (A. H. Dunn). The first record from Studland Heath NNR was for an adult male on 6th March (J. R. Cox). At least 12 juveniles were seen on one bank on 18th October (J. R. Cox and L. T. Howells). The last record was for one juvenile on Studland Heath on the 9th November (J. R. Cox). One record for map reference 8891 (P. Sturdy).

Slow Worm. *Anguis fragilis* L.
One adult recorded at Stoney Down, Corfe Mullen on 12th March. Another seen on Corfe Mullen Common on 1st April and a second on 29th April. On 10th July a specimen was seen at Stoney Down and on 5th August one was found in a garden at Widdicombe Avenue, Parkstone. On 19th August three were removed from a building site to heathland at Corfe Mullen (A. H. Dunn). Two adults and two young were seen near Wareham on 3rd June (Mrs. A. Russell). A freshly killed, tail-less specimen was found on Studland Heath on 22nd February (L. T. Howells and J. R. Cox). The first live record was for five individuals on 8th March (L. T. Howells and S. M. Guy). In all, only 20 noted on the Studland Heath NNR for the year, including one blue spotted form, which indicates under recording for this species. Three dead specimens were found during the year. The last record for Studland Heath was for one individual on the 3rd October (P. L. Darley). A record of the species being found in old stone walls at Yetminster (593109) was dated 5th August (A. Newton). A specimen was seen at mid-day under trees in Milborne Wood (786968) on 10th April (R. Burden).

Grass Snake. *Natrix natrix* Lacepède.
One found in a garden in Broadstone on 22nd May and another in a garden in Corfe Mullen in June (A. H. Dunn). More individuals were recorded for Studland Heath this year, the total being 37. Three were found dead. The first record was on 1st March (J. R. Cox and P. M. Donovan). Twelve were seen on the 12th March and the last record was on 21st September (J. R. Cox). One specimen was observed at Puddletown (ST79) in August (Rev. K. Sawyer).
Another was seen near East Bridge, Bridport (4792) on grass near a tributary of the River Asker on 10th April (M. R. Jellicoe). A sighting at map reference 8988 was made during the year (P. Sturdy).

Smooth Snake. *Coronella austriaca* Laurenti.
Three adults seen during the last week of July and a single individual seen on 19th August, all in the Corfe Mullen area (A. H. Dunn). A doubtful record of one being found in a garden in West Lulworth on 27th April (G. Duncan). Another seen on Forestry Commission land at Stoney Down during the year (J. Arnold).

Adder. *Vipera berus* L.
Two adults seen in Delph Woods, Broadstone on 27th April. One female observed at Blagdon Gap, Cranborne, on 5th August. Another adult female of red colouration seen on Corfe Mullen Common on 19th August (A. H. Dunn). Approximately the same number recorded on Studland Heath as last year which amounted to about 60. The first sighting was of two seen on the 1st March. Nineteen individuals were observed on 12th March. Last recorded at Studland Heath on 25th September when one was seen lying in a woodland clearing and being 'sworn at' by three Willow Warblers from a distance of about two feet (J. R. Cox). A sighting was made in gorse scrub at East Creech (930822) on 2nd July and another at Durlston Head Country Park (0377) on 3rd July (R. W. Small). An adult and six young seen in Puddletown Woods (ST79) in August and a single individual was seen about 20 yards from the pond on Powerstock Common (5497) in July (Rev. K. Sawyer). Another single observation was made at map reference 8889 during the year (P. Sturdy).

