ISSN 0070-7112

Dorset Natural History & Archaeological Society
Proceedings for 1979
Volume 101 (issued December 1981)

Printed by The Friary Press Ltd., Grove Trading Estate, Dorchester, Dorset, and published by The Society.

HEADQUARTERS: DORSET COUNTY MUSEUM, HIGH WEST STREET, DORCHESTER

(*Telephone* Dorchester 62735)

COUNCIL AND OFFICERS 1979

President: N. H. Field Esq., BA, BSc, FSA

Vice-Presidents: Mrs. H. I. Bond, Miss J. Brocklebank, Miss H. A. J. Brotherton, OBE, JP
J. Stevens Cox Esq., FSA, R. F. Dalton Esq., MA,
R. A. H. Farrar Esq., MA, FSA, K. B. Rooke Esq., MB, BCh, MBOU,
Sir Philip Williams Bart

Trustees: W. Stuart Best Esq., MA, Major-General H. M. G. Bond, DL,
Professor R. D'O. Good, MA, ScD, FLS,
G. D. Squibb Esq., QC, BCL, FSA

Council: Four members retire by rotation annually, but are eligible for re-election. The dates placed in brackets give the year of the original election to the Council.

To retire 1980:
J. B. Hawthorne Esq., MSc, MIBiol, FZS (1963)
A. T. Bromby Esq. (1971)
Mrs. E. M. Keats, BSc, FGS, AMA (1978)
Colonel E. D. V. Prendergast, MBE, DFC (1979)

To retire 1981:
Mrs. J. C. Walton (1966)
C. J. Bailey Esq. (1966)
A. Jaggard Esq. (1971)
Mrs. P. Bowyer (1973)

To retire 1982:
J. K. Hasler Esq., MB, BS, MRCS, LRCP, FFARCS, BA (1961)
M. C. Matthews Esq., TD, BSc, FRICS (1967) (Chairman)
R. Machin Esq., MA (1971)
Lt.-Colonel G. E. Gray, CEng, MIMechE (1978)

Co-opted:
J. R. Bradshaw Esq., MA
Mrs. J. M. Fitzpatrick, MA, BSc, MIBiol
Mrs. J. C. Chaplin
A. T. Swindall Esq., FRTPI, ARICS

Officers:

Curator and Secretary:	R. N. R. Peers Esq., MA, FSA, FMA
Assistant Curator:	P. C. Ensom Esq., BSc
Hon. Treasurer:	A. B. Warrick Esq.
Hon. Editor:	W. G. Putnam Esq., BA, FSA
Hon. Field Secretary:	Mrs. D. A. Lang
Conservator:	R. M. Alcock Esq.
Laboratory Assistant:	Mrs. R. Adams to 31/12/79
Secretary:	Mrs. H. M. Painter
Assistant Treasurer:	B. E. Gouldsbury Esq.
Caretaker:	T. Machen Esq.
Assistant Caretakers:	Mrs. H. Machen, W. G. Hyde Esq.
Cleaner:	Mrs. M. K. Dean
Schools Organiser:	Miss L. Poulsen BEd

CONTENTS

It has been suggested that certain references to change of format in the article '100 years of the Proceedings' (*Proceedings,* Vol. 100, pp. 1-3) might reflect adversely on the then Hon. Editor Mr. James Stevens Cox. The author of the article regrets that this should be so, and wishes to state that no criticism of his editorship was intended. No reference was made to content. The actual form of the volume is decided by the Council through the Editorial Committee. Mr. Cox's 21 years of invaluable service (not 16 as given in the article) was acknowledged by his being made a Vice-President of the Society. The author much regrets that this fact was omitted since there could be no greater proof of appreciation of Mr. Cox's editorship.

NOTES FOR CONTRIBUTORS

A pamphlet giving advice on presentation and layout for articles intended for the *Proceedings* may be obtained from the Editor, Dorset County Museum, Dorchester, Dorset DT1 1XA. Contributors are strongly urged to prepare material for publication in the light of this advice: failure to do so will lead to extra work and delay.

DORSET IN THE NEWFOUNDLAND TRADE

GLANVILLE J. DAVIES

The Mansel-Pleydell Trust Prize Essay 1975

John and Sebastian Cabot, upon their return to England in 1497, claimed that the fishing grounds off Newfoundland were so abundant that the fish sometimes stopped the passage of ships.[1] At a time when the Iceland fishery, England's chief source of dried cod, was under threat from the Danes, such evidence of an alternative source for the fishermen of Bristol and the West Country ports could not be ignored. By the mid-16th century, therefore, almost all the ports which later were to be active in the Newfoundland trade, were financing voyages to the fishing grounds.

Merchants of the larger ports valued the distant fishery as an opportunity for trade investment, and in 1610 the *London and Bristol Company for the Plantation of Newfoundland* was formed. Founding members of the Company, though shrewd businessmen, were over-optimistic in their hope that a colony on the island would quickly become self-supporting.[2] There was a constant need for provisions, equipment, livestock and wages, and these absorbed whatever profits were made from fishing voyages. Planters found it impossible to sustain a colony in the 'great uncouthed and solitary wilderness' where agriculture competed for the labour available with the more profitable fishery. Hostility from the migratory fishermen—the 'Adventurers' of Devon and Dorset—towards the growing evidence of a monopoly of trade, in particular the infant settlement which symbolised this monopoly, marred relations in the fishery and discouraged further Company investment. Settlers were regarded as fishing competitors, though Poole during the later 17th century defended them as essential because they offered hospitality to seamen suffering scurvy or shipwreck. While deploring their presence, migratory merchants from Dorset's ports made use of the planters for additional labour, protectors of the winter beaches, and customers for West Country trading. By the 1620s trade could not depend on Company inspired settlements; fishing voyages by individuals was permitted; and the Company merchants admitted, by this concession, that monopoly by Company had failed. There were other attempts to colonise the island, but all failed because investors underestimated the difficulties of establishing permanent settlements, and were unprepared for the long term investment which such settlements represented.[3] The failure of Company control, and the failure of proprietary land grants to individuals, eventually forced the Crown to recognise adventuring seamen as managers of the fishery. In 1634, 1661 and 1676, Royal Charters, known as the 'Western Charters', vested control of the fishery in the Mayors of West Country ports, naming among them the ports of Dorset: Poole, Weymouth, Melcombe Regis and Lyme.[4]

The Charters contained regulations concerning the proper disposal of ballast, the protection and use of fish-drying spaces, the conservation of timber, and other essential day-by-day rules by which the fishery could be managed.[5] In each harbour, 'Admirals', appointed from among the first three ships' masters to arrive, held responsibility for enforcing Charter rules, and controlling any disputes.

The Charters, however, depended on continued royal support, and Dorset merchants, in common with those of other West Country ports, welcomed the opportunity in February,

1 R. Hakluyt, *The Principal Navigations Voyages Traffiques and Discoveries of the English Nation* (5 vols., London, 1907, 1967 edn.), V, pp. 85, 89, 344-45; D. W. Prowse, *A History of Newfoundland from the English, Colonial and Foreign Records* (London, 1895), p. 11.

2 G. Cell, 'The Newfoundland Company: a study of the subscribers to a colonising venture', *William and Mary Quarterly*, third series, XXII, (1965), pp. 611-25.

3 C. B. Judah, *The North American Fisheries and British Policy to 1713* (Urbana, Illinois, 1933), p. 49; R. G. Lounsbury, *The British Fishery at Newfoundland 1634-1763* (Yale, 1934, reprinted by Archon, 1969), pp. 25-27, 39, 45, 50, 55, 77-80, 82-84, 106-107.

4 Weymouth and Melcombe Regis were united in 1571, but the Board of Trade persisted in treating the two communities as separate ports.

5 Star Chamber, Order in Council, 24th January, 1634, *Acts Privy Council Colonial, 1613-1680;* Patent Rolls, 12 Charles II, part 17, No. 30, 26th January, 1661; Patent Rolls, 27 Charles II, Part II, No. 12, 27th January, 1676.

1699, to introduce into the Commons a bill which was intended to replace the Royal Charters. The clauses of the 'Newfoundland Act' of 10 and 11 William III, c. 25, were, for the most part, working regulations for the fishery, directly fashioned from the Charters. The Act remained in force until 1825, and its presence as a Statute effectively prevented any further attempts to monopolise the trade through Company control, or divert the resources of the 'free' fishery to the exclusive use of planters. The Act also enabled Dorset ports to participate freely in a fishery no longer threatened by wealthy merchants of Bristol and London. Throughout the 18th century the Newfoundland fishery dominated the maritime activity of the County, and much of the capital investment of Dorset's ports, and the demand for supplies and provisions and labour from the region, and the distribution of return cargoes, stemmed from the fishery and the Mediterranean markets which it supplied.

The codfish, and the train-oil it produced, provided the main trade from Newfoundland, with furs, skins, seal-oil, timber and salmon as minor ancillary trades which supplied some additional revenue. West Country fishermen favoured the 'dry' fishery in which boats unloaded directly on to wooden stages built into the water on which were erected 'disagreeably dark' buildings which housed the Headers, Splitters and Salters.[6] The Header gutted the fish and cut off the head and tail; the Splitter boned the fish and disposed of the offal; and the Spreader carefully salted the fish before stacking. The 'livers of the codd fish put into a cask by themselves dissolves most into oyle', and this 'train-oil', which fetched £12 to £16 a tun (252 galls.), was a valuable by-product.[7] Behind the Stages, the 'Flakes'—simple brushwood platforms—extended up the beach, and upon these Flakes the salted cod was spread for drying. Small, damaged, or improperly salted fish was generally sold to New Englanders for 40 per cent less than the merchantable fish intended for the Mediterranean market, and this 'refuse' fish found its way to the plantations of the West Indies where it was sold as food for slaves.[8]

Apart from the semi-permanent structures used for drying, the needs of the fishery were few and simple. Cod was caught with baited hooks, and soon after arriving, fishing ship masters would despatch 'bait-boats' to net herring capelin, or catch 'sea-fowl'. Fishermen resented the time spent in collecting bait. When Benjamin Lester arrived in Newfoundland on 27th May, 1767, he spared 15 men for the task of collecting bait, and to his relief the boats returned on 3rd June with sufficient bait to begin the season's work. By 4th August the bait had been used, and he purchased further supplies from an old man who lived near Wadham's Isle who 'knock'd down 2 to 300 Puffins on a Day with poles' to provide bait for fishermen.[9]

Essential for the fishery was a plentiful supply of salt, and because there was no cheap and plentiful supply available in England, ships' masters had to journey to the Portuguese held Isle of May in the Cape Verde Islands, or seek salt in bulk as a return cargo from France. Exchequer Port Books show that large quantities of salt were stored at the ports before the overseas fishing season was due to begin. Five Weymouth vessels in 1677-8 unloaded and stored 217 weys of salt, but such warehousing, although available in that port at the end of the 17th century, clearly was not provided by the mid-18th century, for few ships after the 1730s entered Weymouth with salt. Poole, however, must have maintained large warehouses, for in the first quarter of 1722, 208 weys of salt were imported; in the corresponding quarter of 1723, 323 weys; in 1751-2, 563 weys; and in 1755-6, 848 weys. Clearly, Poole merchants stored salt from one season to the next, and the entry of a ship carrying far more salt than was needed for a season's work at Newfoundland, showed that a brisk trade in salt was common at the start of a season. The *Dolphin* and *Nazareth* in 1701-2 between them imported sufficient salt for the curing of 14,000 quintals of fish, yet this quantity of fish represented the cargo of some 10 fishing vessels. Some merchants, of course, preferred their own steady supply, and the regular voyaging of the *Sukey* in the 1760s and 1770s guaranteed a regular supply for the Lesters, while even merchants like Stephen Barfoot, normally a buyer in the Baltic, found that the occasional cargo of French salt could raise a profit on the voyage, and his ship *Eadem*

[6] J. Banks, *Joseph Banks in Newfoundland and Labrador, 1766, His Diary, Manuscripts and Collections* (Faber & Faber, presented by A. M. Lysaght, 1971), pp. 133-137.
[7] Captain Kempthorne's Report, 1st February, 1716, Public Record Office (PRO), Colonial Office (CO), 195/6, p. 186.
[8] PRO, CO 388/20, 17th September, 1718; CO 194/7, p. 9, Replies to Enquiries by Captain Percy, 1720.
[9] Dorset County Record Office (CRO), Diary of Benjamin Lester, 4th June and 4th August, 1767, D.365/F.3.

was often pressed into service. If a steady supply from return cargoes could not be secured, or the salt purchased at Poole at the start of the season, the merchants could, as a last resort, buy salt which had been loaded in the holds as ballast. The *Swift* in 1787 limped into Poole 'in a very leakey and disabled condition' carrying a load of cheap salt as ballast, and this the owners promptly sold. William Cleeves of Poole, having purchased salt to exchange at Newfoundland, was dismayed to find that French fishermen had already glutted the market and a hogshead of salt fetched a mere 1¼ quintals.[10]

In addition to salt, Newfoundland vessels carried items clearly intended for the maintenance of trade, the upkeep of the crew, the 'passengers' who travelled across each season to seek work in the boat fishery, and the planters who chose, despite the severe climate and primitive conditions, to remain on the island during the winter. Typical was the cargo of the *Roberta* of Weymouth, leaving in February, 1682, with linen, soap, rugs and fishing lines; or the *Willing Mind* of Poole in April, 1709, with a cargo of 'made garments', malt, flour, sail-cloth, nails, cordage, rugs, woollen cloth, serges, shoes, blankets, nets and lines; and in the following year the same vessel carried 125 'suits of wearing apparel', 227 yards of 'Rushia linnen', serges, cloth, haberdashery and '84 pounds of new shoes'.[11] Seven Poole vessels cleared port in 1755 carrying a total of 1,825 made garments in addition to cloth, hats, gloves, shirts, stockings and shoes.[12] Clearly these cargoes were intended for the planters on the island. Other items, and principal among them ropes, nets and cordage, chiefly supplied from Bridport, were essential items for the fishery. By the 1780s about 1,800 people in Bridport and the surrounding areas found employment in the manufacture of rope, net, twine, and sailcloth, and 'upwards of seven thousand people are in constant work' in the supporting outwork, or cottage, industry. A large proportion of this trade found its way on to Newfoundland ships, as indeed did the sailcloth from Beaminster, Broadwindsor, Netherbury, Stoke Abbot, Kingston and Poole, the serges from Lyme Regis, and the 'swanskin' flannel from Marnhull and Sturminster Newton.[13]

Non-perishable items, like malt, wheat, rye, peas, oatmeal, flour, candles, biscuits, barley, beer, cider, spirits and salted provisions, were gathered in the port at the beginning of the season. There were minor variations in these cargoes, as when the *Hannah* in 1722, and the *Unity* in 1723 carried Piscataway rice, and tea condemned out of the Custom warehouse in Weymouth.[14] Perishable items like cheese, butter, fresh meat and vegetables, were generally picked up at Waterford or Cork on the last leg of the outward voyage, together with Irish labourers who sought employment at Newfoundland, and could be depended upon to make up crew numbers.

Some Dorset merchants, especially those operating from Poole, deliberately competed against colonial suppliers to Newfoundland by assembling cargoes of goods which were commonly and more cheaply supplied by visiting New Englanders. Colonial merchants could readily supply sugar, molasses, rum and tobacco, yet quantities of these goods were shipped from Poole to Newfoundland. Poole merchants, perhaps more than any others from the West Country, displayed a particular vehemence towards New Englanders because they supplied cheap goods to the planters at Newfoundland, and because they 'inticed by great wages' the fishermen to desert the fishery at the end of each season. Weymouth loaned some support to Poole, and principally through the regular trading of one family, the Tuckers, to Virginia, was able to supply Poole's merchants with large quantities of tobacco. In 1717, two vessels imported 10,194 lbs. of tobacco which was then delivered to Poole to await shipment to Newfoundland. The Poole ships *Three Brothers, Joseph and Benjamin, Willing Mind,* and *Bonavista* between them shipped 13,356 lbs. of Weymouth imported Virgina tobacco in 1719. Tobacco was often added to general cargoes, and later entries, like the *Loyalty* in 1742, with 1,083 lbs.,

[10] PRO, E 190/882/10, Weymouth overseas, 1677-1678; E 190/911/1, Poole overseas, 1721-1722; E 190/913/6, Poole overseas, 1722-1723; E 190/921/2, Poole overseas, 1751-1752; E 190/923/1, Poole overseas, 1755-1756; E 190/898/2, Poole overseas, 1701-1702; Captain Norris to Lords of Trade, 2nd January, 1698, CO 194/1; Petition of William Cleeves, 23rd December, 1714, CO 194/5; Customs 60/3. One Wey of salt = 320 gallons, dry measure. One Quintal of fish = approximately one hundredweight.

[11] PRO, E 190/884/15, Weymouth overseas, 1681-1682; E 190/900/5, Poole overseas, 1709-1710.

[12] PRO, E 190/923/1, Poole overseas, 1755-1756.

[13] J. Pahl, 'The Rope and Net Industry of Bridport', *Proceedings of the Dorset Natural History and Archaeological Society*, Vol. 82, (1960), pp. 143-156; J. Bettey, *Dorset* (Newton Abbot, 1974), pp. 76-78; J. Claridge, *A General View of the Agriculture of the Country of Dorset* (London, 1793), p. 38; G. Stevenson, *A General View of the Agriculture of the County of Dorset* (London, 1812), p. 27.

[14] PRO E 190/913/6, Poole overseas, 1722-1723; Customs 60/3.

testified to Poole's continuing interest in this community. To a lesser extent, Poole merchants were prepared to compete with colonial traders in sugar, molasses, and rum. From 1732 to 1733, Poole exported 253 cwts. of molasses and 78 cwts. of sugar, and even London-based vessels, like the *Damsel* in 1755, could call at Poole for fishery supplies, and add 8½ tons of sugar before setting out for Newfoundland.[15]

Newfoundland vessels found their markets in the Mediterranean, and their return cargoes reflect the trade available to them when they unloaded their catch in Lisbon, Cadiz, Alicante, and other ports as far as Venice and Gallipoli. Gold and silver coins from Spain, Portugal and Italy, were common currency among the traders of the West Country, and these were imported in exchange for Newfoundland cod. The government was well aware of the favourable trade balance created by the fishery, and supporters of West Country petitions were never slow to press home the point that 'returns from Foreign parts brought home great Quantities of Gold and Silver . . .'.[16] Poole alone, by 1793, could enjoy a trade in which 'the returns I judge to be nearly 39/40ths in specie, or in bills of exchange'.[17]

Wine formed a significant part of the return cargoes of most Newfoundland vessels trading to Spain and Portugal. Poole imported 9,667 gallons of wine in 1751-1752, principally as return cargo. Frequently, other Mediterranean produce, like olive oil, figs, currants, raisins, almonds, lemons and oranges, were shipped also. Raisins, supplied chiefly from the Malaga district, could fetch between 30/– and 50/– per cwt. in London; currants fetched 35/– to 60/– per cwt. Fruit and salad oils were freely available, and cargoes like that of the *Success* entering Lyme in 1701 with 4,000 oranges and 13 barrels of olive oil, or the *Thomas and Richard* of Poole in 1737 with 100 gallons of 'Spanish oil', were not uncommon. Some of these goods, and in particular, olive oil, were shipped to Newfoundland, for there, soaked into bread, olive oil was a delicacy in a diet consisting mainly of salted provisions, fish, oatmeal, and 'sea-bird pie', liberally washed down with bowls of molasses and rum.[18]

Return cargoes from Newfoundland consisted of train-oil, furs, salmon, and timber, with only small quantities of dried cod. Train-oil, which retailed at 2d. a pint by the mid-18th century, was in demand for domestic oil lamps, the woollen industry, for the curing of leather, and for the manufacture of soap. Most returning ships carried train-oil. Poole imported 143 tuns during Xmas quarter, 1717; in 1755-1756, only 297½ tuns entered the port compared to the 853 tuns of 1751-1752. Buyers waited for these cargoes, and Peter Jolliff of Poole was delighted when he sold train-oil at £22 a tun to 'a person that came here from London'.[19]

Timber was imported in small quantities, depending, probably, upon orders being placed at the start of the season. In Xmas quarter, 1724, Poole imported 28,257 feet of board, plus rafters and small spars. Cheap New England timber available later in the century probably reduced this kind of trade. Furs, holding no attraction for Dartmouth, found a brisk trade at Poole. 2,396 assorted fox, marten, seal and beaver skins entered Poole in Xmas quarter, 1724; and five vessels during only one month in 1738, imported 5,615 furs. Visiting buyers were eager for these cargoes, and in 1741-1742, the 11,464 furs held in the warehouse, and the 5,619 of 1755-1756, were all quickly purchased. Salmon was not a trade of significant value in the fishery, despite the enterprise and investment of George Skeffington of Poole who had, in the 18th century, the largest single salmon fishery at Newfoundland. This was largely because, as with all alternative employment, labourers could earn substantially more from a season's cod fishing.[20]

Considerable wealth was accumulated by investors in the Newfoundland trade. Many merchant families shared the wealth of the fishery, and mansions, town houses and estates were gathered by the families of White, Tito, Durrell, Merritt, Jeffrey, Garland, Spurrier,

[15] PRO E 190/907/13, Poole Coastal, 1717-1718; E 190/908/5, Poole overseas, 1718-1719; E 190/919/7, Poole overseas, 1740-1741; E 190/917/13, Poole overseas, 1732-1733; E 190/923/1, Poole overseas, 1755-1756.

[16] C. M. Andrews, *The Colonial Period of American History* (4 vols., Yale, 1934-1938), IV, p. 345.

[17] *First Report from the Committee appointed to enquire into the State of the Trade to Newfoundland, 1793*, p. 394, testimony of Mr. Jeffery of Poole.

[18] PRO, E 190/894/6, Lyme overseas, 1701-1702; E 190/919/13, Poole overseas, 1737-1738; E 190/921/2, Poole overseas, 1751-1752; R. Gravil, 'Trading to Spain and Portugal', *Business History*, Vol. X, (1968), pp. 69-88; V. M. Shillington and A. B. W. Chapman, *The Commercial Relations of England and Portugal* (London, 1907), pp. 216-217; R. Davis, *The Rise of the English Shipping Industry* (David & Charles, 1962), pp. 228, 231.

[19] PRO, E 190/907/9, Poole overseas, 1716-1717; Dorset CRO, D 365/F.2, Diary of Benjamin Lester, November, 1765.

[20] PRO, E 190/913/1, Poole overseas, 1721-1722; E 190/919/3, Poole overseas, 1738-1739; E 190/920/5, Poole overseas, 1741-1742.

Ledgard, and a host of lesser merchants. Local politics became dominated by families whose wealth was derived from Newfoundland. But, where the merchants profited there was scant opportunity for the common people to live comfortably. Recruitment of labour became a problem, partly because under the 1699 Act one man in every five had to be 'green': 'not a seaman, or having ever been at sea before', but principally because work in the fishery was harsh, and the wages pitifully low. Recruitment, therefore, often depended upon the severity of economic depressions, and the strict application of the Poor Law. Men chose to risk their lives in this hazardous trade rather than face the workhouse, casual parish charity, or near starvation at home. Most began the voyage in debt, needing clothes and provisions, much of which was paid in 'truck' as a part of the wage. Often having to pay their return fare, but destitute even at the end of the season, men could choose to return home, and plunge deeper into debt, remain, and eke out a miserable existence fishing and trapping during the depth of winter, or find passage to New England as an indentured servant: an existence fractionally removed from that of slavery. Overseers of the Dorset poor released pauper children as 'apprentices': John Pelly, for example, apprenticed at 9 years, remaining at Newfoundland for 16 years, to return, still a pauper in 1775. Mothers, unable to sustain their families, begged for the opportunity to 'apprentice their sons'. Mary Bond found passage for her son in 1732, but it cost £4 from the Poor Rates; and in 1778 the entire family of Hervey in Edmondsham had passage paid by the Overseer. The lives of the poor may not have been improved, but the Poor Rates of the parish were relieved of some demands. The plight of these people moved the emotions of even hardened naval officers, and Captain Smith wrote to his superiors in Whitehall in 1714 that winter residents were 'more to be pitied than . . . slaves and negroes'.[21]

Dorset's trade with Newfoundland extended from the late 16th century to the mid-19th century, and survived naval and privateering wars against the Dutch, French, Spanish and Americans. By the late 1830s, Poole, long dominant in the overseas trade of the County, faced competition from the Americans and from Newfoundland's fishing vessels. Dorset did not possess the capital reserves necessary for continued promotion of the Newfoundland trade. The wealthy merchants of London and Bristol preferred the more profitable trading to the Americas, the East Indies, and the sugar plantations. Though possessing entrepreneurial skills, Dorset was not able to maintain agents or 'factors' in the Mediterranean, and these were essential for successful long-term marketing. Dorset's ports were not able to handle the larger tonnage commonly used in the later period, and the harbours of Weymouth and Lyme, inadequate even by the mid-18th century, declined rapidly. Poole itself, by 1827, was concerned about harbour silting, and the extensive investment which these ports needed was not to be found. Increasingly as the 19th century progressed, it must have been clear that a trade which relied so heavily on purchase of fish from a settled Newfoundland population, themselves dependent upon the American States, was an unprofitable investment. Dorset's merchants relied upon a migratory trade, and when this was slowly eroded by a settled population, the role of the West Country merchant became less significant. The financially sound trading houses of ports like London, Bristol, and Liverpool, attracted the profitable overseas trades, and Dorset became increasingly dependent on the marginally profitable, but more manageable, coastal trades.

[21] Dorset CRO, P 21/OV 4; P 204/OV 2; P 200/OV 2; PRO, CO 194/5, p. 57.

ARCHDEACON ANTHONY HUXTABLE (1808-1883)—RADICAL PARSON, SCIENTIST AND SCIENTIFIC FARMER

TED WARD

Archdeacon Anthony Huxtable was rector of Sutton Waldron, NE Dorset, from 1834 to 1871. He and his wife worked indefatigably for the parishioners. He rose to both local and national fame when he became tenant of two local farms which he tried to farm in the most scientific manner, hoping thereby, by force of example to bring greater prosperity to both local farmers and labourers alike. His methods attracted such widespread attention that although he was a highly controversial figure he was elected to the Chemical Committee of the Royal Agricultural Society of England, sitting alongside scientists and agriculturists of international repute. Whereas Edward Berkeley Portman (1st Viscount Portman) was undoubtedly a prime influence on Huxtable, Huxtable probably had an important influence on the young Charles Kingsley.

Sutton Waldron village and parish lie immediately to the west of the road from Blandford to Shaftesbury, being seven miles from the former, five miles from the latter. The soil varies from the chalk of Sutton Down, which mounts to 700 ft. above sea level on the east, to greensand and clay on its western boundary below the 200 ft. contour. The Ancient Ridgeway, which runs along the crest of hills from Devon to the east coast of England passes through the village to the summit of Sutton Down[1]. Probably there was little change in population, farming methods and life style in the nine hundred years up to the enclosures of the late 18th and 19th centuries. Before the enclosures there were about 100 separate holdings, very scattered, so that nowhere did two properties of an individual adjoin, some having almost the entire length of the parish between them. The common fields ran at right angles on both sides of the road leading from the Blandford road up Sutton Down[2]. Four large farms then replaced the commonfields and there were still four farms in 1942. The population was 120 at Domesday, in 1811 there were 35 houses housing 66 families (218 people), the main occupations being agriculture and button making (with the advent of button making machines at the mid-19th century the hand made button industry collapsed). The young village bloods in the 19th century indulged in poaching on Cranborne Chase and smuggling. By 1851 there were 257 people but this had declined to 121 by 1921, in 1967 there were about 200. Although the population has varied little the names of villagers recorded in 1539, 1767 and 1942 showed great mobility of families[3]. In general life at Sutton Waldron has been uneventful although the villagers looked forward to the annual fair at nearby Shroton. The only exciting events in the history of the village have been the passing of the cortege of the body of Edward the Martyr (murdered two years previously by his stepmother at Corfe Castle) on its way from Wareham to Shaftesbury in AD 980 and Cromwell leading his cavalry from Shaftesbury to Shroton via Sutton to attack Hambledon Hill. Anthony Huxtable has been the most distinguished person to live in Sutton during its long existence. He was born in Somerset on 30th November, 1808. The Huxtables are West Country people, there are few in Dorset although a relative of Anthony's had a solicitors practice in Dorchester early in the 20th century. Huxtable graduated with mathematical honours from Trinity College, Cambridge in 1833 and was ordained in 1834. In the same year he was presented to the living of Sutton Waldron by Henry Charles Sturt, of Crichel House, who owned much land around Sutton. Huxtable later became tutor to Sturt's sons, Napier and Gerard (the 1st Lord Alington). The small parish was then said to be one of the most

[1] The Antiquities and Events of Sutton Waldron, F. C. Warren, *Dorset Year Book*, 1950/1, pp. 73-79.
[2] Long continuance of the Common Field System: Sutton Waldron, F. C. Warren, *Proceedings*, 1942, *64*, 75-83.
[3] *Sutton Waldron Parish and Church*, typescript by F. C. Warren, Dorset County Library.

backward agricultural parishes in Dorset[4]. Huxtable set to work immediately to make profound improvements. The Rectory, built on the site of a former parsonage, was in such a bad state that Huxtable had to take rooms in a small farmhouse. The very old Saxon church, of which almost nothing is known, was in a very run down state. Huxtable's ambitious programme for the village became more realisable when he married the very wealthy Maria Langston. According to a man whose family has been at nearby Fontmell Magna for several generations Miss Langston was probably related to the Sturts and was living at Crichel House when Huxtable first met her. Maria came from Oxfordshire and tradition has it that she had been jilted, had become slightly demented by the experience and had said she would marry the first man she came across. Huxtable was put in her way as a suitable man and they married in 1840. Some idea of Huxtable's wealth can be obtained from his will. He left about £50,000 plus effects and property. Considering that he had this residual nest egg after

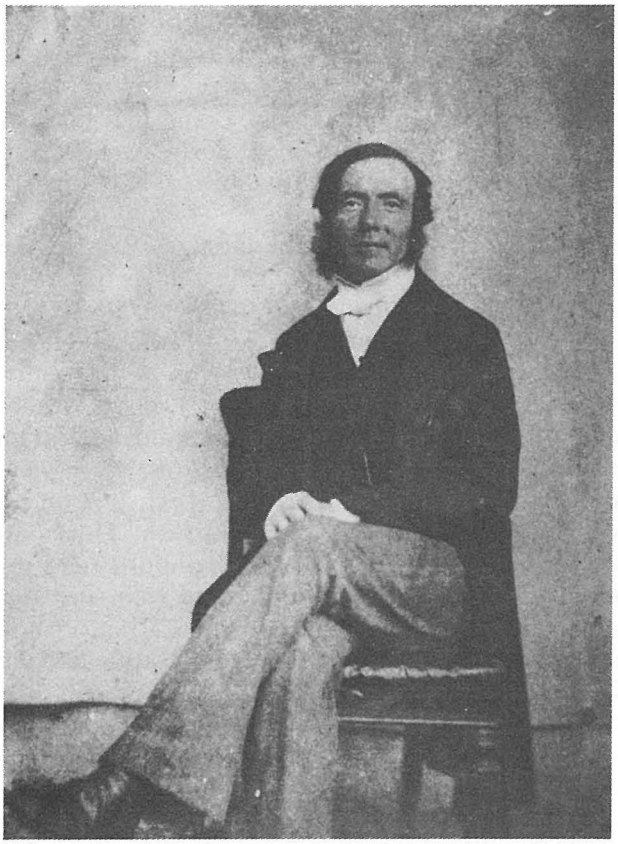


Fig. 1. Archdeacon Anthony Huxtable, *c* 1857, copy of a photograph in the possession of Mr. L. T. S. Bower, PO Box 392, Malindi, Kenya.

spending very large sums on his various projects in the village, that he had lost money when the Blandford Bank failed in 1858 (Huxtable was a vocal creditor), he must, by today's standards be rated a millionaire. Huxtable had no children to inherit so his second wife was the principal beneficiary but £4,000 went to the Society for the Propagation of the Gospel, £2,000 pound to local hospitals and £1,000 to the Sutton Organ Fund (still used to pay the organist today).

It is not clear when Huxtable built Sutton Waldron House, where he lived during his time in the village. Viscountess Nancy Portman lives there now but it has been drastically altered since Huxtable's time. Huxtable also reconstructed the Old Rectory. On his farms he built cottages and extensive farm buildings, these often being of his own novel construction and some only designed for a transitory existence. These activities are not surprising since Huxtable was an extremely practical man, in fact, a first rate engineer.

[4] Obituary notices of Anthony Huxtable in *Dorset County Chronicle* (27th December, 1883), *Western Gazette* (28th December, 1883), *The Times*.

Huxtable and his gifted wife were utterly devoted to the material and spiritual needs of his parishioners. Huxtable's wealth enabled him to employ a curate, thus releasing him to devote more time to his building and farming. Anthony was a man with immense drive and devoted enthusiasm for the causes that interested him, causes to which he could apply his great intelligence and knowledge. Unfortunately all through his life he was subject to bouts of nervous prostration and various forms of physical suffering which caused frequent cessations from work and absence from his parish. The parallel with Charles Kingsley, who was curate at nearby Pimperne for a short time in 1844, is remarkable. Both were full of ideas for which they generated great enthusiasm and application only for each period of intense activity to end in complete collapse. They were like very sensitive computers taking in too many messages for the good of the internal machinery. Then again they were living in a world where tremendous changes were taking place in industry and agriculture, in the very fabric of society itself, changes to which people of this nature over react, probably feeling that it was their personal responsibility to put things to rights. Each of these men was sustained by a devoted gifted wife drawn from more prosperous spheres than the rectors themselves. Huxtable was luckier than Kingsley, he was never short of money to finance his great schemes and his marriages worked well even though there were no children. After Huxtable lost his first wife in 1874 he acquired another devoted partner in Susannah Gott, a Yorkshire widow, who he married in 1875. After Anthony's death Susannah set up the Huxtable Memorial Charity for the relief of the poor in Sutton Waldron and which functions in an amended form to this day. In contrast Kingsley's wife, Fanny Grenfell, contributed to Kingsley's disorders by hankering for the gracious life she had left on marriage and driving Charles to intense work to earn money. In later life Fanny found Kingsley's emotional and sexual demands too much for her (although she was a passionate person herself) and found excuses to put distance between herself and Charles.

Huxtable's greatest building project was the construction of a new church. Henry Sturt gave the land but Huxtable and his wife entirely financed it. It is well positioned and its graceful spire can be seen for miles around. St. Bartholomew's was consecrated in 1847. It appears that the old Saxon church had become too small for the increased population and was very dilapidated. The craze for church restoration and rebuilding was then gathering momentum. By the time Thomas Hardy got involved it was in full swing and later he had bitter things to say about the work in which he had become unwittingly involved. F. E. Halliday in his book on Hardy[5] has this to say 'Some old churches were simply pulled down and rebuilt, those exhibiting two or three periods of Gothic were reduced to one uniform style, irregularities were smoothed away, chancel arches and monuments moved, medieval tracery replaced by caricatures in new stone, and old oak pews and pulpits by new fangled deal . . . for him (Hardy) an old building was primarily the hands that shaped it, the feet that had worn its floors; human interest was more important than the architectural, the associative influences more valuable than the aesthetic'. Looked at in this way Huxtable's act of destruction and rebuilding might be condemned, no doubt today when we are all conservation mad it certainly would be. But since so little is know of the old Saxon church can any worthwhile judgement be given? Certainly many old churches were savaged or ravaged by the Victorians. Pimperne and Durweston, both not far from Sutton, got the full treatment. The patron of both these churches was Lord Portman, a man who had great influence on Huxtable in other spheres, as we shall see later. Today perhaps these things are done better. At Rowner, near Gosport, a tiny very ancient church, rich in monuments, has been successfully grafted on to a very large modern extension to serve the needs of a vastly increased population.

The architect of the new church was George Alexander and the fascinating interior decorations were by Owen Jones. Owen Jones is better known for his work for 'nouveau riche' capitalists, writers and artists, according to Michael Darby of the Victoria and Albert Museum, who believes that Huxtable was personally responsible for bringing Jones to Sutton. Although the flint and green sandstone exterior of the church is unremarkable the interior is compelling, particularly the very unusual stained glass of a secular character and the remarkable work of Owen Jones on the decorations.

[5] *Thomas Hardy*, F. E. Halliday, Adams and Dart, Bath, 1972.

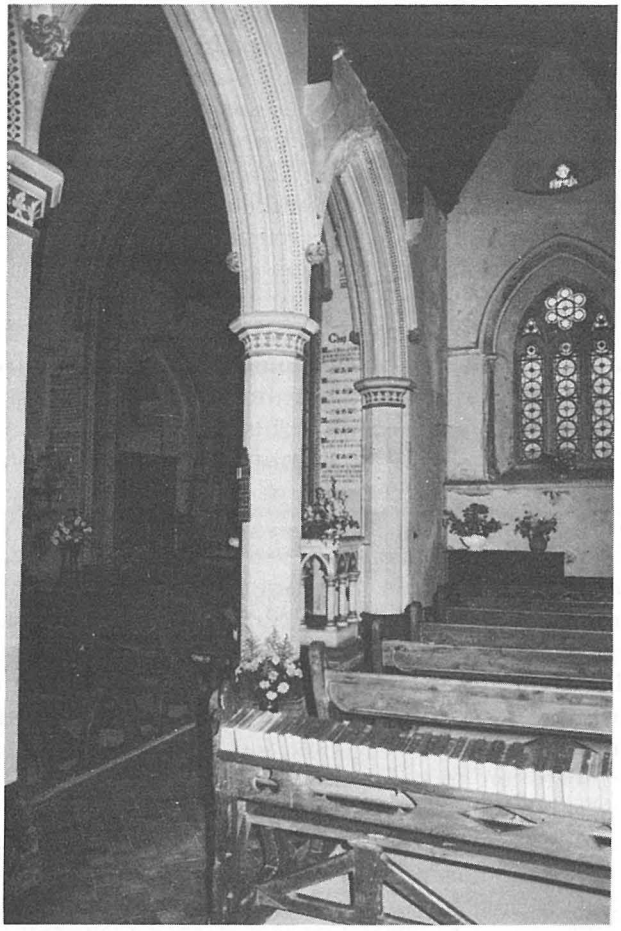


Fig. 2. Interior of Sutton Waldron Church, *Copyright Colin Graham, Dorset Magazine.*

Huxtable, the newly ordained priest, soon made an impact on the local clerical scene. In his first year he founded a book club to serve the clergy of the Blandford area. Then in August, 1855, Anthony founded the Blandford Clerical Society, this being one of the oldest societies of this type in the country and which is still running in full spate. Theological discussions are followed by socialising with the clergy's womenfolk, the food and drink served following the ancient pattern. Huxtable was a Tractarian and the above foundations conformed to this outlook. Paradoxically his deep and active interest in alleviating social distress, his profound practical views on social questions were much in conflict with the normal socially withdrawn Tractarian outlook, more in the mould of his great Dorset contemporary, Lord Shaftesbury (an atypical Evangelical). Huxtable however was never an active campaigning political animal, he worked by example and the printed word. This may have been due to Huxtable's own awareness of the deficiencies in his physical and mental makeup. These were ill suited to the demands that active politics make on a man. He was probably inclined to keep out of the public arena but we shall see that his agricultural enterprises made him a highly controversial, even notorious, public figure—this wouldn't have helped his nerves much. Similarly we can explain his lack of serious ecclesiastical ambitions. Although Anthony was a very conscientious parson, always striving to improve his preaching, his only clerical promotion came in 1862 when he was persuaded by the Bishop of Salisbury to undertake the office of Archdeacon of Dorset. However after nine months he had to resign due to ill health though his grasp of contemporary theological discussion was recognised. Huxtable must have felt sorely the frustration that his health prevented him from fully exploiting his imaginative practical talents and inherent dynamism to the full.

Probably the best known parson in Dorset in Huxtable's time was a man who through his famous campaigning letters to *The Times* and his constant support for the agricultural labourer became a controversial figure of national importance, much resented by the

landowners from whose class he was drawn. This was the Hon. (later Lord) Sidney Godolphin Osborne, third son of the Duke of Leeds.[6] In 1841 he accepted the living of Durweston, where Lord Portman was patron. Durweston being only a mile north of Blandford this made Osborne almost a neighbour of Huxtable. Osborne and Huxtable had much in common. Both had scientific interests, dabbled in sanitary matters, were interested in agriculture (although here Osborne's interests were on particular topics like the cattle plague rather than the free ranging ones of Huxtable) and both had the welfare of the labourer at heart. Unlike Huxtable, Osborne was very much the active political campaigner. The *Dictionary of National Biography* says of Osborne 'a philanthropist of a militant and almost ferocious type, he was always lashing abuses and provoking controversy'. SGO (as everyone knew him from the signature on his *Times* letters) was an Evangelical,[7] hence it is not surprising that he was not a member of the Blandford Clerical Society. It would be interesting to know what Osborne thought of Huxtable and vice versa but there seems to be no information on this topic. Both being clerics and living so near to each other they must surely have met not infrequently, particularly as they were linked through Lord Portman. Of course one has to bear in mind that though SGO campaigned for the downtrodden Dorset labourer he still considered himself very much an aristocrat, albeit a poor one. There is a famous story of SGO delivering a cutting remark to a local brewer who tried to become familiar at a local hunt meeting. Whilst Huxtable seems to have been closely linked with the local establishment his place in society would be regarded as modest by Osborne's standards.

Another clergyman, who like Osborne became something of a national hero, made a fleeting appearance in NE Dorset in 1844. This was the young Charles Kingsley, product of Evangelical rearing. He had been curate at Eversley in N. Hampshire where he had the chastening experience of being faced with a hard drinking patron and a rector who was an ardent womaniser who woefully neglected his parish. Charles however had won the respect of his parishioners but was filled with doubts about the social mission of the church. Early in 1844 he was married to Fanny Grenfell by none other than SGO, SGO being already married to Fanny's sister, Emily. SGO arranged with Lord Portman for Charles to become curate at Pimperne, the rector here being the notorious multi-pluralist, Dr. Wyndham, who employed four curates to work his parishes. SGO's devotion to his parishioners and his hard hitting social campaigning inspired Kingsley to do similar things when he returned to Eversley as rector in late 1844. Kingsley was certainly influenced by Huxtable's agricultural work and Prof. Robert Martin in his biography of Kingsley, *Dust of Combat,* states that it was due to Huxtable that Kingsley tried out scientific farming in a modest way at Eversley. Unfortunately there appears to be no direct evidence of Kingsley meeting or writing to Huxtable but Kingsley could well have been further inspired by Huxtable's work for his parishioners.

In 1848 Kingsley[8] became one of the four leaders of the newly founded Christian Socialist movement, a movement that became interested in scientific farming (possibly in Christian Socialist communities) as a means of benefitting the nation and the agricultural labourer (very much Huxtable's own ideas). They were also interested in using sewage in agriculture, sanitation, and provision of pure water supplies in big cities, and removing pollution from the environment. These were all themes which interested both SGO and Huxtable, SGO in fact was an active supporter of the Christian Socialists. It is surprising to find scientist and social reformer Charles Mansfield,[9] another leader of the Christian Socialists and the most intimate friend of Kingsley, writing to Mrs Kingsley about Huxtable. In this letter of 1850 Mansfield writes 'I must someday have a talk with Charles about the best way of learning to farm in a short time . . . You know all about Mr. Neale's farms and his social projects (Edward Vansittart Neale, Christian Socialist and very wealthy aristocratic philanthropist,

[6] Lord Sydney Godolphin Osborne, *Dictionary of National Biography.*

[7] *The Call to Seriousness,* Ian Bradley, Cape, London, 1976.

[8] *Christian Socialism* (1848-1854), Raven, London, 1920.
Biographies of Charles Kingsley: *Dust of Combat,* Martin, London, 1962; *The Beast and the Monk,* Susan Chitty, Hodder and Stoughton, London, 1975; *Charles Kingsley,* Brenda Colloms, London, 1975.
Charles Kingsley in Dorset, Ward, *Dorset Magazine,* No. 40, 1974.

[9] Charles Mansfield, Ward, *Hampshire Magazine,* August, 1975 and January, 1976.
Blachford/Mansfield papers, IoW Record Office.

EW) . . . he had a notion that I was to manage one of his farms and I find Charles has driven the nail home . . . But I must get the subject up. Does Charles know Mr. Huxtable or Mechi or any of the scientific farmers?' It is amusing to note that in a lecture to a fashionable audience Kingsley cynically remarked that perhaps worn out labourers could be disposed of by melting them down in the sulphuric acid tank and drilling them in the root crops, obviously inspired by Huxtable's preparation of bones for manure in this fashion and his work on root crops.

It has escaped the many biographers of Kingsley that he, SGO and Huxtable were literally within a stone's throw of each other in NE Dorset in 1844, and this at a time when campaigning parsons were very thin on the ground in the whole country. F. G. Heath, a well informed observer of this period, concluded 'one of the most striking circumstances in connection with the movement of the peasantry for better wages, better houses, better treatment, has been the marked indifference exhibited towards the movement by the ministers of religion'. Charles Buller was even more exasperated 'For Heaven's sake do not destroy the Established Church, it is the only thing that stands between us and Christianity'.

Another cause which Huxtable served indefatigably over many years was his work for the Society for the Propagation of the Gospel (of which he became a Vice-President) and his work was so outstanding that the SPG commissioned an account of it, which was published and served as a model for others.

Surprisingly local folk memories survive which show that the wealthy Huxtable may have been resented by some of the locals and at times that he was not all sweetness and light. One local said there was a tradition that Huxtable was a 'hard and grasping man', another said that Huxtable had a man transported for stealing apple wood from his orchard. Folk memories often have hard substance in them but we have no way of checking them. However it is interesting to note that neither Huxtable nor his curate ever wore a cassock, surely confirming that Anthony was a very friendly open rector not wishing to put barriers between himself and his parishioners.

Huxtable's activities as a scientific farmer can only be discussed in the context of the prevailing social conditions since his work had profound social implications as well as agricultural ones. The motivation for Huxtable's work almost certainly came from two local gentry who were working on somewhat similar lines before Anthony came into farming. These were Edward Berkeley Portman (1799-1889; Baron 1837, Viscount 1873) of Bryanston and in a minor role Henry Sturt of Crichel.

There was certainly a clerical tradition in Anthony's family, as evidenced by the clerical Huxtables who attended his funeral, but it is not known if he had any farming background, he could have been plunging into unknown territory in taking up farming. He must have moved into farming in the early 1840s since he joined the Royal Agricultural Society of England (RASE) in 1842, continuing his membership into the 1870s. The *Dorset County Chronicle* records his attendance at an agricultural meeting in Sturminster Newton on 30th November, 1843[10]. Here Lord Ashley Cooper (later the Earl of Shaftesbury) displeased his audience by his speech. They felt that Ashley was not only neglecting their interests but actually opposing them with his support for the Factory Acts, his championship of the farm labourer and by not favouring general protectionist policies for agriculture. Huxtable was probably a Protectionist supporter early on, albeit if only a mild one, but he became an unabashed Free Trader later. It was not surprising that the farmers reacted badly to their MP's speech, farmers in general were then under severe economic pressure and were working themselves up into a frenetic state about their future.

If the farmers were anxious what were the labourers thinking in the 1840s, if they ever had time to think with the constant demands on their time and energy in the futile struggle to maintain their families. The condition of the agricultural labourer in this country at that time was very bad, SGO remarked 'the constant wonder is that the labourer can live at all'. Nowhere was it worse than in Dorset where wages were notoriously low. The Dorset labourer earnt 8/– per week or less with a rent free cottage or 9/– with rent to pay. Earnings could be supplemented by those who had allotments and Huxtable himself studied these allotments,

[10] *Bound to the Soil*, Barbara Kerr, John Baker, London, 1968.

noting the very high yields possible on them with intensive culture. Worse still were the labourers on some Dorset estates who, as elsewhere, were almost entirely paid by the iniquitous truck system. SGO attacked the farmers who compelled their men to take in wages inferior butter and cheese which could not be sold in the market or meat from diseased animals. A labourer told Osborne 'Many of us even get into debt with them (their employers) and then you see, Sir, we must go on'. Many risked transportation by defying the game laws to get rabbits, hares or deer. Old Dorset photographs reveal the labourer as an undernourished, undersized man living in an overcrowded mud walled cottage. According to Caird the Dorset diet consisted of a breakfast of flour with a little butter and tea; bread and cheese midday; tea was potatoes maybe with a little bacon; supper, bread and water. A government enquiry of 1863 found that Wiltshire, Dorset and Somerset had a particularly bad nutritional record with labourers generally better fed than their wives or children. About 1850 Dorset had 15.7% paupers, only exceeded by Wiltshire's 16.1%, whereas in northern counties the proportion was only 6%.[11] Paradoxically when farming was at its most prosperous in the decades after the mid-century, the Golden Age or that of High Farming, the labourer was at his poorest. In such conditions he could feel little concern or sympathy for the fate of his employer.