SUMMARY OF THE DORSET BIRD REPORT 1981

G. P. GREEN

The 1981 Bird Report will be published in mid-June as a separate part of *Proceedings* Vol. 103. It will contain an introduction, a list of rare and scarce birds requiring descriptions, a list of BTO Common Bird Census areas, a list of contributors, the systematic list, a summary of wildfowl counts, reports on the BTO Common Bird Census and BTO Winter Bird Census, descriptions and photographs of rare birds, the ringing and recovery reports and, in addition, there will be a paper on the BTO Nightjar Survey 1981.
It is only possible to mention briefly some of the more noteworthy ornithological aspects of 1981. Amongst those species which have bred occasionally or erratically in recent years there were breeding reports for Great Crested Grebe, Gadwall, Pochard, Quail, Corncrake, Long-eared Owl, Redstart, Wheatear, Wood Warbler and Crossbill. On the debit side there were negative reports for Whinchat, Marsh Warbler, Raven, Tree Sparrow, Hawfinch and Cirl Bunting; whilst the following species are just hanging on: Stone Curlew, Puffin and Yellow Wagtail. There were encouraging increases in the breeding numbers of Woodlarks and Dartford Warblers, whilst the Cetti's Warbler and Bearded Tit continued to maintain their breeding status in the county. The numbers of breeding Sandwich Terns were up, but those of Common and Little Terns were about the 1980 levels. Hobbies had an average year, whilst the attempted breeding of two other rare species of raptor deserve the protection of anonymity.
The exceptional cold weather during December resulted in the appearance of species in much higher numbers than usual, including Red-necked Grebe, Bittern, Bewick's and Whooper Swans, White-fronted Goose, Smew, Goosander, Ruddy Duck, Hen Harrier, Woodcock and Short-eared Owl amongst others. Perhaps more unusual was the appearance of a flock of 24 Pink-footed Geese at Wimborne in late December following a report of a single on Lodmoor earlier in the month. There was a marked influx of wildfowl, notably Wigeon, as well as the usual 'cold-weather' movements involving Golden Plovers, Lapwings, Skylarks and winter thrushes.
Overall spring passage was below average, although the fine warm weather in early April was responsible for the early arrival of many summer visitors including an exceptionally early record

of a Spotted Flycatcher at Portland on 8th April. There was an influx of Hoopoes at this time, associated with a sprinkling of rarer visitors from the south such as Black Kite, Woodchat, Shrike and Serin. Another feature of the spring was an influx of nearctic gulls in the Weymouth area involving a Bonaparte's Gull and a unprecedented total of 11 Ring-billed Gulls, which if accepted will be the 5th-15th records for Dorset.

The autumn passage was rather poor and uneventful due mainly to persistent westerly winds and frequent gales during late September and early October. However these weather conditions were responsible for an influx of Grey Phalaropes and Sabine's Gulls in early October.

Amongst the more outstanding rarities there are reports of a Little Shearwater off Portland on 29th July, a Pallid Swift over Lodmoor on 23rd June, and a Dusky Warbler at Studland on 20th-21st September. All these will be new for Dorset if accepted by the Rare Birds Committee. Other notable rarities not already mentioned include one possibly two more Black Kites, a winter Lesser Yellowlegs, Subalpine, Greenish and Pallas's Warblers, five spring Woodchat Shrikes and a Little Bunting (second county record).

The Dorset Bird Club continues to flourish, holding indoor and field meetings and publishing a quarterly bulletin. The separate reports published by Portland Bird Observatory, Christchurch Harbour Ornithological Group and Durlston Country Park are to be commended.