Huxtable saw that labourers and farmers alike were in deep trouble, trouble that could only worsen if the Corn Laws were repealed (as they were in 1846). The answer in Anthony's mind was Scientific Farming, he would help both farmers and labourers by taking up farming in a scientific manner and by taking the unemployed on to his farms.

Before examining Huxtable's farming record we must first briefly detail the state of agriculture, and that of the Blandford area in particular, in relation to the economic/social conditions of Great Britain then. The 17th and 18th centuries saw Britain in the forefront of agricultural advance with its selective breeding of livestock, the fourfold rotation of crops and the introduction of roots for winter feeding. Humphrey Sturt of Crichel was a well known improving farmer in the late 18th century. Amongst his ventures was the entire reclamation of Brownsea Island off Poole, then some 900 acres of fern, furze and ling. Sturt burnt off the heath, planted trees and sowed crops like clover. Still we lagged behind the Continent in providing facilities for agricultural education. However early in the 19th century we were moving forward again with the development of what came to be called scientific farming. This was the application of the physical sciences like geology, physics, chemistry, botany, engineering to farming. But the Germans moved in quickly and became predominant in the early 1840s in agricultural chemistry. As regards manures, saltpetre had been known to be beneficial from the 17th century but we did not import it in any quantity till about 1850. Guano was another source of nitrogen and imports of this began about 1835. Ground bones, as a source of phosphorus, were used by the late 18th century and our enterprising merchants imported some from the battlefields of Europe, including those fought over by British armies!

Suddenly the agricultural scene blew up into a state of acute crisis, bad harvests from 1839 to 1843 combined with a general trade depression produced 'the hungry forties'. The industrialists saw their salvation in cheap imported food for the masses, enabling wages to be kept low, whereas farmers saw the end of protection as the final blow that would plunge them into total disaster. Nevertheless, faced with the Irish potato famine of 1845 in which a million people died, Peel was forced to repeal the Corn Laws in 1846. To help the farmer he introduced the Land Drainage Act which enabled 2-3 million acres of land to be drained. The answers to the farming crisis were rapid and many. The RASE had been formed in 1838 with the motto 'Practice with Science'. The Royal Agricultural College at Cirencester was opened in 1843 (Huxtable was not amongst the original shareholders). Justus von Liebig, the German who dominated agricultural chemistry, was brought over, with much blowing of trumpets, to propagandise in Britain about the value of chemistry and other sciences to agriculture (he also wanted to stimulate sales of his own type of fertilisers). The great landowners, aided by the medicals (also interested in strengthening chemistry) put up money to found The Royal College of Chemistry in 1846.[12] Huxtable was one of the 700 or so

[11] J. Burnett, *Plenty and Want*, Chap. 7 (Rural England; Romance and Reality), Penguin, London, 1968.
[12] Dr. Marilyn Roberts (Faculty of Arts, The Open University), PhD thesis on *The Royal College of Chemistry*, The John Hopkins University, 1973.

supporters of the college who both contributed funds and aroused support for the project, although his contributions for a wealthy man could only be described as miniscule. In 1845 Huxtable published two papers in the RASE journal. One was on 'Experiments on the shed feeding of sheep', the other was absolutely fundamental to scientific farming, a study of the use of manures in growing a crop of swedes on what was taken to be barren land on Cranborne Chase. These and other activities, plus the patronage of Lord Portman, a leading member of the RASE, must have made a great impression in the RASE and Huxtable was appointed to the Analytical (later Chemical) Committee of the Society in 1846. Here he joined scientists of international stature like Liebig and Playfair, and agriculturists of similar repute like Philip Pusey. This was an astonishing rise to fame for Huxtable who had only just come into farming. In May, 1847, the RASE invited Huxtable to address their members at the annual country meeting to be held that year in Northampton. He was to introduce the subject of the growth of turnips with artificial manures, to discuss the best combination of manures and the readiest mode of detecting adulteration of manures on sale (the adulteration of manures and feeding stuffs was a grave problem in Victorian times and the RASE devoted much time and energy to combating it, especially by providing an analytical service for farmers). Huxtable's address was to be followed up by Professor Way, consulting chemist to the RASE, later to collaborate with Huxtable in research. Huxtable was making a great impression on the farming community, later he became a controversial figure and people wrote critical letters to *The Times* about his work, a sure sign that he was very much in the public eye.

We can now turn our attention to the Dorset scene, in particular to Lord Portman[13] and Henry Sturt, Huxtable's neighbours. Portman was educated at Eton and Oxford, graduating with first class honours. He became Liberal MP for Dorset 1823-32, for Marylebone 1832-3. From the outset he held high office in the RASE, being President in 1846, 1856 and 1859. Obviously it was to his advantage to have a local nominee (Huxtable) on the important Chemical Committee. In its early days Portman published quite frequently in the RASE journal. The outstanding contributions, and of most significance here, were papers published in 1843 and 1847 on the reclamation of 200 acres of poor land known as Durweston Common. Portman said that the pressure on farmers and labourers 'by the panic of 1826' induced him to endeavour to lessen the sufferings of labourers and to check the increase of poor rates (which would bear hard on farmers—EW) by devising a scheme to cultivate by spade husbandry this 200 acres (Shepherd's Corner Farm he named it later) of largely furze and fern, with a little sheep grazing, then rented at 2/6 per acre. By 1842 he claimed he had made an adequate profit on the enterprise and the land was now as good as surrounding arable. He recorded an expenditure of £10,455 to secure a book profit of £88 plus crops in the ground. In 1847 he reported that by his improvements Shepherd's Corner Farm could now be rented at rates equal to those for surrounding arable land and that his neighbours were doing similar work. This long term costed agricultural reclamation with social welfare for the labourer and a hidden dividend for other farmers was the obvious model for the similar work that Huxtable did on Cranborne Chase. It is not surprising therefore that Huxtable dedicated his swede raising research paper to Portman. Louis Ruegg, in his prize winning essay on 'Farming in Dorsetshire' published in the RASE journal for 1854,[14] talking of farm cottages says that Lord Portman had good cottages at Pimperne and Durweston. Ruegg gives special praise to Henry Sturt. Sturt's cottages had three bedrooms with a large kitchen, coal and wash houses, larder and closet. These were carefully sited with a half an acre of land attached. Ruegg goes on to say that the labourers who occupied these cottages took great pride in cultivating their land, carried off the best prizes from the Labourers' Friend Society and had given up poaching! These occupants were encouraged to stay and develop a feeling of ownership. Of steam engines Ruegg says that Portman had the most efficient in the county and from the

[13] Viscount Edward Berkeley Portman, *Dictionary of National Biography*.
Lord Portman, *J. R. Ag. Soc. Eng.*, 1843, *4*, 88; 1847, *8*, 565 (Account of Shepherds Corner Farm at Durweston); 1845, *6*, 343 (On the Disease of Potatoes); 1846, *7*, 158; 1849, *9*, 452.

[14] Four Centuries of Farming Systems in Dorset, 1500-1900, G. E. Fussell, *Proceedings*, 1951, *73*, 116.
Farming of Dorsetshire, Louis H. Ruegg, *J. R. Ag. Soc. Eng.*, 1854, *15*, 389-454.

description Portman used it much as Huxtable did his, Sturt also had a steam engine. Lord Portman and Sturt then were the men whose example served Huxtable well.

Ruegg's essay was cunningly contrived, it had something for everybody in it. Thus whilst he recognises that labourers' wages at 7/– a week were poor he claims that this was not a true picture since the farmers allowed the labourer potato cultivation with his own seed. Ruegg claims that labourers were better off than in public estimation, something SGO would never have agreed with. Then, rather sickeningly, Ruegg says 'A county magistrate who has paid much attention to the subject says of the Dorset labourers "a more civil, obliging and well conducted peasantry does not exist in England". They are indeed terribly addicted to drink, but intoxication is not very prevalent, though a mower will often drink two gallons of beer a day'. Ruegg would have made a good politician.

Fig. 3. The banded brick and flint farmhouse at Sutton Hill Farm, now farmed by Mr. Richard Woodhouse, Huxtable's Hill Farm. *Copyright Colin Graham, Dorset Magazine.*

Huxtable rented two farms from the Sturts of Crichel (local tradition has it that he got these through his wife's connection with Crichel) but the identity and location of these is a vexed one. My conclusions are based on a detailed investigation by Mr. Carter, Dorset County Librarian, in 1870 plus statements of 1850 by David Milne (in the reports he gave of Huxtable's farms, see below) and my own walking of the ground. Huxtable's Hill Farm I believe is the present Sutton Hill Farm (now farmed by Richard Woodhouse), about 1½ miles from Sutton Waldron on Sutton Down. The key item of evidence for this and against the alternative Hill Farm near Iwerne Minster is Milne's statement that Huxtable had 283 acres of a ridge of chalk hills 660 ft. above the sea. The present OS maps give this farm at 668 ft but Hill Farm at only 613 ft. When I looked round the buildings and farm I found it anything but the bleak barren area talked of in 1850. It looked lush with hedges and corn was pouring in for drying. The barn, of flint and brick, is not very big but there was some slight evidence of an old drainage exit that might have fitted operations of Huxtable's type. There are farm cottages, significant in themselves since Huxtable built cottages, of the same type of

construction as the barn. It is known that Huxtable had a tall chimney and less permanent kind of buildings on his Hill Farm. Anthony's Vale Farm could be either the present Vale Farm, worked by Mr. Drake, but this is of 250 acres or it could be the smaller West Farm, owned now by Mr. West. Huxtable's farm in the valley of the Stour was about 95 acres on retentive clay soil. The present West Farm was certainly once owned by Crichel although the original farm house is no longer part of the present farm. One can reasonably settle for the present West Farm.

Fig. 4. One of the original farmhouse buildings, now divorced from the farm and converted into a cottage, nr. West Farm, Sutton Waldron, probably part of Huxtable's original Vale Farm. *Copyright Colin Graham, Dorset Magazine.*

Turning now to Huxtable's membership of the Chemical Committee of the RASE.[15] The committee was set up by the RASE to concentrate on analytical work in agricultural chemistry but later its scope was widened and broadly-based research projects came under its direction. Nevertheless there was always an agricultural analytical service available to RASE members under the direction of the Society's Consultant Chemist. Agricultural analysis was absolutely vital to those who followed the primitive theories of scientific farming at that time. The general idea was that to find out what manures you had to apply to raise a particular crop the chemical composition of the plant (particularly plant ash) was determined, the soil in which it was to be grown was analysed and in this way was indicated what was apparently missing in the soil, so indicating qualitatively and quantitatively what manures had to be applied to feed the plants properly. These ideas were strongly in vogue in Huxtable's time and were a strong motivator for his farming methods. Unfortunately these simple theories were really trying to deal with very complex biochemical systems, they had the substance of truth in them but they were not altogether a sound basis for good farming techniques.

[15] Minutes of the R. Ag. Soc. Eng. Chemical Committee, 1854-1870; Minutes of the Council of the RASE; R. Ag. Soc. Eng. Archives, Museum of Rural Life, University of Reading.

Huxtable, like many similar enthisiasts, must have been disappointed at times with some of the practical results obtained on this basis. Even the great Liebig himself came in for strong criticism from the eternally conservative farming world when results did not go as predicted. Huxtable joined the Chemical Committee in 1846 but unfortunately the surviving minutes only date from 1854 and they are so briefly given that individual contributions cannot be identified. Huxtable seems to have attended one or two meetings each year over his period of office, 1846-1867. The fact that he was kept on the committee for over twenty years clearly demonstrates that whatever his critics thought the RASE valued his services. However he does not seem to have participated in field trials carried out by RASE members for the committee which is what one might expect from Huxtable who liked doing his own thing. Since there were often MPs on the committee, Huxtable was in direct contact with contemporary politics.

Huxtable's first paper to the RASE journal[16] dealt with procedures to combat foot lameness in sheep which arose when the animals were confined to one spot indoors. Anthony described in detail how to construct a lightweight shed (which would last two seasons), the floor being of chalk with layers of gas tar and sand above. Methods are also described for keeping sheep on boards with the floor underneath covered by absorbents like sawdust or burnt clay. Huxtable claimed that his methods kept the sheep in good health and that he found no lameness amongst 300 Southdowns reared this way. It was later in 1845 that Anthony published his fundamental paper on growing swedes on apparently barren land. It was a crucial experiment designed to determine if when the essential constituents of a plant were supplied to the soil in which it was grown could it be cultivated on any land however sterile? It was a vital test for prevailing agricultural theory. For the test he selected five acres of a chalky exposed plot on his Hill Farm, land that was almost devoid of herbiage and hence deemed to be barren. Unemployed from Shaftesbury cultivated it by pickaxing in 1844, rape was sown twice but failed completely. In April, 1845, Huxtable worked out the quantities of manures required to produce an expected crop of 20 tons of swede per acre, noting that some carbonic acid and ammonia would be available from rotting matter in the soil, and some ammonia would be available from the air. Manures used were wood ashes, guano treated with dilute sulphuric acid to counter the effect of rains washing out the manures, burnt bones treated with sulphuric acid to release phosphates and sawdust rotted by fermentation with pigs manure/salt. Huxtable thought that the sawdust would be a source of carbonic acid/ammonia but would also conserve moisture in this exposed high place. Drills were made two feet apart, the manures placed in these and then children went along dropping in the seed mixed with fine soil (*NB* the employment of women and children, even very young children, was common in agriculture at that time). The crop fulfilled all of Huxtable's expectations, it was estimated at 20 tons to the acre. Huxtable remarks that both the men working on the job and eye witnesses regarded the experiment as a well meant but amusing folly! The size and quality of the crop rebuked them. These were Huxtable's costs per acre:

	£	s.	d.
30 bushels of woodashes at 6d.	0	15	0
2 cwt. of Ichaboe guano at 7s. 6d.	0	15	0
50 lbs. of burnt bones and 22 lbs. of sulphuric acid	0	7	0
30 bushels of sawdust	0	2	6
Labour account in hoeing, drilling, dropping seed (the surface of the land being otherwise untouched)	0	19	6
10 lbs. of sulphuric acid poured over ashes	0	1	3
Rent 5s. Rates, etc. 2s.	0	7	0
Seed, 5 lbs. per acre	0	3	6
A pair of horses hauling the artificial manure to the summit of the hill	0	7	0
	3	17	9

[16] Huxtable, *J. R. Ag. Soc. Eng.*, 1845, *6*, 242-4 (Experiments on the Shed Feeding of Sheep); *J. R. Ag. Soc. Eng.*, 1845, *6*, 355 (Experiments in Raising a Crop of Swedes upon Barren Land with Artificial Manures)—*c.f. J. R. Ag. Soc. Eng.*, 1842, 423 (Comparative Results on Growth of Swedes, from Members of the Society, involving Use of Manures).

Huxtable's costings (if anything weighted against him) showed a return of over 300% on his outlay, his yield of swedes being 21 tons per acre of clean roots valued at 15/– per ton at the lowest, plus 4-5 tons green food per acre which was claimed to offset the cost of pulling the swedes. The RASE editor re-evaluates this by including the cost of previous cultivations but even then the profit is still about 100%. This is a very remarkable figure that one must eye very critically since it was mainly on costings that opponents attacked Huxtable. It is probable that Huxtable was helped by the fact that there was more fertility in the soil than appearances had suggested, Huxtable took it as zero, it being 'barren land'. Anthony concludes that with the skilful employment of labour, reliance on the principles of chemistry and adequate capital, that there is no soil, however poor, which will not abundantly repay the costs of cultivation. A sweeping conclusion perhaps but a very heartening one for the many who wanted the widespread wastelands of Britain brought under cultivation (which included men like Kingsley and Mansfield) and in some ways a decisive result for the supporters of the new fangled agricultural chemistry. Huxtable took the opportunity to emphasise the need for accurate weights and measurements in agricultural experiments, claiming that English farmers were far less exact in these respects than the Continentals. He illustrates this with calculations relating feed to live weight in animals, giving due allowance for the value of the manures arising in feeding. Huxtable's experiment was a valuable corollary to work described in the RASE journal for 1842 which described the results of members growing swedes on a variety of soils using varying manures.

Perhaps to convince local sceptics Anthony later demonstrated to a large agricultural assembly at Sturminster Newton a swede in vigorous growth in a cavity scooped out of a block of wood that had been fed on artificial manures alone (almost modern hydroponics!). Huxtable could never be faulted for his skill in public relations and the ability to create the dramatic situation.

Huxtable's use of rotten sawdust recalls the famous medico Nathaniel Highmore of Purse Caundle, Dorset, writing to the great Robert Boyle (once of Stalbridge, Dorset) in 1664 saying that the best manure for flowers was the earth scooped from under rotten wood. Another famous sawdust story, showing that the basic ideas of plant rearing were also being applied to feeding animals concerns William Thompson, Irish eccentric landlord with thousands of tenants in SW Ireland. Thompson was a forerunner of Karl Marx in political ideas and founded an agricultural co-operative in SW Ireland. He, having heard that the flesh and bones of all living animals contain the same ingredients as wood, fed pigs on a diet of sawdust, peat and straw!

Anthony's ability to communicate his ideas on scientific matters is well illustrated by a lecture he gave to a non-scientific audience of local farmers (the lecture was published in London in 1847)[17]. It shows that he had a good grounding in chemistry and that the subject fascinated him. He illustrated the lecture by simple experiments like the spontaneous combustion of phosphorus (amusing but hardly relevant to agricultural chemistry!). He described the general principles of agricultural chemistry, dealing with plant requirements, cultivation techniques (he favoured more and deeper ploughing) and especially the preparation and application of manures, emphasising his own blend of theory and practice. One theme that he emphasised strongly and that still could be borne in mind today was that we should endeavour to supply all our manures ourselves instead of importing them 'We shall realise what I have read in some very hopeful advertisements, England independent of the world' said Huxtable. Anthony's views thus show a reasonable patriotism and were rooted in sound commonsense. Huxtable always emphasised that agriculture is the most backward of the sciences as was also the question of agricultural costing and agricultural economics. He urged caution in comparing and interpreting results obtained on different types of land in varying locations in different climates. Nevertheless, despite Anthony's sceptical approach, it was the work of pioneer experimentalists like him that ushered in the Golden Age of Farming.

That Huxtable was an early exponent of recycling and conservation of resources can be seen from many of his practices and beliefs. He suggested that bones be fermented with urine, salt and ashes instead of using the hazardous chemical, strong sulphuric acid. As a source of

[17] Huxtable, *A Lecture on the Science and Application of Manures*, Ridgway, London, 1847.

nitrogen he used woollen wastes or woollen rags. He was particularly interested in applying sewage as liquid manure. This was not only a potentially cheap, useful manure, available in large quantities in or near towns but its use in agriculture would also contribute to solving the acute problems of urban sanitation prevailing in the middle of the 19th century. We shall have more to say later of Huxtable's collaboration with Edwin Chadwick, the great sanitary pioneer who experimented with the use of sewage as manure. Anthony made his own contribution to solving local sanitary problems, and economic problems for that matter too, by purchasing locally night soil and applying it in liquid form.

What is the aim of all this scientific farming? Whilst Huxtable saw it as a more efficient method of farming he also saw it as the means to improve the feeding of the people through better and cheaper feeding of plants and animals. Always there is this element of social purpose in Anthony's thinking that marks him out as someone rather special amongst his fellow agricultural developers.

The general farming methods employed by Huxtable can be partly seen from his own publications but a very valuable source of information is available from a lecture given by David Milne to the East Berwickshire Farmers' Club, later published in London,[18] in which he gives a detailed description of a visit he paid to Huxtable's farms in 1850 and to a lesser extent Ruegg's prize essay on Dorset farming of 1854. It is most significant that Milne says 'I was most desirous of seeing these farms in consequence of Mr. Huxtable's celebrity as a scientific agriculturist'. Ruegg states 'This report would be incomplete without a notice of the farms of the Rev. Anthony Huxtable of Sutton Waldron, although the notoriety which they have attracted will reduce our notice of them to the condition of a "thrice told tale" '. A foreign visitor to Dorset, around 1855, a Monsieur de Lavergne, remarked 'Mr. Huxtable, one of the boldest pioneers of English agriculture resides in this county. This gentleman was the first to assert the opinion . . . that even at the low prices English farmers could retrieve themselves if they kept up their courage. One can imagine the alarm raised by such an assertion. Mr. Huxtable was treated as a public enemy'. All these opinions only reaffirm what we have said already, Huxtable was in the forefront of agricultural advance and very much in the public eye for a variety of reasons. Yet we must record that history seems to have passed Anthony by, probably because it is only now that we can see his achievements in proper perspective and there is a strong case for his reinstatement amongst the great agricultural pioneers of the 19th century.

Milne's visit lasted two days. He not only walked the farms but also examined the farms' books and accounts (he quotes farm rents as 15/– to 18/– per acre). Hill Farm he found bleak and exposed, with no trees and fences (how utterly different it looks today). Vale farm had only a boundary hedge. No stock was pastured in the fields. Cows, oxen, sheep, horses, pigs were well fed more or less under cover, needing extensive buildings. Ruegg describes a rick barn at the Hill Farm of 40 ft. length, 25 ft. width and considerable height, composed of larch poles, wattled with furze and roofed with ½ in. boards covered with brown paper which had been nailed on, tarred and dusted with grit four times. Rain could not penetrate it, strong winds did not break it up. Ruegg says that Hill Farm was 250 acres on chalk, there being 50 acres broken out of Cranborne Chase and that it had 70 acres average downland. Milne says that Vale Farm had 60 cattle, 30 in milk and all calves were reared. Cows were kept to make butter and cheese, to supply young stock and produce manure. Buttermilk and whey went to the pigs. Hill Farm had 96 cattle, many pigs and over 700 sheep. In the early days cattle were kept tied up on sloping floors (to permit collection of liquid manure in a tank) covered with straw, or better, the cattle lay on wooden spars set above the floor, this kept them dry and allowed air to circulate. Later Huxtable preferred to keep cattle in sheds with airing yards attached which minimised the spread of disease. Huxtable also took the precaution of placing newly purchased stock or sick animals (a dangerous mixture—EW) in an isolated area. Sheep were tied up on wooden frameworks but this was later changed to 3-4 months of the year. Pigs were kept on sparred boards, these also were later provided with airing yards. Huxtable had found that too close confinement caused health problems, e.g. tubercules developed in cattle. Today of course such problems would be much lessened by the use of anti-biotics in feed.

[18] D. Milne, *Report of a Visit to the Farms of Mr. Rigden, Sussex; Rev. Mr. Huxtable, Dorset,* Mr. Martin, Glos, Blackwood, London, 1850.

Research at Munich University, published in 1976, shows that other problems were probably present in Huxtable's system. The German workers found that closely confined pigs became very aggressive and cannibalism could develop. One very interesting point, again showing Huxtable's awareness of the possibilities of new materials, was his idea that rough india rubber might make a useful floor for a cattle shed.

Huxtable placed great emphasis on the collection, storage and use of manures. A great feature of Anthony's manuring techniques was the distribution of liquid manure to the fields by pipelines. He was amongst the first to employ this technique and carried out many experiments on the best and cheapest way to do it. Whilst the great pioneer agriculturist Mechi of Tiptree Hall preferred iron pipes Huxtable thought they would be unsuitable by reason of corrosion. He tried wooden ones but eventually settled for locally made burnt clay pipes. These were 1⅞ in. diameter, cost 7d. a yard, were capable of bearing 200 ft. pressure, were jointed with cement and showed no sign of oozing through the pores. These were placed 2 ft. underground and had take off points up to 400 yds. apart. At the delivery points hollow wooden posts, at right angles to the main pipeline and raised above field level, could be used to connect to hoses or fill water carts (similar to those used to spray roads). Huxtable preferred hoses, which could have been used for a network of distribution, but he found they rotted too quickly and the superior vulcanised hoses were too expensive at that time. To fit up the system the costs were claimed as £1 per acre. By this system either liquid manure from his collecting tank or any manure that would dissolve in water (and made up to a known strength) could be driven by steam engine pumping to his fields. A contemporary writer claimed that within 50 years nearly all artificial manures would be applied in this way and that one might then get the intensive culture of market gardens in field systems. He also claimed that there would be less smell, less danger to health and liquid manures would be much superior to solid ones, since these lost potency during slow assimilation into the soil. It is interesting to note that in 1977 it is reported that tomato growers in Guernsey are going over to cultivating their plants without soil in plastic troughs fed continuously with liquid manures, pumping being electronically controlled. At this point it is convenient to say something about the only personal effect of Huxtable that survives, a letter to Edwin Chadwick (later Sir Edwin) of 25th July, 1848.[19] In this it can be seen clearly that Huxtable was closely collaborating with Chadwick, that he was receiving suggestions from Chadwick, was also making suggestions of his own and reporting on his liquid manure experiments to the great sanitary pioneer. Sir Edwin Chadwick[20] was one of the great innovators and administrators of the 19th century. His activities ranged over a wide variety of subjects of great public importance (e.g. organisation of the police, poor law administration, factory legislation, competitive examinations for the Civil Service and, above all, improvements in sanitation and public health) and was a remarkable man indeed. He must be considered as the man who first brought public sanitation to the forefront of public discussion, he continued to work on it from the 1830s right to the end of his life. In 1842 he published *Report on the Sanitary Conditions of the Labouring Population of Great Britain*, this was the starting point for all who worked in the field after that. Huxtable's letter to Chadwick described the experiments he was carrying out, on both his farms, in the distribution of liquid manure direct to the fields. These experiments must have been motivated by Chadwick's strongly advocated idea of using liquid sewage as an agricultural fertiliser, thus getting rid of large quantities of waste material in a useful manner and probably reducing the cost of providing urban sewage schemes. It is interesting to note that Anthony says his experiments have been restricted because 'he has crippled himself with Church building' and hence has less money to dispose of. At this point in time he was still using wooden pipes but also refers to a special experiment he had carried out in a forcing house using sub-irrigation, presumably in which the liquid manure passes straight into the soil through porous pipes. Huxtable claims that he had got three to four clover crops a year on his farms using liquid manure conveyed through pipes and believes that liquid manure for green crops was the greatest of all modern improvements. It is quite clear from his letter that Anthony was fully aware of Chadwick's wide ranging activities in the field of sanitation, that he was on intimate terms with Chadwick and he was

[19] Letter from Anthony Huxtable to Edwin Chadwick, 25th July, 1848 (incomplete), Chadwick papers, University College, London.

[20] Edwin Chadwick, *Report on the Sanitary Conditions of the Labouring Population of Great Britain*, London, 1842.
Edwin Chadwick, *Dictionary of National Biography*.

expecting Chadwick to visit him at Sutton. Here again we find Huxtable collaborating with one of the great men of the 19th century, just as he had done in his RASE work. The subject cannot be left without quoting some very remarkable words by Huxtable '. . . Who does not see that an extension of the same system offers a safe exit for the refuse of our towns to its manifestly intended end? Surely when the laws of the vegetable kingdom are understood, we shall, in the way here indicated, convert what becomes, by just judgement when left alone, the source of weakness, disease, and pestilence, into the elements of fruitfulness and increasing prosperity. And thus shall every additional quarter of corn imported to our shores contribute not only to direct nourishment to the consumer, but also another element to the ever increasing fertility of our happy island'. Unfortunately urban sewage, at least nowadays, is inevitably contaminated by dangerous industrial wastes and thus when an area of land at Leicester, which had been used for decades for farming using liquid sewage was proposed for housing purposes a few years back there was a tremendous outcry because the land had become dangerously impregnated by heavy metals. However at many sewage works processing goes on to yield both useful fuel (methane) to run the machinery and solid/liquid fertilisers. Methods have also been devised to process sewage to recover metals and protein containing materials.

Returning to Huxtable's use of manures sometimes liquid manure was poured over absorbents like bones and ashes. Solid manure was stored under cover and could be mixed with burnt clay, ashes, sawdust or night soil. Huxtable was strong on burnt clay for his farms.

A four- or five-field rotation was practised involving wheat (but not at the Hill Farm since it tended to get blight there), barley, mangolds, turnips (mangolds being preferred). Steam engines were used extensively on both farms for pumping manure, threshing, chaff cutting, bone milling, bean bruising, root cutting, sack filling. Surplus heat from the engine and boiler was ingeniously used to heat a drying floor for corn and other produce. Steam could be used for heating foods under pressure. The diet for cows included roots, oil cake, bean meal and chopped straw. The use of straw as feed was probably not very satisfactory as over a century later experiments are still being carried out to obtain palatable cheap animal food from straw. It was only in 1977 that the Agricultural Experimental Station of Oregon State University claimed they had solved the problem by pressure hydrolysis with alkalis followed by yeast fermentation.

Milne reported that wages paid by Huxtable in 1850 were 8/– a week, said to be better by 1/– to 1/6 than the general rate in Dorset (*cf.* figures given previously). Cattlemen got 9/– to 10/– per week. The wage bill was about 50/– per acre for Vale Farm, 90/– per acre per annum at the Hill Farm. Extra expenses were incurred by employing bailiffs since Anthony could not supervise continuously, Milne reported that one of these was studying agricultural chemistry. F. C. Warren reported in 1935 that his grandfather, William Warren, was bailiff farmer at West Farm and carried out many experiments in farming under Huxtable's direction. It was also claimed that Warren's advice was much sought after by local farmers. Canon Chaffey Moore of Compton Abbas, NE Dorset, informed me that there was a local tradition that the farm bailiffs exploited Huxtable and that one died a very rich man, a sad story. Of course Huxtable's system required much capital and those farmers who wished to apply his methods had to acquire a lot of knowledge. Anthony had the advantage of being farmer, scientist and engineer all rolled into one. Economies claimed were through use of steam power, absence of fences or hedges, and stock management methods. For Anthony himself extra expenses were inevitable by reason of the requirements of his precise experiments, those on stockfeeding involved the regular weighing of animals, feeds and manures arising. These special expenses must be borne in mind in assessing the critics claims about his profitability, they usually chose to ignore them.

John Creasey, Information Officer of the Museum of Rural Life, University of Reading, gave me this opinion of Huxtable 'he appears to be a 19th century improving farmer of national rather than local interest . . . I do not think this work was grounded in the Dorset agriculture of the time, but was inspired by the practice and writings of the leading agriculturists of the country. Most of his methods were practised by others'. One should also remember that Huxtable read accounts in foreign languages of agricultural work. I would go farther than Creasey. Huxtable's work must have usefully contributed to the body of knowledge arising in his time, his experiment on growing swedes on apparently barren land

was a decisive one for scientific agriculture, somebody had to try it and it fell to Huxtable to do just that. He must have been one of the few farmers of his time who went in for scientifically controlled experiments, interpreted both scientifically and economically. Considering that he probably had little skilled scientific assistance and that he was working in an atmosphere of acute local scepticism he must be considered as a very competent agricultural scientist. Neither must one forget his great awareness of new materials coming into use and his willingness to experiment with them, this includes both materials of construction and manures. He also was a great publicist for scientific agriculture, not only by his skill in writing for the public at large, but also because people just had to think about a man who was labelled a public enemy, an object of notoriety.

We come now to the crux of the matter, all this work was scientifically and socially useful but did it pay? That was what the practical farmer wanted to know. Such practical farmers included many clergy who farmed their glebe lands if nothing else. Few of these made effective contributions to agriculture as examination of the journal of the RASE shows only odd contributions from the clergy. Indeed one notoriously eccentric clergyman, Hawker of Morwenstow, N. Cornwall[21], about whom much has been written and who laboured mightily for his parishioners like Huxtable did, deliberately turned his back on all 'modern' farming methods, was against all 'modern machinery' and even used the flail rather than a threshing machine! Hawker declared that cattle plague was manifestly a judgement of God for national sin. He refused to use scientific manures although on one celebrated occasion he applied guano in the form of a cross to a field and secured prominent growth in the shape of the cross too! He bellowed 'what is the Englishman or Scotsman of the 19th century but a dexterous Blacksmith to whom the Demons have surrendered their myths of Gas, Steam and Electric force in requital for his strong hatred of God and church'. He criticised his neighbours who used progressive methods and machinery because they caused accidents, unemployment and depopulation. Yet it must be recorded that he seems to have done well with his farming and made money by it to aid his parishioners. This clerical poet and arch reactionary represented a backward looking medieval outlook which men like Huxtable were sweeping away.

Huxtable had no doubt that if sufficient capital, the right buildings, the right equipment and agricultural skills could be applied: if rents were reasonable, and recognising that agricultural science was the most backward of the sciences, and must keep on improving, then farming could prosper even in the face of the severe foreign competition inevitable with Free Trade (and against competing countries with better climates than the UK). He gave his answers in his pamphlet *The Present Prices*,[22] 54 pages, published first in 1849 but running to seven separate editions due to great demand for it! His closely argued case, backed up by masses of his own detailed agricultural costings, was based on an expected price of 5/– a bushel for wheat on a yield of 32 bushels to the acre and 5d. a lb. for meat. Significantly he emphasises that he thinks these prices socially desirable as they would be cheap enough to stimulate consumption and achieve his aim of ensuring that the people were better fed. In saying such things Anthony was not speaking as a Little Englander who knew or cared little about what was going on abroad. We have seen already that he was keeping up with foreign developments in agriculture. Anthony clearly recognised that farmers were almost in total despair and wondered if they could even keep on farming with Free Trade operating. Anthony believed the answer lay in scientific farming. He thought that Lawes at Rothampsted had already demonstrated the fixed (*sic*) scientific principles required for growing cereals or turnips, for feeding cattle and using manures to ensure economic farming. Of course in thinking this he was really being very optimistic, and rigid, as agricultural science had a very long way to travel, indeed is continuously evolving even today (recent developments include the employment of less seed by distributing it better and cultivations in which the soil is hardly disturbed at all). An example of Anthony's economic costings is given below:

[21] *Piers Brendon, Hawker of Morwenstow*, Cape, London, 1975.
[22] Huxtable, *The Present Prices*, Shipp, Blandford and London, 1850 (seven editions).

At what cost can crop of 32 bushels of wheat per acre be raised on the average of seasons? (wheat at 5/– per bushel):

Natural produce of the soil	16 bushels
The straw containing ½% nitrogen will furnish in its decomposition in the soil 19½ lbs. of ammonia	3½ bushels
63 lbs. of ammonia will produce	12½ bushels
	32 bushels

The present price of ammonia, whether in guano or sulphate of ammonia is 6d. per lb. The field, being free of couch, will require only one ploughing. The threshing is supposed to be performed by steam at a cost of 1½d. per bushel. The horse labour has been charged at the cost for which it can be done by hired horses in this neighbourhood. With these data the cost of an acre of wheat will be as follows:

	£	s.	d.
Rent £1, Tithes 5/–, Rates 2/6d., Way Rate 10d.	1	8	4
Ploughing, Harrowing, Drilling, Crushing	1	0	0
Tradesmen's Bills		5	0
Bird Keeping and Hoeing		5	0
Reaping 10/–, Harvesting 3/1d.		13	1
Taking in Rick for Threshing and Marketing		4	10
Seed, 2 bushels		10	0
62½ lb. of ammonia at 6d. per lb.	1	11	3
	6	1	6
The produce of 32 bushels at 5/–	8	0	0
Expense of the crop	6	1	6
For interest on capital and profit per acre	1	18	6

Huxtable admitted that in the previous season he had lost money but reasonably blamed this on the very bad weather of 1849.

His critics were not slow to attack, even in the exalted columns of *The Times.*

A cynical but humorous, even 'poetical' pamphlet *Mr. Huxtable and his pigs,* was published in London by Porcius[23]. Porcius suggested that Anthony's claim that fixed scientific principles had been established for growing crops, feeding cattle and making manure was nonsense. He tried to take Huxtable's costings apart. He claimed that Huxtable had a monomania about pigs 'We can almost fancy ourselves transported to a rural village under the superintendence of Mr. Huxtable. No manufacture, save that of sausages, would be allowed within its boundaries'. Of Huxtable's system for keeping stock in closed sheds he said 'A more piteous sight than that feeding house we can hardly conceive: nor would we willingly and systematically treat living creatures so, for the sake of all the ammonia that rankles in a thousand cesspools' (*cf.* modern criticism of the battery rearing of hens or calves). Porcius thought Huxtable was obsessed with nitrogen and ammonia (luckily we are still obsessed with nitrogen today, only now we aim at breeding plants that can abstract the nitrogen directly from the atmosphere, including incorporating in the genes of plants appropriate fragments to confer nitrogen fixation).

Nearer at home, Edward Oke Spooner, a medical man of Blandford, member of a Blandford family that has been distinguished in various ways for nearly 200 years, delivered an address at the Blandford Farmers Club on 27th February, 1850 and subsequently published it in Blandford and London as a pamphlet[24]. Spooner sounds a reasonable kind of man, well acquainted with contemporary agricultural theory and practice (his brother William was a distinguished pioneer of veterinary science and later set himself up in a business in Southampton dealing in artificial manures). Spooner claimed that Huxtable had

[23] Porcius, *Mr. Huxtable and His Pigs,* Blackwood, London, 1850.

[24] E. Oke Spooner, *The Adventures and Transformation of Nitrogen and Ammonia or the Rev. A. Huxtable's Great Pig Secret Analysed,* Ridgway, London, 1850.

been too hasty, had not properly digested the mass of agricultural data available or the caution with which it had been presented. He doubted the accuracy of some of the analytical chemistry and stressed (quite rightly) that even the great Liebig had been proved unsound at times[25]. He claimed that Huxtable had not allowed for the incidence of diseases, often brought on by bad weather. Spooner thought that Huxtable's schemes for handling manure were too expensive, better to let the sheep roam the land and manure it thereby directly. Spooner strongly objected to keeping stock in closed sheds as an unnatural unhealthy system and thought that Huxtable's methods required too much capital. 'We fear that the great alchemist of Dorsetshire as *The Times* has called him, is made of the same materials as his prototypes of old . . . his agricultural hobby is a very innocent and delightful one; and it is only when his public statements are likely to mislead landlords, tenants and the community that stern and sober criticism would call him back from his butterfly chase after nitrogen and ammonia and would fix him less to the less fascinating residium of the pounds, shillings and pence of the system actually worked at Sutton Waldron'. Spooner believed Huxtable's analyses and data to be out of step with other people's and 'Mr. Lawes (a great agricultural scientist who achieved great success with his colleague Gilbert at Rothampsted—EW) has wisely declined to endorse Mr. Huxtable's calculations—Lawes only got half the weight increase for sheep per week that Huxtable got and used more food'.

Undeterred by his critics, except that they probably tempered his early over-enthusiastic optimism, Huxtable soldiered on into the 1860s with his scientific farming, scientific farming that had a stronger case with every year that passed and changed its face gradually in so doing. Unfortunately there is little or no evidence available as to Anthony's achievements in his last decade of farming. Indeed Huxtable does not seem to have really got into the history books of farming. Yet, as we have noted already, many eminent men thought highly of him, and, despite his critics, he continued to serve the RASE over more than 20 years. This for me clinches the matter, if he had been such a fool and an optimistic fool at that as his critics made him out to be, then distinguished men would have turned aside from him, put him out of office, this they failed to do and one can only conclude that whilst much of what his critics said was worth saying Huxtable seems to me a deserving case for re-instatement as a 19th century farmer of some importance, not just a scientific farmer though but one with political awareness and motivated always by goals he set of social justice for labourer and farmer alike. It is fitting therefore that we conclude with an account of an important scientific experiment that Huxtable carried out around 1845 and whose importance to science has only just been recognised as recently as 1971 by historians of science at the University of Strathclyde who were engaged on a systematic historical study of the important phenomenon of absorbtion.

It has been known from the very earliest times that soil can remove salts and colouring matter from a solution, in particular that sand has the power of removing salt from sea water. Lord Bacon in *Sylva Sylvarum* speaks of a method practised on the coast of Barbary for obtaining fresh water from sea water based on this property. Similarly the sweetening effects of soils on odorous substances was vaguely recognised (e.g. leaving a smelly knife in the ground for a time to remove odour). Early in the 19th century various scientists studied the absorption of dissolved substances from water by soils, including the fact that passing putrified dung liquor through earth could render it colourless and odourless. However the systematic study of what were really very complex phenomena was triggered off by experiments carried out independently but at about the same time in 1845, or thereabouts, by Huxtable in Dorset and by Sir Harry Thompson in Yorkshire[26]. Professor J. T. Way, consultant chemist to the RASE, had analysed a specimen of liquid manure that Huxtable had collected at his farm and it was to him that Huxtable reported that he has passed liquid manure through a bed of Dorset loamy soil from his farm and found that after its passage through the 'filter bed' the urine was deprived of colour and smell '. . . in fact it went in manure and came out water'. This implied that soil had the power of separating from the solution those organic substances which give colour and offensive smell to putrid animal liquids. It seems obvious that Huxtable carried out his experiment to try to discover

[25] *Short History of Technology*, Derry and Williams, Oxford, 1960.
[26] Forrester and Giles, *Chemistry and Industry*, 1971, 1314.

something about the manner in which liquid manure acted in the soil in order to make his manurial techniques as efficient as possible. Perhaps this also explains why Huxtable poured drainage from his dung pits over ashes, sifted mould and other absorbents, or poured urine over 'solid dung'. Thompson's experiments were more prolonged and systematic. Both Huxtable and Thompson reported their results to Way in 1848. Way's interest was greatly aroused and he proceeded to make a systematic investigation of this absorption phenomena. Way reported his work in the journal of the RASE in 1850[27]. For the many experiments he described, including repeating Huxtable's experiment, he used two specimens that Huxtable made available (a thin soil from the downland and a yellow clay, subsoil from Huxtable's lower farm), and a red soil from Berkshire. Some of the experiments involved modified specimens of these soils (e.g. calcined soils, soils treated with acid or mixed with other absorbents). Whilst Way was mainly concerned with the implications of his experiments on procedures for applying manures (both farmyard and artificial), he later became interested in sewage treatment and in pollution of rivers, topics that could well have stemmed from the Huxtable type of experiment. It is interesting that filtration of all water supplied from rivers for London was made compulsory in 1855. The RASE continued their experimental work and on 4th May, 1859, with Huxtable present, their Chemical Committee approved a project for studying the changes in liquid manure passing through different soils.

By an effort of imagination we can try to visualise the strange appearance of Huxtable's farms, especially the one on Sutton Down. Here was a vast windswept area, devoid of hedge and fence, dotted with the wooden posts for delivering liquid manure to the fields, making it a weird sight for the locals. Tall buildings of unusual construction, the farmhouse and cottages, the pencil of the tall chimney, breaking the skyline, the silence of the downs only broken by the steady beat of the steam engine and the noises of the incarcerated stock. To the onlooker it must have seemed both menacing and unnatural. For Huxtable, a quiet sensitive man, it needed persistent courage and enthusiasm to relentlessly pursue his scientific farming in face of local suspicion and scepticism, even militant, critical opposition[28].

Attempts to find the records of the following were not successful: Blandford Literary Institute (to which both SGO and Huxtable contributed papers), Blandford Farmers Club, Blandford Agricultural Society. The only personal effect of Anthony Huxtable that could be traced was the letter to Edwin Chadwick. No records of relevant tenancies were available at Crichel House.

[27] Way, *J. R. Ag. Soc. Eng.*, 1850, 323.

[28] Private Communications from Canon R. A. Wells (Iwerne Minster), Canon R. G. Chaffey Moore (Compton Abbas), Michael Darby (Victoria and Albert Museum), Lady Camilla Osborne, Brian Masters, Dr. C. H. Giles (University of Strathclyde), Victor Adams (Blandford), John Creasey (Information Officer, Museum of Rural Life, Reading University), Brenda Hough (Archivist, The United Society for the Propagation of the Gospel), Professor Edward Carswell Spooner, Commander Martin (Crichel House).

A MESOLITHIC HABITATION SITE ON WINFRITH HEATH, DORSET

SUSANN PALMER AND GEOFFREY DIMBLEBY

General Information

The site lies on sandy heathland on the summit of Whitcombe Hill, Winfrith Heath, south Dorset, at SY 806875 at a height of about 170 ft. (52 m) above Ordnance Datum. The hill is capped with Valley Gravel of Pleistocene age, over Tertiary Bagshot Beds, sloping southwards into Whitcombe Vale and northwards into the valley of the River Frome, some three-quarters of a mile distant. The sea at West Lulworth lies southwards about 4½ miles (7.2 km) away across the ridge of downs.

In 1970 Mr. J. C. Reynolds of the United Kingdom Atomic Energy Establishment, which owns the land, found two areas with a dense concentration of Mesolithic artifacts, about 300 ft. (90 m) apart. The present report describes an excavation directed by the first-named author, at the request of the Dorset Natural History and Archaeological Society, in 1971-2 on the easternmost of the two sites, which appeared to be the more prolific; it is hoped to investigate the other site at a future date.

The site is very exposed and is subjected to severe denudation by wind and rain; part may already have been eroded away as it ends abruptly to the south on an eroded slope of the hill. The area has been regularly used for many years by local youths to practise motor-cycle riding. The result is that the archaeological levels on the hill are frequently exposed on the surface or very lightly covered by loose sand.

The main part of the site is about 36 ft. (about 11 m) west of a small low mound which is marked on the 6 in. OS map as 'Tumulus, site-of'. Grinsell lists it as Winfrith Newburgh No. 9 (1959) and the Royal Commission on Historical Monuments (1970) as Winfrith Newburgh monument (42) with a disturbance in the centre. It is approximately 2½ ft. high and 26 ft. (0.75 and 8 m) in diameter with no sign of a ditch. There is no record of any excavation, but as the mound was not directly threatened and because of limited time, it was decided to leave it untouched. One of the authors (SP) had some misgivings as to the accuracy of the identification of the mound. Our site datum post was 42 ft. 7 ins. (13 m) west of the mound's estimated centre.

Initially a grid system was laid out over a large area on the summit of the hill; 12 × 12 ft. (3.6 × 3.6 m) squares are marked with a capital A, B, C, etc. in the text and on the plans (Fig. 7). Artifacts were collected from the surface of all these grid squares in order to determine the area of maximum distribution; this was found to be in squares A1, A2, A3, B1, B3, C1, C3 and D2, which were subsequently excavated. In 1972 two additional units of 6 by 12 ft. (1.8 and 3.6 m) (Z1 and Z2) were excavated to the east of the first year's work. Excavation proceeded in spits of approximately 3 to 3½ in. (9 cms) depth at a time, as an additional control and in the absence of clearly demarcated boundaries between the different deposits. Not all units were fully excavated owing to lack of time.

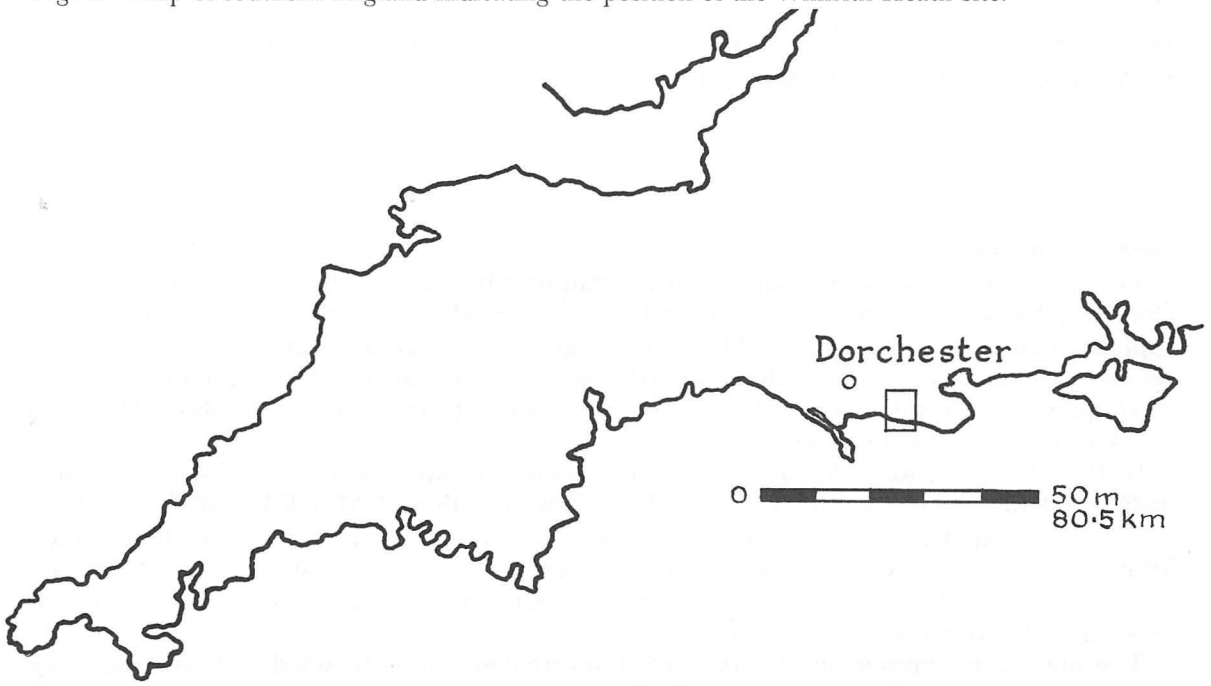
All finds were carefully examined and identified each day on the site and work records and small-finds records were kept. All the artifacts were again examined and recorded after completion of the excavations. Random sieving within all areas and at all levels did not produce noticeably more artifacts than did careful trowelling and brushing in the loose sand.