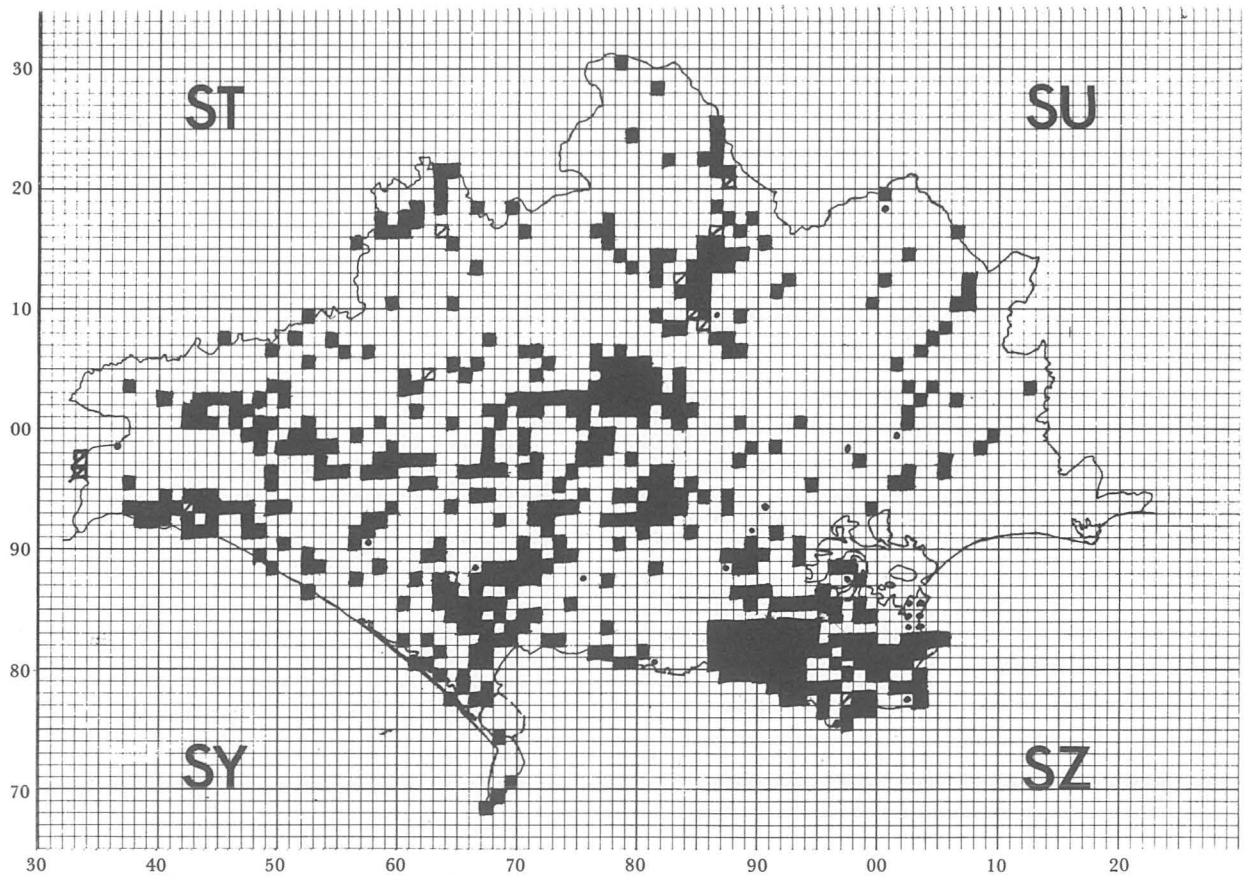
MAMMALS

E. M. KEATS

Mammal observations have been submitted by a number of members and non-members of the Society both direct to me and to the Dorset Environmental Records Centre in the Dorset County Museum. All reports are filed in the Centre and a small number are printed here, and the distribution map for badgers has been updated. I am sure more of the 1 km squares could be filled if recorders would send in evidence of the presence of badgers for those squares not filled in.