Stratification

The natural deposits on the hill and the adjacent heath have the distinctive characteristics of a well-developed podzol. Where not eroded away, a thin layer of raw humus lies under the heather. In some areas where there are shallow hollows in the ground, very thin deposits of recent semi-decomposed vegetation can be found where water has accumulated; this material has a plate-like structure when removed and it contains no artifacts.

The thickness of the various horizons of the profile varies in the exposures which were examined over the whole area. One small sondage was excavated into these natural deposits

Fig. 5. Map of southern England indicating the position of the Winfrith Heath site.



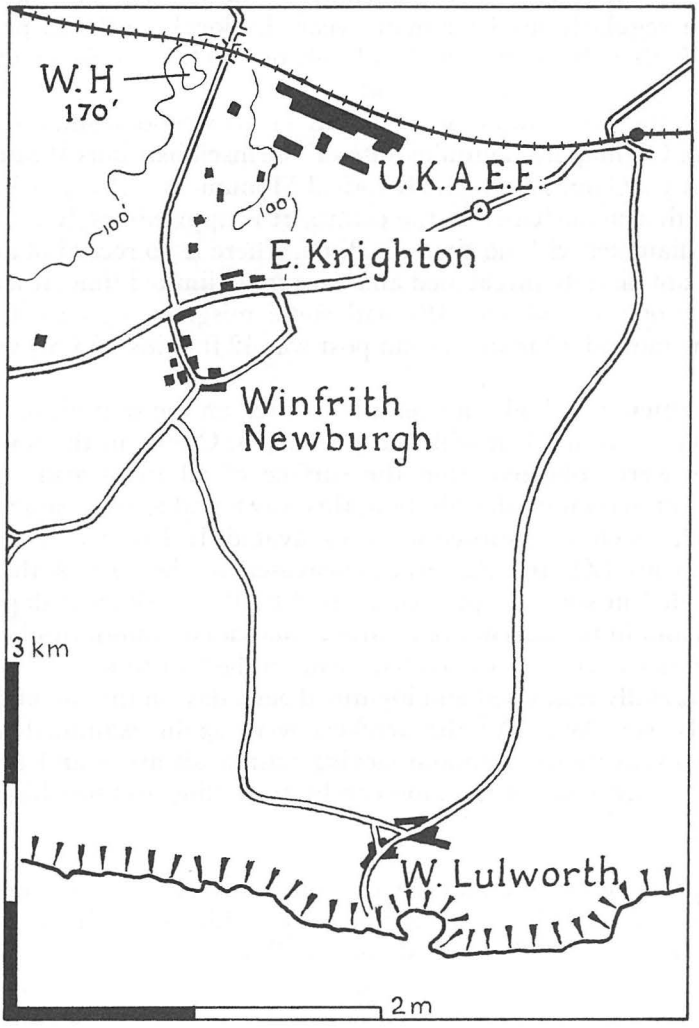


Fig. 6. Map of the Winfrith Newburgh area, Dorset, indicating the locality of the Winfrith Heath site, on Whitcombe Hill, near the UK Atomic Energy Establishment.

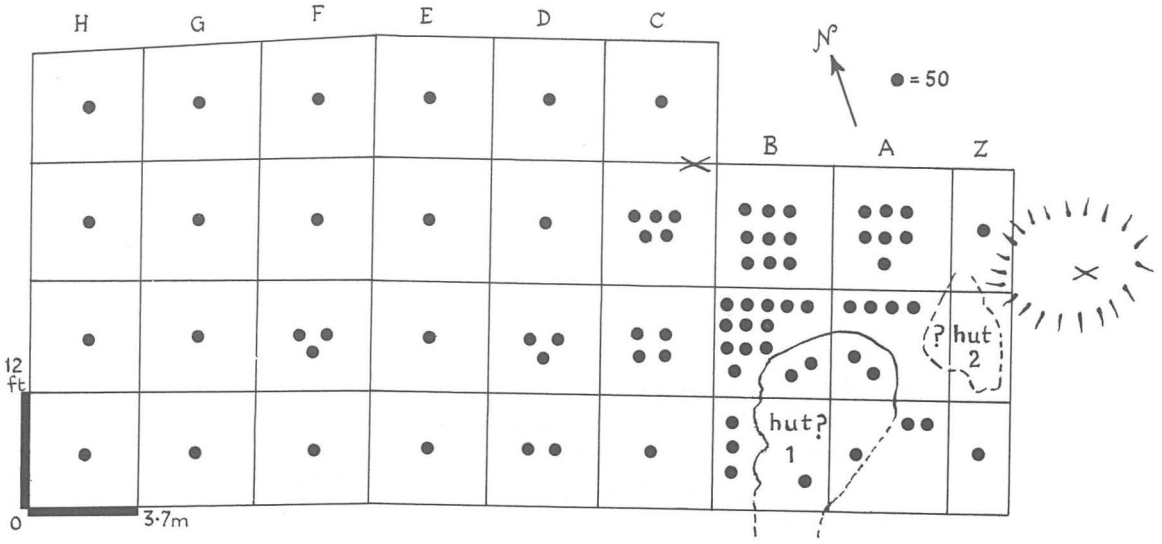


Fig. 7. General plan and lay-out of trenches of the Winfrith Heath site on the summit of Whitcombe Hill. The dots indicate the distribution of artifacts collected from the surface of the site, prior to excavations, each dot representing 50 or part thereof.

(Fig. 8). The upper eluviation horizon is dark grey and has an average thickness of 8-10 ins. (25 cms). The next horizon of maximum leaching also has the same average thickness and is light grey-brown in colour. The illuviation horizon, at an average depth of 18-22 ins. (45-55 cms), is an orange-brown Pleistocene gravel which in some places contains pockets of ferruginous sand.

The profile within the excavated area of the archaeological site differed considerably from the above natural profile and suggested ancient disturbance (Fig. 9). The layers of organic matter are here absent and a thin lens of fine loose white sand, between 2-4 ins. (5-10 cms) thick, covers the site. It was noticeable during the excavation that this sand is blown about on windy days. Below this loose sand, a large area was revealed of very black humic sand (Layer 1b), fairly compact but in discontinuous patches varying in thickness between about 2 and 6 ins. (5-15 cms). Embedded in it were a large number of stones, ranging from some 3 to 6 ins. (7-15 cms) in size, mostly flints derived from the Pleistocene gravel, concentrated in a fairly well-defined roughly oval area (see Fig. 11 and following discussions). Elsewhere marginal scatters continuing beyond the limit of the black sand, occurred most obviously to the north and south-east. The stones often protruded above the black sand but their bases were bedded in it or rested on its bottom. A more continuous but much smaller area, of similar character but with less regular margin, was revealed in the eastern part of square A2 and the adjoining unit Z2.

The black humic sand, as may be seen in Fig. 9, lay in a shallow and irregular depression, perhaps in part at least natural in origin, since there is a corresponding dip in the underlying stratum in section 1. The stones embedded in it may have helped to resist erosion and allowed the sand to continue to absorb humus from later periods.

In a few areas small patches of gritty yellow clay (Layer 1a) about an inch (2.5 cms) thick occurred amongst the stones on top of the black sand and in a few instances covered the smaller stones. This clay was only found in this area in association with the black sand and stones. The patches varied in size from about 6 in. to 4 ft. (15 cms-1 m).

Below this was black sand (Layer 1b) and below this over the whole site, grey humic sand (Layer 1c), some 6-10 ins. (15-25 cms) thick, as found elsewhere on the hill. In those areas where neither black sand, stones nor clay occurred, this grey humic sand was found immediately below the loose surface sand.

Below this was a pale greyish brown sand (Layer 1d). In part of the site however, in areas A1-2 and Z2, areas of black gritty sand (Layer 2), with big stones of about 5-7 ins. diameter

(12-17 cms) were found in the same horizon, at a depth of about 12-16 ins. (30-40 cms), capping or adjoining the greyish brown sand. This stratum as a whole overlay archaeologically sterile gravel (Layer 3) at some 19 ins. (48 cms) or more below ground surface.

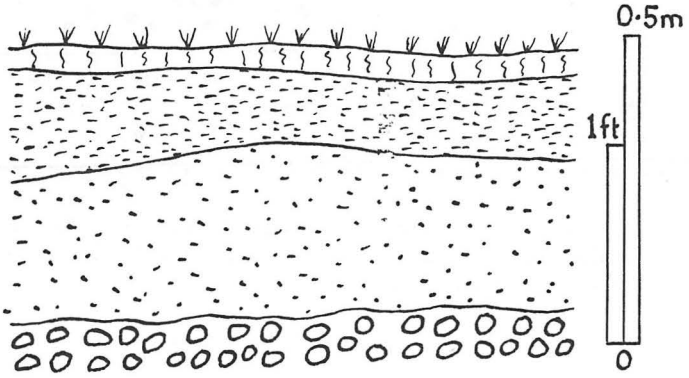


Fig. 8. Winfrith Heath: section drawing of the natural stratigraphy of the deposits on Whitcombe Hill outside the habitation area. The legend is the same as for fig. 9.

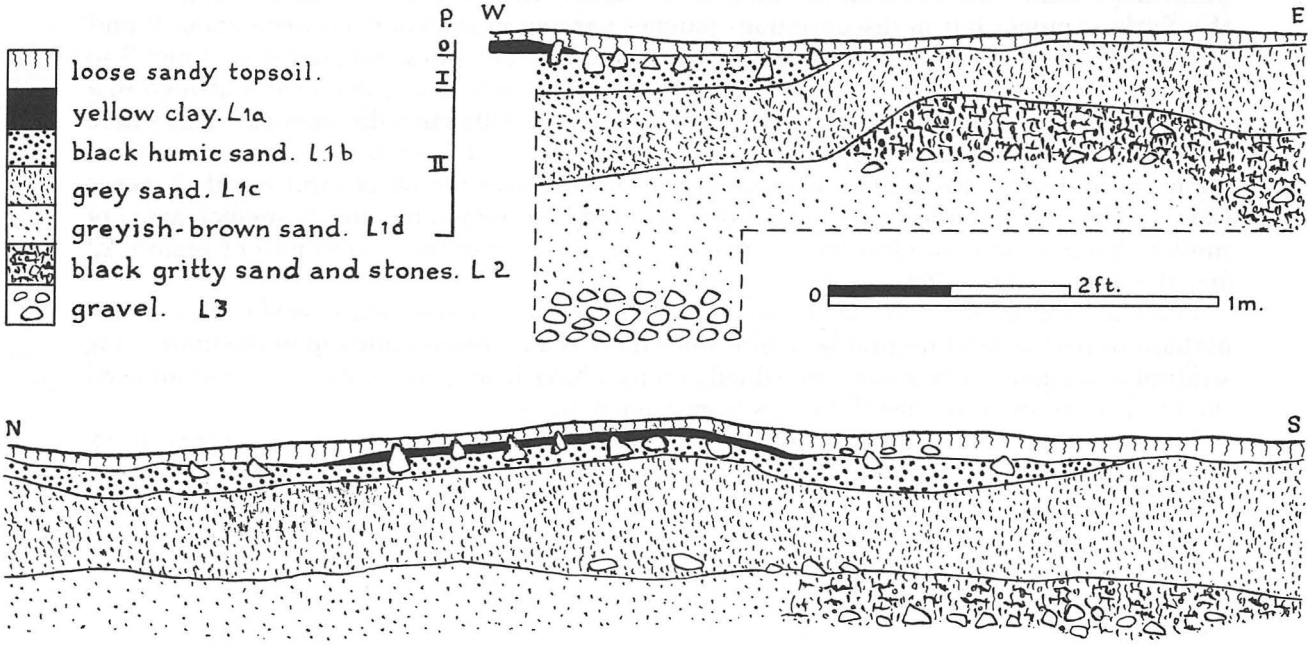


Fig. 9. (a) & (b) Winfrith Heath: stratigraphy of sections through the habitation area on Lines 1 and 2, indicated in fig. 12. Pollen Layers (P.O.-II) are indicated against fig. 14.

Vertical Distribution of Artifacts

The site was excavated successively in horizontal spits of approximately 3 ins. (7.6 cms) deep. No artifacts were found in the clay (L1a) and the first to appear below the loose top sand were in the black sand (L1b). The accompanying histograms give an indication of the total yield of artifacts in those squares that were excavated down to at least Spit 4 or 5 and Layer 2. It must be noted that Layer 2 was nowhere fully excavated due to lack of time, so reducing its potential yield; artifacts from it are indicated for three squares only (A2, B2 and C2).

In the histograms the topsoil is represented by the columns lettered 't', indicating yield of surface finds made prior to excavation. Thereafter each column represents the yield from each successive spit in the appropriate grid square, while the numerical key is provided by the scale at top right.

It will be seen that in four of the units (A3, B3, C2, D2) there is evidently a large concentration of artifacts in Layer 1 Spit 2 which corresponds to the level of black sand with stone concentrations (Layer 1b). In squares B1, B2, A2 and D2 there is an increase of artifacts either towards the base of Layer 1 or in Layer 2. It can also be seen that artifacts were vertically distributed throughout the various deposits without any apparent breaks, so far as this can be determined within the limits imposed by digging in spits, although there are variations between totals in different squares.

In general it was found that there were fewer artifacts in the brown sand (L1d) except in those areas where Layer 2 was present. There were no artifacts below about 16 ins. (40 cms) in depth.

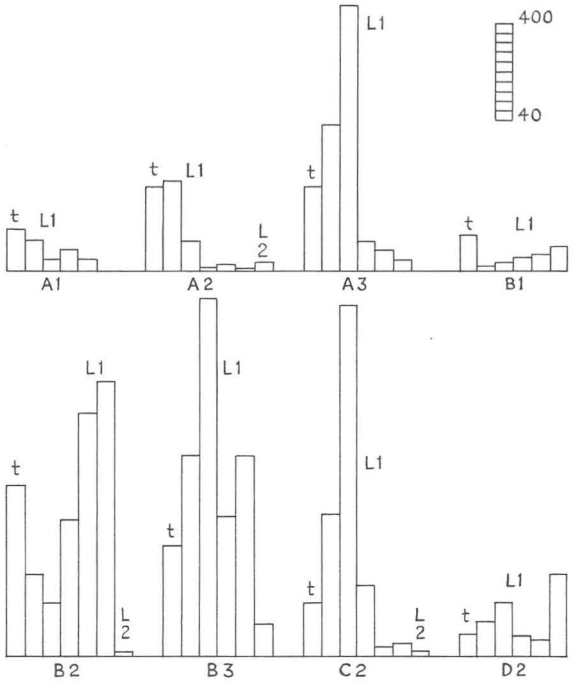


Fig 10. Histograms indicating the vertical distribution of artifacts.

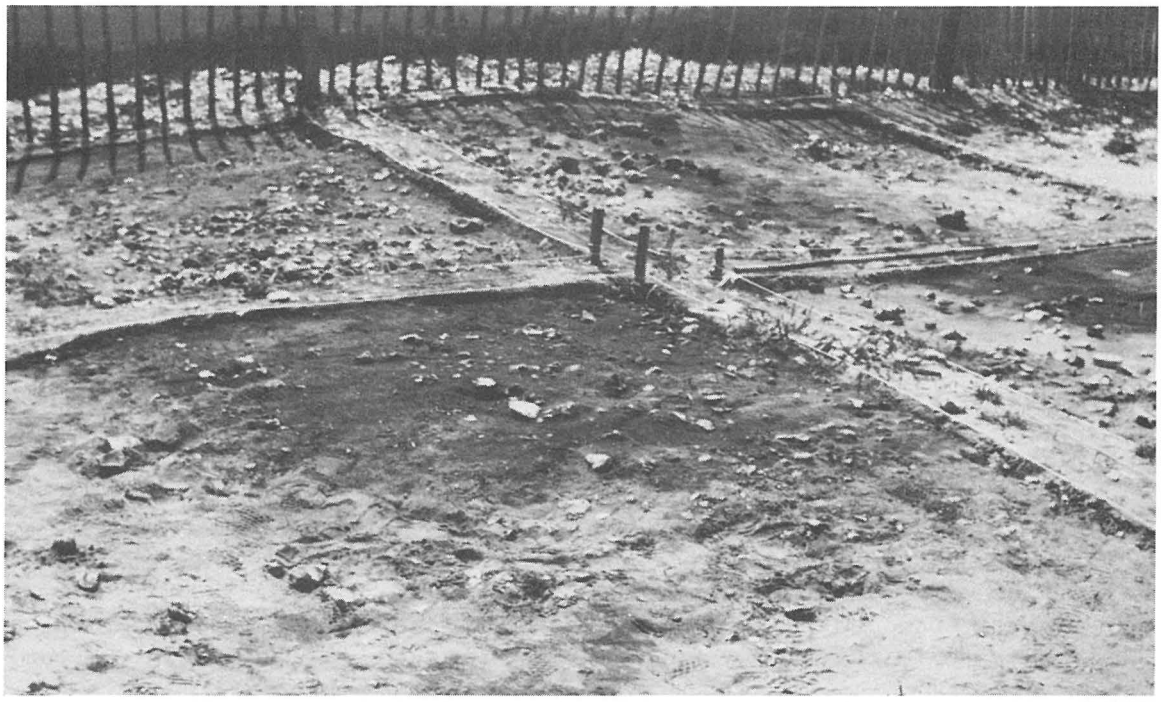


Fig. 11. View of the Winfrith Heath Mesolithic site, looking south. The occupation area is indicated by the pebble-spread and darker soil.

The Structural Features

As already described, concentrations of stones in areas of black sand (L1b) occurred in two distinct areas, some 3½ ft. (approx. 1 m) apart, in squares A1-2, B1-2 and Z2. It will be apparent from Fig. 12 that, despite some peripheral scatter of stones outside the spread of black sand, there is an undeniable relationship between the distribution of these two elements, and we have noted the frequent embedding of the stones in the black sand. Many of the stones and accompanying artifacts were calcined. The larger concentration of stones was very roughly oval with a central section open to the north, devoid of black sand and with a considerably lesser density of stones. The longer axis of the oval measured at least 18 ft. (5.5 m) with a width of about 14 ft. (4.3 m), although the southern end, which abuts upon an eroded scarp of the hill, may once have extended further. The isolated patches of hard gritty clay (L1a) occurred amongst the stones, sometimes partly covering them.

Three shallow circular patches of very dark sand, some 2-3 in. (5-7 cms) in diameter, a fourth somewhat larger, occurred at or near the edges of the oval concentration of stones; these were sectioned without positive results, largely owing to the extreme looseness of the dark sand, which made it difficult to determine the exact shape of the holes, suggested by the fact that the dark discolourations penetrated into the surrounding sand for about 2 in. (5 cms). Excepting the fourth patch, no stones were specially associated with them. The fourth larger and westernmost patch was very dark and well-defined and contained a powdery substance with the appearance of wood-fibre, tightly wedged between three stones (Fig. 13). This feature also penetrated about 2 ins. (5 cms) into the sand below the stoney surface at an estimated angle of 80°, with its top facing inwards towards the centre of the stoney oval. The woody substance disintegrated completely on excavation and became mixed with sand. The feature did not have the appearance of a decayed tree or bush and the presence of the three stones did not appear fortuitous. Although the feature cannot certainly be regarded as a post-hole with traces of a stake *in situ*, the presence of stones closely packed round the top or bottom of such a hole is usually regarded as lending weight to the argument that they were intended for the support of a deliberately planted post. The dating of the post-hole would, of course, depend on the rest of the archaeological evidence.

The smaller and more irregular area of black sand and stones to the east of the oval feature was explored further in 1972. It also contained patches of clay in similar relationship to the black sand and stones, but two small patches occurred outside the area to the south, the only instance on the site where clay patches were not intimately associated with the black sand and stones.

Artifacts were densely concentrated in seeming close association with the above features, particularly in squares A1-2 and B1-2; many were found in the black sand and amongst the stones of Layer 1b, but the greater proportion lay immediately round the perimeter of the oval to the north and west.

During the two season's work evidence of Mesolithic activity was also found in Layer 2 at a depth of about 12 to 16 ins. (30-40 cms), i.e. at the base of Layer 1d or as a lens penetrating into Layer 1d. Here a deposit of very black gritty sand and large stones (L2) coincided with an increase in artifacts in some of the excavated squares. None of these stones were calcined, and there were no signs of coherent shapes to suggest a deliberate structure.

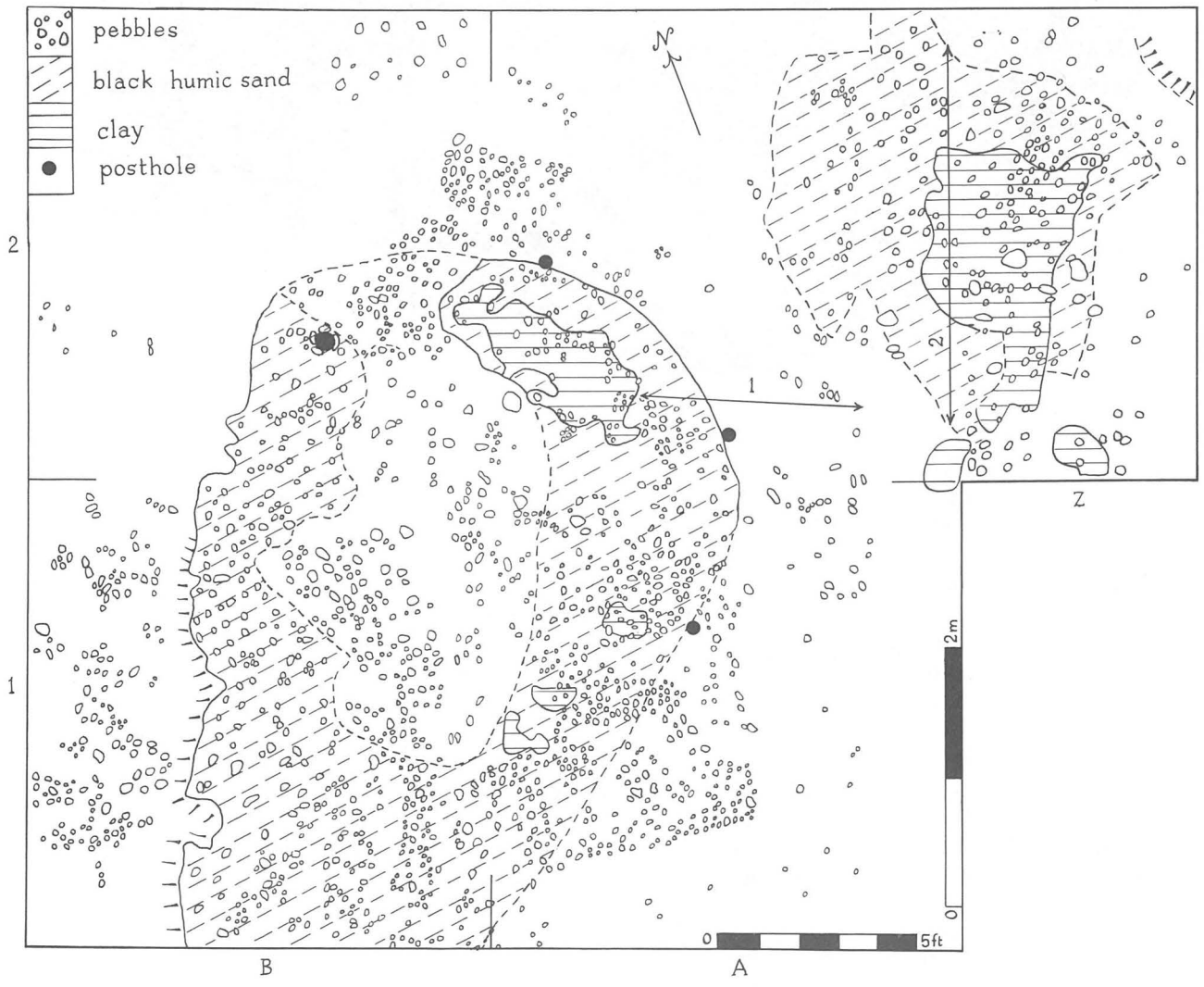


Fig. 12. Winfrith Heath: plan of occupation area in trenches A1, A2, B1, B2 and Z2. Lines 1 and 2 through the site indicate the positions of sections shown in fig. 9.

Fig. 13. Close-up view of the stump of a post between three tightly packed stones on the edge of the occupation area in Trench A2 (*photo N. van Lawick*).

The Pollen Analysis (GWD)

Exploratory analyses on samples from selected levels during the 1971 excavation revealed that pollen was present in abundance and that in some of the Mesolithic levels it indicated decidous woodland, a great contrast to the present conditions of open heathland. In the 1972 season, therefore, a series of contiguous samples was taken at 1 in. (2.54 cms) intervals from the edge of one of the clay patches (L1a), at that time thought to be possibly part of the floor of a hut, through the flint-rich sands beneath and into the archaeologically sterile sand beneath, a series covering 19 ins. (48.2 cms) depth in all.

The samples were treated by acetolysis and HF and the analyses are presented in the Appendix. Fig. 14 shows the curves for selected pollen types throughout the series, and also included is the analysis of the modern turf (Sample B1, 1971).

The modern turf (B1) clearly reflects the present condition of the site, with heather (*Calluna*) forming 76 per cent of the pollen total. The NAP/AP $\left(= \frac{\text{non-tree pollen}}{\text{tree pollen}}\right)$ ratio of 1660 per cent (approximate only because inevitably based on an inadequate and meaningless tree pollen count) reflects the complete treelessness of the area today.

The top sample of the series (0-1 in.) (0-2.5 cms) from the clay patch is also in a category by itself. Grasses (*Gramineae*) are the most abundant pollen group, and a glance at the diagram shows that there is no other sample in the series with which this can be matched. It is likely, therefore, that this clay material had come from somewhere else; indeed there is no such clayey horizon in the soil profile on this ridge. It has a pH of 5.2, a whole unit higher than any other samples in the series (see Appendix II).

The rest of the diagram falls into two clearly distinct pollen layers (PI and PII) as indicated in Fig. 14. The pollen spectra of the six samples comprising the upper layer PI are characterised by high percentages of heather and other light-demanding species, and low values of tree pollen. The NAP/AP ratio of the top sample (0-1 in.) (0-2.5 cms) is 1609 per cent, closely comparable with the modern heath sample (B1). For reasons given later, ivy (*Hedera*) pollen is excluded from these ratios.

At 6 ins. (15.2 cms) there is a sudden change; below this level the light-demanding species are only present in small quantities, but the trees and shrubs, especially oak (*Quercus*) and hazel (*Corylus*) become dominant and continue so to the bottom of the series. This pollen layer, PII, has a mean NAP/AP ratio of 107 per cent. Another and unexpected feature is that in PII the total amount of pollen (absolute pollen frequency) shows a big increase compared with the values for the lower part of PI.

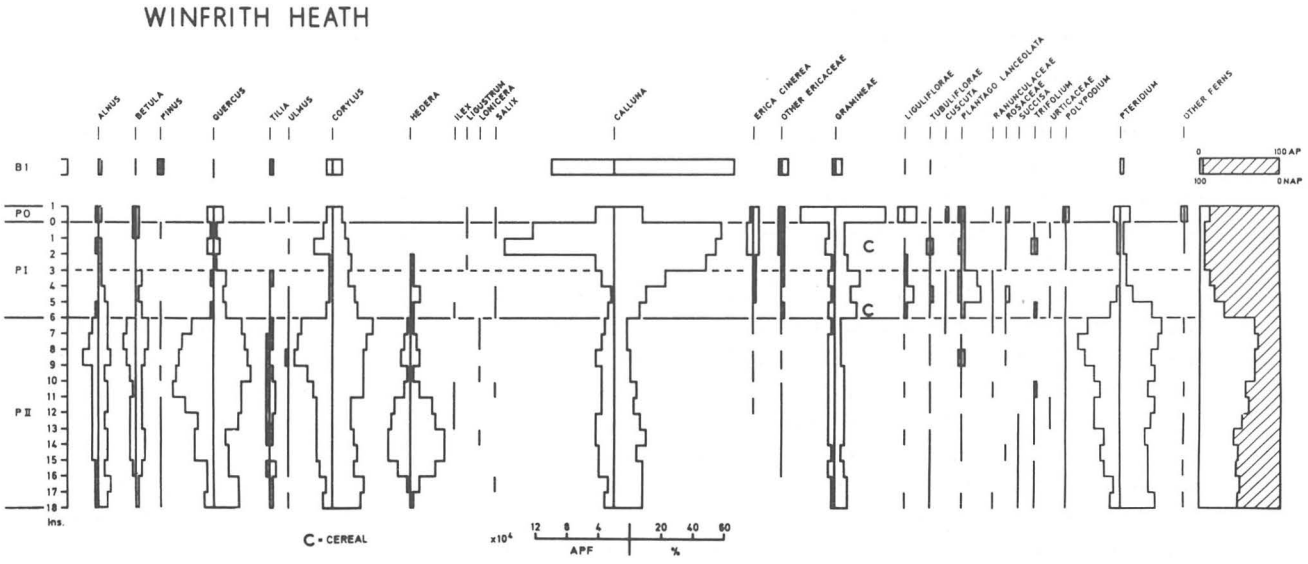


Fig. 14. Winfrith Heath: diagram showing distribution of pollen with depth. For each taxon the left hand histograms indicate absolute frequency and those on the right percentages of total pollen and fern spores.

Pollen Layer II (6-18 in.) (15.2-45 cms).

It has to be considered whether this depth of humus-stained sand (L1c, L1d, L2) is a soil that has developed *in situ* or whether it is an accumulated deposit. Because of the intense podzolization of these heathland soils, which may be post-Mesolithic, the chemical condition of the sand is no guide to the nature of the soil in the Mesolithic period. It may be remarked, however, that this sand has a depth of 21 ins. (53 cms) or more before it gives way to gravel, and that throughout this depth it is intensely leached. This is rather deep for the A horizon of a heath podzol and might indicate that some aggradation has taken place.

The critical evidence on this point comes from the vertical distribution of the flint artifacts. They occurred throughout the zone between 6 and 16 ins. (15 and 40 cms) depth, and there was a concentration at 14-16 ins. (35-40 cms) in some trenches. Were these artifacts buried by accumulation of sand or were they worked into the deposit from a surface at a higher level? If the soil had been a podzol at the time of the Mesolithic occupation there would have been no natural agency by which they could have been incorporated. Earthworms are the most active agency of burial, but they do not survive in acid soils, so solid objects deposited on the surface of a podzol remain there. It is by no means impossible, however, that this site carried a much less acid soil of the brown type in Mesolithic times; indeed, the abundance of trees such as alder (*Alnus*), birch (*Betula*), oak and hazel in the pollen record suggests a lower acidity, though even so the excellent pollen preservation points to a pH too low for the surface-casting earthworms. However, the depth of 10 ins. (25 cms) through which the artifacts are distributed is somewhat beyond the normal depth of burial by earthworms. It is not a question of how deep the worms can penetrate, but of the depth of soil through which they feed, for it is by this process that the soil is raised when the casts are made. In an earthworm-rich soil the maximum stone-free depth attained is usually less than 8 ins. (20 cms) and more commonly 5-6 ins. (12-15 cms), and even such a depth may take centuries to achieve. However long the worms are active, they will not bury stones beyond a certain depth. As 10 ins. (25 cms) seems over-deep for such burial, it is more likely that there has been some aggradation of sand on the surface. This would be windblown sand (the site is on an exposed ridge) derived from the contemporary soil surface and consequently could contain contemporary pollen. It is significant that the absolute frequency remains high throughout this 10 ins. (25 cms) zone and does not fall with depth as is usual in acid brown earth soils developed *in situ*; if this is so, we can interpret this pollen diagram sequentially like any other stratified deposit.

Casting one's eye down the diagram (Fig. 14), it will be noticed that most of the curves show relatively little change. The curve for ivy (*Hedera*) is, however, an obvious exception; between 13 and 15 ins. (33 and 38 cms), its percentages exceed those of any other species. This is a quite remarkable state of affairs, but not without precedent. Recently Simmons and Dimbleby (1974) discussed this phenomenon in other Mesolithic and later contexts. They suggest that such accumulations of ivy pollen, which are always associated with occupation sites, are an artifact produced by the winter feeding of animals on sites. Ivy is an evergreen plant valuable for winter fodder, and as it flowers in late October or November it would be producing pollen when it was being collected for this purpose. It has been shown that in later periods peaks in the ivy pollen curves are associated with the keeping of domestic animals, but in Mesolithic times the herding of red deer is another possible explanation.

There is one other feature of this diagram which bears on this conclusion. Ivy is shade-tolerant but it only flowers in full light. Even if it is climbing a tree it does not flower unless the tree is exposed to light from the side or its crown has died back. Under such conditions one would expect to see a considerable response in other light-demanding species such as hazel, birch, bracken (*Pteridium*) or the grasses. Fig. 15 shows that there is some reduction of oak pollen in the ivy zone, but that there is a reciprocal increase in birch, and to some extent in hazel, so that a woodland cover still remains. Even in completely open conditions it seems impossible that ivy could be so dominant as to produce these high percentages, and even it if did, it would mean the complete smothering of the other vegetation, which patently did not happen.

One is therefore forced to the conclusion that the ivy pollen is artificially introduced to the site and does not come from vegetation growing there. For this reason I have not included ivy in the non-tree pollen, and in Fig. 16 the percentages of the more important taxa are presented calculated in a pollen total which excludes ivy. These curves show the small increase in the non-tree pollen at the ivy zone, particularly reflected in the heather curve; it seems reasonable to see this as an effect of human pressure, perhaps via grazing animals, producing a lighter canopy in the forest around an occupation site, and to see the ivy as being brought to the same site by the people concerned. Following this period of forest, which is of the mixed oak of forest type characteristic of the Atlantic period (Zone VIIa), re-establishes itself and by the top of PII is at its densest. It should be noticed (Fig. 14) that even at 18 ins. (45 cms), there was abundant pollen present and it is apparent that the sampling range had not reached the bottom of the pollen profile.

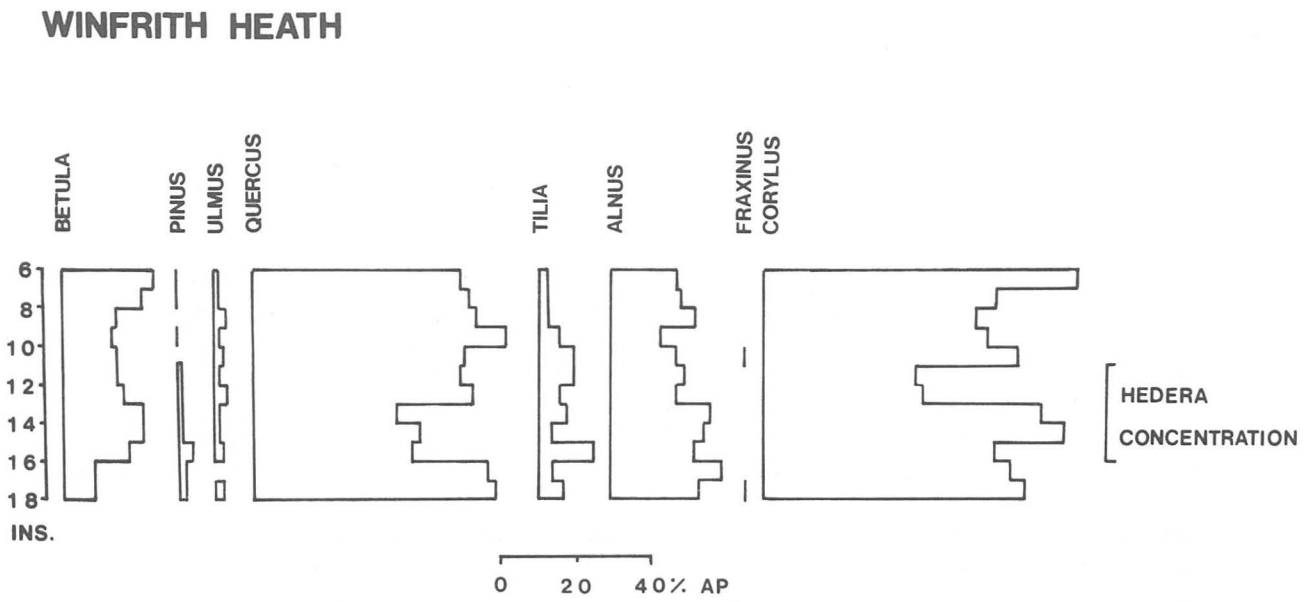


Fig. 15. Winfrith Heath: the tree-pollen distribution in Pollen Layer II expressed as percentages of sum of arboreal pollen (AP).

Fig. 16. Winfrith Heath: the distribution of selected taxa in Pollen Layer II expressed as percentages of total pollen and fern spores minus *Hedera* pollen.

Pollen Layer I (1-6 ins.) (2.54-15. cms)

The pollen evidence of PII is in keeping with the Mesolithic character of the archaeological material and indicates that the occupation was in the Atlantic period. In PI (Layer 1b) however, the relationship is much more complex, for in spite of the purely Mesolithic character of the archaeological assemblage there is a strong element in the pollen spectrum of post-clearance land use. It has already been pointed out that the clay of the clay patch (L1a) contained an anomalous pollen suite, one which had a distinctly agricultural character, and which does not seem to be of immediate local origin. Archaeologically, owing to the absence of artifacts therefrom, it is not possible to attribute this clay patch to the Mesolithic or any other period, but the pollen evidence indicates that it is no earlier than the Iron Age in origin. This Layer, L1a, can have no relevance to the Mesolithic occupation.

If pollen analysis had not been carried out on Layer 1b no question would have arisen as to the Mesolithic nature of the flint artifact assemblage at the surface of this layer. The reason for doing such an analysis is not to check the archaeology but to provide an environmental background for the archaeology, though within broad limits it may also provide a dating bracket.

In this particular case we have the apparently absurd juxtaposition of a Mesolithic occupation with a pollen assemblage representing a post-clearance landscape in which agriculture was being practised. This paradox arises from a failure to understand the mechanism of pollen incorporation into a soil. In dealing with the deepest layer, PII (=Layers 1d and 2) reasons were given for regarding this as a progressively aggrading deposit, so that to a large degree it was possible to regard the pollen as contemporary with the artifacts in it. In Layer 1b (PI) the situtation is fundamentally different. The presence of artifacts of Mesolithic age at the surface could mean (assuming that later disturbance can be ruled out) that the present surface has been exposed continuously since Mesolithic times. Supporting evidence for this will be produced below. In this circumstance, pollen is being deposited continuously on this surface and slowly being washed down into the deposit (soil) beneath. The pollen at the surface, therefore, should reflect the present or recent pollen rain; a comparison between the sample 0-1 in. (0-2.5 cms) and the modern sample B1 shows that there is a close similarity, though the former does have a greater range of taxa, particularly of agricultural weeds.

As one progresses downwards the dominance of *Calluna* is seen to lessen and other taxa such as the grasses increase. There is also an increase in the woodland species, some of them totally absent from the upper part of the diagram. Most significant among these is the ivy, which, as we have seen, is to be regarded as in effect an artifact of Mesolithic man. Again it must be stressed that the temptation must be resisted of seeing all the different components in any one sample as co-eval. For instance, the presence of both ivy and cereal pollen in sample 5-6 in. (12-15 cms) does not imply that they were deposited together. One may be a relic and the other a later arrival in the same sample. For this reason the AP/NAP block diagram at the right of Fig. 00 is not strictly valid over PI, though acceptable for PII, which is an aggraded deposit. However, it has been included to demonstrate the contrast between the two zones in their NAP content.

It is in this lowest part of PI that pollen may be beginning to relate to the Mesolithic occupation. Below the dotted line on the pollen diagram we can see the considerable presence of those taxa so characteristic of PII, including the woodland associate bracken. These are all petering out as one reads the diagram chronologically upwards from the bottom of PI, but their presence at the base of this layer gives the continuity with PII that validates the interpretation of the surface of PI as Mesolithic. In this connection there are three possible circumstances which could have obtained:

(a) that the layer PI when first deposited was pollen-free and that the Mesolithic pollen was deposited on the surface from the surrounding vegetation;
(b) that the pollen was contained in the sand, which was blown topsoil, and has subsequently been progressively washed down;
(c) a combination of both (a) and (b).

It is not possible to distinguish between these three alternatives, but there is one implication which may be drawn. This is that the Mesolithic occupations responsible for the artifacts on the surface have produced a relatively much smaller concentration of ivy pollen

than was the case at the peak concentration in PII. However, this merely seems to be a continuation of a trend that was already taking place in the upper layers of PII. On the face of it this suggests a change of practice, but it may be merely that the supply of ivy as a resource had been virtually exhausted by a long-continuing practice of deer husbandry. Otherwise there is no reason to doubt that the environmental setting of this occupation resembled that of PII, namely a woodland environment, though probably not dense forest.

Though they are not exactly parallel in detail, the pollen diagrams for three other Mesolithic sites in southern England, all terrestrial sites on sand, also show a Mesolithic layer covered by later sand deposits. These are Iping (Keef *et al*, 1965), Oakhanger (Rankine *et al*, 1960) and Addington (Dimbleby, 1963). In each case the layer containing the microliths is covered over by a depth of 5 or 6 ins. (12 or 15 cms) of sand which contains the subsequent pollen history. Though the sites vary from Boreal to late Atlantic in date, and also in ecological setting, they have this common feature in the pollen diagram and it is to be seen again in PI at Winfrith. It must be admitted that no conclusive explanation has been found for this stratification, though windblow may be involved, but in all the cases mentioned there are grounds for believing that it developed in the Mesolithic period. At Oakhanger microliths were found on the present land surface (Rankine's Phase III), very much as at Winfrith. Here, however, the presence of gravel layers in the subsoil reveals more clearly than at the other sites some evidence of stratigraphic disturbance, and whereas at Oakhanger there was an archaeologically sterile layer between Phase III and Phase II, here at Winfrith there is a scatter of artifacts between the surface and the PII zone.

A final point concerns the dark colour of the sand of this layer (L1b). This is due to humus and the loss on ignition of the top three samples shows a consistently decreasing gradation:

0-1in. (0-2.5 cms)	20.50%
1-2 ins. (2.5-5 cms)	15.00%
2-3 ins. (5 cms-7.5 cms)	8.75%

These figures would confirm the interpretation of this level being a soil surface that has been under vegetation. Taken in conjunction with the pollen analysis it clearly seems to represent a long-established heathland soil surface. The similarity should be noticed between the pollen spectrum of the modern heath surface (B1) and the 0-1 in. (0-2.5 cms) sample of PI. The pollen curves show consistent trends with depth that indicate that at the point sampled the profile has not been disturbed probably since Bronze Age times at the latest.

Summary of Pollen Evidence

1. The lower part of the pollen diagram (PII), associated with a flint assemblage, suggests that at this time somewhat open deciduous forest was present. The forest was of the Atlantic (Zone VIIa) period. The openness of the forest may have been contributed to by human influence, and the presence of large quantities of ivy (*Hedera*) pollen may signify some husbandry of herbivores, perhaps red deer.
2. This occupation layer was sealed by a shallower covering of sand (PI), containing some microliths within it, but with a high and localised concentration of them at the surface. The pollen cannot be directly related to the archaeological assemblage. Whilst there are elements of pollen of the PII layer present, the bulk of the pollen is post-clearance and shows a long history of heathland.
3. The organic matter content of the top sample of PI supports the view that this was an old heathland land surface.

Interpretation and Discussion (SP)

At all levels the finds are of typical Mesolithic character; despite careful scrutiny on site and afterwards no artifacts whatsoever of any other period were noted, except for one Lower Palaeolithic flake found on the surface of the eroded hill-side, outside the excavated area (see list of finds). There is further no evidence for gradual or sudden typological changes throughout the various layers.

The Early Phase

The earlier horizon of activity at Winfrith in Layer 1d and Layer 2 presents us with no major problems of interpretation, although, admittedly, we know very little about this phase apart from the information provided by the pollen analysis. This early Mesolithic occupation of the site appears to have taken place during the Atlantic climatic period in an environment dominated by trees and shrubs, particularly oak and hazel.

Although fairly big stones were found at this level, no definite arrangement was discernible. They were uncalcined and therefore certainly not derived from Layer 1b, where many stones were calcined. The presence of the stones can hardly be explained naturally, but on the other hand it is clear that they do not belong to an *in situ* structure. The stones were associated, to an extent, with an increase of artifacts. The soil profile below Layer 1b has an undoubted disturbed appearance and the sands are mottled, but clear-cut features and intrusions are not apparent, such as might have pointed unequivocally to the previous existence of structures. These conditions, although they might have been contributed to by animals, seem consistent with the more general human activities of walking, working or living on sandy soil in all weathers.

The most interesting and important aspect of the site in this phase, for which parallels have been quoted, is furnished by the evidence for importation of ivy by man, doubtless for winter feeding, most probably of deer, thus providing very early evidence for tentative attempts at domesticating herded animals. Although there is insufficient evidence to show exactly what the nature of human activity on the site was, whether short-stay or winter camping, it is unlikely that Mesolithic people would have camped at any great distance away from the animals on which they depended, for reasons of security and convenience.

The Later Phase

Whereas the lower pollen profile (PII) can be directly related to the archaeological assemblage, this is not the case with PI, corresponding to archaeological layers 1b and 1c. However, Dimbleby has given possible explanations for this situation and has stressed that the pollen evidence is not necessarily at variance with the archaeology.

It may be helpful to explain a little more explicitly what is meant when we say that Layer 1b is of Mesolithic age. What are we dating? Clearly not, for instance, the sand grains; these are derived from much older geological sources. Nor are we saying that the pollen must be Mesolithic; some of it may be, but some is certainly later. Pollen may be an integral component of the layer, or it may be a later intrusion and in this case both elements seem to be involved.

When we say that Layer 1b is Mesolithic we mean that it was deposited in its present stratigraphical position, in which it forms the present land surface, in Mesolithic times. It is the date of the deposit we are referring to, not the date of the components which make it up. But it does carry type fossils, the microliths; and as it does not seem to be possible that they were derived from an earlier deposit, we must assume that they are contemporary with, or at least no earlier than, the laying down of this layer.

The pollen analysis does not deny the possibility that the layer in question was laid down in the Mesolithic period and has some features which would tally with this. This being so, the pollen record cannot be held to gainsay interpretation of the structures and surface assemblage as Mesolithic remains *in situ*.

It would not have been unreasonable, during work on the site, to envisage an archaeological context for the scattered clay patches (L1a) as part of the stony oval features. The clay contained no artifacts whatever and are therefore only archaeologically datable, by association; as may be seen in plan (Fig. 7) only two small patches were encountered seemingly outside the fringes of what may be an occupation floor. The clay is clearly not local hill-wash, for the site occupies the summit of the hill, but the pollen analysis confirmed importation from elsewhere. The clay yielded a pollen suite clearly indicating conditions which existed most probably not before the Iron Age. Although some degree of contamination cannot be ruled out altogether, we cannot simply dismiss the pollen record as misleading in this particular instance.

If this is so, then two alternative possibilities are forced on us: either to regard the clay patches only as the result of post-Mesolithic activity, thereby throwing serious doubt on the

reality of their association with the stony features, but thus allowing for the possibility of a Mesolithic dating for the stony features; alternatively, if we were to insist on a contemporaneous association between the clay and the stones, then the dating of the stone features as Mesolithic must also be regarded as dubious. There is no easy solution to this dilemma, and perhaps it will be best to discuss the evidence for the nature and relative dating of the rest of the archaeological features of Layer 1b first, keeping in mind the fact that in the larger part of the site Layer 1b is the topmost archaeological level.

It must also be recalled that there is a correlation, hardly to be accidental, between the Mesolithic artifacts, both in their general distribution and their particular concentration, and the area of black humic sand and stone concentration (L1b). The largest percentage of artifacts indeed occurred, as we have stated, immediately outside the perimeter of the stones and black sand, a circumstance that would normally be taken as a fair indication of contemporaneity. In this respect, therefore, the evidence is stronger for regarding the stones and black sand, lying in the irregular hollow, as originally Mesolithic in age, notwithstanding the fact that these features appear to share the disturbing relationship with the apparently recent clay patches. Furthermore, round the perimeter of the dark sand were a number of smaller circles which would normally be interpreted as post-holes and therefore also appear to share in the coincidental occurrence of features.