The check list numbers and scientific names are as listed in *The Identification of British Mammals,* by G. B. Corbet, British Museum (Natural History) 1969. In addition to the observations printed, the following species were also reported in 1981: 2. Mole, *Talpa europaea.* 3. Common Shrew, *Sorex araneus.* 4. Pygmy Shrew, *Sorex minutus.* 5. Water Shrew, *Neomys fodiens.* 8. Greater Horseshoe Bat, *Rhinolophus ferrumequinum.* 18. Noctule, *Nyctalus noctula.* 21.-22. Long-eared Bats, *Plecotus* spp. 24. Fox, *Vulpes vulpes.* 27. Stoat, *Mustela erminea.* 28. Weasel, *Mustela nivalis.* 30. American Mink, *Mustela vison.* 32. Otter, *Lutra lutra.* 43. Sika Deer, *Cervus nippon.* 44. Fallow Deer, *Dama dama.* 45. Roe Deer, *Capreolus capreolus.* 53. Brown Hare, *Lepus capensis.* 55. Rabbit, *Oryctolagus cuniculus.* 59. Dormouse, *Muscardinus avellanarius.* 61. Harvest Mouse, *Micromys minutus.* 62. Long-tailed Field Mouse, *Apodemus sylvaticus.* 64. House Mouse, *Mus musculus.* 66. Brown Rat, *Rattus norvegicus.* 67. Bank Vole, *Clethrionomys glareolus.* 68. Water Vole, *Arvicola terrestris.* 69. Short-tailed Field Vole, *Microtus agrestis.*

1. **Hedgehog,** *Erinaceus europaeus.* Major and Mrs. A. M. Hall reported an interesting incident at Buckland Newton. On the night of 27th August they heard an extraordinary noise, which might be described as a powerful bellows working fairly fast. A torch was shone on to the gravel path from the bedroom window and a large badger was seen attacking something; for a few seconds it took no notice of the torchlight, then it ran off leaving behind a motionless object which gradually uncurled itself and was a large hedgehog. It shook itself and ran off at speed apparently unharmed. Mr. A. H. Dunn reported finding a skin only in Corfe Mullen, had this one been eaten by a fox or badger? On a mild night 28th February Mr. J. D. Powne saw a rather thin and drowsy hedgehog outside his back gate at Compton Valence. Several other recorders have sent in observations of live hedge-



Badgers: Key: ▨ pre-1960 records; ■ 1960-1981 inclusive.
◉ Evidence without sightings, e.g. tracks, droppings, hair, latrines, etc. Scale: 1 small grid square to 1 km square.

hogs and road casualties. In July two young hedgehogs foraging in a Dorchester garden were making audible squeaks, they also seemed to be making inaudible signals which could be detected with a QMC mini bat detector.

11. **Whiskered Bat,** *Myotis mystacinus.* One flew in from over the sea at Portland Bill on 31st March and was catching insects over the Observatory Pond, it was trapped in a mist net and identified.

12. **Natter's Bat,** *Myotis nattereri.* A ♂ found dead on 18th April at Bagber by Col. E. Prendergast was identified at the Institute of Terrestrial Ecology.

19. **Pipistrelle,** *Pipistrellus pipistrellus.* Observations and counts were made on two roosts in Purbeck in June and July by Mr. W. G. Teagle. Other reports of roof roosts in the county may be this species but specific identification of the bats has not been made.

31. **Badger,** *Meles meles.*
A number of sightings have been reported, including one from Mrs. A. Russell of a badger visiting a farm at Briantspuddle on 17th October to eat cattle cake.

34. **Grey Seal,** *Halichoerus grypus.* A bull Grey Seal was recorded at Portland Bill on 3rd October.

56. **Red Squirrel,** *Sciurus vulgaris.* Mrs. K. B. Parkyn has again submitted detailed notes on this species on Brownsea Island, dates and numbers recorded, with weather conditions and the grid references. 1981 showed a marked rise in numbers over all previous years when recording has taken place, a total of 480 squirrels were seen and as the beach and acorn crops were not particularly good there were few sightings of large groups of squirrels. The numbers of people carrying out the recording was slightly up on previous years but it was not thought to be enough to account for the increased number of sightings. Although the actual population can not be assessed from these sightings the numbers do suggest that a fairly large and thriving colony is present on Brownsea and is well distributed over the island. Three other unconfirmed reports of Red Squirrel sightings in Dorset have been submitted, are these Red Squirrels or rather rusty-coloured Grey Squirrels? The one seen near Bovington was seen at 10 yds. and seemed to be red all over, it was seen by Mr. C. W. G. Rogers and Mr. C. H. Riman. It would be interesting to know if small pockets of Red Squirrels are surviving in mainland Dorset.