If the artifacts in Layer 1b were not in a primary position, there would be no satisfactory explanation for their occurence here; there are no means whereby the vast majority of them could have worked their way up some 12 in (30 cms) at least from Layer 2 all over the site.

No artifacts of post-Mesolithic character have been found on the site. Ill-fired prehistoric pottery need not be expected to have survived recognisably in the acid soils, but occupation sites of the Neolithic, Bronze Age and Iron Age and even of the Roman period, commonly display characteristic flint and other assemblages of a kind not apparent here. It must, however, be stressed that the pollen spectrum of the clay indicates clearly that this clay can be no earlier than the Iron Age, indicating therefore that some or other activity, at an unknown time, did take place on the site without leaving any other trace. It may have been tempting to speculate on the possibility of associating the clay with the barrow (if barrow it be), but even the Bronze Age would be too early for the clay; if there was any Bronze Age activity on the site, it is certainly not reflected in the finds.

If we are to argue that the stones and clay arrived on the site either together or, alternatively, at different times but both at a post-Mesolithic date, we would be dealing with an additional and an even more inexplicable coincidence; on the other hand, if the stones were the remnants of Mesolithic activity, it may be that at a very much later date the clay was placed here, for an unknown reason, because this stony area presented a more stable surface than the adjacent sand. The stones and artifacts were often highly calcined but this intensity of heat was not reflected in the condition of the clay, although fairly hard but possibly due to sun-drying over a long period; this fact also tends to support the view that the clay is not contemporary with the other elements of the site. It must therefore be accepted that there is no proof whether the stones and clay are contemporary or not; the evidence is circumstantial, and the problem remains unresolved.

In summary, and excluding the problem of the clay, the author (SP) regards the archaeological evidence as favouring the interpretation that the features of Layer 1b are of Mesolithic origin despite the problems associated with this interpretation, for the following reasons:

1. The close spatial relationship between the artifacts, which are reasonably beyond dispute in a primary position, and the features consisting of the stones, dark soil in a hollow and the small dark circular soil patches which would normally be interpreted as post-holes. It would be difficult to rule all this out as coincidence.
2. The occurrence of burnt artifacts and burnt large stones, concentrated only in this particular spot, which rules out heath fires and, incidentally, proves that these elements cannot be derived from the lower uncalcined layers.
3. There is nothing in the nature of these features or occurrences which are unacceptable in a Mesolithic context, as comparisons can be drawn with other sites, as will be shown.

If we accept the above arguments, we are left with only one apparently unsurmountable problem—the clay patches—rather than several inexplicable situations. It may be that in the

future further evidence will come to light in the area which will provide the proof one way or another.

Regardless of whether the shallow depression in which many of the artifacts lay was completely natural or artificially enlarged, we may suggest that it was selected for use by Mesolithic folk, much as at sites like Abinger or Farnham, Surrey, where habitation areas occurred in hollows associated with evidence for post-holes (Leakey, 1951; Clark and Rankine, 1939). At Abinger in particular stones were associated with the hollows. Vegetation, as suggested by the humus, may have developed naturally in the hollow, enhancing it for use, or grass and leaves may have been placed there deliberately. We know that such domestic arrangements were already in use during the Lower Palaeolithic as at Kalambo Falls (Coles and Higgs, 1969, 105-7).

The denser concentration of artifacts around the perimeter of the stoney feature of Layer 1b can be regarded as consistent with knapping activity outside a shelter. Such structures are thought likely to have been made of turves or branches perhaps propped up with stones. If they were huts rather than wind-breaks they would have been covered over, perhaps by the simple method of bending the branches and tying them together at the top or by placing branches and grasses horizontally over low walls of earth or branches.

If one or both of the circular features at Winfrith were to be accepted as Mesolithic structures, they need not imply anything more substantial than what we have outlined, allowing the small circular patches to mark the sites of some of the more deeply embedded branches. The ground plan of the larger feature is nearly identical to that of the epi-Palaeolithic/early Mesolithic huts at Pinnberg near Hamburg (Rust, 1958), where relatively stone-free gaps in the north or south were regarded as possibly representing entrances. In this case the possibility should also be considered that the concentration of stones could merely be the residue of weights used on a flimsy structure, which subsequently collapsed, leaving the stones to mark its former outlines.

Economy

The evidence for ivy brought to the site in late autumn, presents the distinct possibility that animals in close proximity to the site could have had a major place in the economy.

Although samples of the various sands on the site were sifted, no food remains whatsoever were found, apart from a single limpet shell from a depth of about 6 ins. (15 cms), towards the base of L1b or top of Layer 1c. One cannot attach too much significance to it in view of the absence of other organic material. It is difficult to see that excessive acidity of the soil caused all the bone to disappear while one shell remained; it may well be that a cooking or eating area was lost at the eroded southern edge of the site.

A measure of contact with the coast is further implied by the presence of a Portland chert trimming flake in square B2 in Layer 1c; this could suggest movement between Winfrith and the Portland sites (Palmer, 1977).

ASSEMBLAGE ANALYSIS

Approximately 2400 artifacts were collected from the surface of the squares, included in the initial survey of the site (Fig. 3). Although not all these squares were subsequently excavated, these artifacts are included in the typological analysis of the assemblage from the site. Examples of tool-types are shown in Figs. 18-21.

Microliths

(Different types of microliths are discussed in Palmer, 1977).

A1	form, partly blunted down one side	158
A2	the same with some opposing retouch	2
B1	the whole of one edge blunted	37
B3	the whole of one edge blunted plus part of the opposite	1
C1	one edge blunted and obliquely across the base	2
D1b	scalene triangle	1
D2b	crescent with the chord blunted	1
D4	rhomboid	2
H2	broadbased trapezes, elongated	2
	unclassified fragments	22
	Total microliths	*223*

(The rhomboids were noticed after completion of the drawings).

Core axes, *tranchet* (Fig. 17)	1
Picks, *non-tranchet*	1
Chopping-tools	1
Scrapers:	
one side	7
two sides	1
end	13
side and end	3
steep retouch on chunky flakes	4
convex	46
core	3
micro-	9
Total scrapers:	*86*
Tanged points	2
Shouldered points	5
Truncated blades	3
Blunted flakes	4
Blunted blades	45
Burins	39
Knives (*note:* 6 of these may in fact be for use as sickles)	11
Awls/borers	3
Saws	8
Retouched blade segments	3
Diversely retouched flakes	27
Diversely retouched blades	19
Abraded pebbles	1
Microburins:	
bulbar variety	34
tip variety	14
Krukowski	4
allied forms (notched microblades, mis-hits, etc.)	26
Total microburin forms:	*78*
Cores:	
1 platform, part utilised	75
platform, whole utilised	14
2 platform, parallel	12
2 platform, intermediate angle (saddle-cores)	41
2 platform, right angles	15
3 platforms	15
4 platforms	5
intersecting platforms	5
discoidal	11
multi-platform, unclassifiable	49
Total cores:	*242*
Axe-trimming flakes (*tranchet*)	8
Waste flakes (including utilised flakes and core-trimming)	15583
Waste blades (including utilised blades)	2915
Miscellaneous:	
Lower Palaeolithic flake	1
Core-trimming flake with polished area	1
Pebble rubbers	1
Flake with resinous substance adhering	1
Fabricators	4
Total Artifacts:	*19,326*
Limpet shell	1
Pieces of ochre	9
Fossils (bivalve, sea-lily)	2

Specific tools (excl. utilised flakes, blades): 444 i.e. 2.3 per cent of total assemblage.
Microliths: 228, i.e. 51.3 per cent of the total number of tools.
Scrapers: 86, i.e. 19.3 per cent of the total number of tools.
Truncated and blunted flakes/blades: 52, i.e. 11.6 per cent of the total tools.
Knives: 11, i.e. 2.4 per cent of the total tools (Note: possible sickle-knives: 6, i.e. 54 per cent of the knives or 1.4 per cent of total tools).
Burins: 39, i.e. 8.7 per cent of total tools.
Core-tools: (axes, picks and axe-trimming-flakes) 10, i.e. 2.1 per cent. The percentages for shouldered and tanged points, awls are negligible.
Microliths Summary: Form A1 69.2 per cent of total microliths
Form B1 16.3 per cent of total microliths.

9.7 per cent of the microliths could not be classified, being too damaged. This means that all the other classified types of microliths together only comprise approximately 4.8 per cent of the microlith total, as follows: A2 .9 per cent; B3 .4 per cent; C1 .9 per cent; D1b .4 per cent; D2b .4 per cent; H .9 per cent; D4 rhomboids .9 per cent.

Microliths form A1 occur in all trenches and at all depths. The one microlith form D1b came from the topsoil of Trench B3; the one form D2 came from Spit 1 of Trench A2; the two rhomboids both came from Spit 2 of Trench C3 and are therefore contemporary with the upper occupation (L1b); trapezes came from Spit 4 of Trench B3 and Spit 3 of Trench A3 and are therefore earlier than the upper occupation.

The *tranchet* axe came from Spit 2 of Trench A3, the chopping-tool came from Spit 1 of Trench A1 and both these are therefore more or less contemporary with the more recent occupation, but the axe-trimming flakes came from all depths, up to Spit 4, showing that axes were made at all times; the pick came from Spit 4 of Square B2 and therefore within Layer 1c, grey sand; the presence of axe-trimming flakes in this sand also indicates that these two types of core-tools were being made at the same time. A Portland chert core-trimming flake came from the same depth in square B2, as already discussed.

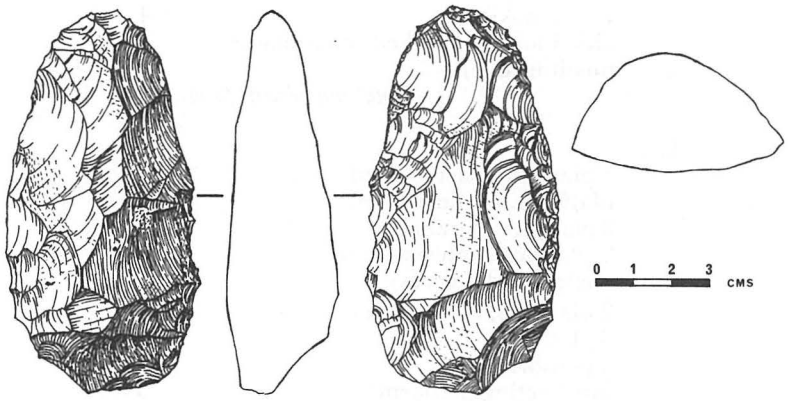


Fig. 17. *Tranchet* axe from Trench A3, layer 1 spit 2, Winfrith Heath Mesolithic site. Scale ½.

Comparisons and Discussion

The nearest large sites to Winfrith of which we have full details regarding the assemblages are Portland Site 1 (Palmer, 1971, 1977), Iwerne Minster (Summers, 1941) and Downton (Higgs, 1959). There are a number of large sites in East Dorset, the majority of them still only known from surface or casual collecting, and it is possible that some of them may eventually produce more informative assemblages on excavation (Palmer, 1977). The following table gives a comparison of the percentages of microlith types from these sites:

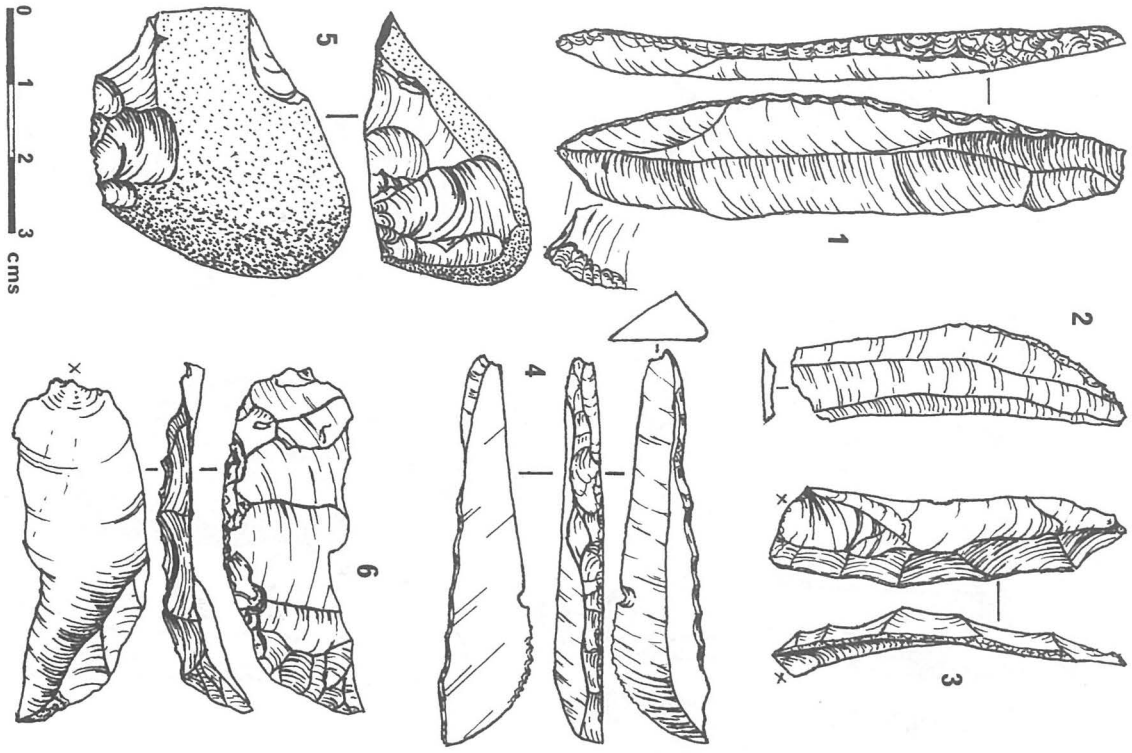


Fig. 18. Artifacts from Winfrith Heath Mesolithic site: blunted blades (1-4); steep scraper (5) and axe-trimming flake from Trench B3, layer 1 spit 2 (6). Full size.

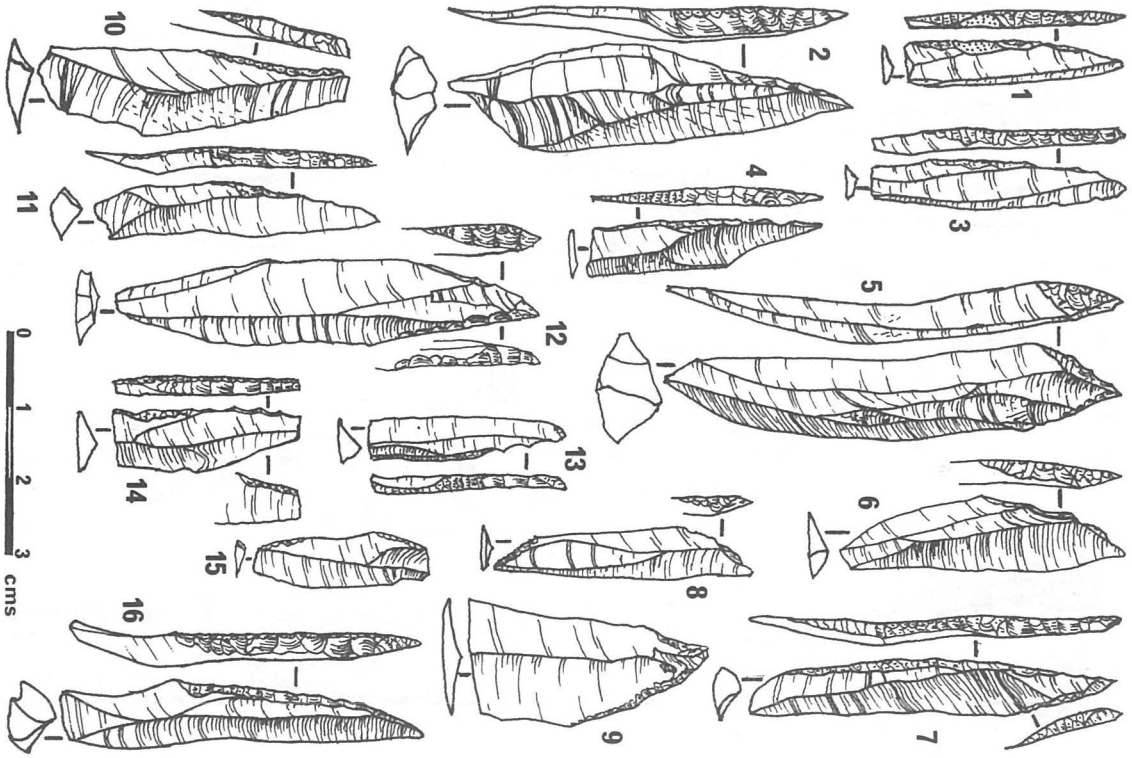


Fig. 19. Microliths from Winfrith Heath Mesolithic site: form A1 nos. 2, 3, 5, 6, 9, 10, 11, 16; form A2 nos. 4, 12; form B1 nos. 1, 13, 14; form C1 no. 7; form H2 trapezes nos. 8 and 15. Full size.

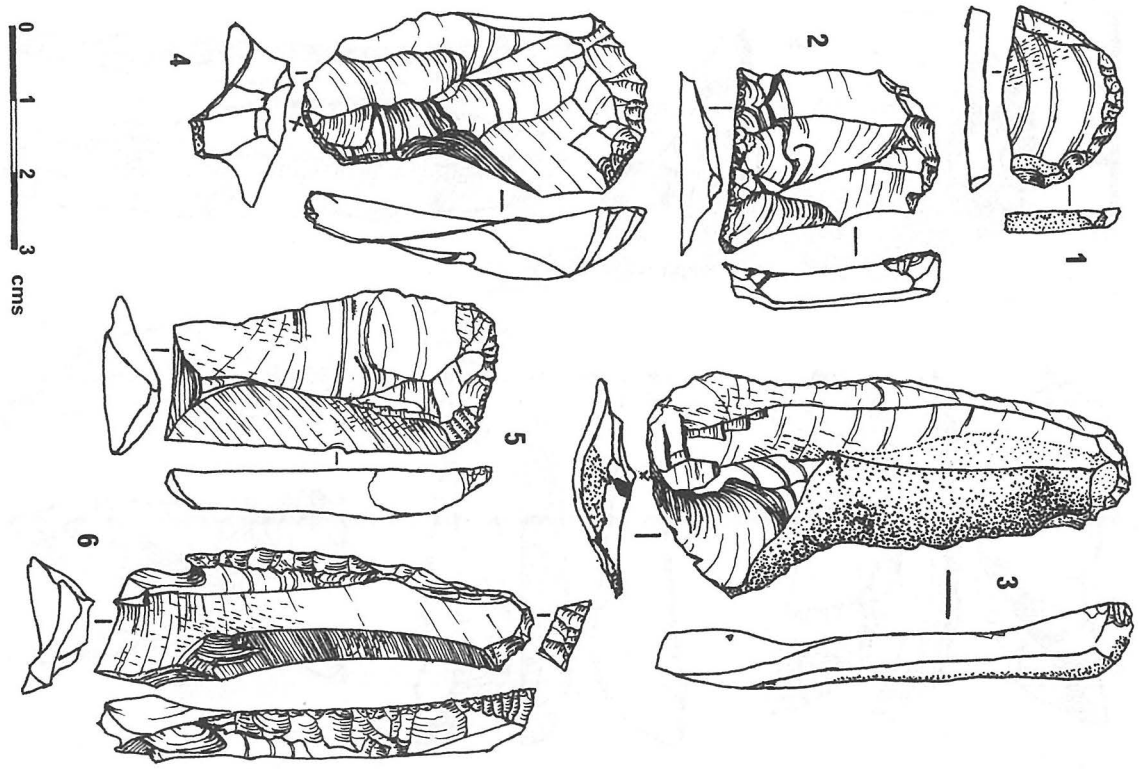


Fig. 20. Various scrapers from Winfrith Heath site. Full size.

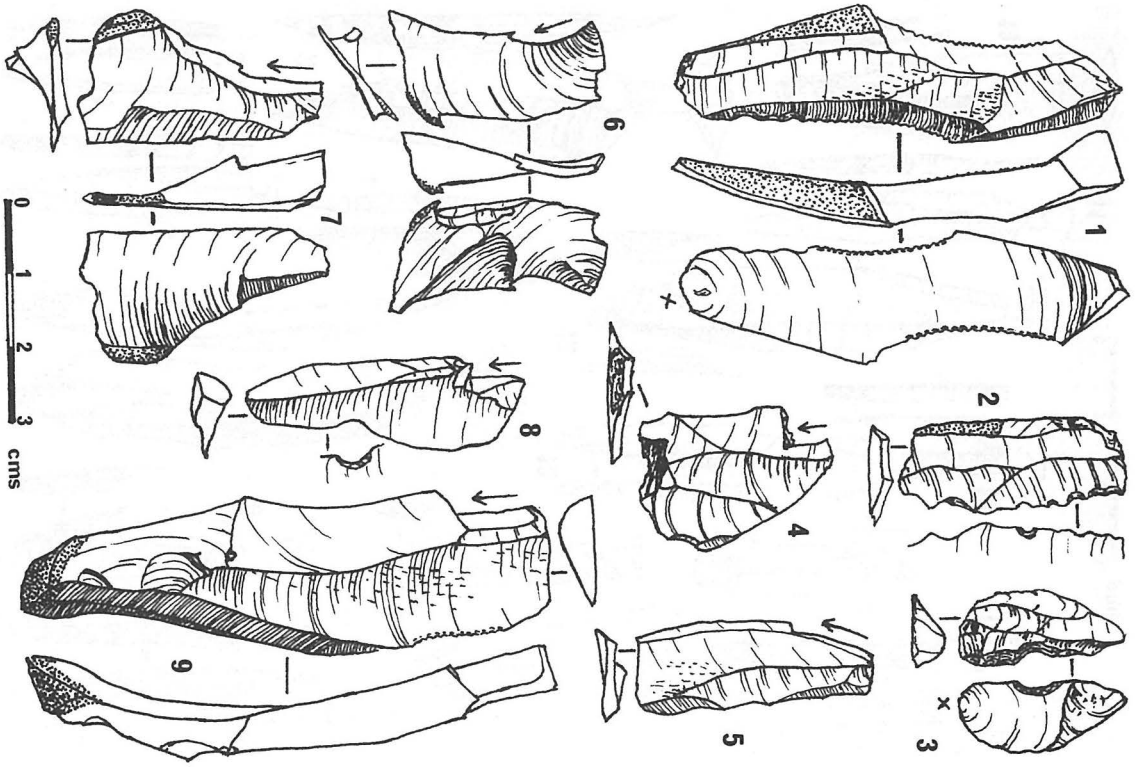


Fig. 21. Various artifacts from Winfrith Heath: saws nos. 1-2; burins nos. 4-8; composite tool burin/saw no. 9; Krukowski micro-burin no. 3. Full size.

	Winfrith Heath	*Iwerne Minster*	*Downton*	*Portland Site 1*
A1 and A2	70.1	72.8	52.0	23.0
B1	16.3	14.0	21.6	14.6
B2/3	.4	1.5	7.2	10.4
C	.9	1.5	2.4	18.8
D1b	.4	3.9	3.2	3.4
D2	.4	3.2	1.6	.7
D3 (Clark's D5)	—	—	3.2	7.6
D4 (Clark's D6)	—	—	2.4	8.3
D4 (rhomboids)	.9	—	—	—
E	—	—	1.6	2.7
F	—	2.3	1.8	0.7
G	—	—	—	4.8
H	.9	.8	4.0	3.4
Microlith % of total tools	51.3	23.2	23.2	10.2
Scrapers	19.3	68.1	65.0	40.0

From this table it can be seen that there are several significant differences between the assemblages from these sites. Of particular interest is the small number of microliths from Site 1 Portland in comparison with the other three sites. The discrepancies will be even more noticeable at the Culver Well site, Portland, on which work is still continuing (Palmer, 1976), where nearly half of the microliths appear to be scalene triangles, a form of very little importance at Winfrith. It will also be noted that at Winfrith microliths are the most important tool from the site, whereas at the other sites scrapers are more important. The small number of microliths from Iwerne Minster could in part be due to the fact that all the finds from here were surface finds and it is therefore easy enough to overlook microliths.

Rhomboids appear to be a form not frequently encountered in the southern counties, although some have been found at Braishfield near Romsey, Hampshire, (Palmer, 1977) and one or two were recently found at Culver Well. This type of microlith is sometimes regarded as a form which developed fairly late during the Mesolithic period and is also frequently regarded as being characteristic of the so-called 'Sauveterrian' industries or 'industries of Sauveterrian affinities'. As non-geometric microliths predominate at Winfrith and as core-tools are present, we obviously have to conclude that rhomboids on their own do not always have a high diagnostic value. Although the Winfrith site is probably late Mesolithic, Culver Well is quite early (5,200 ± 135 bc), so that this microlith form is also not a clear indication of date.

In general, Winfrith appears to compare best with Iwerne Minster, differing mainly as regards some of the lesser microlith forms. As regards comparisons, it is most unfortunate that not enough is known about the assemblages obtained from the Blashenwell and Ulwell sites very nearby on Purbeck (but see Palmer, 1977).

It has been shown (Palmer, 1977) that in England there appear to be in general differences between the assemblages of inland sites and coastal Mesolithic sites, not more than 4 miles from the present coastline which is not radically different from the coastline of late Mesolithic times. It may, in fact, be valid to talk of a Coastal Mesolithic Culture (tentatively referred to by the writer as the Portland Culture). Important characteristics of many coastal industries appears to be relatively high figures for picks, axes and microliths form B1 (the whole of one side blunted). Several core tools or their trimming flakes have been found at Winfrith, but microliths of form A1 predominate to a very large extent over all other tools. This is a feature of many inland sites. The Winfrith site is only 4½ miles (7.2 km) from the sea and can probably be regarded as marginally coastal; the Mesolithic folk were probably hunters and gatherers on the heathland, with an occasional or periodical walk to the sea for the gathering of sea-food. This dual economy might to some extent account for the assemblage differences between Winfrith and the other sites discussed above.

Dating

The pollen profile suggests that the site was occupied by Mesolithic people during the Atlantic period. It does seem likely that the occupation was established well before the end of the Atlantic period, as we have to allow time for the increase in arboreal types of vegetation, shown by the pollen.

The occurrence of ivy in the lower occupation immediately calls to mind the site of Oakhanger where similar evidence of animal husbandry appeared in an Atlantic context (Simmons and Dimbleby, 1974). Oakhanger has two radio-carbon dates of 4430 ± 115 bc and 4350 ± 110 bc (F68 and F67) although Jacobi (1976) suggests that it may in fact be a good deal earlier. At Oakhanger large numbers of microlith of form A1 were also found, so that we may suggest that the Winfrith site is of more or less the same date range.

Summary

1. On the summit of Whitcombe Hill, Winfrith Heath, a very rich Mesolithic site has been found on sandy heath country.
2. The grey (L1c) and brown (L1d) sands at 6-20 ins. (15-50.8 cms) were undeniably deposited during the Atlantic period. Many Mesolithic artifacts occur throughout this horizon. At the base of the grey sand and within the brown sand (L2) there is evidence of an early Mesolithic occupation on or near the site, associated with a high percentage of ivy pollen very probably derived from fodder gathered elsewhere for some form of animal husbandry, perhaps of deer.
3. There is pollen evidence for somewhat open deciduous forest broadly contemporary with this early phase of activity and perhaps due to man's influence, following which, but still within the Atlantic period (Zone VIIIa) there was an intensification of the mixed oak forest. Later clearance was associated with the emergence of heather as the dominant vegetation, probably from the Bronze Age onwards.
4. Features consist of areas of black sand and big stones concentrated in hollows and associated with an abundance of Mesolithic artifacts; the larger and better defined area is roughly oval in shape. Smaller circular patches may possibly be post-holes. The archaeological and pollen evidence for this Layer 1b is not in harmony but is reconcilable, and various arguments are put forward to support a claim for regarding the features and occupation at this level as *in situ* Mesolithic. If these arguments are accepted, the features may be regarded as the remnants of flimsy huts or shelters.
5. A problem is presented by the presence in the same areas of small patches of imported clay containing pollen indicative of Iron Age or later conditions and which are therefore not reconcilable with the Mesolithic occupation.
6. The assemblage from all levels of the occupation is most nearly comparable with that from Iwerne Minster, Dorset, but with differences probably resulting from the site's position within walking distance from the coast.

Acknowledgements

We are grateful to the officials of the United Kingdom Atomic Energy Establishment at Winfrith Newburgh who gave permission for the excavation to take place on their land and who also gave assistance in numerous ways. We also thank Mr. J. C. Reynolds, an employee at the Establishment, who discovered the site and readily made all his information available and gave his full co-operation. The work was sponsored by the Dorset Natural History and Archaeological Society and carried out by volunteers, to whom thanks are also due. Some of the drawings are by Mrs. Jean Apted and Mr. A. Hart; the site surveying was done by Mr. Ray Newton. We are grateful to Mr. R. A. H. Farrar for revising the text and helping in many ways, but he cannot be blamed for any remaining shortcomings.

Bibliography
Clark, J. G. D., and Rankine, W. F., 1939. Excavations at the Mesolithic pit dwellings at Farnham, *Proceedings of the Prehistoric Society, 5,* 61-118.
Coles, J. M. and Higgs, E. S., 1969. *The Archaeology of Early Man.* Cambridge.
Dimbleby, G. W., 1963. Pollen Analysis of a Mesolithic site at Addington, Kent. *Grana Palynologica, 4,* 140-148.
Grinsell, L. V., 1959. *Dorset Barrows.* Dorchester.
Higgs, E., 1959. Excavation at a Mesolithic site at Downton, near Salisbury, Wilts. *Proceedings of the Prehistoric Society, 25,* 209-212.
Jacobi, R. M., 1976. Britain Inside and Outside Mesolithic Europe. *Proceedings of the Prehistoric Society, 42,* 67-84.
Keef, P. A. M., Wymer, J. J. and Dimbleby, G., 1965. A Mesolithic site on Iping Common, Sussex, England. *Proceedings of the Prehistoric Society, 31,* 85-92.
Leakey, L. S. B., 1951. *Preliminary Excavations of a Mesolithic site at Abinger Common, Surrey.* Surrey Archaeological Society Research Paper No. 3.
Palmer, S., 1971. Second Report on the excavations at Portland Site 1, 1967 to 1968. *Proceedings 92,* 168-180.
Palmer, S., 1976. The Mesolithic habitation site at Culver Well, Portland, Dorset: Interim Note, *Proceedings of the Prehistoric Society, 42,* 324-327.
Palmer, S., 1977. *Mesolithic Cultures of Britain.* Poole.
Rankine, W. F., Rankine, W. M. and Dimbleby, G. W., 1960. Further excavations at a Mesolithic site at Oakhanger, Selborne, Hants., *Proceedings of the Prehistoric Society, 26,* 246-262.
Royal Commission on Historical Monuments, 1970. *County of Dorset: south-east Dorset,* H.M.S.O.
Rust, A., 1958. *Die Funde vom Pinnberg.* Neumunster.
Simmons, I. G. and Dimbleby, G. W., 1974. The possible role of ivy (*Hedera helix* L.) in the Mesolithic economy of Western Europe, *Journal of Archaeological Science, 1,* 291-296.
Summers, P. G., 1941. A Mesolithic site near Iwerne Minster, Dorset, *Proceedings of the Prehistoric Society, 7,* 145-146.

APPENDIX II

pH Values of Pollen Samples

Depth (ins.)	*pH*	*Depth*	*pH*
1-0 (Clay)	5.2	9.10	4.2
0-1	4.1	10.11	4.1
1-2	4.1	11-12	4.0
2-3	4.0	12-13	4.0
3-4	3.7	13-14	4.0
4-5	3.7	14-15	4.0
5-6	4.0	15-16	4.0
6-7	4.0	16-17	3.8
7-8	3.9	17-18	3.7
8-9	4.1		

Measurements by glass electrode in aqueous suspension.

APPENDIX I

Pollen Counts

Ins.	1-0	0-1	1-2	2-3	3-4	4-5	5-6	6-7	7-8	8-9	9-10	10-11	11-12	12-13	13-14	14-15	15-16	16-17	17-18	1971 B1
Sample	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	
Alnus	11	3	6	6	6	7	23	29	18	26	19	23	30	24	22	22	17	29	27	5
Betula	8	11	2	1	9	6	11	41	21	16	17	19	23	22	22	24	14	8	9	2
Carpinus	—	—	—	—	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Fraxinus	—	1	—	—	—	—	—	—	—	—	—	1	—	—	—	—	—	—	1	—
Pinus	7	—	+	—	—	—	+	+	+	—	+	—	2	1	1	1	3	2	2	3
Quercus	24	7	9	7	20	11	24	96	57	70	95	74	88	81	33	41	34	56	69	2
Tilia	1	—	—	—	3	2	1	6	3	3	9	13	16	8	7	4	12	4	8	3
Ulmus	1	—	1	—	—	1	2	1	1	3	2	2	1	4	1	1	2	—	2	—
(Total Tree Pollen)	(52)	(22)	(18)	(14)	(29)	(27)	(61)	(173)	(100)	(118)	(142)	(132)	(160)	(140)	(86)	(93)	(82)	(99)	(118)	(15)
Corylus	26	33	31	32	30	27	56	141	61	66	83	89	64	63	63	74	50	64	81	20
Hedera	—	—	—	3	7	11	7	14	12	16	9	24	72	83	97	93	52	18	10	—
Ilex	—	—	—	—	—	—	+	—	—	—	—	1	1	1	—	—	—	—	—	—
Ligustrum	2	1	—	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Lonicera	—	—	—	—	—	—	—	1	+	—	1	—	—	—	1	—	—	—	—	—
Salix	5	1	—	—	—	2	1	—	—	—	—	1	—	—	—	—	—	1	—	—
Calluna	86	285	192	154	89	39	54	45	22	31	43	61	59	83	87	64	64	60	75	221
Erica cinera	16	18	11	7	3	3	2	1	—	1	1	—	+	—	—	—	—	—	—	—
Erica tetralix	3	2	—	1	—	—	1	—	—	—	—	—	—	—	—	—	—	—	—	—
Misc. Ericaceae	6	5	3	5	3	1	3	3	—	1	—	1	2	4	1	2	1	—	—	14
Gramineae	155	22	19	19	45	22	45	20	12	13	22	23	32	31	23	17	24	26	33	11
Cereal type	—	—	1	—	—	—	1	—	—	—	—	—	—	—	—	—	—	—	—	—
Campanulaceae	—	—	—	—	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Caryophyllaceae	2	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Spergula	—	—	—	—	—	—	+	—	—	—	—	—	—	—	—	—	—	—	—	—
Chenopodiaceae	—	+	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Compositae																				
Artemisia	—	2	+	—	—	—	—	1	—	—	—	—	—	—	—	—	—	—	—	—
Centaurea nigra	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Cirsium	1	—	—	—	—	+	—	—	—	—	—	—	—	—	—	+	—	—	—	—
Liguliflorae	34	—	1	3	8	13	6	—	1	—	—	3	—	—	2	—	—	—	1	+
Tubuliflorae	3	1	3	1	1	3	2	—	1	1	—	3	3	—	+	2	1	3	2	2
Cuscuta	5	—	—	—	1	1	1	1	—	—	—	—	—	—	—	—	—	—	—	—
Cyperaceae	2	1	—	—	—	—	—	—	—	—	—	—	—	—	—	1	—	—	—	—
Labiatae	—	—	—	—	—	—	—	—	—	—	—	—	1	—	—	—	—	—	—	—
Plantago lanceolata	12	5	4	6	30	23	9	—	1	4	1	3	—	1	2	3	—	—	2	1 (P. major)
Primulaceae	—	—	—	—	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Ranunculaceae	1	—	—	—	1	1	2	+	—	—	—	1	—	—	—	—	—	—	1	—
Rosaceae	3	1	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Potentilla	3	—	—	1	—	5	2	+	—	1	—	—	—	—	—	1	—	—	—	—
Rubiaceae	4	+	—	—	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Rumex cf. acetosa	1	—	—	1	—	—	—	1	—	—	—	—	—	—	—	—	—	—	1	—
Succisa	—	—	—	—	—	—	—	—	—	—	—	—	—	1	1	2	1	1	1	—
Trifolium	—	1	3	—	—	—	5	—	—	—	—	5	4	5	2	—	1	2	1	—
Umbelliferae	1	1	—	—	1	—	—	—	—	—	—	—	—	1	—	—	—	—	—	—
Urticaceae	—	1	—	—	—	2	1	—	—	—	—	—	1	1	—	—	—	—	—	—
Varia	10	7	5	6	8	5	6	6	2	2	3	4	3	5	3	9	3	3	6	—
Dryopteris type	5	1	1	—	—	—	—	1	—	—	—	+	—	1	1	—	1	—	2	—
Lycopodium clavatum	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	3	—
Osmunda	—	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Polypodium	7	1	1	1	—	1	3	3	1	1	1	2	1	1	+	1	1	1	1	—
Pteridium	27	8	5	8	10	16	69	146	69	61	91	80	112	106	68	78	62	58	91	5
(Sphagnum)	—	—	(1)	(1)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
TOTAL	473	420	299	263	279	202	337	557	282	316	397	433	515	527	437	440	343	336	429	289

FINAL REPORT ON THE EXCAVATIONS OF THE ROMAN FORT AT WADDON HILL, STOKE ABBOTT, 1963-69

GRAHAM WEBSTER

The work at Waddon Hill started in 1959 and was completed in 1969. Two reports have been published[1] and this is the third and final one, covering the years 1963-69 and with some general conclusions. The work was continued through the great kindness of the landowner, the late Mrs. G. Tolley. We were made welcome every year by her and her family and encouraged by their enthusiasm and deep affection for the site. The Society continued its support with financial aid and help in other ways and the Dorset County Council lent tools and equipment throughout and their Divisional Road Surveyors were always helpful. My colleague the late Mr. George Rybot remained throughout a staunch ally and when necessary a shrewd *advocatus diabele*. Many came every year at their own expense to help, some very regularly and without all this skilled and unskilled help, little would have been achieved. A major contribution was that of Dr. Martin Aitkin of the Oxford Research Laboratory in his continued and detailed prospecting which had led to the excavation of all the pits and post-holes. I am grateful to those who have produced specialist reports and to Miss Annelise Wilson, my research assistant, who has helped to bring this report into its final state.

The defences

The most important work on the defences was that in 1959, when the details of the bank and ditch system for the east end of the fort were studied. The reconstruction previously offered (First Report, Fig. 3) was based on the main front revetment being buried in the rampart and the rock-cut trench in front of the bank being identified as a ditch. It became clear from work on the north side that the latter was the foundation of a trench or slot which continues round the full circuit of the defences and which must have held a massive timber front. This would suggest that the rampart was at least 25 feet wide at the base which would raise the possible height from 15 to 18 feet. Further work in the concluding year, produced with difficulty, the irregular curve of the SE corner. The east gate appears to have had six posts although there was time only to record the presence of four of them. The front of the gate had been cut away by a later quarry. In one of the post-pits at the west corner, it was possible to see the void of the post itself 12 inches square. Evidently the posts had been sawn off at ground level when the gate was dismantled.

The size of the gate, 18 ft. to 19 ft. wide by 12 ft. deep would have given two passages similar to the *Porta Decumana* at Brough on Humber[2]. The posts of this gate were 10 Roman feet apart and it seems likely that this was the intention at Waddon, at least in the lateral dimensions. A strange feature is the presence of a channel through the centre of the south passage, which has a butt-end on the line of the front posts. This is one of a sequence of channels which clearly mark the limits of areas of buildings and separates the open space between the buildings and the defences into two parts. As considered below, one of the functions of these channels was drainage and the relationship of this particular length to the gate must show that it was not open but covered with timber at least in the area of the gate. The fact that these channels discharge at some points into rock-cut pits suggests that their function was drainage. However, they also appear to have been boundaries.

The line of the defences on the south side of the hill was found to be a straight line cutting across part of the hill where there was a natural re-entrant bight. This involved an engineering problem which the army would not have found difficult.

[1] First Report *Proceedings* 82 (1960), 88-108: Second Report, 86 (1965), 135-149.
[2] J. S. Wacher, *Excavations at Brough-on-Humber 1958-61*, Society of Antiquaries Research Report No. 25 (1969), 13-15 and Fig. 5 and 7.

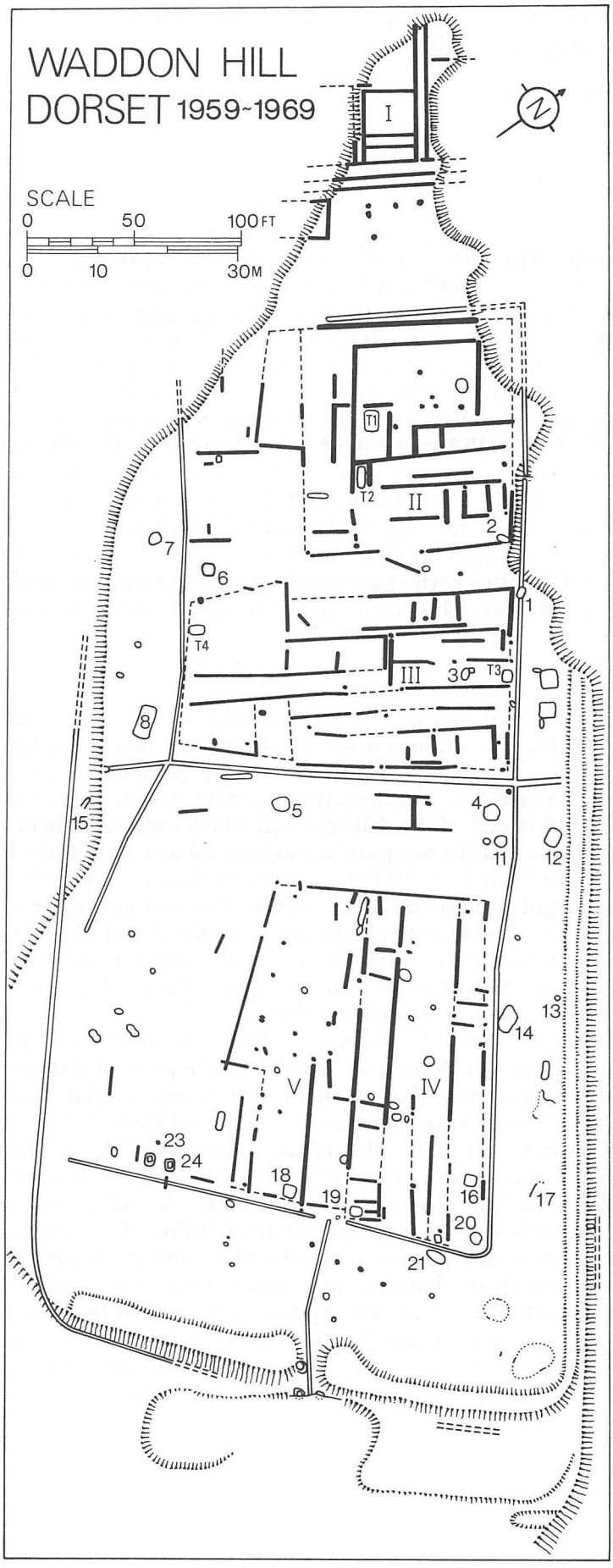


Fig. 22. Plan of Waddon Hill.

The depth of the bottom of the timber upright in its slot was about nine feet below ground level. The effect of this was also to increase the earth pressure on the timber front. This could only have been secured by anchoring the revetment to prevent it being overturned. The slot is too small to provide a rigid support at the base. Considerable advantage could have been gained by having the whole front at an angle, using perhaps the inner side of the slot as suggested in the reconstruction (First Report, Fig. 3). There is no other evidence to suggest how the stability of the rampart was secured on this southern slope of the hill. Two post-pits (7 ft. by 7 ft. and 8 ft. by 8 ft.) of an internal tower were discovered on the northern side, north of Building III, but as the post voids had not survived, it was not possible to estimate their distance apart, but the probabilities were between 10 and 15 ft. Two slots each 35 ft. long were found in a relationship to each suggesting either external structures or an anchorage connected with the erection of the main posts.

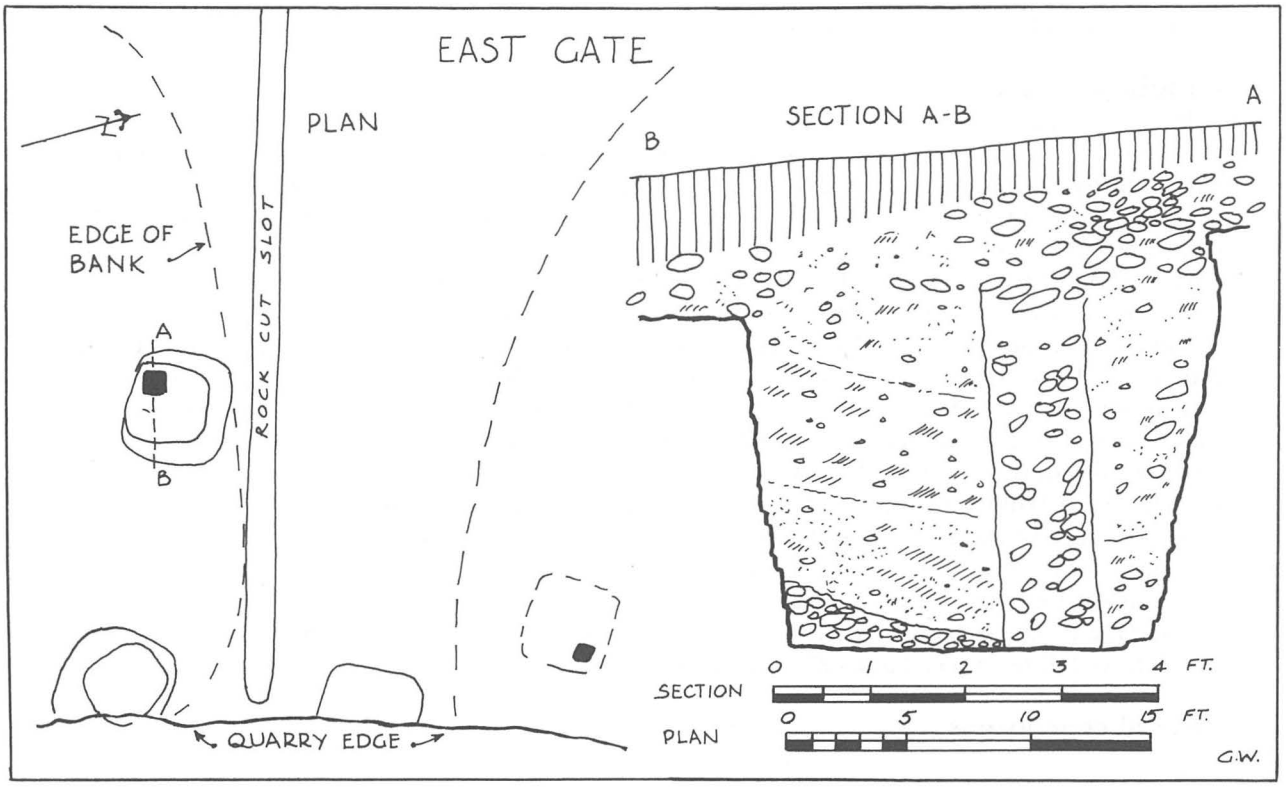


Fig. 23. Plan of the East Gate and section through one of the post-pits.

The buildings

The interim reports dealt with the three westernmost buildings which had survived on the edge of the quarry. They consisted of: No. 1. Only a small fragment of which remains may have been the *principia* of headquarters building; No. 2. postulated as a *praetorium* or commandant's house; No. 3. a large and complicated structure was not described in detail in the report, but a plan published (Second Report, Fig. 2) which showed how much had been recovered by 1963. Further details were added in subsequent years and the building now appears to be about 80 ft. by 150 ft. overall. It is unfortunate that so little of the foundation trenches were present or recoverable from the south end, but these areas could have been small compounds. If one sees this whole area as a sequence of strip-buildings, two of them with cross-partitions, it is possible to visualise barrack-blocks or stables. If, on the other hand, it is seen as a single building it has some of the elements of a hospital (*valetudinarium*). To the east of this building or group of buildings is one of the lines of demarcation. This particular one has the appearance of a drain, since at both ends it cuts into the defences. On the south side it runs into a pit which could have had the function of a soak-away, but what

happened at the north end is not clear. There are similar rock-cut trenches running along the north end and south sides of the fort and these define very clearly the limits of the buildings. The probability of the most easterly example running into the gate has already been stated above. It suggests that some lengths, possibly all, had a timber covering. Although no trace of this was observed at any point, the filling of the channels was very clean clay brought to the site. Had the channels been open, they would have collected silt and occupation material which would have been recognisable; this strongly suggested that the whole system was covered and the timber work could also have been the foundation for a fence where necessary, but leaving ample access to the defences. There remains to be explained the planning of these slots in relationship to Building V. They meet in such a way as to suggest two openings. But Building V is totally blocking any access into the area. This would seem to be conclusive evidence of two periods and that this fence/drain belongs to the latest period. Nevertheless, as indicated above, the buildings are all confined to the areas enclosed by the system, showing some kind of continuity of arrangements between the tents lines of the first phase of occupation and the later timber buildings.

Buildings IV and V

Between Buildings III and IV/V there is an open space with a single building, with an H-shaped plan and which may have been a store. To the south of this is a large latrine trench. The easterly of these buildings has an E-W axis unlike the others. The whole of this area was carefully stripped and the foundation trenches sought in the places they ought to have been, but there are still serious gaps in the plans. The buildings have the appearance of barrack-blocks with some of the internal divisions surviving. The presence of square water tanks (16 and 19) in each at the east end suggests that the officers' quarters were here. The smaller one in the verandah of IV was probably a refuse-pit comparable to that at Hod Hill in Barrack I. There is a yard area south of V in which post-holes are indicative of open sheds or lean-to structures. A feature of IV is a latrine-trench in the verandah at the west end which was enlarged to 19 ft. in length, space for 9 or 10 men at any one sitting, presumably for the whole of the unit occupying the two blocks. The length of the blocks 150 ft. is rather longer than the Hod Hill examples, so also is the width (IV is 32 ft. overall and V is 36 ft.). At Hod Hill the larger of the two kinds of barracks are identified with cavalry. If these two Waddon buildings were for troopers, the yard and its structures could be explained as additional accommodation needed for horses, so also could the large open space to the south of the block. Horses could have been tethered here in picket lines and given shelter in structures which have left no trace. Tanks 23 and 24 could also have been for horses, one for each troop.

General conclusions

Date

The complete absence of Neronian coins and the quantity of Claudian issues, somewhat worn, makes it appear unlikely that the army was here much after AD 64, the year of Neronian base metal issues. But the date of abandonment must have been close to this date and the brooches and samian confirms this (pp. 58 and pp. 84). The starting date must be assessed in relationship to the evidence from Hod Hill. The samian for this fort is unmistakably Claudian and the coins of that emperor were hardly worn. The excavator concluded that 'the occupation did not last far into the principate of Claudius and was over before AD 54'. The Waddon material is quite different and seems to fit into a later phase. The two forts need to be seen in the historical context. The disposition of units made by the first governor, Aulus Plautius, were those of an occupying army spread thinly over the newly conquered province and with perhaps more men on and near the frontier zone to watch the barbarians without who had not yet been conquered nor were under any treaty[3]. This arrangement had to be radically altered by Ostorius Scapula who arrived at AD 48 to find the province invaded by Britons from South Wales. He needed more troops in forward positions and he had to bring campaigning forces into being. It was necessary in dealing with

[3] *Britannia* I (1970), 180-184 and Fig. 1.

Caratacus in South Wales to secure the Devonian peninsula and gain control of the Bristol Channel. This general forward movement left the rearward areas of the province with only token forces. The action of stripping these areas of much needed forces must have given Scapula much concern. He could only counter it by planting a *colonia* at Camulodunum and terrorising the tribes by his sudden decision to disarm them. Hod Hill was one of the forts abandoned in this move and Waddon one of those now established *c.* AD 50. The abandonment of Waddon about AD 64 can only be associated with the revolt of Boudica in AD 60. The effects of the decision forced on Scapula to strip the province of troops for his campaigns against Caratacus and found the *colonia* now at last came to violent fruition. After the defeat of the rebels it was necessary to re-occupy parts of the province to stamp out any embers which still smouldered and to seek and destroy the rebels who had fled to their home lands. There was probably trouble in the south-west too. The massacre at South Cadbury may be datable at this event[4]. The men were needed either in dealing with trouble to the west or in policeing the Midlands and East Anglia. The fort was given up and never occupied again. The extreme range of dates for Waddon could be AD 48-64, but one is safer in restricting it to the decade AD 50-60 with the possibility of adding one or two years either way.

The nature of the occupation

The fence/drain boundaries clearly belong to an earlier phase and the recovery of some scattered iron tent pins are sufficient evidence to postulate tented occupation preceding the timber buildings. This suggests that in the initial phase the troops were being used in a forward campaign. This could have been the operation needed to round up the bands of invading Britons and consolidate the frontier on the lower Severn. It is difficult to assess the original nature of the hill top, but as excavation proceeded it became evident that some clearance and levelling had taken place. Irregular holes packed with clay indicate tree felling and the removal of the stumps. There were also areas of clay filling and the changes in the natural rock top seem to be due to the removal of some of the upper layers as part of general levelling. The rampart was built by digging quarry pits along the edge just as the Britons built their fortresses. In a later operation they were filled in and levelled off. There was much Roman rubbish in these quarry pits showing that this operation was not primary. On the other hand at no point was there any evidence of the kind of defences one associates with a tented site; unless one accepts the boundary fence. Had the full length of the hill been used by the army, the internal dimensions, i.e. excluding the ramparts, would have been *c.* 1200 by 260 feet, an area available for building of 4.5 acres as compared with 6.86 acres at Hod Hill. The maximum length of the fort excavated is 790 feet. Assuming that Building I was the *principia* and the remainder was allocated to barracks and granaries, it would have been possible to have had about 10 blocks which together with the three at the eastern end bring the total to the same as those at Hod Hill (six legionary and seven auxiliary). The presence of both auxiliaries and legionaries is well attested by the finds:—

Legionary equipment

Bronzes
52, 58 Scabbard mounts from a *gladius*.
57 Scabbard hilt guard from a *gladius*.
22 Cuirass hinges from a *lorica segmentata*.
54 Chape from a *gladius* scabbard.
29 A belt-plate, probably legionary.
30 Scabbard ring from a *gladius*.

Ironwork
61-63, 74, 83 Ballista bolt-heads.
94 Shield boss from a *scutum*.
58 *Gladius* and scabbard.
67 A complete *pilum*.

There is also an early discovery of an intaglio now in the Bridport Museum, which has been identified by Dr. Martin Henig as showing a capricorn and a dolphin[5]. This could well have been worn by a soldier or officer of *Legio II Augusta* since the capricorn was the badge of that unit.

[4] L. Alcock, *By South Cadbury, that is Camelot . . .* (1972), 171.
[5] *Proceedings*, 93 (1972), 192.

From First Report
Fig. 8, No. 41 Two cuirass hooks.
Fig. 8, No. 42 Plume mount.
Fig. 8, No. 43 Decorated dagger scabbard.
Also some pilum heads in the Dorchester museum.

From Second Report
Fig. 7, No. 19 Decorated belt-plate.

Auxiliary equipment

From First Report
Fig. 6, No. 8 Harness mount.

From Second Report
Fig. 8, No. 28 Bit.
Fig. 7, No. 21 Part of a bow.

From present report

Bronze
23 Probably a harness ring.
40 Part of a harness mount.

Iron
215 Large harness buckle.
90 Round shield boss.

Apart from the last item, all these are pieces of horse equipment which need not necessarily be auxiliary, since there was a small detachment of mounted men with each legion, but No. 105 and the great number and variety of spears and lance heads must signify a mounted unit equipped as a fighting force.

THE FINDS

Abbreviations used in the finds reports

Aislingen und Burghöfe	G. Ulbert, *Die Römischen Donau-Kastelle Aislingen und Burghöfe,* (1959) Römische-germanische Kommission, Limesforschungen i.
Bagendon	E. M. Clifford, *Bagendon, a Belgic Oppidum* (1961).
Caerleon	V. E. Nash-Williams, 'The Roman Legionary Fortress at Caerleon in Monmouthshire 1927-9' (1932), *Archaeol. Cambrensis* 87, pp. 48-104.
B.M.C.	British Museum Catalogue.
Cambodunum	Werner Krämer, 'Materialhefte zur Bayerischen Vorgeschichte Heft 9', *Cambodunumforschungen* (1953-1).
Camulodunum	C. F. C. Hawkes and M. R. Hull, *Camulodunum* (1947), Soc. of Ants. Research Rep. XIV.
Fishbourne	Barry Cunliffe, *Excavations at Fishbourne* (1971), Soc. of Ants. Research Rep. XXVII.
Hod Hill 1	J. W. Brailsford, *Antiquities from Hod Hill in the Durden Collection* (1962).
Hod Hill 2	Sir Ian Richmond, *Hod Hill Vol. 2: Excavations carried out between 1951 and 1958* (1968).
Hofheim	E. Rittering, Das Frürömische Lager bei Hofheim im Taunus', *Annalen des Vereins für Nass auische Altertumskunde und Geschichtsforschung* (1913).
Kastell Butzbach	Gustav Müller, *Untersuchungen am Kastell Butzbach* (1962), Römische-germanische Kommission, *Limesforschungen* ii.
Mack	R. P. Mack, *The Coinage of Ancient Britain* (1953).
Maiden Castle	R. E. M. Wheeler, *Maiden Castle, Dorset* (1943), Soc. of Ants. Research Rep. XII.
Marian P. den Boesterd	*Description of the Collections in the Rijks-Museum G. M. Kam at Nijmegen* V, The Bronze Vessels (1956).
Newstead	James Curle, *Newstead, a Roman Frontier Post and its Peoples* (1911).
Novaesium	H. Lehner, 'Novaesium', *Bonner Jarbücher,* 111-112 (1904).
Rheingönheim	G. Ulbert, *Das Fruhrömische Kastell Rheingönheim,* Römische-germanische Kommission, *Limesforschungen* 9.
RIC	H. Mattingly and E. A. Sydenham, *Roman Imperial Coinage* (1923 and later).
Richborough	J. P. Bushe-Fox, *Excavations of the Roman Fort at Richborough, Kent,* 1st (1926), 2nd (1928), 3rd (1932) and 4th (1949); Soc. of Ants. Res. Rep. Nos. VI, VII, X and XVI.
S.	E. A. Sydenham, *The Coinage of the Roman Republic.*
Saalburg	L. Jacobi, *Das Römerkastell Saalburg bei Homberg vor der Höhe* (1897).
The Lunt 1, 2 and 3	Brian Hobley, 'Excavations at the Lunt', *Trans. Birmingham Arch. Soc., 1* Vol. 83 (1969) 65-129; *2* Vol. 85 (1973) 7-92; and *3* Vol. 87 (1975) 1-56.
Verulamium	S. S. Frere, *Verulamium Excavations* 1, (1972), Soc. of Ants. R.R. XXVIII.
Waddon 1 and 2	Graham Webster, 'The Roman Fort at Waddon Hill, Stoke Abbott', *Proceedings, 1* Vol. 82 (1960) 88-108; and *2* Vol. 86 (1965) 135-149.

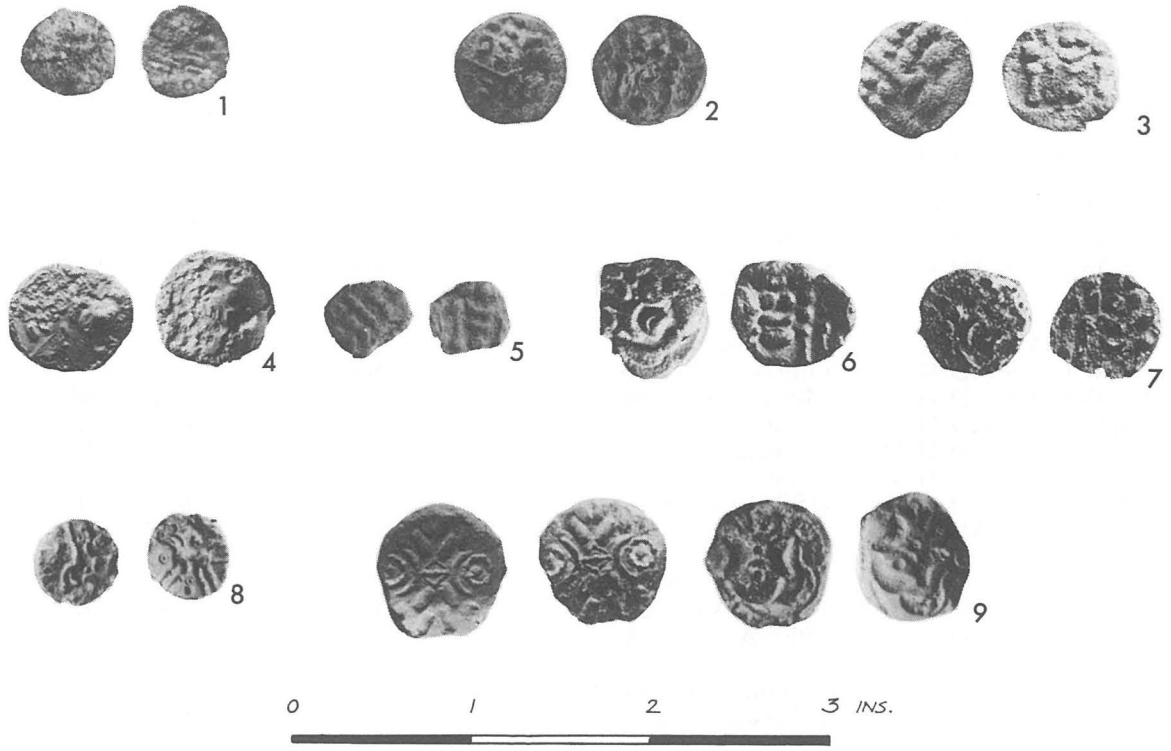


Fig. 24. The British coins: all at life size.

The British Coins by D. F. Allen
All except No. 10 illustrated on Fig. 24

DUROTRIGES

1. Silver quarter stater; type Mack 319, weight 6.559 gr. = 0.425 g. (See *Hod Hill 2,* p. 151.)
2. Base silver on bronze stater; type Mack 317 or 318, weight 51.25 gr. = 3.32 g.
3. Base silver on bronze stater; type Mack 317 or 318, weight 21.0 gr. = 1.36 g.
4. Base silver on bronze stater; type Mack 317 or 318, weight 26.0 gr. = 1.68 g.
5. Base silver on bronze stater; type Mack 317 or 318, weight 8.7 gr. = 0.56 g.
6. Base silver on bronze stater; type Mack 317 or 318, weight 62.577 gr. =. 4.055 g.
7. Base silver on bronze stater; type Mack 317 or 318, weight 34.352 gr. = 2.226 g.

DOBUNNI

8. Silver coin type F; Mack 382, weight 16.9 gr. = 1.09 g.

CORITANI

9. Bronze core of stater of *Vep. Corf;* weight 57.75 gr. =. 3.75 g.

KENT

10. *Adminius* (not illustrated).
    Obv. within a small circle inside a wreath. Beaded circle outside.
    Rev. Hippcamp right. Loop (snake?) above below. Beaded circle outside weight 15.58 gr. = 1.01 g.
    This is the second known example of this coin and a better specimen than the first—type Mack 314[6].

Roman coins

Emperor	*Date*	*Type*	*Type of Coin*	*Reference*
Republican	88 BC	*Denarius*	S 692	
AVGVSTVS	29-27 BC	IMP CAESAR Triumphal Arch	*Denarius*	*BMC,* 631
AVGVSTVS	29-27 BC	Otherwise illegible from Pit 17	*Denarius*	
AVGVSTVS	29-27 BC	C. L. CAESARES type	*Denarius*	*RIC,* 1, 350

[6] A note has appeared in *Britannia* 7, (1976), and the coin is now in the British Museum.

TIBERIVS	AD 14-37	PONTIF MAXIM	*Aureus*	*RIC*, 1, 3
TIBERIVS	AD 14-37	PONTIF MAXIM	*Denarius*	*RIC*, 1, 3
GAIVS	AD 37-41	DIVVS AVGVSTVS	*Dupondius*	*RIC*, 1, 8, p. 96
GAIVS	AD 37-41	VESTA type	*As*	*RIC*, 1, 30
CLAVDIVS	AD 41-54	Minerva	*As*	*RIC*, 1, 68
CLAVDIVS	AD 41-54		*Quadrans*	*RIC*, 1, 72
CLAVDIVS	AD 41-54	NERO CLAVDIVS DRVSVS type	*Sestertius*	*RIC*, 1, 78
CLAVDIVS	AD 41-54	Otherwise illegible	*As*	
CLAVDIVS	AD 41-54	Minerva type (?)	*As*	*RIC*, 1, 66
CLAVDIVS	AD 41-54	Ceres type	*Dupondius*	*RIC*, 1, 67
CLAVDIVS	AD 41-54	Ceres type	*Dupondius*	*RIC*, 1, 67
CLAVDIVS	AD 41-54	Ceres type	*Dupondius*	*RIC*, 1, 67
CLAVDIVS	AD 41-54	Otherwise illegible	*Quadrans*	
CLAVDIVS	AD 41-54	Otherwise illegible	*Sestertius*	
CLAVDIVS	AD 41-54	Minerva type, copy	*As*	Copy as *RIC*, 1, 65
CLAVDIVS	AD 41-54	Antonia	*Dupondius*	*RIC*, 1, 82
CLAVDIVS	AD 41-54	Minerva type, copy	*As*	Copy as *RIC*, 1, 66
CLAVDIVS	AD 41-54	Copy	*As*	
CLAVDIVS	AD 41-54	GERMANICVS	*As*	*RIC*, 1, 84
CLAVDIVS	AD 41-54	Head of Antonia from Pit 18	*Dupondius*	*RIC*, 1, 82 *BMC*, 166
CLAVDIVS	AD 41-54	SPES AVGVSTA	*Sesterius*	*BMC*, 124
CLAVDIVS	AD 41-54	Head of Antonia	*Dupondius*	*BMC*, 166
CLAVDIVS	AD 41-54	SPES AVGVSTA	*Sesterius*	*RIC*, 1, 64 *BMC*, 124
CLAVDIVS	AD 41-54	Antonia type from Pit 22	*Dupondius*	*BMC*, 166
CLAVDIVS	AD 41-54	Otherwise illegible		

Two illegible coins.

The Brooches by D. F. Mackreth

All illustrated: See Figs. 25 and 26

Introduction

It is natural to compare the brooch collection from the fort at Waddon Hill with that from its relatively near neighbour at Hod Hill, for this all published brooches from the two sites have been considered. As the total number from each site is not directly comparable—Waddon Hill has less than half the number of brooches found on Hod Hill—each collection has been divided into the main types and the totals in each reduced to a percentage. It would be tedious to give the figures, but the following tendencies may be noted.

The Colchester type is poorly represented at Waddon, while its derivatives are nearly twice as common as at Hod Hill. The Nauheim Derivative is also rarer at Waddon Hill. Strip brooches of both ordinary and Aucissa influenced types are well represented at Waddon, but the Aucissa itself is less common.

The brooches from Waddon Hill show that this fort survived to a later date than that at Hod Hill and possibly started later. The low number of Colchester types coupled with the higher number of its derivatives are a good indication of a different *floruit* for each site. At Waddon Hill the Aucissa type seems to be waning and, although the number of brooches from Hod Hill is low, the very absence from Waddon Hill of the Langton Down (one at Hod Hill) and the Rosette (two poor ones at Hod Hill) could be taken to show that those types are probably at the end of their *floruit,* quite possibly even at the time that Hod Hill was established.

A note of caution is, however, advisable: the Nauheim Derivative is much less common at Waddon Hill than at Hod Hill yet there is little indication in brooch collections from other parts of central southern England that the type is dying out at this time (*Fishbourne,* II, 100, Figs. 36 and 37, 1-21), but that it persists into the latter part of the first century. It is possible that in some areas it is partially replaced by a whole host of new brooch types, mainly the derivatives of the Colchester type.

On both sites there are examples of the probable original type of brooch which was to develop into the Headstud proper (*Hod Hill,* I, p. 11, Fig. 10, C 100, C 101; *Waddon I,* 97, Fig. 7.25). Comparisons with other sites may not be valid: the two sites under brief review were military and it is possible that the supply of brooches, like other artifacts, were severely conditioned by factors which did not operate in the open market.

A Silver Divided Bow Brooch with a Safety Catch by Grace Simpson

This hinged brooch has several remarkable features. It is very small, only 3 cm wide. The silver balls on the ends of the bars pass through the double bow. The bow is semi-circular: a form which is only paralleled in the western Roman provinces by a bronze brooch found in the early Roman camps at

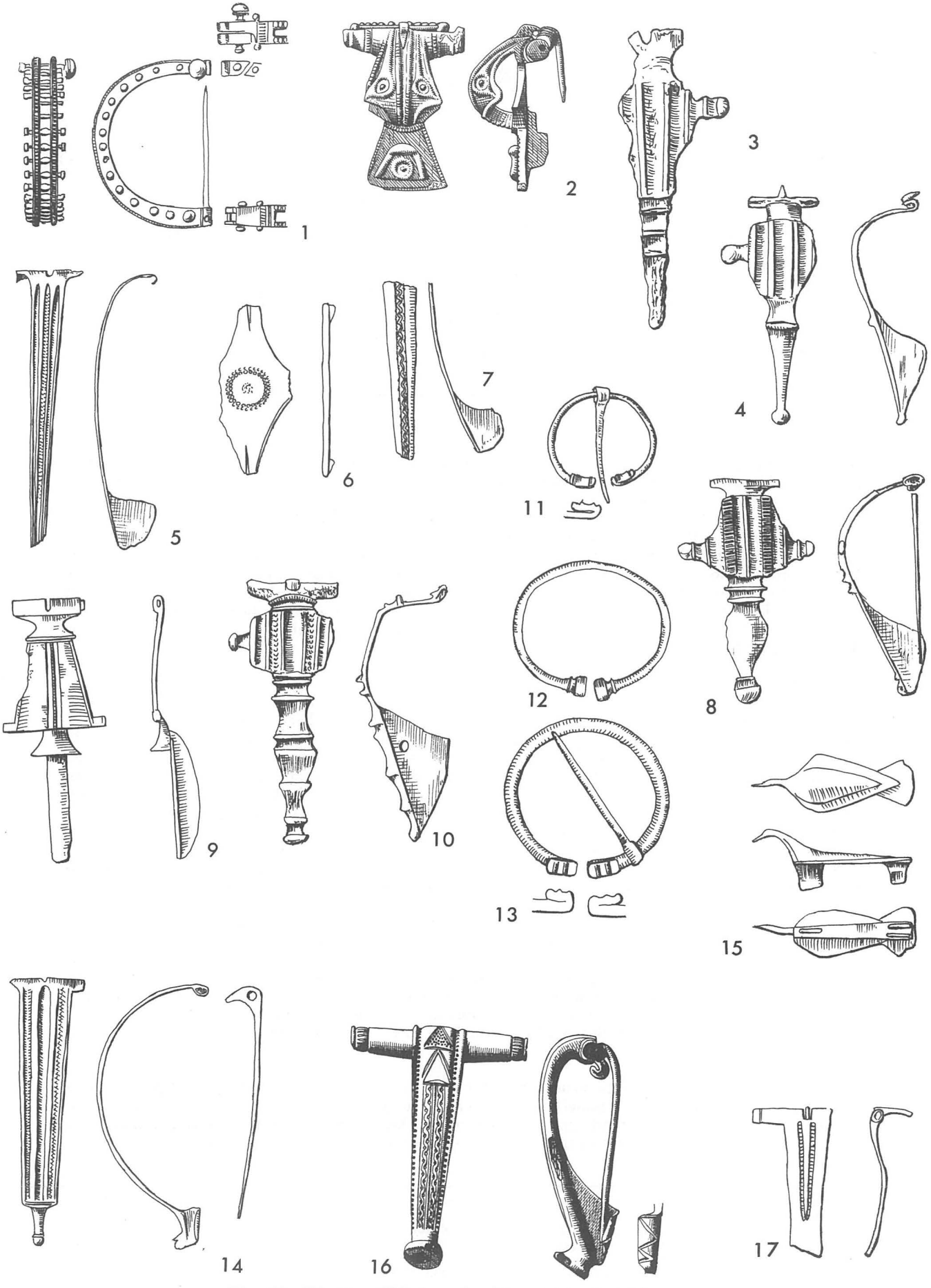


Fig. 25. Waddon Hill: brooches Nos. 1-17, all at life size.

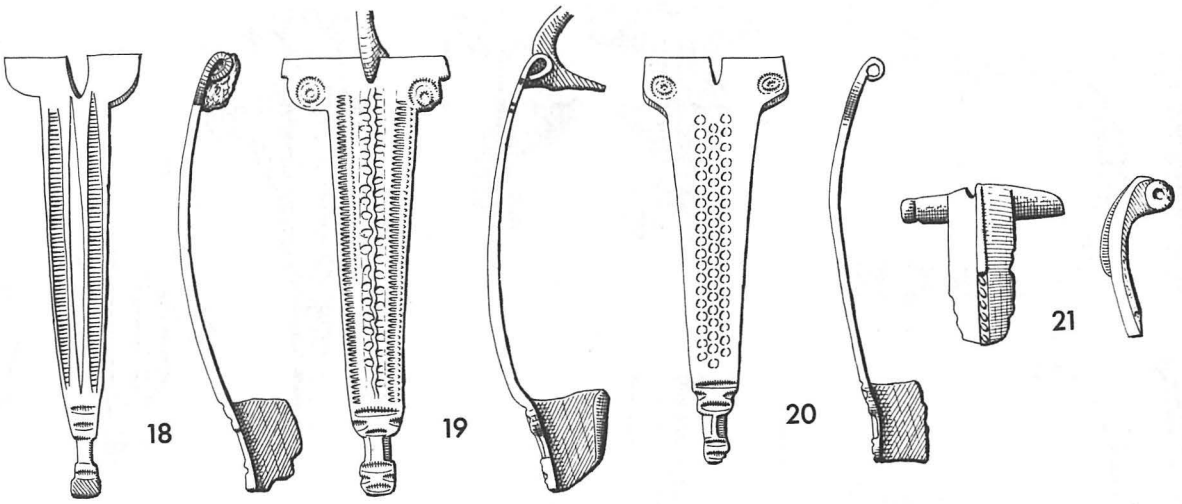


Fig. 26. Waddon Hill: brooches Nos. 18-21, all at life size.

Neuss[7]. Both brooches also have closely similar safety catches and lack the normal protruding catch plate. The Neuss brooch has a single bow, 3.5 cm wide. I have classified it as a Gitterfibel or divided bow brooch because of its likeness in other respects to the Waddon Hill silver brooch. Enquiries to brooch specialists throughout the European and Near Eastern Roman provinces have brought no information of any other brooches with a safety catch.

The particular feature of the safety catch is that it could be opened and closed by rotating the large knob in order to hold the pin in a small slot. The Neuss brooch has lost the large rotating knob, and it differs from the silver brooch by having a small curved groove which held the pin. The safety catch could then have been rotated on its tiny iron axis or rivet, and the pin was held firmly in place.

The context of the Neuss brooch is probably Augustan, and it was sealed by timber buildings of the Tiberian period[8].

Aesica type

2. The axis bar through the coils of the spring passes through a pierced plate at the end of each wing. The chord of the spring is passed through a pierced crest on the head of the bow. Each wing has beaded ridges on either side of a fluting lying between plain ridges. Although the body of the brooch is cast in one, it has two parts: a back-plate consisting of a fantail foot below a plain lozenge shape, and the bow proper which rises from the top of the fantail and joins on to the spring-case. Down the bow and on either side of the crest is a beaded ridge, on either side of which the bow is splayed out from the top and curved back to the bottom, thus leaving a roughly triangular surface with bordering ridges which were probably once beaded. The spaces left are filled with relief ornament which looks like an eye with projections running to the top and side corners of the triangles. At the top of the fantail foot is a curved step. Round the remaining sides of the foot are recessed beaded borders with a small boss at each of the bottom corners. The central space has a raised circle and dot which is inside relief ornament made up of curvilinear elements.

The relationship of this brooch to its famous namesake is clear and the basic distribution of the more elaborate specimens of the type suggests an origin somewhere in southern Britain. Because of its shape, this brooch was more difficult to make than any of the standard brooches. To some extent, the need to simplify the manufacture led to a quick devolution of the type[9] and the type is relatively rare in either its elaborate or simplified forms. The Aesica derives patently from the Rosette which arrives in Britain before the Conquest. There is no reason to date any of the Aesica brooches later than AD 50-60: the quality of the Aesica brooch itself would be enough to ensure it a long life.

Hod Hill types

3. As in all Hod Hill types, the head is rolled over to house the axis bar of the hinged pin. Below a cross-moulding on the head is a panel with four vertical ridges separated by flutes. One wing survives at the top of this panel and is made up of a moulding and knob. The foot of the brooch is thin and has three cross-mouldings and flutes at the top. The brooch was once tinned or silvered.

[7] Grace Simpson (forthcoming), *Novaesium 7: The Bronze and Iron Objects from the Excavations at Neuss* (Rheinisches Landesmuseum, Bonn), Taf. 1, 1.

[8] H. von Petrikovits and G. Müller, *Bonner Jahrbücher*, 1961, 449-485. *Novaesium 1-5*, 1967-1972, catalogue of the South and Central Gaulish pottery, the lamps, coins, plant remains, and the later Roman pottery; that of the early Roman pottery and the Arretine pottery is forthcoming.

[9] E.g. one from South Cerney (*Archaeologia* LXXX (1930), 39, Fig. 2b).

4. Here is a repeat of the main panel of three ridges with one surviving wing half way up on the left. This wing is formed of a single knob. Between the main bow and the foot, which has a cross-moulding at the top, is a waist. The foot tapers to a simple knob.

8. A more elaborately modelled brooch than 3 or 4, with a narrow central moulding separated by a flute from a broad moulding with cross-cuts on each side. Near the bottom of this main section is, to either side, a wing formed of a knob with two cross-mouldings between it and the bow. The foot has two cross-mouldings at the top, and a foot-knob and moulding at the bottom. Between these there is a plain flat surface with a swell to the sides.

9. The upper bow splays out from two cross-mouldings down to the side knobs of very simple form. Each side of the main area has a border ridge and down the centre runs a beaded ridge lying in a recess. The foot is flat, plain and straight sided, with a widely splayed moulding at the top.

10. A highly elaborate brooch with two cross-mouldings at the top, one of which is beaded. The main panel is wider than it is long, has six vertical ridges with wide flutes between. The flute on each side of the central one has a series of V-shaped incisions in it. Only one of the wings on either side of the panel survives, and this is a knob at the end of a long stem. The lower part of the brooch is made up of seven cross-mouldings above a foot-knob.

The variety of design to be observed on these Hod Hill types is no surprise, but it is not possible to discern any chronological significance in the range which appears in this country, except that those which belong to the transition from the Aucissa to the fully blown Hod Hill should be earlier than the developed type. The Hod Hill was popular and remained in use a long time, but it is clear that hardly any survived the early AD 70s and they were probably going out of use progressively throughout the AD 60s.

Strip types

5. The bow is narrow and tapers to a plain foot. The head is wider and is, like those on all Strip brooches, rolled under to house the hinged pin's axis bar. Down the bow are three longitudinal recesses, the central one of which has a series of punched nicks down it.

7. The head of the bow is missing. The detail on the bow is badly enough finished for the method of making the decoration to be seen. First, lines were incised to mark the edges of the grooves, and then the grooves were cut out to leave a narrow central ridge; lastly, a punch was used alternately on either side to deform the central ridge to produce a wavy line.

14. As 5, except that it is the outer grooves which have the ornament, and the foot is finished off in imitation of an Aucissa: a narrow section terminating in a knob.

18. As 14, but greater care has been taken over the foot. Above the narrow section are two cross-cuts and the foot-knob has another across the top.

19. A much more careful copy of an Aucissa, this brooch has dot and circle ornament on either side of the head. The main bow has the wavy line decoration of 7 down the centre. On either side of this is a repeat of the grooves of no. 18. The foot has two cross-cuts above the chamfered narrow section, with a small nick between on either side. The foot-knob has a repeat of these cross-cuts.

20. A less careful copy of an Aucissa than 19, the head with the dot-and-circle 'eyes' is less well formed. The main bow has three lightly incised vertical lines which acted as guides for the punched dots superimposed upon them. The foot is as for 19, but the foot-knob is simpler.

There is a strong similarity between the brooches of this type from Waddon Hill and those from Hod Hill, once allowance has been made for the fact that the larger collection from the latter site shows greater variation. At both sites the ordinary Strip brooches appear with Aucissa imitations. The major difference between the two collections is that at Waddon Hill the Aucissa proper is less well represented than at Hod Hill.

Plate types

6. A flat plate, once of a lozenge form with concave sides. The ends on the long axis were once bifurcated by a groove and the sides turned out to form small bosses. The ends on the short axis would have been plain, possibly squared off. In the centre of the plate is a circular recess with traces of a central feature surrounded by a ring of double punched dots. The brooch was once tinned or silvered.

There is sufficient surviving of this brooch to show that it comes from a workshop the distinctive features of whose products was the bifurcated ends (*Bagendon*, 184, Fig. 36.6; *Camulodunum*, p. 325, pl. XCVIII, 170; *Brough IV*, 109, pl. XXV, 6). On most of these the central feature is also present and one from Colchester most likely gives the correct finished form, with a red enamelled boss. The present main distribution of the few specimens known to the writer—in central southern England and Essex—may indicate that the type was going out of use at the time of the Conquest and therefore is hardly likely to date later than AD 50-55 (the Hod Hill terminal date is within a year of AD 50: *Hod Hill*, II, 119).

Zoömorphic type

15. A crudely modelled figure of a bird with no indication of wings, or eyes, and only a rudimentary beak. The tail is of fantail type and the figure may be intended to represent a dove. The pin was hinged and the brooch tinned or silvered.

Little can be said about this brooch. A more crudely worked version is present at Hod Hill (*Hod Hill*, I, Fig. 11, F1) and there is another from Colchester (*Camulodunum*, p. 326, pl. XCVIII, 180), but as zoömorphic brooches are never common at any time it is not possible to give a date range. Attention,

however, may be drawn to a Plate brooch from Waddon Hill (*Waddon 1*, p. 97, Fig. 7.23) which is quite clearly a dove: it is possible that the choice of a dove carried a significance which is now lost to us.

Colchester derivatives

16. A carefully made and finished brooch with a hinged pin made of a piece of wire with the end bent up to form the necessary projection of this kind of pin. Each wing is cylindrical and terminates in a recessed beaded ridge. The bow has at the top two incised triangles: the upper is filled with a mass of small punched dots and the lower has a green enamel setting. Beneath these, and filling the rest of the bow to the up-turned foot-knob, are two recesses containing wavy lines made as in brooch 7. but with the recesses filled with red enamel. Down each side of the bow is a ridge with a series of punched dots filling the groove next to it. The return of the catch-plate is ornamented by a series of incised lines which form a chevron.

The relationships of this brooch lie with a curious group from which the headstud emerges. The forward facing foot-knot can be paralleled on a brooch type which seems to belong to the eastern side of the country (Scunthorpe[10]; Hambeleden[11]; *Verulamium* 116, Fig. 29.11). These examples also show the different kinds of emphasis given to the area where the stud was to develop; and so the triangles on the present brooch fall into place as one of the family's characteristics. The Waddon Hill brooch has no secure dating outside the site on which it was found.

17. A hinged pin brooch with one wing and the lower part of the bow missing. The surviving wing is rudimentary, circular in section and has a groove round the end. The bow is plain and of flat section, with two raised beaded ridges which meet at the bottom to form an elongated V.

The ridges form the dominant feature on this brooch and, arranged in this fashion, are not a common form of decoration. It is possible that the brooch is an early example of a small group to be found mainly in Dorset, Wiltshire, Gloucestershire and Somerset. Few have been published; however, one from Kidlington[12] shows some of the characteristics of the developed type which is always hinged, has simple wings and usually has a loop cast on the head.

21. A hinged pin brooch with the lower part of the bow missing. The wings are round in section and taper outwards. The left hand wing has a moulding at the end. The bow has a swelled front with a ridge on the upper part. Below this is a recess in which lies a bead-row. Little can be said about this fragment and there is no helpful external dating.

Penannulars

11. The ring is plain with a circular section. The terminals are turned up and along the ring. Each terminal has a groove at each end with a flute between.

13. A larger version of the last, where the terminals each have two cross-cuts.

12. A plain round sectioned ring with disc terminals separated from the ring by a small plain moulding and groove.

11. and 13. belong to Fowler's type D, and 12 belongs to type A3. All three could be first century according to the date range given by Fowler, this is confirmed by their occurrence on this site.

Waddon Hill and Hod Hill compared with the brooches in individual classes reduced to percentages of the total published collection from each site.

Class	*Site*	
	Hod Hill	Waddon Hill
Colchester	8.2	2.2
Colchester Derivative	8.2	15.2
Nauheim Derivative	9.9	2.2
Langton Down	.8	—
Rosette	1.6	—
Strip (plain)	9.9	15.2
Strip (Aucissa copy)	11.5	15.2
Spettisbury	.8	—
Aucissa	8.2	4.3
Hod Hill	24.7	19.5
Proto-Headstud	1.6	2.2
Plate	4.7	8.7
Penannular	9.9	10.9
Aesica	—	2.2
Oddity	—	2.2
	100.0	100.00

[10] H. E. Dudley, *Early Days in North-West Lincolnshire* (1949), 189 and Fig. 52.4.
[11] *Archaeologia*, LXXI (1920-1), Fig. 23.
[12] *Oxoniensia*, XVII/XVIII (1952/3), p. 56; Fig. 25.6 and pl. III.
[13] I am most grateful to Mr. Frank Bailey for the photographs.

Fig. 27. Bronze bust of Mercury at twice life size: paste intaglio (1), blue glass intaglio (2) and cornelian intaglio (3), all at c. four times life size (see p. 64 for sizes).

Bronze Bust of Mercury by J. M. C. Toynbee

The bronze (see Fig. 27) is 3.7 cm high and has a fine dark green patina. It shows the head, part of the shoulders, and the nude chest of Mercury, the bust terminating below in a calyx of stylised acanthus leaves. The god has a chubby, boyish countenance and wears a winged *petasos,* beneath which is seen his hair, combed forward on to the brow in neat locks that fork in the centre after the Augustan style and escape down either cheek in front of the ears and down the neck behind. Minute drilled holes mark the pupils of the eyes. The complete circuit of the brim of the *petasos* is edged with tiny 'pearls'. The modelling of the face and chest is remarkably plastic and vigorous and the engraving of the individual strands of hair and of the leaves of the calyx is extremely fine.

While the head is solid-cast and fully finished at the rear, the back of the bust is hollow, shows distinct traces of tooling, and displays a sharp, triangular nick cut in the base of the neck. Mr. Henry Hodges, who kindly examined the bronze in the laboratory of the London University Institute of Archaeology, assures me that it also betrays remnants of the solder by which the piece was attached to an object or a surface behind it; and the nick was presumably cut to secure it in place by a form of rivet. The bust was, indeed, clearly a mount of some kind. Had it been affixed to a vessel, the head, being fully worked and unflattened at the back, must have projected above the rim; but no type of bowl, cup, or cauldron with such a style of ornament springs to mind. Possibly the bust was attached to a slightly rounded boss on the outside of a small box or casket, the head slanting forward to some extent, as in the case of two bronze busts on the exterior of a chest from Pompeii[14]. An officer of the fort garrison could well have possessed a decorated casket; and what better mascot than Mercury could have adorned a money-box?

The 'twin' of the Waddon Hill bust, also 3.7 cm high and obviously cast from the same mould, but with its details far less well preserved, was found in France, at Villardó-d'Héria (Jura), and is now in the Besançon Museum[15]. This piece, too, is hollow behind and has a similar triangular nick at the base of the neck. It must have served the same purpose as the Dorset Mercury, which was clearly imported from a continental workshop. The god's hair-style suggests for these pieces a date not later than the first quarter of the first century AD.

The Intaglios by Martin Henig

(See Fig. 27)

1. Paste intaglio with blue upper surface and black lower surface, imitative of nicolo. Flat, oval (11 mm by 9 mm; 2.25 mm thick) (Henig No. 524).

The paste depicts a facing tragic mask with long hanging locks on each side. It was evidently intended to suggest Medea or some such character. Dramatic themes seem to have been popular in the Roman army; we may cite a paste from the fort of Kirkbride, Cumberland that shows a playwright holding a similar tragic mask[16], or the fine garnet intaglio portraying a mask in profile, from the praetorium at Housesteads, Northumberland[17].

The intaglio under discussion can probably be assigned to the middle years of the first century AD[18].

2. Blue glass intaglio with green streak; 11 mm by 10 mm. Convex c. 2 mm thick (Henig No. 406).

Apart from some chemical corrosion (pitting) on the face, the condition is excellent for a paste, and suggests that it was not long in use before its loss.

The symbols represented are the attributes of various Roman deities or personifications; on the left (description is of an impression), a palm suggests *Victoria;* beside it is the club of *Hercules* while to the right, the cereal plant brings *Ceres* to mind (the green flash in the glass roughly coincides with the plant and presumably this is deliberate); below are the rudder and steering oar that belong to *Fortuna.* To the Roman soldier, who wore this seal, it presumably served as a charm. With it he could invoke the protection of four important powers—Victory; Hercules (symbolising military prowess)[19]; Ceres (prosperity and material abundance) and, above all, Fortune (who controls human destiny).

The only comparable representations from British sites come aptly enough from Hod Hill, Dorset[20] and Richborough[21] where they may also be ascribed to the invasion period without difficulty.

[14] E. Pernice, *Die hellenistische Kunst in Pompeii v: Tische,* Zisternenanmundungen, Beckenuntersätze, Altäre and Truhen, 1932, Pls. 51, Fig. 1; 53, 56, Fig. 1.

[15] D. Lebel, *Cataloque des collections archeologiques de Besançon v: Les bronzes figurés,* 1960, p. 58, no. 177 (A.435), pl. 69, fig. 5. The photographs published here were taken by M. Meusy of Besançon Cornillot, Conservateur des Musées de Besançon.

[16] Martin Henig. *A Corpus of Roman Engraved Gemstones from British Sites,* British Archaeological Reports 1974, App. 7.

[17] Martin Henig, No. 525.

[18] For parallels to our gem, cf. A. F. Gori, *Museum Florentinum, Gemmae antiquae ex thesauro mediceo* (Florence 1790), pl. xlv, Nos. 8, 10 (= S. Reinach, *Pierres Gravées* (Paris, 1895), pl. xxii).
A. Furtwängler, *Geschreibung der geschnittenen Steine im Antiquarium* (Berlin, 1896), Nos. 5245, 5252.
G. Maddoli, 'Le Cretule del Nomophylakion di Cirene', *Annuario Scuola Acheologica di Atene* XLI-XLII (1965), 39-145, No. 642, a sealing from the city's public record office burnt down in the Jewish revolt of AD 115-117.

[19] On the significance of Hercules to the Roman soldier, cf. I. A. Richmond: 'The Roman Legionaries at Corbridge and their Cults', *Archaeologia Aeliana,* 4 Ser. XXI (1943), 171.

[20] Henig No. 405 (Paste, subject not identified but evidently depicts rudder, corn and cornucopiae (of Abundance)).

[21] Henig No. 422 (Probably Rock Crystal—shows crossed cornucopiae and the caduceus of Mercury).

Numerous pastes and gems of similar type are known from elsewhere employing various devices including those shown on our gem[22].

3. Cornelian intaglio with flat upper surface; circular (diam. 10 mm) set in the remains of an iron ring (Henig No. 447).

The subject is Ajax kneeling towards the right[23]. He is nude apart from a conical cap or helmet upon his head. Over his left shoulder the limp corpse of Achilles (who wears a tunic) can be seen. The gemcutter has shown great skill in contrasting the lively musculature of Ajax with the drooping and pathetic remains of his companion.

A number of features—for example Ajax's great beak of a nose and pointed chin as well as the tapering of his fore-limbs—point to a glyptic tradition other than the Graeco-Roman one. The subject was known in Etruria at least as early as 570 BC as it occurs on the handles of the François Vase[24]. On an Etruscan scarab dated *c.* 500 BC the figures are named, 'Aivas' and 'Achele' respectively)[25]. The Waddon Hill intaglio is doubtless of North Italian workmanship, but can be nowhere near as old as these two objects. Like the intaglio from Verulamium which depicts Diomedes seizing the Palladium, it may be assigned to the second or first century BC[26]. In any case it was clearly an antique when its owner (presumably an Italian legionary) took it to Britain[27].

The Artefacts

22. Three cuirass hinges from a *lorica segmentata,* two with a triangular cut-out, this is a common form which has been identified by Mr. Charles Daniels as belonging to the shoulder strips (from find of complete armour at Corbridge[28]; (cf. also a pair from Wroxeter[29]).
23. A small harness or baldric ring with a projecting button for fastening to an eyelet in leather or cloth. It is well made and has a central groove (cf. examples from Margidunum)[30].
24. A buckle tongue.
25. A buckle tongue shaped to fit into a D-shaped buckle with internal scrolls (cf. *Aislingen,* Taf. 17, No. 33; *Rheingönheim,* Taf. 26, No. 19).
26. A hollow boss which could have been a mount to disguise a nail head on a box or other wooden object.
27. Part of a large bone belt buckle (cf. *Rheingönheim,*Taf. 45, Nos. 8and 9).
28. A buckle tongue of cruciform shape (cf. an example from London[31]).
29. A rectangular belt-plate with relief of a debased leaf and scroll design in repousée and traces of tinning, very similar to two plates from *Hod Hill 1* (Fig. 4, A.115 and 116).
30. A small moulded ring from the scabbard of a *gladius,* similar to those illustrated by Dr. G. Ulbert and in particular one from Vrhnika-Nauportus, Slovenia[32].
31. A buckle tongue with curved pointed end.
32. An identical but slightly larger example.
33. Small green bead of annular form.

34. and 35. Tinned belt plates decorated with incised circles and with small rivet holes at the centre for the attachment of a central circular mount, also with holes at the corners for fastening to leather (cf. *Hod Hill,* I, Fig. 5, Nos. A 119 and A 121; *Aislingen und Burghöfe,* Taf. 61, Nos. 21-22; *Hofheim,* Taf. XI, 48; *Rheingönheim,* Taf. 27, Nos. 1-10, Taf. 54, Nos. 2-4).

36. A small pendant roughly in the form of a leaf with three holes and terminal knob (cf. *Rheingönheim,* Taf. 36, Nos. 11 and 14).
37. A keyhole type eyelet for attachment to a toggle, it is one of the hinged variety (*Waddon,* 1, No. 36) and very similar to examples from Nettleton Shrub, Wilts.[33]; Kingscote, Glos.[34]; Augsburg[35] and *Hofheim* (Taf. XI, No. 63).

[22] P. Steiner, *Xanten—Sammlung des Niederrheinischen Altertums—Vereins* (Frankfurt a.m. 1911), pl. XIV, Nos. 209-211.
G. Sena Chiesa, *Gemme del Museo Nazionale di Aquileia* (Aquileia 1966) Nos. 1419-1456 (especially Nos. 1449, 1450).
A. Furtwängler, *Beschreibung der geschnittenen Steine im Antiquarium* (Berlin 1896), Nos. 2232-2264; 6094 ff. (these pastes dated specifically to 1st cent. BC-1st cent. AD); 6625 ff. and especially Nos. 6094, 6629, 6631, 6635.
H. B. Walters, *Catalogue of the Engraved Gems and Cameos, Greek, Etruscan and Roman in the British Museum* (London 1926), Nos. 2608, 2614, 2624, 2625.
P. Fossing, *The Thorvaldsen Museum. Catalogue of the Antique Engraved Gems and Cameos* (Copenhagen 1929), Nos. 1602 ff.

[23] I owe this information to Professor J. M. C. Toynbee. Impression described.

[24] P. E. Arias, *A History of Greek Vase Painting* (London 1962), 292 and pl. xlvi.

[25] G. M. A. Richter, *Engraved Gems of the Greeks and the Etruscans* (London 1968), 203, No. 822.

[26] Martin Henig, 'The Veneration of Heroes in the Roman Army', *Britannia* I (1970), 249-65 on the significance of such gems in military contexts. The Verulamium intaglio is illustrated on pl. xxvii A and B.

[27] Note the following close parallels to our gem in addition to the Etruscan scarab cited above.
A. Furtwängler, *Königliche Museen zu Berlin. Beschreibung der Geschnittenen Steine* (Berlin 1896), Nos. 649-651; 4293. P. Fossing, *The Thorvaldsen Museum. Catalogue of the Antique engraved Gems and Cameos* (Copenhagen 1929), No. 109.
E. Schmidt, *Antike Gemmen in Deutschen Sammlungen I Staatliche Münzsammlung München. Part 2, 81-230. Italische Glaspasten vorkaiserzeitlich* (Munich 1970), Nos. 1341-1343.

[28] *The Armour of Imperial Rome* (1975), 174-181.

[29] *Archaeol.* J.115 (1960), fig. 8, no. 257.

[30] do., fig. 3, no. 14 and p. 76, no. 54.

[31] do., fig. 6, no. 167.

[32] *Germania* 47 (1969), Taf. 33.