57. **Grey Squirrel,** *Sciurus carolinensis.* This species seems to continue to thrive in the county and an interesting observation was made by Mr. J. D. Powne near Compton Valence. As he approached a stunted beech tree alongside a field and about ¾ mile from other trees a crow's nest fell out of it. It was a fine still day, 15th September and as the nest hit the ground a Grey Squirrel emerged and fled into the hedge. The nest which was lined with sheep's wool had small twigs still with fresh leaves on them added to it and presumably the squirrel was adapting it as its drey. The squirrels route to other trees was probably along the hedgerows.

87. **Common Dolphin,** *Delphinus delphis.* Two dolphins swam up the River Frome to Wareham and were diverted back towards Poole Harbour in early October, unfortunately one thought to be a young one about 5 feet long was found barely alive on the bank of the Frome near Arne the next day. It was taken to Poole Aquarium but was dead on arrival, it had an eye infection. It was passed on to Cambridge University where research work on Cetaceans is carried out.

89. **Bottle-nosed Dolphin,** *Tursiops truncatus.* This species was recorded off Portland Bill in February, March, April and May. Other unidentified dolphins were also seen off Portland Bill in April, August, October and November.

91. **White-beaked Dolphin,** *Lagenorhynchus albirostris.* A dead animal beached at Lyme Regis was found on 2nd May.

OBITUARY

J. K. HASLER, MM, MB, BS, MRCS, LRCP, FFARCS, DA

John Kenneth Hasler was born on 25th August, 1898, above Mussoorie in India, the son of a Baptist Missionary the Reverend J. I. Hasler. He married, in 1935, Olive Clendinnen, daughter of a Staffordshire doctor. John, the eldest of their three children, is in general practice. They also have two daughters Margaret and Celia. J.K.H. was educated at the School for Sons of Missionaries (now Eltham College) and at the Middlesex Hospital Medical School.

He served for thirteen months in the Army in 1917 and 1918, in France, with the King's (Liverpool) Regiment, the 8th of Foot, and was awarded the Military Medal in 1918. For practically the whole of his professional life he was a successful practitioner in the relatively new speciality of anaesthesia and served in this capacity in several hospitals in London until 1950 when he was appointed senior anaesthetist to the West Dorset Group of Hospitals. He was a pioneer of spinal anaesthesia and contributed many articles and sections to text books on this and allied subjects. He retired in 1963, and then became lecturer and examiner for St. John Ambulance Brigade, and was made a Serving Brother in 1971.

From the age of about five he had an interest in natural history, especially botany and ornithology. He joined the Society in 1953 and was appointed to the Council shortly after retiring. He was a valued member of the Natural History and Geology Committee for many years and an active member of the Society leading many natural history field excursions and lecturing in the winter on an extraordinary variety of subjects. These lectures are scattered over almost twenty years and range from botany, 'Wild Flowers of Dorset', 'The Solanaceae', 'Plants in Folklore', and 'Flowers of the Coast', to the use of natural history themes on postage stamps and, seemingly at the other end of the spectrum, 'Interesting Examples of Dorset Inn Signs'. He gave the natural history talk at the Dorset Evening which commemorated the first 100 years of the Society.

Dr. Hasler represented the Society on the Winfrith Heath Preservation Committee and was an active supporter of the Dorset County Museum Music Society. Music indeed was one of his particular interests. After retirement he joined the West Walks Singers and had twelve very enjoyable years performing major choral works.

A substantial sum has been given to the Museum by his friends and family in his memory. With the agreement of Mrs. Hasler and her family it is intended that the money should be spent on the purchase of equipment such as binoculars (RSPB variety), hand-lenses, nets for catching insects or for 'pond dipping', for the use of Junior Members of the Society.

An admirable obituary by two of his colleagues, Dr. J. W. Warrick and Mr. F. M. Hanna, has appeared in volume 282 of the *British Medical Journal* for the 27th June, 1981.