[33] *Wilts. Archaeol. Mag. 65* (1970), 195-198.

[34] *Trans. Bristol and Glos. Arch. Soc.* 91 (1973), fig. 4, no. 16 and p. 81.

[35] *Die Römer in Bayern* (1928), Abb. 2, no. 7.

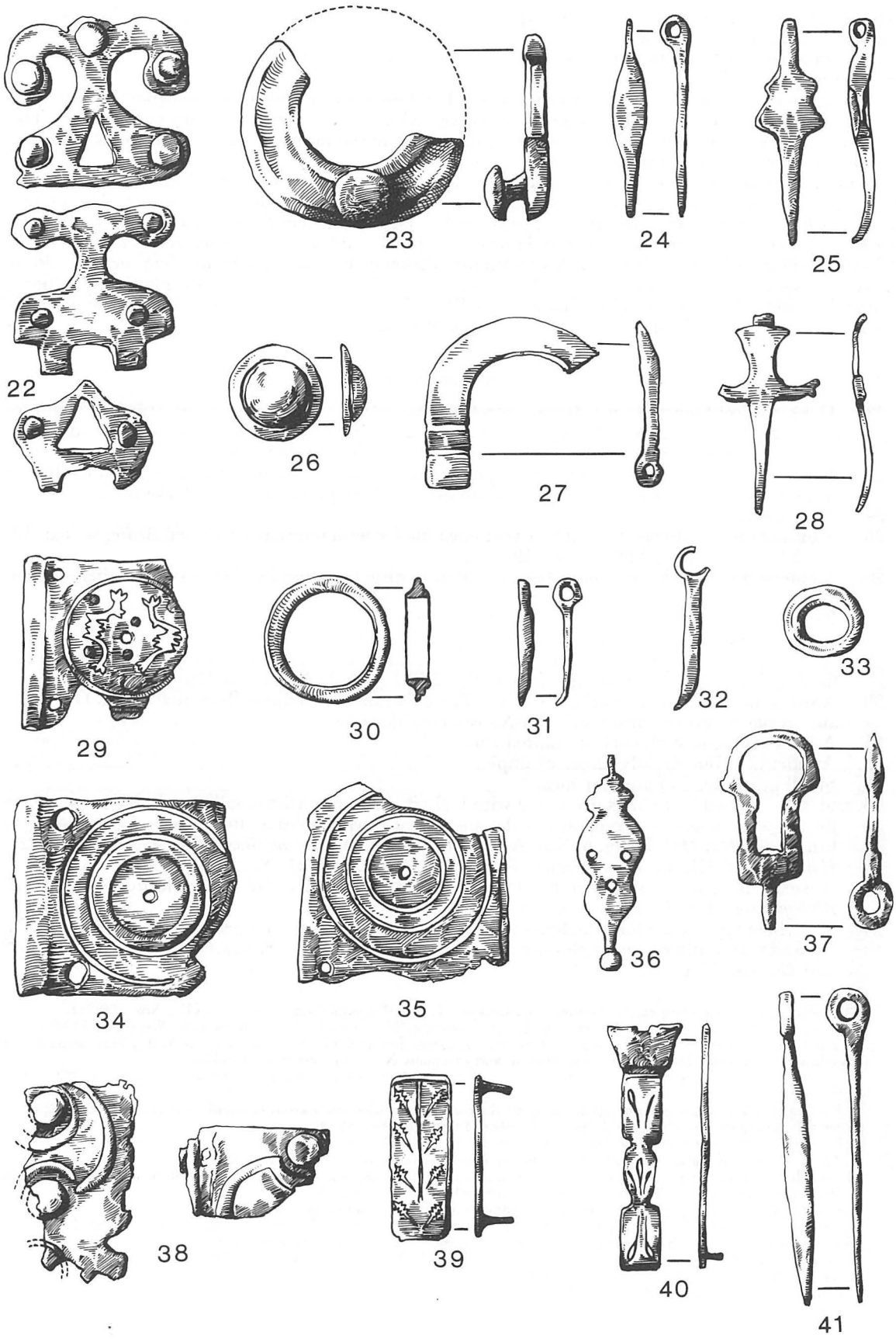


Fig. 28. Waddon Hill: bronze objects Nos. 22-41, all at life size.

38. Two fragments of thin plates, square or rectangular in shape, decorated with reliefs in the form of domes and spirals and a broken back curve. These plates could have belonged to a box, belt or scabbard (cf. *Richborough* IV, Pls. XLVII and XLVIII; *Aislingen und Burghöfe*, Taf. 21, Nos. 2-3).
39. A small rectangular plate decorated with tinning and niello inlay in the form of leaves. The tangs at the back indicate that this was attached to a leather belt or apron strap. There are many examples of this type of mount (cf. *Rheingönheim*, Taf. 27, No. 14; *Aislingen und Burghöfe*, Taf. 62, No. 5; *Verulamium* 1, 1972, No. 41; Ham Hill[36]).
40. A mount decorated with tinning and niello leaves. This is half the original size and the central part would have been circular with a rivet hole in the middle. The surface of this area indicates that it would have been covered with a circular disc. There are many examples of this type of harness mount, almost identical pieces are in the Fremington Hagg hoard[37].
41. A long buckle tong or pendant.
42. A D-shaped buckle from a *lorica* strap.
43. Two examples of rings with folded strips with rivet holes for attachment to leather straps. In both cases the rings are circular but slightly D-shaped.
44. A hinge from a belt or strap. One of the pieces has two leaves for attachment to both sides of the leather. Four of the rivets survive (cf. *Hod Hill*, ii, Fig. 56, Nos. 10 and 12).
45. and 46. Three fragments of hinged bronze for attachment to belts or leather strips, typical of those on a *lorica* (cf. *Rheingönheim*, Taf. 34).
47. A piece of folded bronze for attachment to a leather strap or belt fastened to a ring. This is probably a piece of baldric similar to those which carry the *gladius* and dagger (cf. *Rheingönheim*, Taf. 44, Nos. 10-12).
48. See Nos. 45 and 46.
49. A D-shaped buckle from the strap of a *lorica segmentata*.
50. The hilt guard of a dagger or knife with incised decoration on one edge.
51. Small thin iron plate with curved edge turned over, perhaps a fragment of armour.
52. A decorative mount in silver consisting of a palmette and scrolls. This has been identified by Dr. Günter Ulbert as part of a legionary scabbard mount fixed above the chape, from complete examples from Pompeii in the National Museum in Naples[38].
53. Fragment of a piece of thin iron slightly curved with one edge bent out, probably a piece of a bowl or ladle.
54. The chape of a *gladius* scabbard with traces of tinning. It is identical to those illustrated by Dr. Günter Ulbert from Pompeii[39] including one in the British Museum from the Thames.
55. A length of edging similar to, but smaller than No. 59 and 60, so presumably from a dagger scabbard. It is unfortunately bent and so impossible to identify the usual waisted outline.
56. Two solid bronze bars, semi-circular in section. One has a slight taper. The thinner end is complete with a slight swelling and nail-hole. In both cases the other end is broken at the nail-hole. They are probably decorative mounts for a wooden object like a box.
57. The top of a scabbard hilt-guard with a curved design and four holes on one side and a punched curved design on the other. This is not a feature on the Pompeii *gladii*, but a similar one has been found at Waddon (*Waddon*, 1, No. 38), and several from Hod Hill (*Hod Hill*, 1, A 2, 3 and 4; A 1 has been mounted up-side-down).
58. A scabbard mount and sword in the Ashmolean Museum, Oxford, is said to have been found at Long Windsor, Dorset, with a *sestertius* of Claudius (*Spes Augusta* type)[40]. There is no place of this name in Dorset and it is a reasonable assumption to consider it as a mistake for Broadwindsor, which is only a mile from Waddon Hill. The sword is a legionary *gladius* with a blade 476 mm long and 44 mm at mid-point and 46 mm at the hilt. The tang is 56 mm long and 16 mm wide. There are two mounts (a) with a groved strip and a flat plate with a tinned surface, (b) a thin strip broken at both ends but enough survives at one end to show the expansion for the loop which held the ring for suspension from the baldric. It is normal in scabbards for only the top and bottom panels to be decorated[41]; the Pompeian examples being exceptional (they may have belonged to praetorians). There are three more strips above the tapered end, the upper two of which expand into loops as in the case of (b). The other piece (a) is presumably for the lower panel and if complete would have shown the beginning of the taper.
59. and 60. Two lengths of scabbard edging with traces of leather still visible on one of them (cf. a similar piece from Waddon (*Waddon* 1, No. 44 and Ulbert[42])).
61. Pyramidal bolt head similar to Nos. 62 and 63.

[36] *Archaeol. J.* 115 (1960), fig. 5, nos. 118, etc.
[37] R. Butler (ed.) *Soldier and Civilian in Roman Yorkshire*, 1971, nos. 59-63.
[38] *Germania* 47 (1969), 97-128 in which ten other examples are quoted, including a fragment from Corbridge.
[39] do., no. 5, Taf. 26 and 32.
[40] These items were sold at Sothebys as Lot 87 on 12/13 April, 1948 and purchased by the Ashmolean. I am grateful to Dr. Christopher Young for drawing my attention to these, and to Mr. David Brown of the Ashmolean Museum for giving me access and allowing me to draw and publish this material. These items have been published by N. A. Griffiths, *Britannia* 10 (1979), 259-60.
[41] See examples from Mainz (*Mainzer Zeitschrift* XII and XIII for 1917-18, Abb. 6, no. 175; and *Gesellschaft pro Vindonissa, Jahresbericht*, 1965, Abb. 7.
[42] Ulbert, *op. cit.*, no. 52.

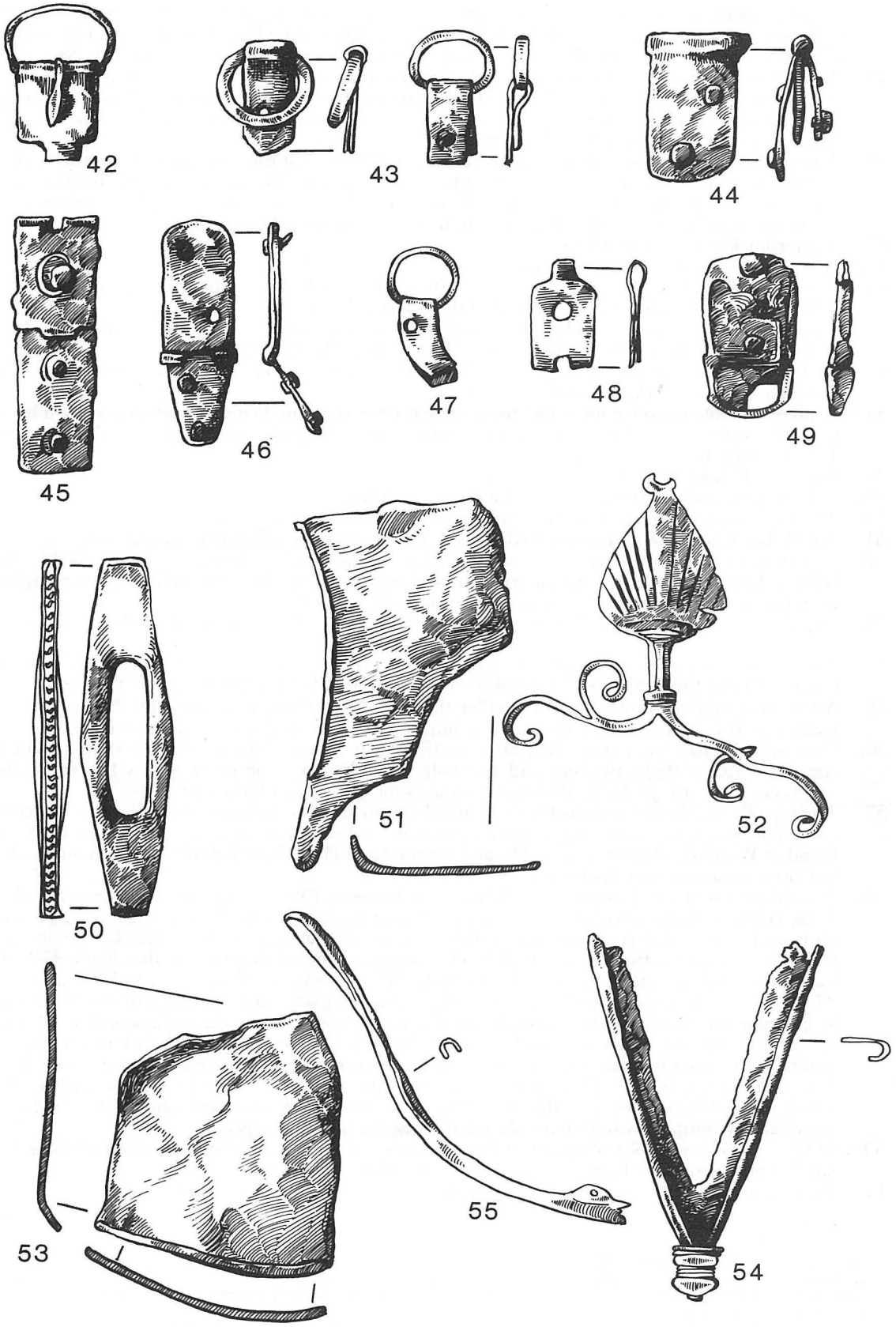


Fig. 29. Waddon Hill: bronze objects Nos. 42-55, all at life size.

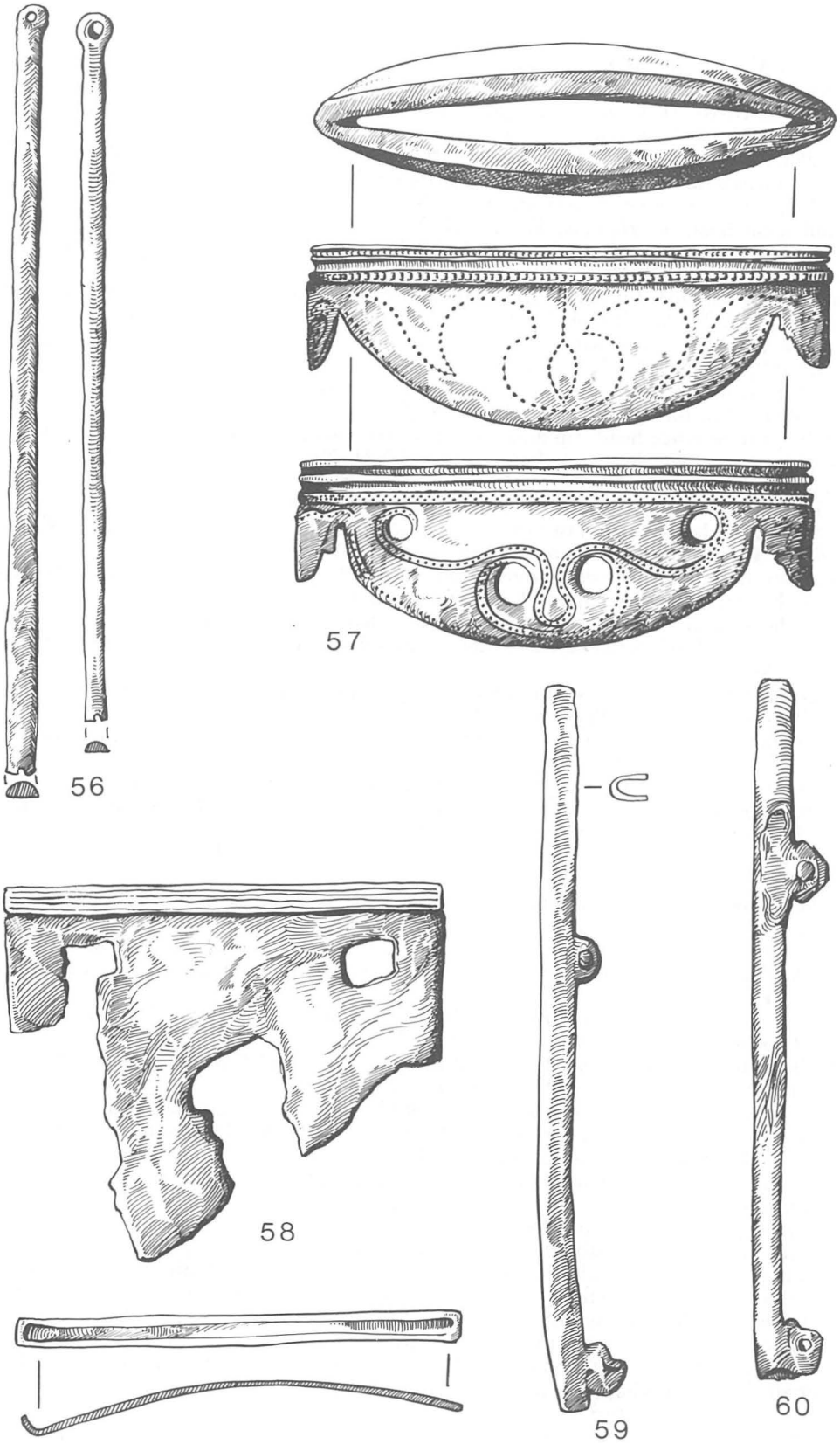


Fig. 30. Waddon Hill: bronze objects Nos. 56-60, all at life size.

62. Pyramidal bolt head similar to 63.
63. Pyramidal bolt head, square in section (cf. *Hod Hill,* II, Fig. 58, A 1a, b, c, e; *Hod Hill,* I B.181, p. 6, Pl. VI (heavier type); *Hofheim,* Taf. XVII, 29-58; *Maiden Castle,* Fig. 93, Nos. 1 and 2; *Aislingen und Burghöfe,* Taf. 27, Nos. 5, 6, 14, Taf. 53, No. 2, Taf. 67, No. 3; *Rheingöheim,* Taf. 46, Nos. 7-13, 16-18, 21-23; *Kastell Butzbach,* Taf. 16, No. 13; *Newstead,* Pl. XXXVII, Nos. 8-9, 11, 12, 14, 16-18, 20-21, noted only in early fort ditches and early pits; *Richborough* IV, Pl. LVIII, No. 288; *Saalburg,* Taf. XXXIX, Nos. 20, 21, 23, 24, 27; *Caerleon,* Prysg Field, Fig. 19, Nos. 7, 8, 10, 11, *Camulodunum,* Pl. CIV, No. 10; Saalburg, *Bonner Jahrbuch,* 1966, p. 205, No. 1).
64. Small spear or lance head, very similar to No. 72.
65. Small spear head (cf. *Hofheim,* Taf. XVII, No. 9).
66. Small spear or lance head (cf. *Hofheim,* Taf. XVII, No. 1; *Aislingen und Burghöfe,* Taf. 27, No. 12; *Saalburg,* Taf. XXXVIII, No. 2).
67. Pilum head (cf. *Hod Hill* I, Pl. IIB, B.108 and B.109; *Hofheim,* Taf. XVII, No. 55; *Aislingen und Burghöfe,* Taf. 27, No. 2; *Camulodunum,* Pl. CIV, No. 11).
68. Long spear or lance head with only part of the socket (cf. *Hofheim,* Taf. XVII, No. 13; *Hod Hill* I, Pl. V, B.9; *Newstead,* Pl. XXXVI, No. 4).
69. Small spear or lance head with long socket (cf. *Hofheim,* Pl. XVII, No. 9).
70. Part of spear or lance head, very similar to No. 75.
71. Small spear or lance head, tip and part of socket missing (cf. *Hofheim,* Taf. XVII, No. 18).
72. Small spear or lance head (cf. *Hofheim,* Taf. XVII, No. 1).
73. Small lance head (cf. *Hofheim,* Pl. XVII, No. 8; *Aislingen und Burghöfe,* Taf. 67, No. 2).
74. Ballista-bolt head with pyramidal head, similar to No. 63.
75. Small spear or lance head in two pieces (cf. *Hod Hill* I, Pl. VI, B.25; *Maiden Castle,* Fig. 91, No. 5; *Hofheim,* Taf. XVII, Nos. 7 and 9; *Aislingen und Burghöfe,* Taf. 27, No. 7).
76. Small spearhead with medial ridge on one face only (cf. *Hofheim,* Taf. XVII, No. 10; *Maiden Castle,* Fig. 91, No. 7; *Newstead,* Pl. XXXVI, No. 6).
77. Lance head with long tip and a socket to fit a shaft 17 mm diameter.
78. Lance head with triangular cross-section at the spike end (cf. *Saalburg Jahrbuch,* 26 (1969, p. 134, abb. 4, No. 11).
79. Large socketed spike with square section (cf. *Newstead,* Pl. LXIII, No. 11).
80. A calthrop (cf. *Caerleon,* Prysg Field, Fig. 22, p. 28, No. 17).
81. A complete dagger with bronze terminal, centre plate and guard, and traces of the wooden handle (cf. *Hod Hill* I, Fig. 12, B.2, p. 5).
82. Part of a small spear or lance head with long socket (cf. *Hofheim,* Taf. XVII, No. 48).
83. Ballista-bolt with folded socket and flat triangular head (*Maiden Castle,* Fig. 93, No. 13).
84. Small spear or lance head very similar to Nos. 64 and 72.
85. Spear head with broad leaf-shaped blade (cf. *Hofheim,* Taf. XVII, No. 17; *Aislingen und Burghöfe,* Taf. 27, No. 13).
85A. Socketed spear with medial ridge (cf. *Hofheim,* Taf. XVII, No. 2; *Richborough* IV, Pl. LVIII, No. 287).
86. Small socketed spear or lance head (cf. *Hod Hill* I, Pl. VI, B.25; *Maiden Castle,* Fig. 91, No. 5; *Hofheim,* Taf. XVII, Nos. 7 and 9; *Aislingen und Burghöfe,* Taf. 27, No. 12; *Saalburg,* Taf. XXXVIII, No. 12).
87. Small spear or lance head (cf. *Hofheim,* Taf. XVII, No. 1; *Aislingen und Burghöfe,* Taf. 67, No. 2).
88. Small spear head (cf. *Aislingen und Burghöfe,* Taf. 27, No. 7).
89. Small spear head with broad blade and short socket (cf. *Hofheim,* Taf. XVII, No. 54).
90. A round dome-shaped shield boss from an auxiliary shield.
91. Spear or lance head with long blade (cf. *Hod Hill* I, Pl. VI, B.25; *Maiden Castle,* Fig. 91, No. 8; *Hofheim,* Taf. XVII, No. 7; *Aislingen und Burghöfe,* Taf. 25, No. 11; *Rheingönheim,* Taf. 46, No. 28; *Newstead,* Pl. XXXVII, No. 22; *The Lunt,* I, Fig. 23, No. 1).
92. Large black glass bead with white streaks and indentations, probably imitating in shape the ubiquitous melon bead.
93. Blue glass bead of dumb-bell form.
94. Square shield boss, probably for a legionary *scutum.*
95. A nail cleaner, part of a châtelaine (cf. *Hod Hill,* I, Pl. XI, 1, 60 and 61, pp. 16, 17).
96. Two nail cleaners from châtelaines. In one, the loop for attaching it to the bar with the other implements, is broken, as also are the two prongs at the other end. This type is unusual in having oval expansion in the middle, perhaps to facilitate use. They are similar to one found at Waddon which could be the same set (*Waddon* 1, No. 62; cf. *Hod Hill,* I, 1962, Pl. XI, No. 161).
97. A small thin spade-shaped pendant or possibly from a châtelaine.
98. Iron finger ring with an intaglio of two-toned blue glass (see separate report on the intaglio).
99. Fragment of a shale bracelet with a turned moulding.
100. Small tubular glass bead.
101. Two small tubular green glass beads.
102. Part of the blade of a dagger with a medial ridge (cf. *Camulodunum,* Pl. CIV, No. 1).
103. Parts of two iron *styli.*
104. A lamp pricker with a small attached ring for the chain which connects it with the lamp, as on the one from Carnuntum[43]; other examples also detached from the lamp but with the chain attached come from *Hod Hill* (I, 1964, Pl. XI, No. 168; see also *Fishbourne* II, Fig. 45; *Richborough* IV, Pl. LIII, No. 203, etc.).

[43] *Römische Forschungen in Niederösterreich,* Band 1 (1964) Taf. XI, no. 3.

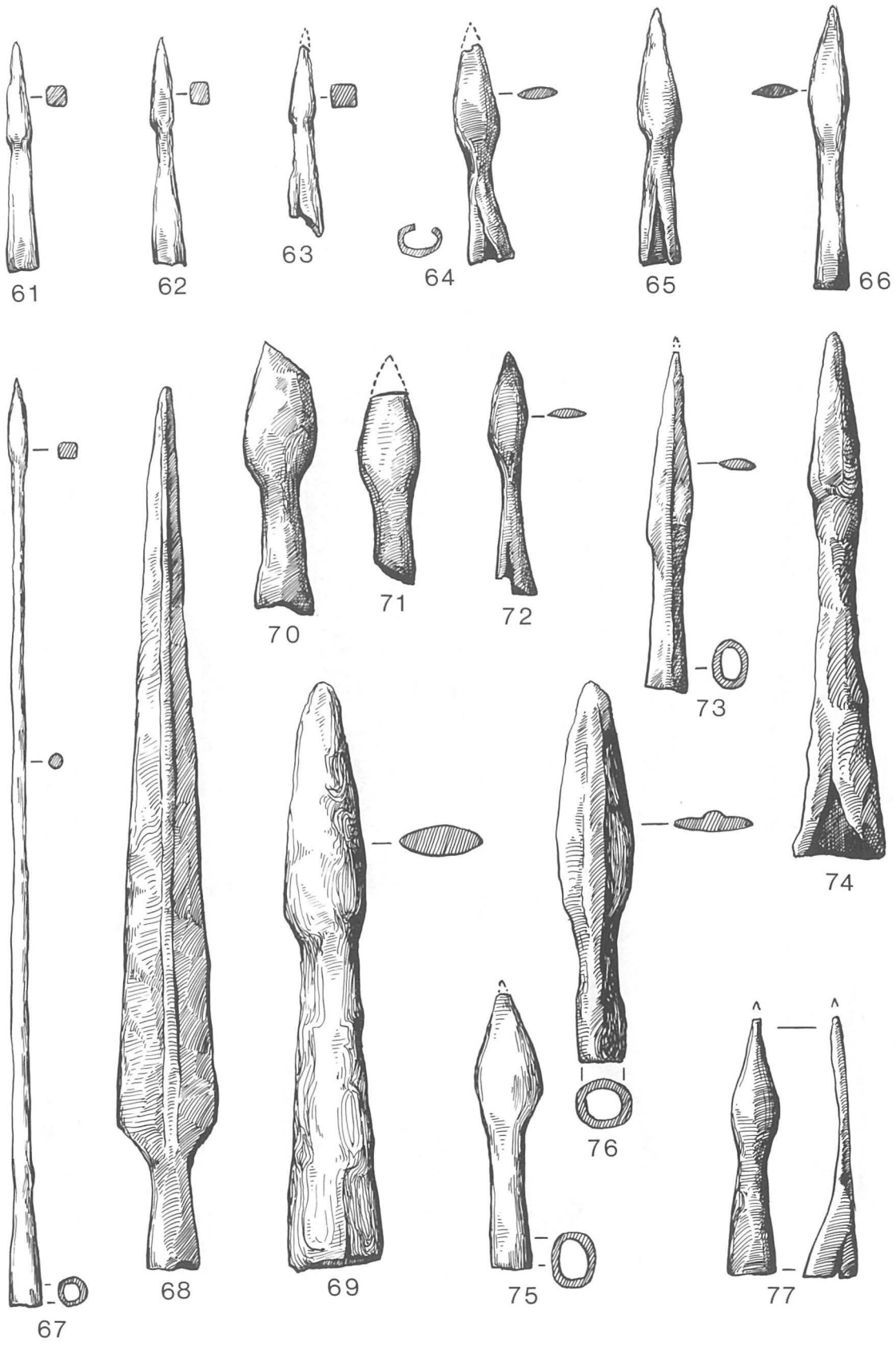


Fig. 31. Waddon Hill: iron weapons Nos. 61-77, all at half size.

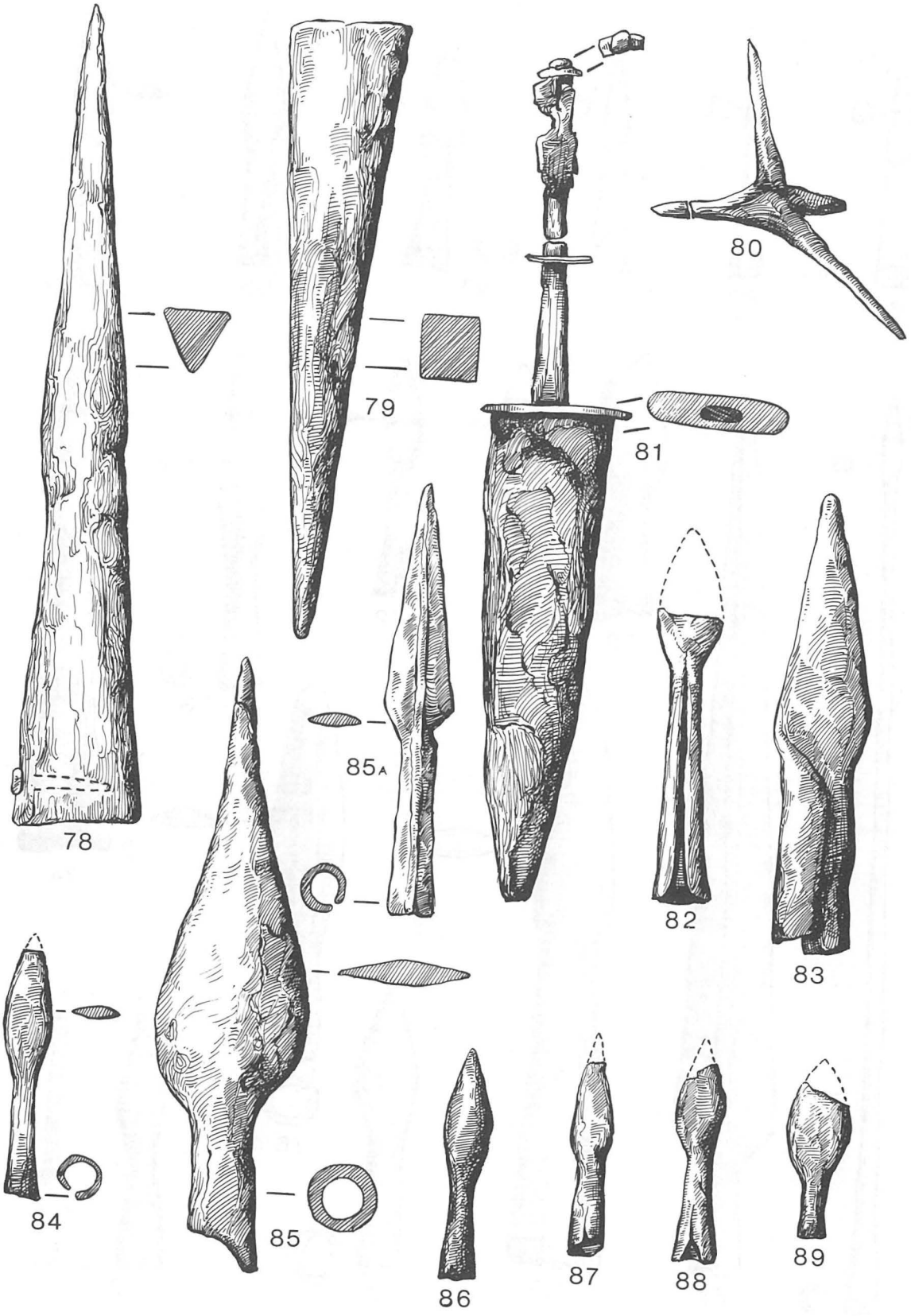


Fig. 32. Waddon Hill: iron weapons Nos. 78-89, all at half size.

105. Iron key for a tumbler lock (cf. *Hofheim,* Taf. XX, Nos. 56-59; *Hod Hill* 1, Pl.XII, K.10; *Aislingen und Burghöfe,* Taf. 28, Nos. 30-33; *Rheingönheim,* Taf. 50, Nos. 31-34; *Verulamium* I, p. 185, Fig. 68, Nos. 75-78; *Caerleon,* Jenkins' Field, p. 23, Fig. 17, No. 14; *Novaesium,* Taf. XXXIII, No. 52; *Saalburg Jahrbuch* (1910), Taf. 1; *Cambodunum,* 1953, Pl. 1, Taf. 19, No. 37).
106. A small piece of plate bronze with a cordon forming a curve of 5 cm radius. It is probably a piece of scrap bronze from a large dish with a central ompholos (cf. Maria P. Den Boesterd, Pl. IV, No. 18).
107. A bone object with a large rounded end and indications of a similar swelling at the broken end, probably a toggle.
108. The hook from a baldric or harness mount for attachment to a ring (cf. *Rheingönheim,* Taf. 35, Nos. 1 and 2, etc.).
109. Circular lead counters: Mr. R. F. Wright reports: The lead roundel of 179 grains is about 2/5 *uncia* (421 grains). This does not match the half *uncia* or the *sicilicus* (¼ *uncia*) and the symbols for these weights do not occur upon it. From this is drawn the conclusion that it is not a weight. The obverse is read as R (retrograde) though the surface is partially damaged. There are other examples of leaden gaming counters in Britain.
110. Small bronze weight of biconical profile.
111. A bronze ring too large for a finger or baldric.
112. A small knob with the stub of a tang large enough for driving into wood, this is probably a decorative feature from a cart.
113. Two links from a bronze chain.
114. A lead roundel similar to No. 109, the obverse is read as L = AL. The vertical was cut from above and the sloping foot added. The reading IV = ∧'4' is not considered workable as an alternative. The reverse is blank.
115. A circular piece of flat bronze with a small rivet hole for attaching to a wood staff.
116. White glass counter with flat base typical of many found on the site.
117. A small piece of bronze which seems to have been shaped but has jagged cut ends as if it had been cold cut with a chisel for scrap.
118. Bone dice with the arrangement of numbers identical to the modern type, unlike other examples from Roman sites (i.e. *Richborough* V, Pl. 149, No. 242, with two each of the numerals, 4, 5 and 6; *Richborough* I, Pl. XV, No. 31 has all the numerals; Roman Fort near Brecon[44], has numerals 2, 3, 4 and 6, but with two 2s and a blank side; whereas one from *Newstead* (Pl. XCIII, No. 3) appears to conform.
119. Fragment of bone handle with incised lattice decoration (cf. *Aislingen und Burghöfe,* Taf. 28, No. 1, Taf. 67, No. 28; *Newstead,* Pl. XCIII, No. 7; *Saalburg,* Taf. LX, No. 13; *Novaesium,* Taf. XXXV, No. 4; *Das römishe—germanische Central Museum in Bildlichen, Darstellungen aus seinen Sammlungen,*1889, Taf. XXII, No. 27).
120. A small loop with extensions, presumably for stitching into cloth or leather to form an eyelet.
121. A small dome-shaped washer with tinning and a hollowed base, probably for holding together parts of a pendant.
122. Two fragments from a lamp with relief decoration, one showing a captured barbarian.
123. An implement with one end splayed and the other in the form of a small scoop, probably for extracting cosmetic paste from a jar and mixing it on a slab.
124. A bronze ring probably from a harness which seems to have been worn on one side.
125. Spike or punch (cf. *Aislingen und Burghöfe,* Taf. 27, No. 22; *Newstead,* Pl. LVIII, No. 11, *Novaesium,* Taf. XXXI, No. 29).
126. Iron ring 1¼ ins. in diameter.
127. Part of a cauldron suspension consisting of a ring attached to a long bar from which hangs a double link and the centrepiece with attachment for three chains (cf. an example from Scotland[45]).
128. A suspension loop with knobbed terminal fitted into a D-shaped ring from a cauldron chain.
129. Thin curved knife (cf. *Hofheim,* Taf. XVIII, No. 35; *Rheingönheim,* Taf. 49, No. 15.
130. A pebble of soft calcareous mudstone[46] with four short nicks carefully scored on one edge.
131. Part of a handle with a spoon-shaped terminal. These objects have been identified as ladle handles (*Rheingönheim,* Taf. 37, Nos. 1-3; A Radnoti, 'Bronze gefässe von Pannonien', *Diss. Pann.* 1938, 97 ff. Taf. 28, Nos. 8 and 9); presumbaly also of the type illustrated from Nijmegen (Maria P. Den Boesterd, Nos. 99 and 107) which could have been used in the army as liquid measures.
132. Part of a latch lifter (cf. *Hofheim,* Taf. XX, No. 42; *Aislingen und Burghöfe,* Taf. 28, No. 24).
133. Flat round lid with a loop for attachment.

[44] *Y Cymmrodor,* 37 (1926) 119, fig. 61.
[45] *Proc. Soc. Antiq. Scot.* LXXXVII for 1952-3, p. 15, fig. 2.
[46] I am grateful to Miss E. M. Samuel for this identification.

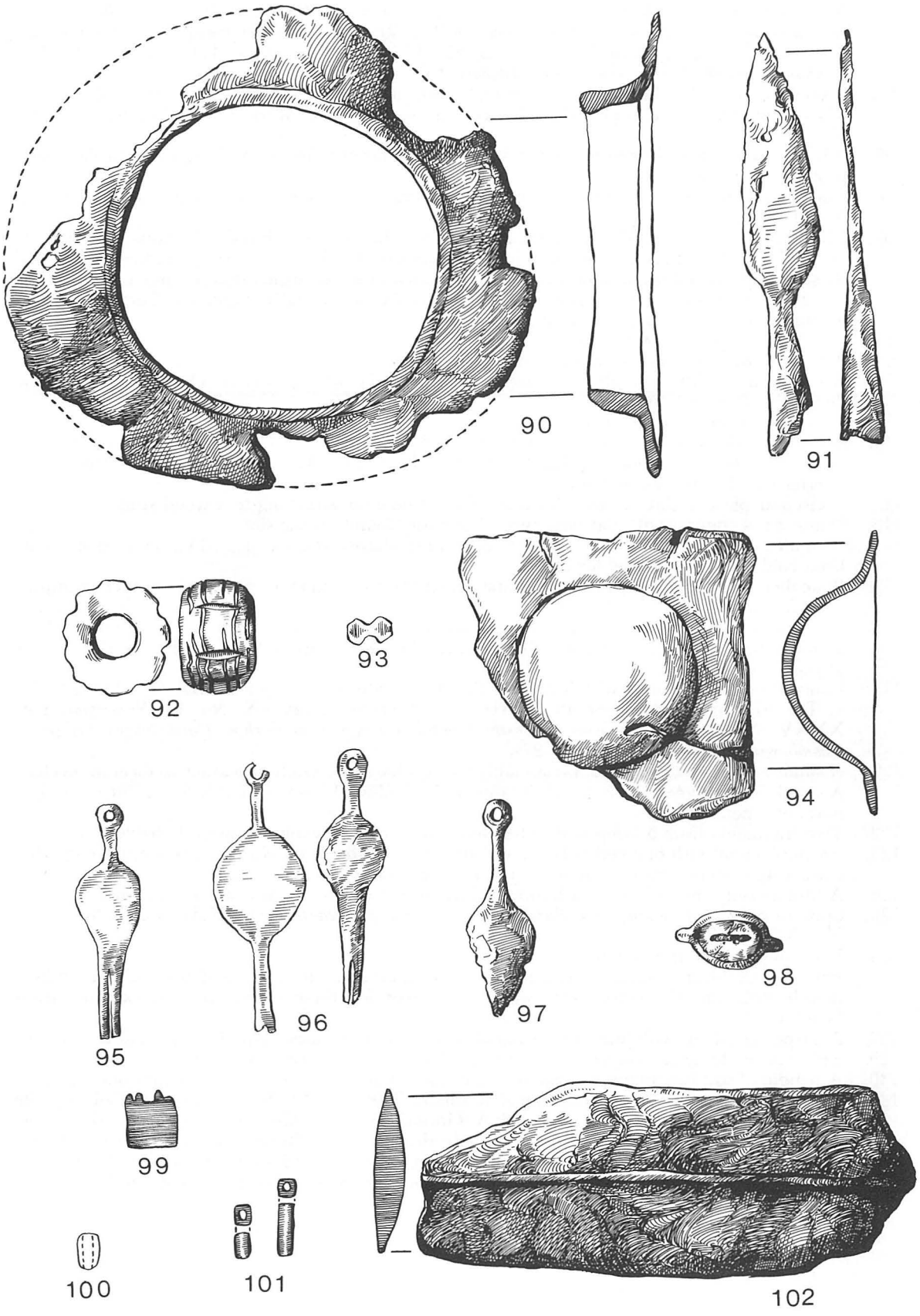


Fig. 33. Waddon Hill: bronze, glass and iron objects, Nos. 92, 93, 95-101 at life size; 90, 91, 94, 102 at half size.

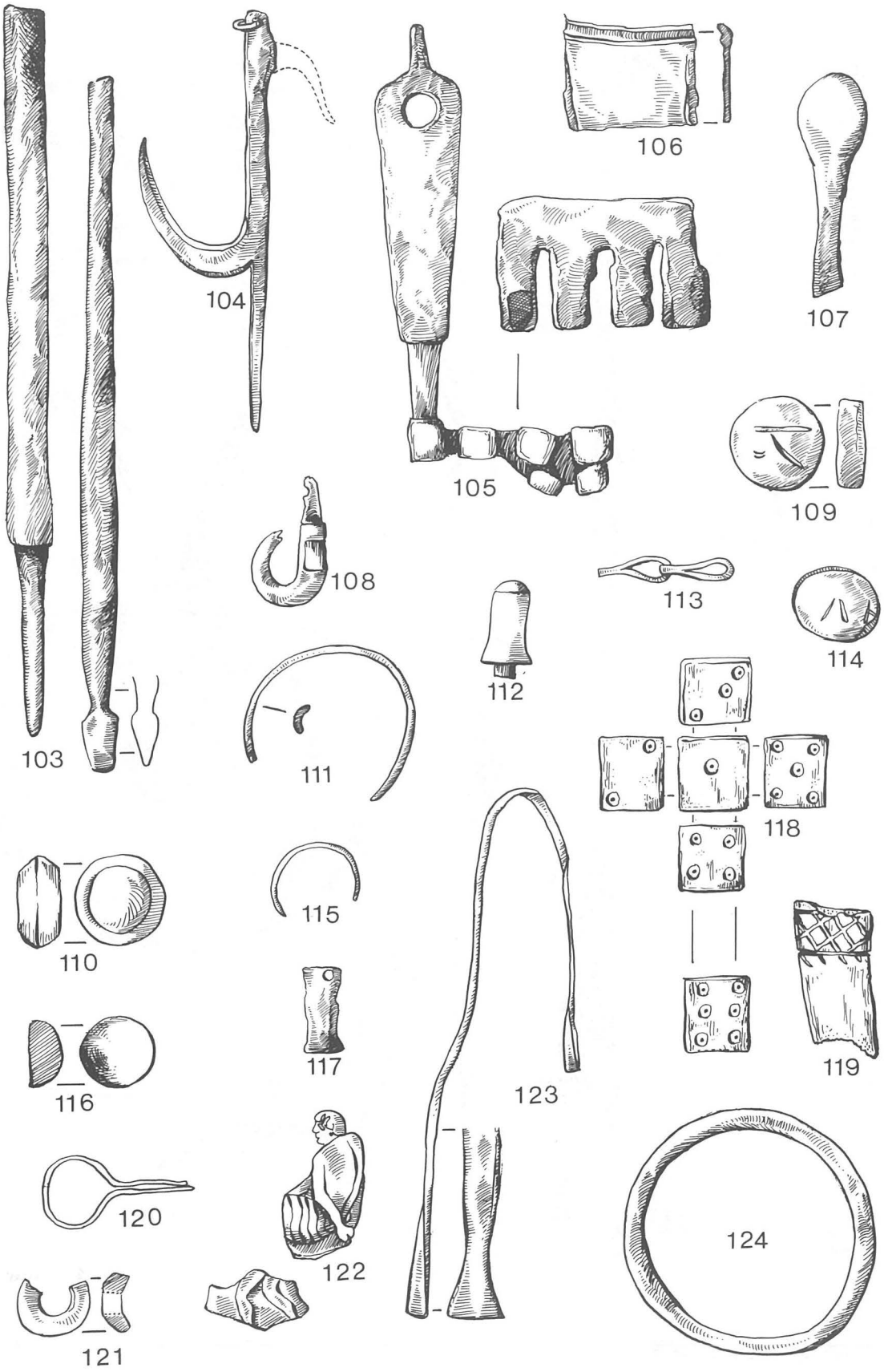


Fig. 34. Waddon Hill: bronze, bone and pottery objects Nos. 103-124, all at life size.

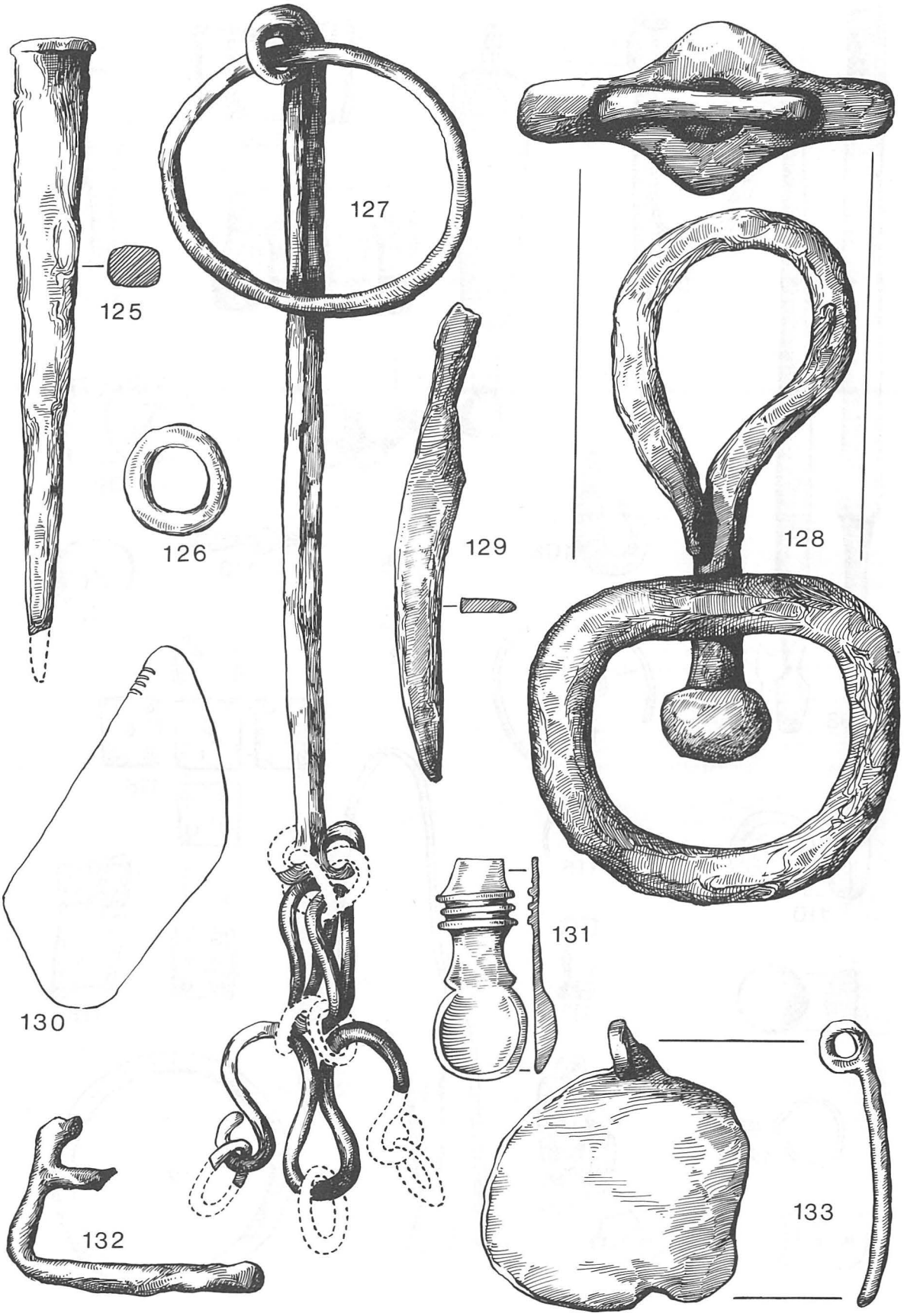


Fig. 35. Waddon Hill: iron, bronze and stone objects, Nos. 127, 128, 131, 132 at life size; Nos. 125, 126, 129, 130, 131 at half size.

134. A small iron dish of irregular shape, probably a lamp holder.
135A. Round iron socket or ferrule.
135. Iron wedge (cf. *Hofheim,* Taf. No. XX, No. 23).
136. Iron lid with small rivet hole in centre for knob (cf. *Kastell Butzbach,* Taf. 17, No. 7).
137. Iron ring.
138. A crudely made knife-guard with a square hole punched through it for the tang and sides bent over.
139. Knife point and part of the tang missing (cf. *Hofheim,* Taf. XXI, No. 5; *Rheingönheim,* Taf. 49, No. 18).
140. Fragment of a flat oval-shaped guard, presumably for a knife, since it is too small for a dagger.
141. A small iron knife or razor[47]; although it is not a standard type of Roman razor as shown by von Jochen Garbsch, *Bayerische Vorgeschichts-Blätter,* 40 (1975), 68-93.
142. A circular guard from a knife. It has a flanged edge and the hole for the tang either by wear or design is unusually large, it may have been enlarged and then wedged.
143. Latch lifter with one arm broken (cf. *Hofheim,* Taf. XX, No. 50; *Novaesium,* Taf. XXXIII, No. 57).
144. A bronze nail with a round head. The bend at the head suggests that it was drawn with a claw from the wooden object it helped to hold together.
145. A dagger or knife guard.
146. Gouge with broken end (cf. *Hod Hill* I, Fig. 13, G.37: *Rheingönheim,* Taf. 48, Nos. 4 and 5; *Newstead,* Pl. LIX, No. 12).
147. Thin curved knife with ring at end of the handle (cf. *Hofheim,* Taf. XVIII, No. 50; *Rheingönheim,* Taf. 49, No. 8).
148. Iron spike, similar to No. 125.
149. Iron wedge (cf. *Hofheim,* Taf. XX, No. 7).
150. A length of chanelled iron, probably a gouge (cf. *Rheingönheim,* Taf. 48, No. 4).
151. Iron tool with tapering ends, one half square and the other half round section, probably a punch like an example from Scotland[48].
152. Single edged saw with part of the tang (cf. *Verulamium* I, p. 167, Fig. 61, Nos. 12 and 13).
153. Part of a chisel (cf. *Saalburg Jahrbuch,* (1910), Taf. VI, No. 4; *Saalburg,* Taf. 28, p. 209, Nos. 6 and 7).
154. Tapering bar with a broken point, probably a chisel (cf. *Hofheim,* Taf. XX, 25-28).
155. Nail with large round head (cf. *Hod Hill* II, Fig. 59, C.7e).
156. Iron staple (cf. *Hod Hill* II, Pl. 42).
157. A rectangular piece of bronze with traces of tinning, it is bent into a right angle and has a large rounded head nail still attached and a large hole for another. This is clearly a decorative piece for fastening to the edge of a box or similar article.
158. Iron chisel with square section 9¾ ins. long (cf. *Hofheim,* Taf. XX, No. 6).
159. Part of a small adze—hammer.
160. Plain bone knife handle (cf. *Rheingönheim,* Taf. 45, No. 7).
161. Iron pin with conical head (cf. *Novaesium,* Taf. XXXI, No. 22).
162. Tip of a knife.
163. Thin fragment of flat iron of irregular shape with purpose made, triangular hole.
164. Small iron wedge.
165. Large nail.
166. Iron tent peg (cf. *Aislingen und Burghöfe,* Taf. 30, No. 20; *Rheingönheim,* Taf. 52, No. 14; *Richborough* V, Pl. LVI, No. 278; *Saalburg Jahrbuch,* 26 (1969), Abb. 9, Nos. 10-17).
167. Part of a straight-backed knife or cleaver.
168. Half of a head of a small carpenter's hammer.
169. A similar piece of iron.
170. Small flat-headed bronze nail with an exceptionally thick tang.
171. Nail (cf. *Hod Hill* II, Fig. 59, 67a; *Aislingen und Burghöfe,* Taf. 40, No. 52).
172. Small hook.
173. Probably part of a small adze (cf. *Newstead,* Pl. LIX, No. 2).
174. Dome-headed nail, bent as if around oval object.
175. Small piece of flat iron probably part of a key or lock.
176. Small loop handle for a bucket or cauldron (cf. *Hod Hill* II, Fig. 59, C.4).
177. Head of a lynch pin (cf. *Maiden Castle,* Fig. 90, No. 10).
178. Hook or part of a chain link.
179. U-shaped wall hook, similar to No. 198.
180. A staple ring.
181. Small eyelet (cf. *Aislingen und Burghöfe,* Taf. 30, No. 19).
182. Handle of a key (?) with large hole for hanging (cf. *Maiden Castle,* p. 283, Fig. 94, No. 5).
183. Iron strap end with two rivet holes.
184. Handle of a large knife with a round terminal (cf. *Saalburg,* Taf. 58, No. 10).
185. Strip of iron bent at one end with two rivet or nail holes.

[47] cf. *Excavations at South Cadbury, 1966-70* (1972) pl. 62.
[48] *Proc. Soc. Antiq. Scot.* LXXXVII for 1952/3 fig. 10c. 66.

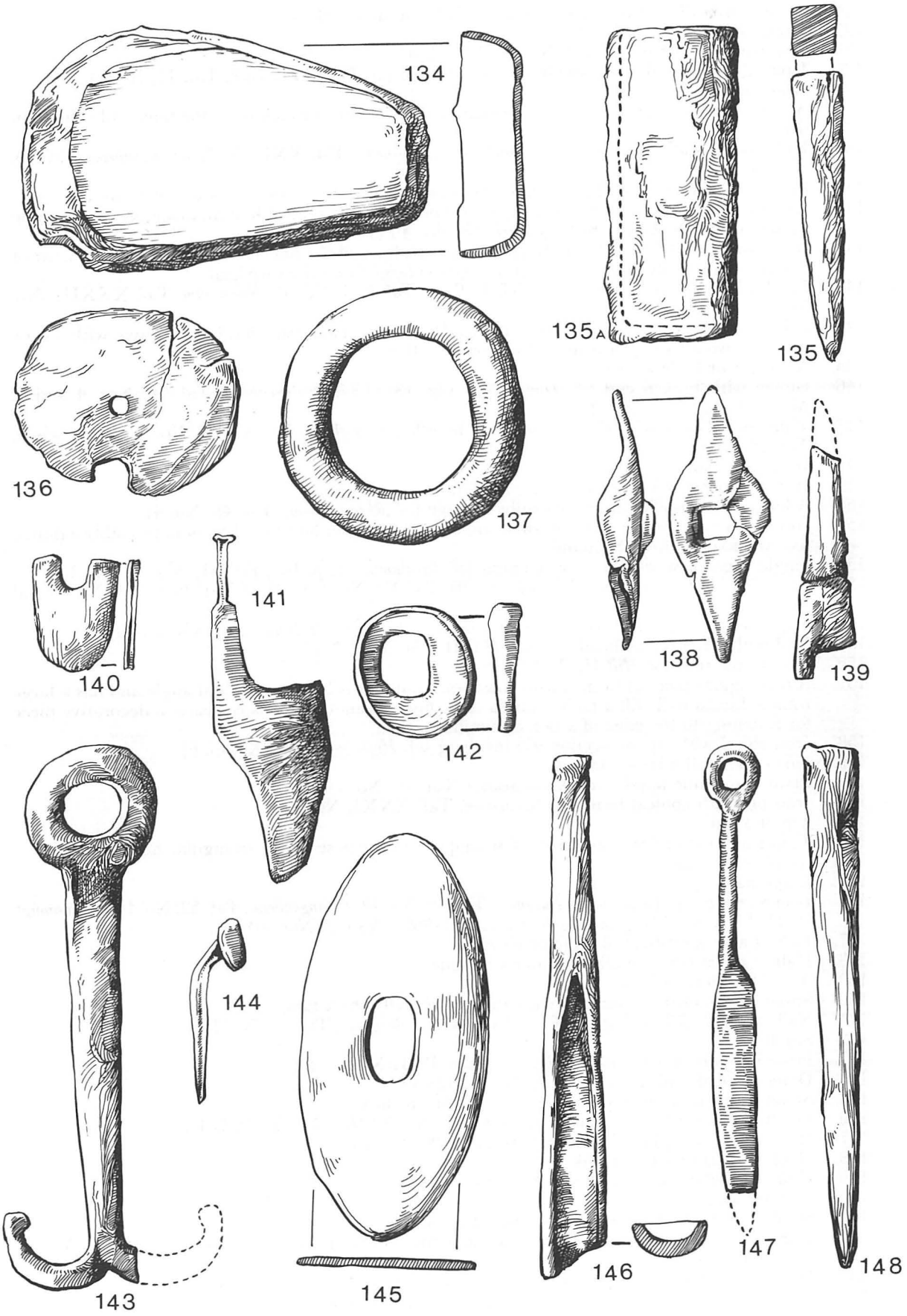


Fig. 36. Waddon Hill: iron and bronze objects Nos. 134-148, all at half size.

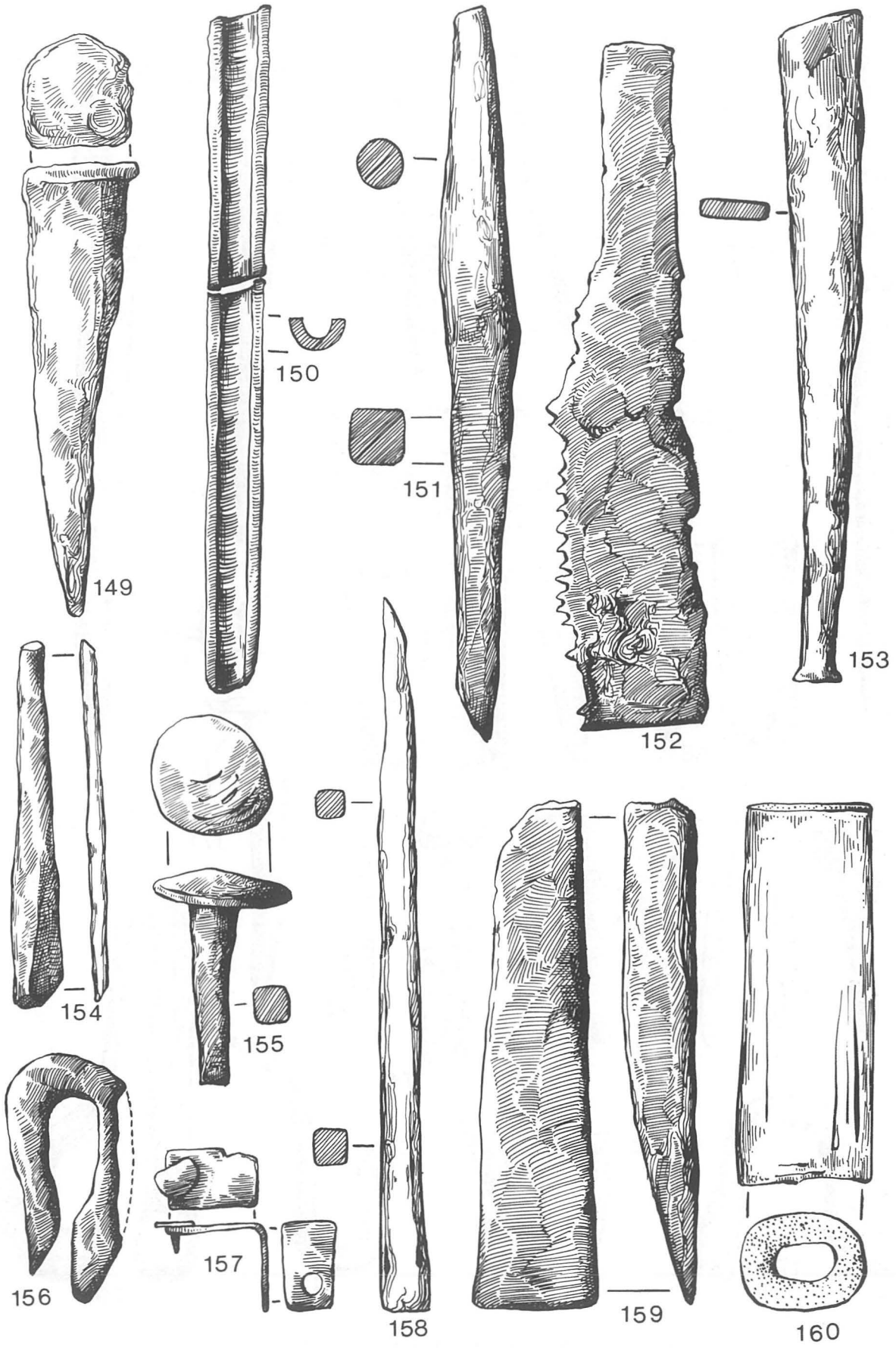


Fig. 37. Waddon Hill: iron and bone objects, Nos. 149-159 at half size, No. 160 at life size.

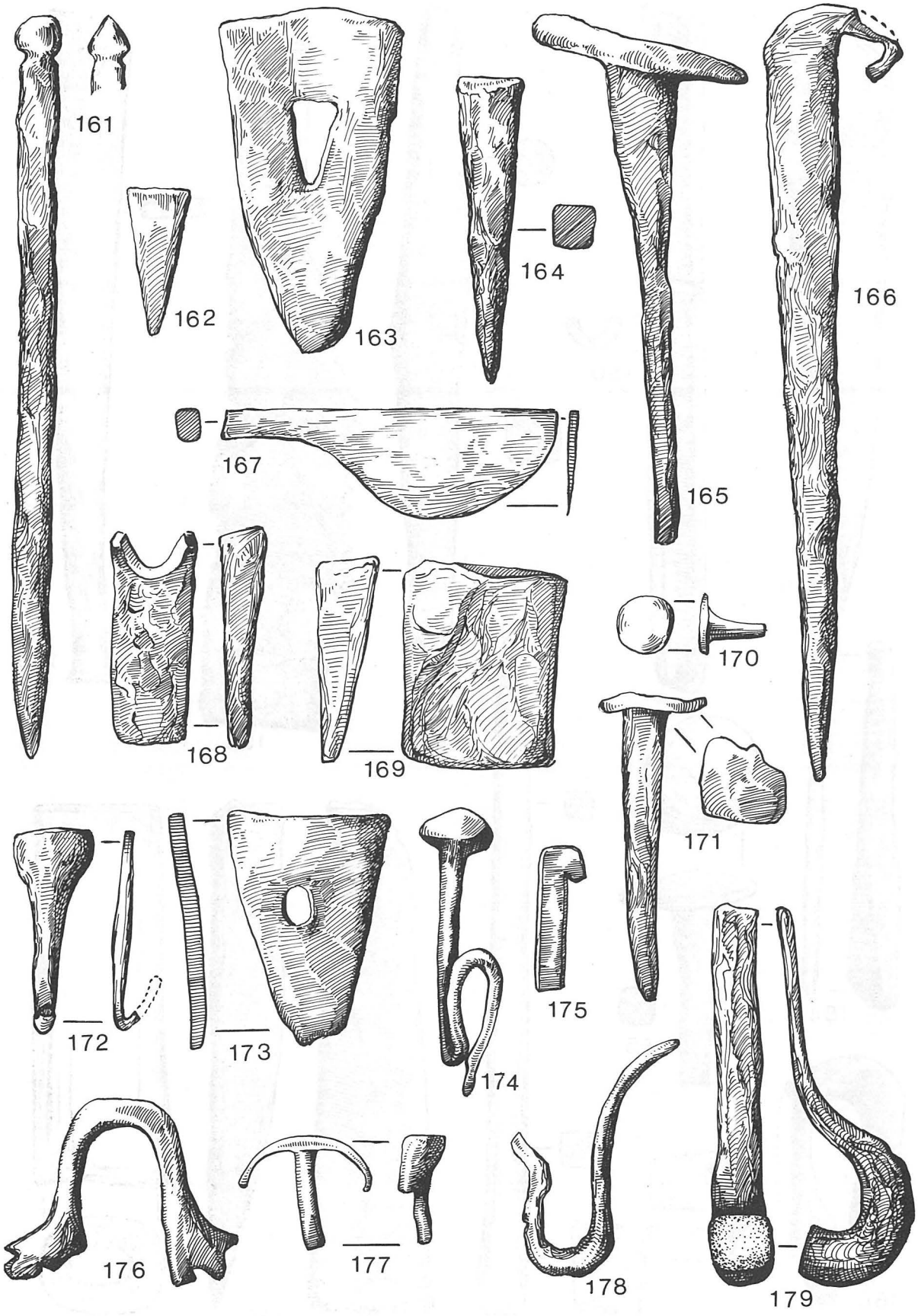


Fig. 38. Waddon Hill: iron objects, Nos. 161, 165, 169, 170, 172-176, 178, 179 at life size; Nos. 162-4, 166-168, 171, 177 at half size.

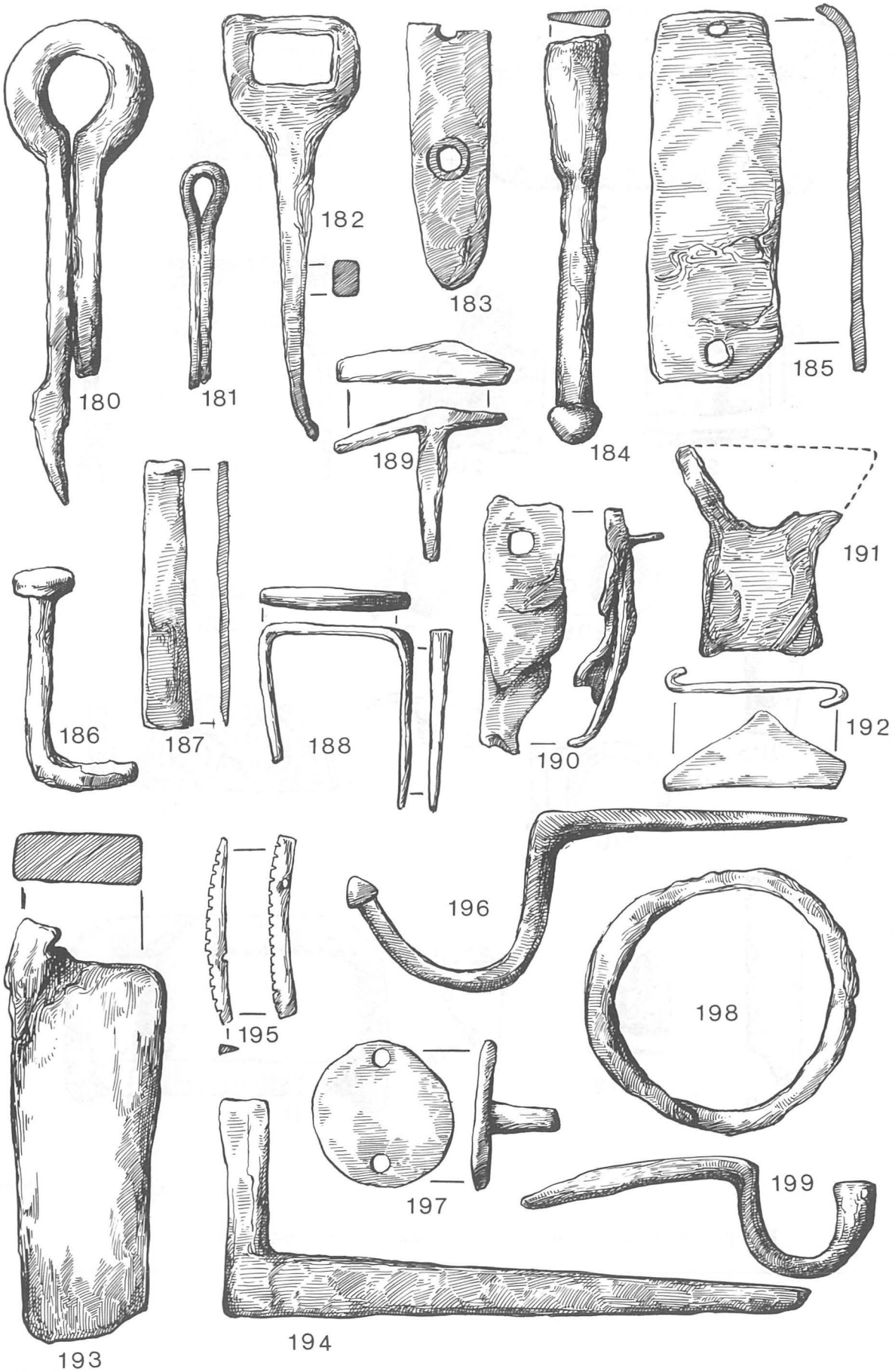


Fig. 39. Waddon Hill: iron, bronze and baked clay objects, Nos. 181-186, 190, 192-196, 198-199 at life size, Nos. 180, 187-189, 191, 197 at half size.

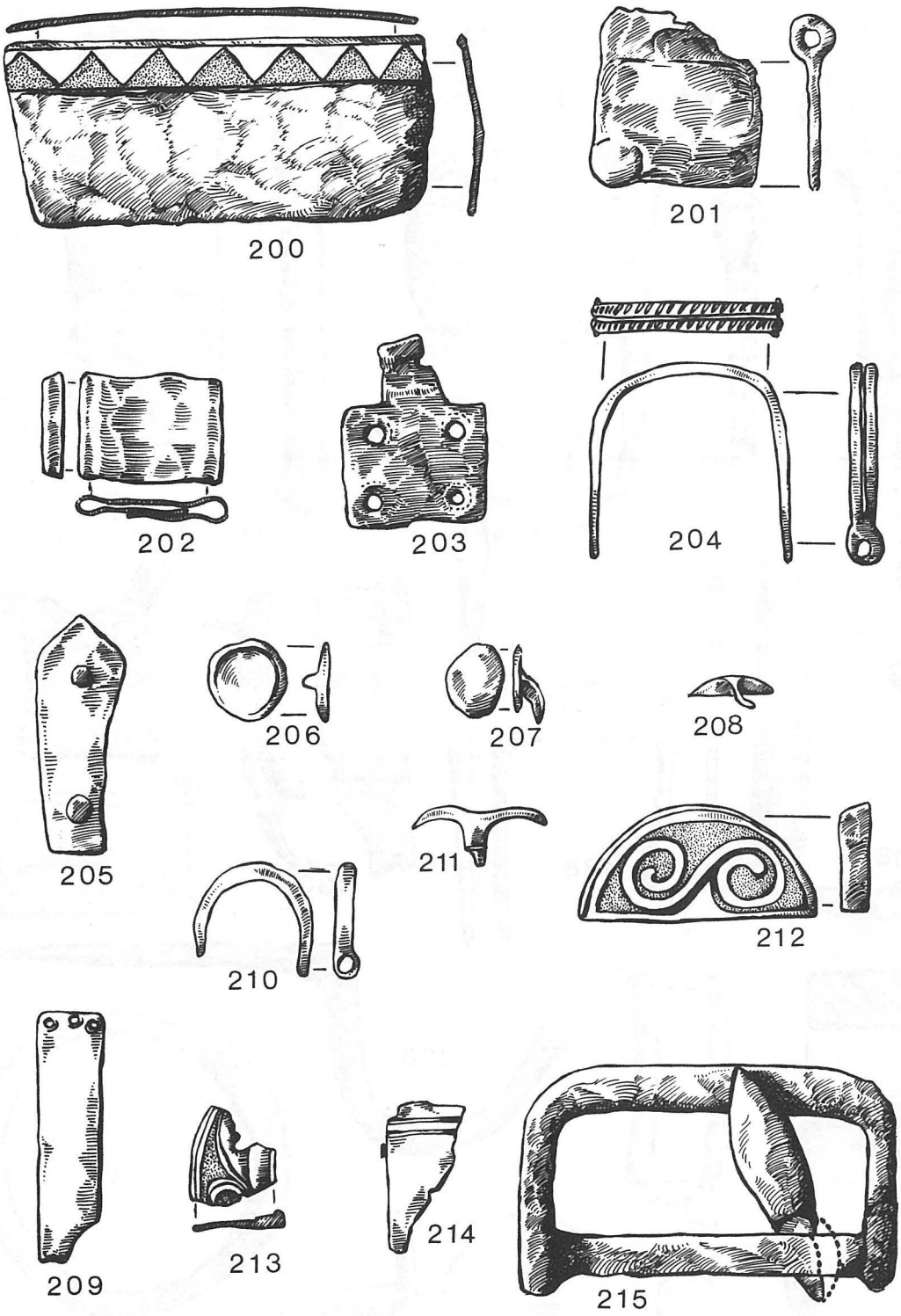


Fig. 40. Waddon Hill: bronze and iron objects Nos. 200-215, all at life size.

186. Part of a hook (cf. *Rheingönheim,* Taf. 52, No. 36; *The Lunt* I, Fig. 24, No. 4).
187. Probably a fragment of a chisel.
188. Thin bracket (cf. *Aislingen und Burghöfe,* Taf. 30, Nos. 40-42, Taf. 53, No. 20; *Novaesium,* Taf. XXXI, Nos. 33 and 41; *Brough-on-Humber, 1958-61*[49], Fig. 42, No. 30).
189. Small hammer head.
190. Junction of three strips with a bronze rivet.
191. A crudely shaped piece of baked clay in the form of a small lamp.
192. Triangular boot plate.
193. Part of a thick iron bar, probably from a wrought iron ingot.
194. Large hook probably for a door hinge (cf. *Aislingen und Burghöfe,* Taf. 30, No. 18).
195. Two curved strips of bronze edging with notched decoration. There are small rivet holes for attachment to wood. The wedge-shaped section indicates that these edges were tapped into a wooden object.
196. U-shaped wall hook, similar to Nos. 178 and 198.
197. Round headed stud or nail with two holes.
198. Iron split-ring (cf. *Cambodunum,* 1953, Pl. I, Taf. 21, No. 22).
199. U-shaped wall hook (cf. *Verulamium,* I, p. 185, Fig. 68, Nos. 86 and 89; *Caerleon,* Prysg Field, p. 33, Fig. 27, No. 13; *Novaesium,* Taf. XXXI, No. 47).
200. A rectangular piece of sheet bronze with a worked edge one side forming a small triangular rim above a narrow band of decoration of triangles picked out by incised lines and punched dots. The piece is slightly curved which suggests that it may be a piece of scrap bronze cut from a bowl or dish with a diameter of *c.* 24 cm.
201. Square piece of iron folded to form a socket for a hinge; a bronze stud and traces of another show that it was fastened to leather.
202. A rectangular strip which has been folded round a leather strap or belt.
203. A square piece of sheet bronze with four rivet holes and an extension on one side. This is probably part of a cuirass hinge of a different type from No. 6, but comparable to one from *Rheingönheim* (Taf. 33, No. 17).
204. A belt buckle decorated with a central groove and inclined nicks on the curved part (cf. *Rheingönheim,* Taf. 26, Nos. 8 and 9).
205. A bronze strip with pointed ends with two rivets.
206. A small hollow-headed stud with a tang for attachment to leather or wood. It is probably part or a piece of composite decoration from a belt-plate or harness pendant.
207. A stud with a flat circular head and thick tang probably for attachment to a wooden box or cart.
208. Small round bronze dome-shaped stud.
209. A thin strip with three rivet holes at one end and indications of more at the other, for attaching to leather or wood.
210. A small plain U-type buckle (cf. No. 204).
211. A small fragment of a decorative mount or even the top of an instrument like one from *Rheingönheim* (Taf. 42, No. 7).
212. A semi-circular piece of bronze with a chamfered edge on the curve face, one side is decorated with a simple scroll in red enamel. It is complete and there are no indications of how it could have been attached to anything. The piece is too small to have been the foot of a bucket (*Fishbourne,* Fig. 51, No. 151; Maria P. Den Boersterd, Pl. V. Nos. 113 and 114). It seems more likely to have been a weight set into a strap-end which was cut away to reveal the decoration.
213. A small fragment of a mount of uncertain shape with decoration in relief and punch marks. It is unfortunate that this piece is so small but the curved outer edges are finished and there is a rivet hole. It may itself be part of a scroll as part of a curvilinear design.
214. A small fragment of sheet bronze with two parallel incised lines, too small for identification.
215. A large D-shaped iron buckle, probably from a horse harness (cf. *Aislingen und Burghöfe,* Taf. 18, No. 26; *Hofheim,* Taf. XIV, No. 26).

Flint Artefacts by Dr. L. Barfield

216. Flint blade with deep retouching along both sides.
217. Parallel sided flint blade, unretouched.
218. Barbed and tanged arrowhead.

Barbed and tanged arrowheads can be attributed to the Bell Beaker tradition in Britain; only No. 218 is culturally diagnostic.

[49] See footnote 2.

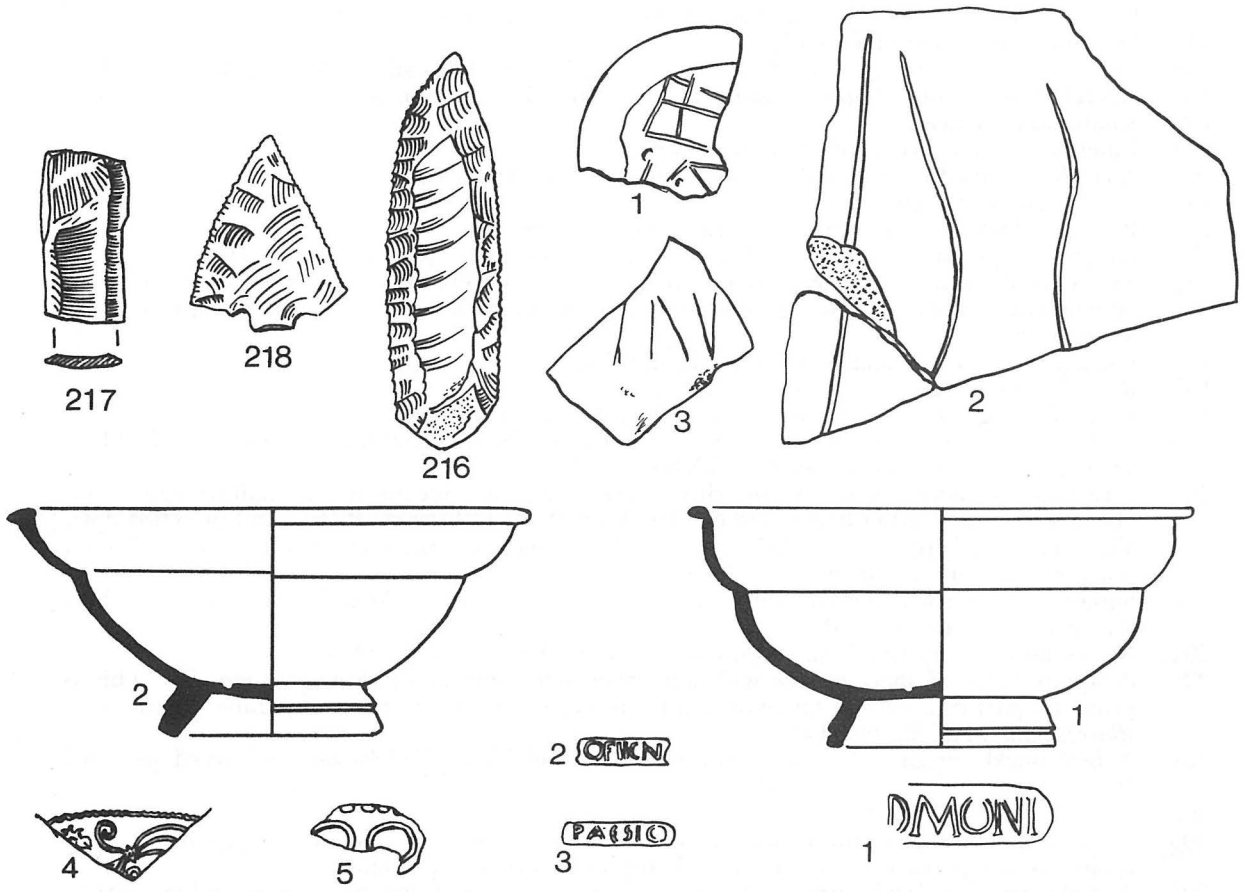


Fig. 41. Waddon Hill: flints Nos. 216-218 at life size; Nos. 1-3 graffiti on pottery at life size; Nos. 1-5 samian at half size with stamps at life size.

The samian ware by B. R. Hartley

Almost all the samian ware from Waddon Hill is in small, eroded fragments, often flakes in very soft condition. Nevertheless, the material found since 1963 includes some 115 sherds from identifiable forms. All are South Gaulish and all are almost certainly from La Graufesenque and, or, its related centres rather than from Montans.

In contrast to Hod Hill, virtually all the forms represented are standard ones from the settled Rutenian repertoire, the only uncommon pieces being two dishes of form 16, one stamped by Paestor (No. 3). As usual for pre-Flavian sites, forms 15/17 (18 examples), 18 (23), 15/17 or 18 (9), 24 (13), 27 (26) and 29 (10) predominate. The less common forms are Ritterling 4b, i.e. form 15/R (2), Ritterling 8 (2), Ritterling 9 (8), Ritterling 12 (1), Ritterling 14 (1) and form 16 (2). A few of these have definitely Claudian characteristics of form and fabric, but most are closer to the late-Claudian-Neronian tradition.

The potters' stamps offer more precision. They are:

1. Damonus Die 12f DAMONI on form 27. This stamp is only otherwise known on form 18 (R?) at Arles, form 27 at Vichy and form 29 at Clermont-Ferrand, Mainz and Wiesbaden.
   Damonus's work is not common in Britain, where all his stamps are from pre-Flavian, mostly Claudian, foundations. The only sites with multiple stamps for him are: Camulodunum (2), Colchester(2), Hod Hill (4), London (6), Owslebury (2) and Silchester (3). His general range is AD 25-55 and the present example is on a typical Claudian cup with tall, grooved footring and flat lip. *c.* AD 40-50.
2. Licinus Die 25c OFLICN on form 27. An early stamp of Licinus, with records in Britain only from Camulodunum and Fingringhoe. The cup is very like the last. *c.* AD 40-55.
   Licinus Die 54b (not illustrated) LICI*N* on form 27. An uncommon stamp, with most examples (7) from Paris. A probable record for Rheingönheim offers the only external evidence of date. The stamp was always used on cups and is probably slightly later than the last. *c.* AD 45-60.
3. Paestor Die 2a PAESTOR on forms 16 and 27. As often, the E and R are poorly impressed and the stamp seems to read, and often is read as PAISTOF. The range of forms associated with it (usually Ritterling 8, and forms 24 and 27), together with its presence in the Claudian-Neronian warehouse at Narbonne-les-Ports suggests a date *c.* AD 45-55.

Scotnus Die 5a · SCOTNS · on form 18 135 (*Waddon 2*, Fig. 4, No. 2). This stamp is normally on forms 15/17 or 18, rarely on form 29. A record from the second pottery shop at Colchester (Hull, Roman Colchester, Fig. 99, 17) and other burnt examples from Colchester, together with its presence in Period Ib at Fishbourne, and its relative commoness in Britain suggests basically Neronian date, *c.* AD 50-65.

Rogatus Die 10a′ or 10a″ [ROG]AIↃ on form 24 136 (*Waddon 2*, Fig. 4, No. 3). Even in its earliest known version (10a), this stamp never has more than ROGATↃ, but the letters are between guide-lines. 10a′ and a″ both have ROGAIↃ, with and without a swallowtail beginning to the frame. The stamp is usually on form 24 or 27, but occasionally on Ritterling 8 or even Ritterling 5 (10a′). The final version 10a″ is in Period I of Valkenburg and at Camulodunum. The range for the series as a whole is *c.* AD 30-50, with a″ *c.* AD 40-50.

4. A small fragment of form 29 with a winding scroll and a seven-pointed pierced star.
5. A small fragment of form 29 with a widely spaced bead row and two large, plain annular rings (cf. Knorr 1952, Taf. 68).

Comments

That the foundation of the fort at Waddon Hill came rather later than that of Hod Hill is suggested by the absence of the non-standard forms of samian ware present at the latter. On the other hand the presence of stamps of Damonus, Paestor and Rogatus strongly suggests a date in the 40s for the initial occupation. The range and nature of the plain forms points to occupation continuing well into the 50s and conceivably throughout them. There is, however, nothing likely to be later than AD 60. What scraps of decorated ware survive seem to point the same way, all apparently being Claudian or early-Neronian.

Graffiti (Fig. 41 nos 1-3)

1. Scratches on the underside of the pedestal base of a vessel in black ware. They appear to be marks of no particular significance.
2. Fragment of an amphora on which two letters have been cut. They could be . . .] DI and are probably the end of a name.
3. A graffito on a black native vessel. It is probably the end of a name in the genitive case.

Coarse Pottery

1. Mortarium with a hook-rim in cream ware, lighter than 10YR 8/6 (Munsell Chart) with quartz grits mixed in the body (Pit 8).
2. Mortarium with a hook-rim and prominent bead in light buff ware with quartz grits mixed in the body.
3. Mortarium in cream ware with the typical Claudian wall-side rim form and surmounted by a large roll-rim.
4. A double-handled flagon with the handles showing a peak and the rim with an internal lid-seating in black burnished ware with brown oxidised patches. This is a fully romanised form but made in the local native technique including the vertical burnishing on the neck, a feature of later flagons made in the South West.
5. Rim of a small flagon in a light pinkish-brown ware.
6. Flagon with a bell-mouth rim in light red ware.
7. Jar with everted sides like samian form Dr. 33 in a dark pinkish-brown ware with a dark brown surface.
8. Flagon or a rim of unusual form but with a lid-seating and a wavy-line on the inside of the rim in a buff ware with dark brown surface. Cf. *Maiden Castle*, Pl. XXVIII, No. 3. This is an example of the internally grooved rim characteristic of the Armorican pottery which had a considerable influence on 'Glastonbury' ware, though possibly the two derived variously from a common tradition of Marnian metal culture. Elements such as the internally grooved rim and geometric 'sub-Hallstatt' patterns seem to first occur in Britain around the middle of the 1st century BC. There is literary evidence for trade between Brittany and the South West at this time which would probably lead to settlement of people of Armorican stock, whose presence would encourage local imitations of 'B' Armorican pottery styles.
9. Small bowl in cream ware with a greenish-brown colour coat, decorated with 'raspberry roundels'. This is a typical product of the Lyons kilns[50].

Native type wares (Only forms which are new or show variants on those previously published from the site are given).

10. Small bowl in black ware with a bead rim (Pit 8). Not illustrated: as Nos. 11 and 12.
11. Wide bowl in black ware with a bead rim.
12. Wide bowl with a groove below the rim in a red-brown gritty ware with traces of a black surface.
13. A large jar with inturned rim in a reddish-brown quartz-gritted ware with a brown surface of varying shades (Pit 8).

[50] Kevin T. Greene, *Guide to Pre-Flavian Fine Wares c. AD 40-70* (1972), fig. 7, 5.1.

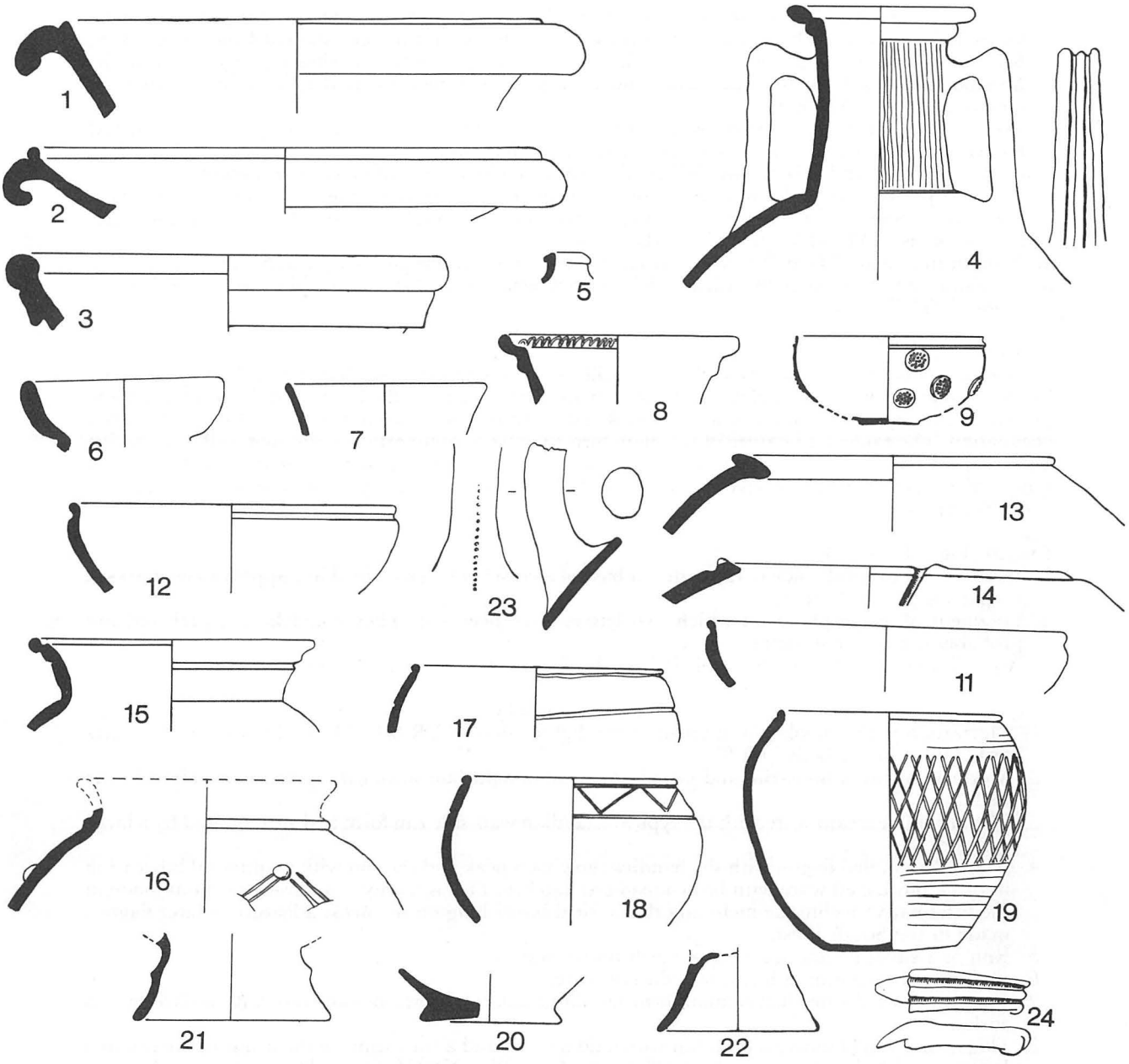


Fig. 42. Waddon Hill: coarse pottery at quarter size.

14. Very large jar in a grey ware with a groove below the rim and with a chamfered face on the inside. There is a small lug at an angle down the rim and by the side of it, a groove worn in the rim and on the surface of the vessel.
15. Large jar with everted rim with a slight lid-seating in a black ware with lighter surface.
16. A large jar with a cordon on the shoulder in a red-brown ware with a black surface. Decorated with a boss and pair of diagonal incised lines.
17. A hand-made jar with grooves below the rim and on the body in a black ware.
18. A jar with a bead rim in a gritty dark brown ware with a black surface and linear decoration with incised grooves and chevrons.
19. Jar with a bead rim and lattice decoration in a black ware, part burnished.
20. The base of a jar in a black ware.
21. A pedestal base with a cordon in a black ware.
22. A pedestal base in a red-brown ware with a black surface.
23. A handle of a large jar, oval in section and decorated with a vertical line of small punch marks in a black ware.
24. A flat grooved handle, or leg, with a tang at one end for luting into the body in a red gritty ware.

Glass by D. B. Harden

(All the pieces are too fragmentary for illustration)

1. Two fragments, both brown, from vertical-sided deep bowls (not the same bowl) with horizontal wheel-cut grooves or wheel incisions: (a) part of the side with one broad, deep groove, flanked by groups of incisions, no weathering; (b) part of the base with flattened bottom (no kick); one group of wheel-incisions at bottom of side. Dulled and some pitting and roughness on the surface. Claudio-Neronian, cp. Harden, *Camulodunum,* p. 302, nos. 68 ff.

2. Fragment of base of bowl, purple, with opaque white marvered trails. From a bowl with everted, knocked-off rim and pinched-out vertical ribs on body. Claudio-Neronian, cp. Harden, *Camulodunum,* p. 295 f., nos. 20-21 (the bottom can be flat or concave).

3. Six fragments (two of which join) of the rim, side and base of a pillar-moulded bowl, green; probably all from the same bowl. Two ribs reach to the base, fading out towards its centre; on interior, two wheel-cut horizontal grooves near bottom of side. H. *c.* 2¼-2½ in. D *c.* 8 in. Claudio-Neronian, cp. Harden, *Camulodunum,* p. 301 f., especially no. 62, pl. lxxxviii.

4. Six small fragments (blue, green and brown), too small to permit of any closer dating, or to give any indications of the shape of the vessel to which they belong.

5. Eight fragments of a pillar-moulded bowl of mosaic glass, 7 ins. in diameter, clear amber dappled with opaque white, including three rim fragments and a number of body fragments and a triangular fragment from the centre of the bottom, showing on its inner (matt-ground) side a slightly raised disk, 1 cm diameter.

6. Four fragments of a pale green pillar-moulded bowl. For pillar-moulded bowls in general, see *Camulodunum,* p. 301 f.; for examples in dappled mosaic see *id.* p. 294 f., nos. 16-19, pl. lxxxvii, no. 17.

7. Ten fragments of a deep bowl, dark amber, with incurved rims finished by grinding, and horizontal wheel cut lines and incisions round the body.

8. Two fragments similar to No. 7, bluish-green, one a rim fragment, thicker and heavier than No. 7 with a finely-made groove and incision near edge, the other from the lower part of the body with one thin groove *c.* 2 cm above the basal angle. For this shape of bowl, with wheel cuts and incisions, see *Camulodunum,* p. 302 f., nos. 68-73, pl. lxxxviii, 68-9, 72-3.

9. Fragment of shoulder of ribbed bowl, pale green, with opaque-white marvered trails wound spirally and blown with the bowl; the ribs were tooled after the blowing was completed, cp. *Camulodunum,* p. 294 f., 20-21, pls. lxxxvii, 21, 21a and lxxxviii, 20.

10. Fragment of rim from a bowl (?) with outsplayed sides, deep blue. This is not, as might at first seem, from a pillar-moulded bowl, since the polishing on the exterior goes too far down the vessel. There appear to be no parallels for it and its exact shape is not certain: but it clearly belongs to the ground-and-polished class of the early-middle 1st century AD.

11. Three tiny fragments of vessel, shape indeterminate, of opaque sky-blue glass. For this colour of glass cp. *Camulodunum,* p. 298 f., nos. 41-4.

12. A number of indeterminate body fragments, blue and common green, and a fused fragment of deep blue glass.

13. Fragment of pillar-moulded bowl, green.

14. Rim fragment of cylindrical bowl, green; polished on exterior and on top of rim. One broad and one narrow horizontal wheel-cut band below rim.

15. Part of bottom of flask or unguent-bottle, amber, with opaque white marvered trail. There is an 'up-and-down' almost 'scalloped'—feel on the inside edge of the fragments, possibly caused by ribbing on the body.

16. Fragment of 'quoit' bead, green.

17. Six fragments from pale green shallow pillar-moulded bowls: these might all come from the same bowl.

18. Fragment of rim of pale green bowl with vertical sides: lip ground and polished, with one broad wheel-cut groove and one narrow wheel-cut line running round the exterior horizontally immediately below the lip.

19. Four indeterminate pale green fragments.

20. Fragment (in two pieces which join) from junction of neck and shoulder of a large dark blue flask or jug: the neck, at least at its base, was apparently fairly wide, to judge from the remaining traces of the upward curve.

21. Eight indeterminate dark blue fragments, some perhaps from the same vessel as No. 20: others from smaller vessels with thinner walls.

22. Fragment of rim of amber bowl with vertical sides: lip ground smooth, with one horizontal wheel-incision on exterior just below.

23. (a) Three fragments from just below the rim of an amber bowl with vertical sides, each showing part of a broad horizontal wheel-cut groove running round the exterior just below the lip.

(b) Two indeterminate amber fragments, both of which might come from the same bowl as (a), though the thicker piece more likely belongs to a different vessel.

24. (a) Fragment from the side of a pale opaque sky-blue bowl with convex profile. Bowls of Dragendorff 27 shape in opaque glass are frequent (even of this particular sky-blue colour) and this piece looks as if it belongs to such a shape, in which case the existing convex part would be the lower portion and there is a trace at the thinner end of the fragment where it seems to begin to bend out into the upper convexity of this Dragendorff 27 shape.

(b) Two smaller fragments of similar opaque pale sky-blue glass, the larger of which seems also to belong to a Dragendorff 27 type, but *not* to the same vessel as (a). (There is a rib on the exterior and a faint trace of an outward bend of the wall on the interior, which suggest this interpretation, but not enough is extant for the interpretation to be convincing.)

* * * *

This glass is all of the 1st century AD. The recognisable fragments can all be equated with Claudio-Neronian material from Camulodunum and may be ascribed in broad terms to the middle of the century, say between AD 40 and AD 75.