Dorset Natural History and Archaeological Society

MONOGRAPH SERIES

Historic Towns in Dorset by K. J. Penn

DNHAS Monograph No. 1. 133 pages, A4, paperback with 44 full page maps. Published 1980. Price £9.80 (£8.80 to DNHAS members) p.&p. currently £1.

This volume describes the 22 places in Dorset which could have been considered urban in the Roman or Medieval periods. The current sizes of these range from Newton Studland where there is now only a farm, through villages such as Milton Abbas, to towns like Dorchester and Poole. There are two maps of each town: one showing the present town, including listed buildings, conservation area, etc.; and another at the same scale showing early features. Each town's topography, archaeology, and documents are described, along with the archaeological potential and the town's likely development.

'This is an outstanding example of the urban implications survey, with carefully research texts and plans showing conservation areas, listed buildings, and recent development, and also early features, for 22 historic towns in Dorset, among them several which are crucial to any study of town growth in southern England.'

Council for British Archaeology, March, 1981.

Dorchester Excavations Volume 1: Excavations at Wadham House 1968, Dorchester Prison 1970, 1975 and 1978, and Glyde Path Road 1966 by Jo Draper and Christopher Chaplin

DNHAS Monograph No. 2. 118 pages, A4, paperback, 51 figures and 34 plates. Published 1982. ISBN 0 900341 10 6. Price £10 (£7 to DNHAS members) p.&p. currently 90p

The Dorchester Excavation Committee was set up in 1968 to take responsibility for all archaeological excavation in the town. Wadham House was the first site excavated for the committee. A stratified sequence of Roman features was excavated there, ranging from a first century street and massive water conduit, to a late fourth century structure. There are reports on well stratified pottery groups from most levels.

Dorchester Prison was built on the site of the Medieval Castle in the late eighteenth century, and the excavations of 1970, 1975 and 1978 there sectioned the Castle defences. The area was refortified during the Civil War. The Castle, the Civil War defences and the late Medieval and post-Medieval houses are discussed and related to the many documents which survive relating to this area. Roman occupation was also found, including third and fourth century stone and timber buildings. Sealed groups of medieval pottery – rare in Dorset – are illustrated and described.

The Glyde Path Road excavations of 1880 and 1966 are also in this volume. Part of a fourth century town house with simple mosaics was found, together with an outbuilding, a well and post-Medieval pits.

All the reports include extensive sections on the finds – Roman, Medieval and post-Medieval – including pottery, metalwork, glass, etc. Wherever possible documents are used to amplify the discussion.

The Bronze Age Cremation Cemeteries at Simons Ground, Dorset by D. A. White

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The Bronze Age urn cemeteries at Simons Ground, Dorset, excavated in the late 1960s, represent the largest burial urnfield ever scientifically excavated in the United Kingdon. Three hundred urns and the sites of 100 unurned

cremations were discovered on four sites less then 300 metres apart on waste heathland in east Dorset. The excavation campaign, over four seasons on threatened sites, involved the excavation of five round barrows and their associated urnfields. The barrows are of considerable interest; two were purely ritual mounds lacking any primary burial. Four of the barrows had causeways in the south eastern sector of their ring ditches, and three were built over the remains of ritual structures that had been burned prior to the construction of the barrow mounds.

For the most part the burials were carried out after the barrows were built. However one group of urns was discovered under the buried soil of a barrow. In several cases the urnfields could be subdivided into groups. Radiocarbon dates for the complex range from 1200 to 500 BC.

The most important aspect of the site lies in the large sample of data that was collected. Apart from the obviously large sample of burial ceramics, a large sample of cremated bone was obtained and is analysed in the report with interesting conclusions. The stratigraphy of the urnpits is described in detail showing how the cremation was put in the urn and how the urn was buried. Different patterns were adopted and ritual fires were often lit during the burial ceremony.

The volume of data presented in the appendices makes the Monograph an important source of data for anyone interested in the Bronze Age archaeology of Europe.