Animal Bones from Two Tanks at Waddon Hill by Barbara Noddle

Both tanks (23 and 24) (Fig. 22) contained mainly cattle bones and both contained bones which seemed to be from the same individuals. The bones were well preserved, including large portions of skull, but were fragmentary.

Tank 23

Cattle Bones:

Individual 1. Half skull and mandible of mature individual. The third lower molar bore only four cusps instead of the normal five, with subsequent abnormal wear of the upper third molar. This condition is not uncommon in ancient cattle of all periods and may amount to 10 per cent of individuals. In modern animals it occurs in about 1 per cent (A. Andrews, MLC, personal communication). Other bones which probably came from this animal were a left scapula, length 285 mm, one radius, a pair of ulnae, two carpel bones and a complete set of phalanges (two first, two second, two third) two coccygeal vertebrae and one astragalus. The dimensions of the astragalus suggest a body weight of 140 kg[51] (Noddle, 1973).

Individual 2. Scapula length 230 mm, immature left metatarsal and an immature vertebra proximal width of metatarsal 36 mm. By modern standards[52] this animal would have been less than two-and-a-half years old at death, but probably not much under, as those bones which could be measured were nearly as big as the adult specimen.

Individual 3. One set of foot bones, both first and second phalanges immature. By modern standards this animal would have been under one year old at death. Other bovine bones which could not be assigned to either of the adult individuals with any certainty were a caleaneum fragment, two other tarsal bones, two patellae and a skull fragment bearing a horn core. The basal circumference of this was 125 mm and it was of the short oval type associated with the Celtic shorthorn of the Iron Age (see Fig. 43: 2).

Sheep and goat bones:

The following bones might have been derived from a single individual pair of distal tibiae, distal width 23 mm, immature calcaneum, radius distal immature, pair metatarsals, one complete (dimensions below), metacarpal shaft, ulna, scapula with long narrow neck (15.5 by 17 mm) two horn core fragments and a first phalanx length 31 mm. The appearance and dimensions of these bones agrees with a short tailed sheep of the Soay type, again typical of Iron Age flocks. The state of maturity of the bones indicates an animal of less than four years old by modern standards.

The following bones were derived from a mature individual of different type. Mature vertebra and pair of metacarpals of more robust animal (dimensions below) and a relatively short necked scapula (17 by 17 mm). These dimensions would seem to be derived from a larger long tailed type of sheep or a cross between long and short tail. Ryder[53] has stated his belief that the long tailed sheep was first imported by the Romans, basing his evidence on wool structure. There has been little skeletal evidence hitherto.

Goat or ram of second type of sheep

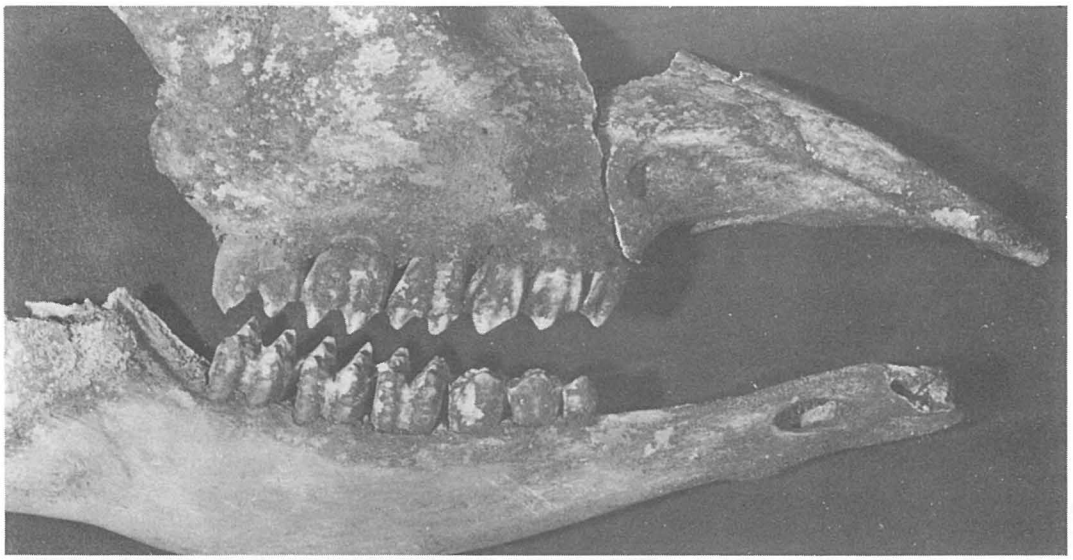
Pair of metatarsals and metacarpal shorter and thicker than the above. If this was a ram of either of the above types, one would expect the bones to be longer as well as thicker than the others, whereas primitive goats of the type still existing in the feral state in North Britain often have very short metapodials. The metatarsal has a shaft which is rectangular rather than square (shorter side width), which again is a goat characteristic.

A fourth individual was represented by a scapula. This animal died shortly after birth and may be either lamb or kid.

[51] B. A. Noddle, 'Determination of the body weight of cattle from bone measurements', in *Domesticationsforschung und Geschichte der Haustierre* (1971), J. Matolcsi (ed.), p. 377.

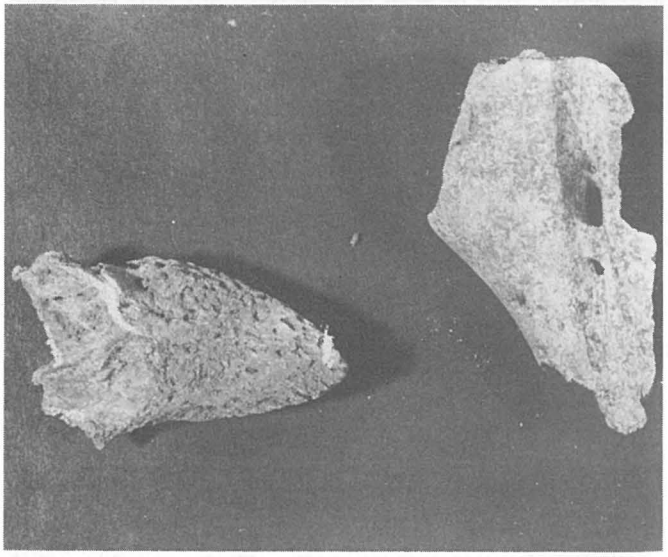
[52] I. A. Silver, 'The ageing of domestic animals', in *Science in Archaeology* 2nd ed. (1969), D. Brothwell and E. Higgs (ed.) p. 283.

[53] M. L. Ryder, 'The history of sheep breeds in Britain', *Agric. Hist. Rev.* 12 (1964), pp. 1 and 65.



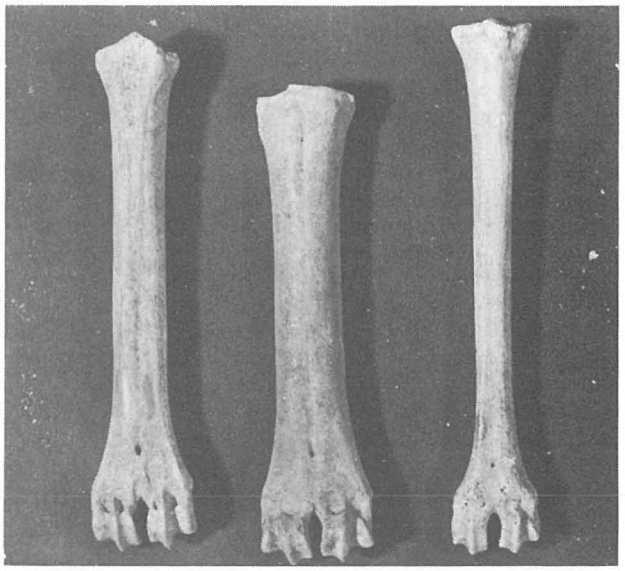
1

0 50 100 MM.



2

0 50 100 MM.



3

0 50 100 MM.

Fig. 43. 1. Waddon Hill: Portion of bovine skull and mandible lacking fifth posterior cusp and illustrating the occlusion with the upper tooth row.
2. *Left:* young bovine horn core of typical Celtic shorthorn configuration. *Right:* portion of bovine frontal bone with large orbital foramen.
3. *Left:* metatarsal probably derived from long tailed type of sheep. *Centre:* metacarpal of goat. *Right:* metatarsal of short tailed type of sheep.

Dimensions of sheep and goat metapodials found in Tank 23

Short-tail sheep	*Length*	*Proximal Width*	*Distal Width*	*Mid shaft Width*
Metacarpal				11.5
Metatarsal	125	19	20	9
		18		9
Long-tail sheep				
Metacarpal	115	19	23	12
Goat				
Metacarpal	111	23.5	27	16
Metatarsal	118	20	24	13

Some of these bones are illustrated in Fig. 43. All measurements in mm.

Pig bones:

The right shaft of a humerus and an astragalus were present. Length of astragalus 9 mm.

There were also some bones of a field mouse, *Apodemus sp.*, identified by T. M. Clegg.

Tank 24

Cattle Bones:

Individual 1. Parts of skull pair of maxillae, portion of orbit with very large orbital foramen, zygomatic arch, pair hyoid bones, ramus of mandible, pair of horn cores typical of Celtic shorthorn and third lower molar showing little wear. This suggests an animal of about two years old by modern standards (see Fig. 43). Limb bone fragments comprised part of two immature femora, parts of two immature proximal tibiae, astragalus, suggesting body weight of 155 kg metatarsal fragment, two first phalanges, one second and three third. One of the femora had had the nutriant foramen on the anterior proximal part of the shaft and not the posterior distal position which is much more common. The writer has observed the proximal foramen on three occasions in modern animals, two of which were animals of the Welsh black breed, which is supposed to have been derived from the Celtic shorthorn.

Also fragment immature ulna and four vertebrae with unfused epiphyses.

Individual 2. Immature first phalanx temporary premolar and unworn second lower molar, suggesting an animal under one year old.

Sheep bones:

Shaft of tibia, atlas vertebra, first phalanx length 30 mm. Two incisors.

Goat:

First phalanx length 39 mm.

Pig:

One molar.

The ages and the anatomical parts of the cattle found in these pits is worthy of comment. The youth of most of the animals suggests that they had been kept mainly for meat and hide production rather than for labour. It is possible that the two very young animals were casualties. As only one or two limbs, or just waste foot bones in the case of the youngest animals were found, it is conjectured that part of the meat was consumed about the time of the slaughter, and the rest preserved in some way, but it is possible other bones were placed in a contemporary pit on another part of the site, as may happen if the meat is divided between several households. It is possible that in tank 24 the bones were derived from more animals than has been stated.

The Fish Bones by Gordon Howes

There are three fragments. These are two centre (abdominal) and a hypural (part of the caudal skeleton) of a Sea Bass (*Dicentrarchus labrax* (Linn.)). This is a fairly common fish around the British Isles and they are particularly common in estuaries and quite well up river.

SHERBORNE OLD CASTLE, DORSET: MEDIEVAL POTTERY FABRICS

B. P. HARRISON AND D. F. WILLIAMS[1]

INTRODUCTION

From 1900 onwards there have been excavations at Sherborne Old Castle, in the parish of Castleton, on the edge of Sherborne (NGR: ST 648167). This work has produced large quantities of Medieval coarse wares, particularly from the most recent excavations conducted by Peter White, Inspector of Ancient Monuments, for the Department of the Environment, and has provided an opportunity to further pursue the queries of R. A. H. Farrar, who discussed the pottery from the Old Castle and Durrant Close, Sherborne[2], recovered in both cases by C. E. Bean, FSA. At the same time it seems reasonable to describe the means by which this pottery study has been undertaken.

The surviving remains of Sherborne Old Castle originate in the twelfth century, but there is scattered evidence of earlier activity on the site, notably a graveyard disturbed by a rock cut ditch and by the building of the castle-palace[3]. The earliest groups of pottery occurring on the site date from the twelfth century, although there have been a few sherds of what appears to be grass tempered ware, from the area of the North Gate. The castle was built by Bishop Roger of Sarum, 1107-1139, Chancellor of Henry I, who often acted as viceroy when Henry was away on frequent long visits to his French possessions. Roger supported Stephen, when he was crowned king in 1136, but Roger's power was curtailed in 1139 and Sherborne was confiscated with Roger's other castles at Devizes, Malmesbury and Sarum. During the Crown's occupation Sherborne was garrisoned from time to time and it was during this period that major additions were made. In 1354 Bishop Wyville regained the castle for the See of Salisbury from the Earl of Montague, who held the castle at the time. The castle was used and maintained by the bishops of Salisbury until 1542. It was again held by the Crown until Elizabeth I transferred it to Sir Walter Raleigh in 1592, but it was in need of too much attention and fell out of regular use when he moved to the Lodge, now the New Castle. The last major period of use was during the Civil War, when the castle was besieged twice, once in 1642 and again in 1645, after which it was slighted. The pottery sequence of the site shows this general continuity, with disruption caused by redeposited material[4].

A series of twelfth to sixteenth century sherds was submitted to Dr. Williams from the most recent excavations, which form the basis for this study, although sherds from the castle also match pottery from the town of Sherborne and its immediate district[5]. The main problem in the Sherborne area is that there has been little work undertaken on medieval pottery types and the clays used in their production, in consequence any analysis at this stage must be regarded in isolation. It must be stressed that this is only the beginning of a necessarily wider study of medieval pottery in the North Dorset area. The large quantity of pottery from the Old Castle site has made it difficult to do anything other than select a group of the most obvious types for thin sectioning and heavy mineral analysis, thus omissions are inevitable, especially with regard to the less frequent fabrics.

The pottery was sorted through on a very general level, noting the various inclusions in the sherds and grouping on this basis. At the same time the vessel types were defined wherever possible, this was made easier by the coincidence of pottery fabrics with certain vessel types,

[1] B. P. Harrison, BA: Department of the Environment, Sherborne Old Castle, Dorset. D. F. Williams, PhD, Department of the Environment Petrology Project, Department of Archaeology, University of Southampton.

[2] R. A. H. Farrar: Archaeological notes on C. E. Bean's excavated material from the mound to the east of the Old Castle, and Durrant Close. *PDNHAS* 73 (1951), pp. 106-111.

[3] C. E. Bean, FSA: verbal communication and *PDNHAS* 77 (1955). In addition Peter White, Department of the Environment excavations.

[4] Castle History: Fowler, J. *Medieval Sherborne*. RCHM (Eng.): *West Dorset*, section on Castleton. White, P. R.: Sherborne Old Castle, Dorset (DoE, DAMHB). Bishop Roger: Kealey, Edward J., *Roger of Salisbury—Viceroy of England*.

[5] C. E. Bean verbal communication, and viewing of selected material from the town.

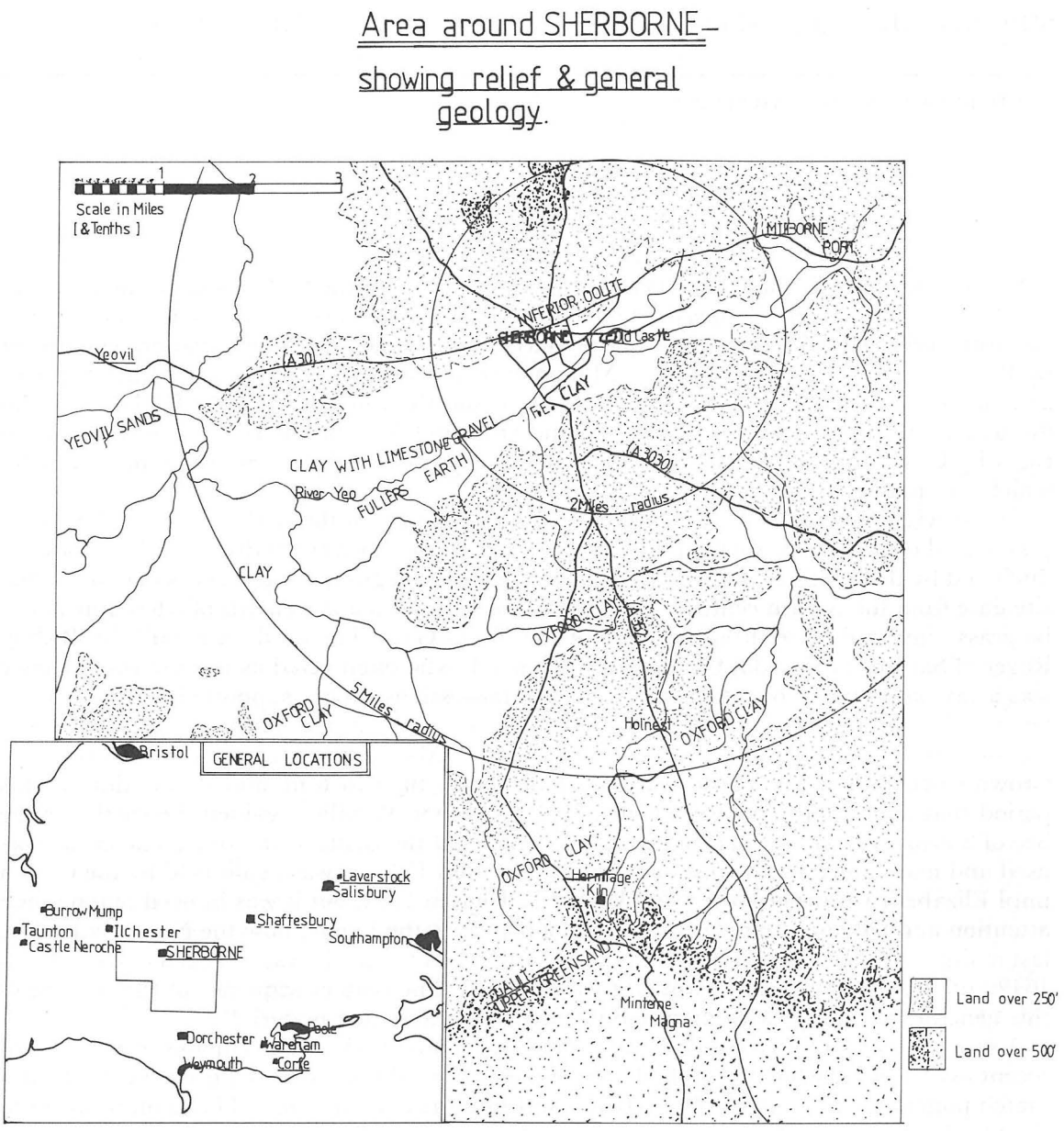


Fig. 44. Sherborne Old Castle: geology and site location plan.

but this was not totally reliable. (Reference is made to the list of vessel types and the fabrics used to produce them at the end of this paper.) As examples of each type were found, some sherds were kept as a control and some were put aside for analysis. In the early stages reassessment was frequently necessary. Details were made clearer by use of a magnifying glass, but otherwise initial assessment was visual.

At the same time any published material on the pottery from other excavations in the area was consulted, and considered in the light of the likely effect on Sherborne. Generally there are very few sites noted in the Sherborne area. There is only one excavated kiln site at Hermitage[6], just over five miles to the south of Sherborne and this has been considered in the fabric assessment. There have been excavations in South Dorset at Wareham[7] and Corfe

[6] Field, N. H. 'A thirteenth century kiln at Hermitage, Dorset', *PDNHAS* 88 (1966), pp. 161-175.
[7] *Medieval Archaeology:* Vol. 3 (1959). Wareham West Walls. RCHM (Eng.), pp. 120-138. Vol. 4 (1960). D. F. Renn. The Keep of Wareham Castle, pp. 56-68.

Castle[8], which have produced wares which have already been compared with Sherborne pottery regarding shape only[9]. Material from Laverstock seemed similar and was taken into consideration. Wherever similarities were seen samples were taken for comparison[10].

By the time thin sectioning and heavy mineral analysis was considered for the Sherborne pottery, a very definite set of questions had been formulated, so that direct comparisons could be made where necessary and fabrics defined within a pre-existing framework.

(1) What is the precise petrology of the fabrics; fabric types A, B, C, D and E?.
(2) How do these fabrics compare with pottery samples from: Hermitage, Laverstock, Corfe Castle and Wareham?

The petrology report of Dr. Williams is the reply to these questions, but as will be seen the answers are also of use to other researchers, since the samples were taken from a wide area. Future research on similar lines should also be facilitated by a readily accessible group of identified fabrics.

FABRIC ANALYSIS (DFW)

Introduction

A range of Medieval sherds from Sherborne Old Castle, and other sites, were submitted for petrological analysis. As a first step all the sherds were examined with a binocular microscope (×20). This was followed by selective thin sectioning and heavy mineral separation (Table 1) to allow study in polarised light under the petrological microscope. As a result of this a number of fabric divisions could be made on the basis of the aplastic inclusions present in the pottery. These are listed below following the description of the sherds. Munsell colour charts are referred to together with free descriptive terms.

The Methods

For thin section examination a small sample of pottery (*c.* 10 mm by 10 mm) is ground down until the majority of non-plastic inclusions present in the clay are transparent, and can be identified by their optical properties in polarised light under the petrological microscope. This method of fabric analysis is extremely valuable for characterisation, for pottery made in a similar way from the same materials will appear alike under the microscope. When fragments of rocks or certain unique minerals are present in the clay it is frequently possible to determine the source of the raw materials, thereby indicating the area of origin of the pottery-making and the area of distribution achieved.

However, much Medieval pottery contains a range of common inclusions, such as flint and quartz sand, the thin sectioning of which does not allow the same degree of precision in suggesting likely origins. In cases as these the technique can still be used profitably, for it allows a textural analysis to be made, where not only the type of inclusion, but also the latter's size, shape and relative frequency can be considered. A comparison of the texture of different sherds can often provide evidence for suggesting a common source, or alternatively several different ones.

When dealing with very sandy fabrics, heavy mineral separation, a much under-used technique, can often provide a useful means of classifying the sand present in the pottery, as distinctive heavy mineral assemblages can usually be assigned to a specific geological source. For this method a comparatively large amount of sample is required (17-20 gms), which is crushed and floated in a heavy liquid such as bromoform, allowing the heavy minerals to be siphoned off. These can be mounted on a glass slide and studied under the petrological microscope, allowing identification and counting of individual grains.

THE FABRIC GROUPS

Fabric A (Coarse flint ware)

Hard harsh fabric, the surface colour varies from light red (2.5YR 6/8) to dark grey (2.5YR N4/), with a light to dary grey core. Flint and quartz sand are normally clearly visible throughout the fabric.

[8] *Medieval Archaeology:* Vol. 4 (1960). RCHM (Eng.): West Bailey, Corfe Castle, pp. 29-55.
[9] Comparison with material provided by C. E. Bean, in the report in note 8 pp. 46 (with 44) and 51 to 53.
[10] Thanks are due to Dorset County Museum for material from the sites of: Hermitage, Wareham and Corfe; and to the South Wiltshire Museum at Salisbury for kiln wasters from Laverstock.

Petrology

Inclusions of flint are common, average size 2.5 mm across, together with frequent ill-sorted subangular quartz grains, ranging in size from 0.20-1.00 mm, and a little limestone.

Fabric B (Fine flint ware)

The description of Fabric A could almost equally be applied to the sherds in this group, the only difference being the smaller size of the flint present, up to a maximum of 1.5 mm across and the fact that it appears to be less frequent in the paste than for Fabric A.

Fabrics A and B, representing the majority of pottery from the site, have been grouped very tentatively on the basis of the presence of two extremely common inclusions in much Medieval pottery, flint and frequent quartz grains. It is possible that careful study may reveal several subdivisions of this pottery by making a detailed textural analysis of the main constituents present. However, to obtain meaningful results such work is best done by incorporating the Sherborne pottery in a general review of Medieval flint tempered ware from several local sites, and as such this lies outside the scope of present work. Due to the common nature of the inclusions, therefore, it is difficult to be precise about possible origins, though given the large quantity of pottery involved a fairly local source seems likely.

Sherborne is situated on Upper Fullers Earth and flinty clay levels. Both deposits contain frequent fragments of flint, which would be present in the clay if this was used for pottery-making, even if an attempt was made to refine the clay somewhat. A heavy mineral separation on a sherd from Fabric B (Table 1) produced a fairly wide range of minerals, but as these are all common types and little similar work has been done in the area, it has not been possible to be precise about origins. However, at this stage there is nothing in the thin section or heavy mineral results to suggest a non-local source for either of these fabric groups.

Fabric C (Coarse quartz ware)

Very hard, rough fabric, grey or black outside surface, sometimes with a dull olive-green glaze, normally with a dark grey core and creamy inside surface. Numerous quartz grains protrude through the surfaces giving the fabric a 'pimply' texture.

Petrology

Frequent subangular quartz grains, average size 0.60-1.00 mm, though some are up to 2.00 mm across, and a little flint. A heavy mineral separation on a sample from this group, and also from Fabric D below, in both cases produced too few grains to give a meaningful result.

Fabric D (Fine quartz ware)

Hard smooth fabric, mottled olive-green glaze with a white core and inside surface.

Petrology

Frequent inclusions of subangular quartz grains, average size 0.20-0.40 mm.

Fabric E ('Hermitage-Type' ware)

Hard fairly rough sandy fabric, surfaces tend to be light red (2.5YR 6/8), with traces of an olive-green glaze, and a lightish grey core.

Petrology

Abundant inclusions of subangular quartz, average size 0.20-0.50 mm. Also present are frequent fairly well-rounded light brown grains of limonite (altered glauconite), and some collophane.

The presence in some numbers of glauconite suggests an origin in the Greensand and Gault Beds, of which the nearest deposits to Sherborne lie some six miles to the south. Close to these deposits is situated a thirteenth century kiln at Hermitage whose products appear fairly similar in the hand-specimen to those at Sherborne[11]. Thin sectioning of waste material from the Hermitage kiln revealed a similar range of inclusions to the Sherborne pottery including the glauconite grains. A heavy mineral separation on samples from Sherborne and wasters from Hermitage also displayed points of similarity, notably in the comparatively high percentage of rutile, contrasting with a separation on a sherd from Sherborne Fabric B (Table I). It seems quite possible, therefore, that this fabric group, ranging in date from the thirteenth century to 1450 plus, was made in the general area of Hermitage. Indeed, some of the thirteenth century examples from Sherborne may even be products of the Hermitage kiln itself.

Laverstock-Type ware

Two sherds from Sherborne Old Castle appear similar to certain jug types from the Laverstock kilns near Salisbury[12]. Thin sectioning of the Sherborne sherds reveals frequent subangular quartz grains, average size 0.20-0.30 mm, and flecks of mica. This agrees quite well with similar analyses of jugs from

[11] Field, N. H. as note 6.

[12] Musty, J. Algar, D. J. and Ewance, P. F.: 'The medieval pottery kilns at Laverstock, near Salisbury, Wiltshire'. *Achaeologia* Vol. 102 (1969), pp. 84-146.

the Laverstock kilns, and the Sherborne jugs may well come from there, though this cannot as yet be conclusively demonstrated. Heavy Mineral analysis on two products of the Laverstock kilns, a tile and coarse jug, produced too few grains for a meaningful assemblage. However, one interesting point did arise from thin sectioning, namely that a section from a Laverstock cooking-pot differed from the jug sample tested. The former contained only a scatter of subangular quartz grains, and these were a size grade higher than those in the jug, average size 0.40-0.60 mm. Either a slightly coarser clay was used for cooking-pots as opposed to jugs, or else the added sand was gently crushed for the jugs. The coarser texture of the cooking-pots was probably deliberate, adding refractory qualities to the vessels.

South Dorset Wares

A small amount of comparative material from Wareham (unglazed) and Corfe Castle (both glazed and unglazed) was also examined, to see if South Dorset Wares were represented at Sherborne. The Wareham samples contained little else but quartz grains, average size 0.30-0.40 mm. A heavy mineral separation on one of these sherds (Table I) produced a tourmaline-rich assembly recalling that found in the pottery of the Romano-British black-burnished industry centred around the western shores of Poole Harbour and on the heathlands south of Wareham[13]. An origin in this area may also be likely for the Wareham sherds, the Medieval potters utilising roughly the same clay beds as were in use during the Roman period. Neither thin sections nor the heavy mineral assemblage agreed with those of the Sherborne samples studied.

Thin sectioning of the Corfe Castle sherds showed a scatter of subangular quartz grains, average size 0.80-1.00 mm, with a little flint and iron ore. Texturally, these sherds appear to be slightly different to those samples from Sherborne Fabrics A, B and C, containing less quartz than the latter, and so suggesting the possibility of a different origin, though it is difficult to be precise on this point.

TABLE I
Percentage of Non-opaque Minerals

Site	Zircon	Tourmaline	Rutile	Kyanite	Andalusite	Staurolite	Garnet	Apatite	No. of grains counted
Sherborne Old Castle Fabric B	71.0	13.4	2.8	1.4	4.3	1.4	4.3	1.4	269
Sherborne Old Castle Fabric E	83.6	4.2	8.8	1.3	—	—	1.4	0.7	277
Hermitage Kiln	80.6	2.5	11.2	2.1	—	—	2.1	1.5	397
Wareham	40.8	51.9	0.9	0.9	3.7	0.9	—	0.9	308

MEDIEVAL CERAMIC INFLUENCES IN SHERBORNE

Sherborne is situated on the Dorset side of the Somerset and Dorset county border, well inland from the coast. One can see from the vessels illustrated at the end of the paper, that the general tradition of West Country pottery shapes is followed, as evident among examples found at Burrow Mump[14], Castle Neroche[15], Ilchester[16], Portland (Southwell)[17], and to a lesser extent at Shaftesbury[18]. This similarity is no more than a very general indication of source, whereas knowledge of the petrology of the clays used can supply a closer indication of the origins of the vessels. The pottery from the Old Castle can be divided into two major groupings: wares with large flint inclusions and wares with a large quartz sand content. The precise origins of either of these types must still be based on assessment of the occurrence of the wares on the site. The A and B flint wares appear to occur in greater abundance than the

[13] Williams, D. F. (1977): 'The Romano-British black burnished industry: an essay on characterisation by heavy mineral analysis', in Peacock, D. P. S. (ed.), *Pottery and early commerce* (London, 1977), pp. 163-220.

[14] Gray, H. St. George: 'Excavations at Burrow Mump'. Especially the section on the pottery by G. C. Dunning. *PSANHS* 85 (1939), p. 124.

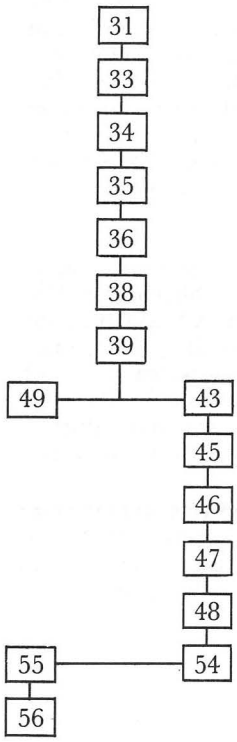
[15] a. Gray, H. St. George: 'Excavations at Castle Neroche'; the pottery notes. *PSANHS* 49 (1903), p. 23.
b. Davison, B. K., 'Castle Neroche, an abandoned Norman fortress in South Somerset'. Notable the pottery from Periods III and IV, pp. 50-56. *PSANHS* 116 (1972), pp. 16-59.

[16] Pearson, T., in Leach, P., *Ilchester Excavations*, CRAAGS Forthcoming. In addition much verbal information.

[17] Farrar, R. A. H.: Notes, *PDNHAS* 76 (1954), p. 98.

[18] Thanks are due to Mrs. J. Grainger, Honorary Curator, Shaftesbury Museum and Mr. W. Moore, Shaftesbury and District Archaeological Society.

TABLE II (BPH)



Layer	A	B	C	D	E	*Specific wares*
31	1	16	9	4	1	0
33	1	2	10	3	0	0
34 *Disturbed layers*	No pottery present					
35	4	17	2	4	2	0
36	0	1	1	4	0	0
38 (4 sherds)	0	0	1	1	0	0
39	0	6	7	11	1	1 (Donyatt)
43 13th-14th century	0	3	6	2	0	0
49	3	13	9	1	4	1 (Donyatt)
45	0	6	2	1	5	0
46	1	6	1	0	0	0
47 13th century	4	16	5	0	0	0
48	5	11	3	2	0	0
54	9	22	4	4	0	0
55 12th century	11	15	5	2	0	7 (Early sandy ware)
56 Counted as part of 55						
Garderobes—sealed contents						
Structure YC: (12th century)	3	2	1	0	0	0
Structure W: (14th century)	0	1	1	1	16	0
Structure H: (15th century)	0	1	0	0	7 plus	0

For this table one area was taken as an example and an assessment made of the number of vessels represented in each layer. In some cases the vessels represented are identified by no more than one sherd, whereas in other layers one vessel may be complete. Nevertheless this tends to be more reliable in a sherd count in indicating the occurrence of fabrics at certain dates.

C and D quartz wares, and the general occurrence of similar wares throughout the wider area on initial examination suggests a more local source for the flint wares. In this case the petrological analysis can only imply that the source is not ruled out as being local. It can be said that the same would apply to the quartz wares.

In the period from the 12th to early 14th century the main pottery type is the flint ware, A and B wares in the fabric analysis. A local source for this ware is suggested by the large quantity of pottery of A or B type recovered from layers of the appropriate date. Similarly large quantities of this type of pottery have been recovered from excavations in the town of Ilchester, and the few scattered examples of pottery from the town of Yeovil[19], also have a larger proportion of this ware. The common factor could be the valley of the River Yeo flowing through all three towns and through several areas of flinty clay. On present evidence there was a base for the production of these wares in Ilchester[16], but it has not been proved that Ilchester was the only base for such an industry, as it is evident that A Fabric, and especially B Fabric pottery was in use at Sherborne Old Castle after the mid-13th century when Ilchester was no longer a trade centre. Nevertheless, Ilchester may have started as the centre and further kilns developed away from the town at a later date, along the River Yeo valley.

The proportion of quartz sanded wares is smaller than that of the flint wares in the early

[19] Mr. L. C. Hayward: Yeovil Local History and Archaeological Society.

period of the Castle, with an increase of relative occurrence from the 13th century onwards, yet these are more complex to identify being from more than one source. It appears to be a more satisfactory ware for production, especially for jugs, and at Sherborne Old Castle it is apparent that it has been transported over greater distances than A and B wares. The nearest known source of sanded wares would be the kiln at Hermitage, producing the ware classed as E Ware-Hermitage type. It should be noted in studying the products of this kiln in relation to Sherborne Old Castle pottery, that Hermitage may be the centre for a more extensive industry starting in the 13th century and continuing into the late 15th or 16th centuries. Sherds of a later date from Sherborne, were submitted for study and they compared with wasters from the Hermitage kiln, despite the disparity of dates. There is a further suggestion of the continuation of this industry by the reference, in the records of the Consistory Court in 1617[20], when a potter at Holnest, two miles distant from Hermitage, was granted fuel gathering rights. Vessels of E ware-type bear a marked stylistic resemblance to the pottery excavated from the kiln site, as seen by cooking pot no. 14 and jug no. 22 here, compared with the earlier pots illustrated in the Hermitage report[21]. Thin section and heavy mineral analyses have also revealed a few sherds comparable with Laverstock kiln wasters. Laverstock pottery, especially the pitchers, is of a fine quality and already accepted as being transported over a wide area[22]. The kiln supplied the Royal Palace at Clarendon[23] and it is possible that when Sherborne was in Royal hands during the same period, the chances of vessels travelling to Sherborne would be increased. Without petrological analysis such specific wares would be missed and simply classed as C or D wares.

FOR FUTURE CONSIDERATION (BPH)

Research into ceramic sources has continued after the petrological analysis, especially in attempting to define the finer sandy wares. Initial assessment of possible sources has been based on similarity of form and decoration followed by comparison under a magnifying glass, with types already identified in the initial study. In consequence, there has been noticeable similarity at Sherborne with pottery from the following sources:

Donyatt (near Ilminster)[24]
Bristol, Redcliffe[25]
Bristol, Ham Green[26]
Shaftesbury[18]
Kington Magna[27]
South Wiltshire[28]
Poole Harbour[29]

The Donyatt kiln is accepted as being of major importance in the area to the north of Sherborne and it appears to have been brought to the castle from the mid-13th century onwards. There are fine examples of wares from this kiln occurring all over the site, although the largest group is that dated in the Civil War period, which tends to be the case with most sites where this ware occurs, for example: Ilchester. Pottery from the Bristol, Redcliffe kiln has already been found at Castle Cary, in the form of a fairly simple jug[30], therefore it was no surprise to find a very fine example of decoration from a jug assumed to come from this kiln (illustrated no. 25), very like that of an example in the British Museum[31]. With the occurrence of this ware it was also possible and in fact proved to be the case that there was a market for Ham Green Ware, as several sherds have been identified among pottery from the site. Both of the Bristol wares were initially classed as C/D and D wares, dependent upon the quality of the fabric.

The C and D quartz wares are also seen to compare visually with pottery from Shaftesbury and from a village midway between Sherborne and Shaftesbury, Kington Magna. In the case

[20] Brears, Peter, C. D.: *The English Country Pottery*, Gazeteer—Holnest.
[21] Field, N. H., as in note 6, illustrated vessels: 15, 21 and 40.
[22] Laverstock Report—note 12.
[23] Laverstock Report—note 12, page 143.
[24] Coleman-Smith, R., and Pearson, T., *Donyatt Excavations* (forthcoming).
[25] Dawson, D. R., Jackson, R. G., and Ponsford, M. W.: 'Medieval kiln wasters from St. Peter's, Bristol'. *Trans. Bristol and Gloucester Archaeological Society*, (TBGAS), Vol. 91 (1972), pp. 159-167.
[26] Barton, K. J., 'A Medieval Pottery Kiln at Ham Green'. *TBGAS*, Vol. 82 (1963), 95, pp. 95-126.
[27] Mrs. Merry Ross, SDAG, local publication forthcoming.
[28] Staff of the Salisbury and South Wiltshire Museum.
[29] Verbal, I. Horsey and K. Jarvis: Poole Museums Archaeological Unit.
[30] In Bristol City Museum.
[31] John Cherry, Assistant Keeper, British Museum.

of Kington Magna there is also the occurrence of A and B wares, likely to come from the Sherborne direction and a 'hybrid' fabric, which is a flinty C/D ware and possibly local to the Kington Magna area. It appears that many of the quartz wares must be coming from the Shaftesbury area, or that the two towns are drawing from the same source, with Shaftesbury being the closer to this source. There is close comparison of the fabric and glaze of illustrated vessel no. 3 with a 14th century skillet excavated in Shaftesbury. There are other such similarities which are at present based on visual factors.

The difficulty in defining many of these wares has led to confusion over the precise origin, especially as a suggested source has been the Poole Harbour area, so far unproven by petrological examination. Another suggested origin is the South Wiltshire area, and there is no way at present by which one can differentiate between pottery from the Poole Harbour area or South Wiltshire by simple use of a magnifying glass. Further research has led to further questions which will have to be answered at some stage in the future: is there an identifiable difference between the pottery from the Poole Harbour area and that of South Wiltshire? If so, what is it?

How comparable are the A and B wares of Sherborne with those found at Ilchester—also largely known as B wares?

Stylistically wares compare with pottery from Bristol and Donyatt, is this proven by the petrology?

CONCLUSIONS (BPH)

The petrological analysis of material from Sherborne Old Castle has been the important starting point in what has developed into a study taking in North Dorset and parts of Somerset. Questions have also been posed on matters such as the similarity of pot fabrics found in the Poole Harbour and South Wiltshire areas. The petrology report has not proven any link with the Poole Harbour source yet on visual examination in several cases, after pottery was sent for analysis, this has been the suggested area of origin. With the same sort of visual examination, it also appears difficult, if not impossible, to differentiate between this ware and that from South Wiltshire. Further consideration of this will have to take thin sectioning and heavy mineral analysis into account in order to define any differences.

A fairly simple site like Sherborne Old Castle has proven itself to be at the centre of a complex pattern of trade, of which ceramics will be a very small part. It seems possible that materials are being traded from as far way as 50 miles, as in the case of Laverstock in the 13th century, Bristol in the 14th century and Donyatt from the 13th to the 17th century. The closer a source was to the site the more regular it appears that the supply would have been.

TABLE III

Medieval Pottery Fabrics linked to vessel types—as defined at Sherborne Old Castle

1. Grass tempered ware: total of five sherds recovered. None illustrated.	B.
2. None illustrated.	A, B, C.
3. Hand thrown cooking pots. Nos. 1, 2, 10, 12b.	A, B, C.
4. Wheel made coarse cooking pots[1], largest group. Nos. 11, 12a, c, d, 16.	A, B, C.
5. Pans, shallow bowls, rims like class 4[1]. Nos. 4, 5.	A, B.
6. Handled pans, also some without handles (a and b respectively. a. No. 9. b. No. 8.	A, B.
7. Tripod pitchers. Green glazed, globular. Nos. 17, 18, 19, 20.	B, C.
8. Heavy coarse pitchers, sometimes confused with class 7, glazed, thick walls. None illustrated.	A, B, C.
9. Lighter fine jugs. Glazed and painted. Includes imports. Nos. 21, 23, 24, 25.	(B), C, D, E.
10. Large late medieval to 16th century round jugs. Glazed with accurate combing marks round the girth. No. 22.	E.
11. Large cooking pots, same tradition as class 10. No. 14b.	E.
11a. Lids for the same type of vessel identified above. No. 14a.	E.
12. Late medieval straight sided pans. Nos. 6, 7, 13.	B, E.
13. Utilitarian vessels: like salt cellars, fish dishes, lamps. None illustrated.	A, B, C, D, E.

Further work will certainly extend this range of suggested vessel types, with greater accuracy of dates than can be suggested at present.

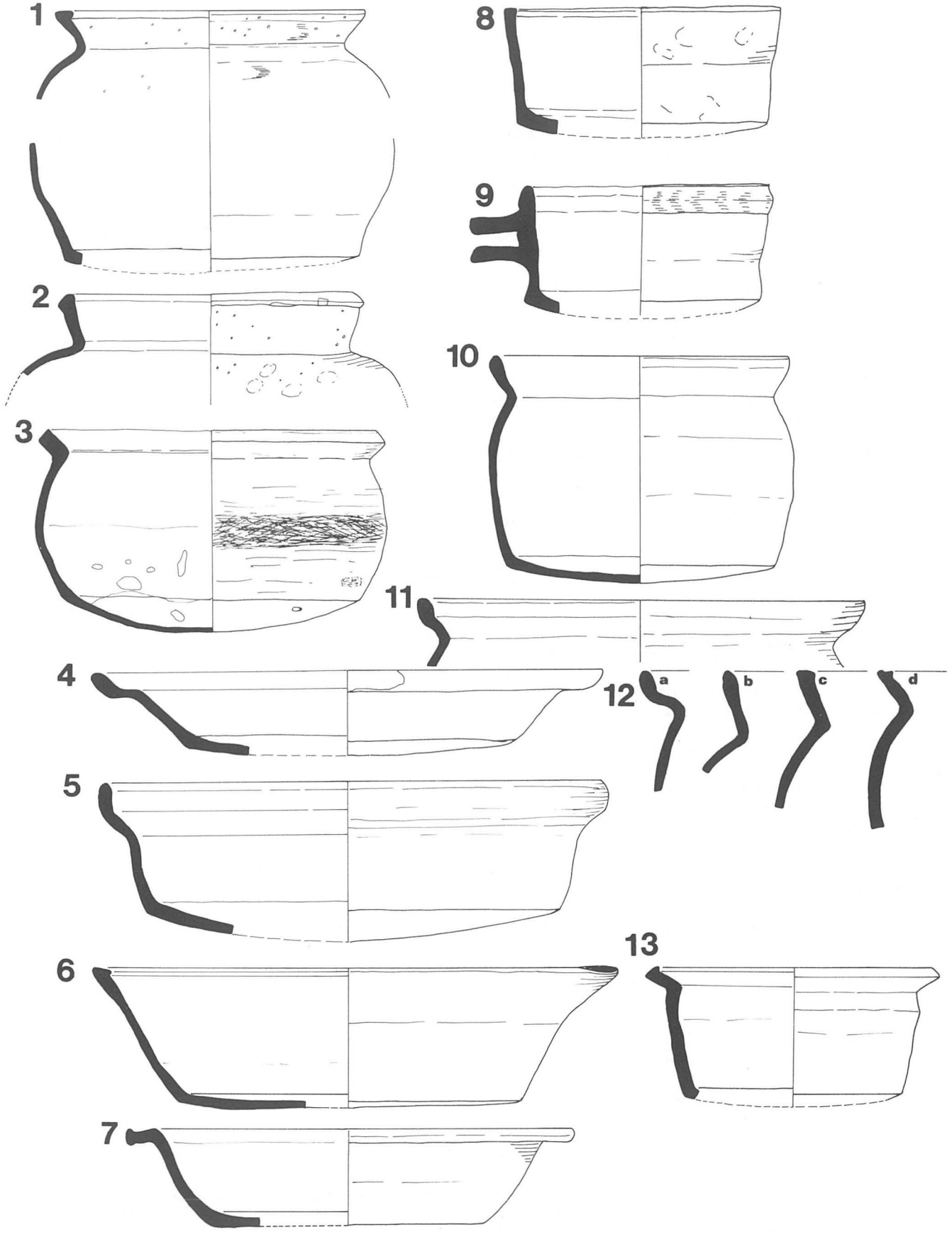


Fig. 45. Sherborne Old Castle: medieval pottery nos. 1-13, at quarter reduction.

No. 1. Early cooking pot. Not entirely typical of the area. Unglazed. Fabric: A to B ware, with some noticeable subangular quartz in the fabric. Unstratified.

No. 2. Class 3 cooking pot, light brown to orange colour throughout. Unglazed. Fabric: C ware. 12th century.

No. 3. Class 4 cooking pot, similar colour to No. 2 above. Glazed inside. (Comparative with Shaftesbury vessel.) Shallow scratch marks around the girth. Fabric: C ware. 14th century context.

No. 4. Typical shallow bowl, or pan, class 5. Unglazed. Fabric: B ware. From 13th century context.

No. 5. Another shallow, class 5, bowl, although slightly deeper than 4. There are traces of cereal food remains in the bottom. Fabric: B ware. 13th century context.

No. 6. Class 12 later pan in a harder fabric, with some gritty glaze inside around the base. Slight lip at one point of the rim. Fabric E ware, with some flint. 15th century context.

No. 7. Smaller class 12 pan. Some internal glazing. Fabric: E ware with some flint. 15th century context.

No. 8. Small class 6b pan. Completely unglazed grey ware with burning traces. Fabric: A ware (From C. E. Bean excavated material). Late 12th century.

No. 9. Small class 6a handled pan. Unglazed dark grey exterior, with a bright orange interior. Fabric: A ware. Same context as No. 4. Very coarse, hand finished.

No. 10. Small class 4 cooking pot from amongst the C. E. Bean material. Unglazed, with soot on the outer surfaces. Fabric: B ware. 13th century.

No. 11. Class 4 cooking pot rim, with possible lid seating. Generally grey to brown appearance. Fabric: B ware. Later 12th to 13th century.

No. 12. General examples of different cooking pot rims, with diameters similar to that of No. 11.
a. Late 12th to 13th century example. Fabric: B ware.
b. C ware rim. 12th to early 13th century date.
c. C ware, with some flint. 12th to early 13th century date.
d. E ware, hard fabric. Late 13th to 14th century date.

No. 13. Very small class 12 vessel. Fabric: E ware, with very little flint. 14th to 15th century.

No. 14. a. Class 11a lid. Fabric: E ware, very much of a layered texture, with small holes. Two at least found on the site in 14th to 15th century contexts. b. Class 11 cooking pot, which matches 12a above in diameter and fabric, E Hermitage-type; both are clearly marked with accurate combing.

No. 15. Small pot, within the class 11 group, being of the same tradition. Fabric: E ware. Probably 15th century.

No. 16. Section of class 3 cooking pot. Fabric: A ware, with applied strips. Food traces inside. 12th century.

No. 17. Section of class 7 tripod pitcher. Light green glazed ware. Fabric: B ware. Early 13th century date.

No. 18. Upper part of class 7 pitcher. Olive green glazed. From C. E. Bean excavations from a late 12th century context. B ware, with applied strips and vertical combing marks.

No. 19. Upper section of class 7 pitcher. Light green glazed. Fabric: B ware. Combed decoration; late 12th century context.

No. 20. Tripod pitcher spout. Olive green glaze. Fabric: C ware. Late 12th to 13th century.

No. 21. Class 9 fine jug. Decorated with horizontally combed lines, just below the neck; white paint lines at various points, a thumbed strip around the top of the neck and glaze probably applied with a brush. Rather globular appearance, with a flat base. Fabric: E ware. Late 14th century to 15th century.

No. 22. Very large class 10 jug. Very little splashed glaze. Fabric: E ware. 15th century.

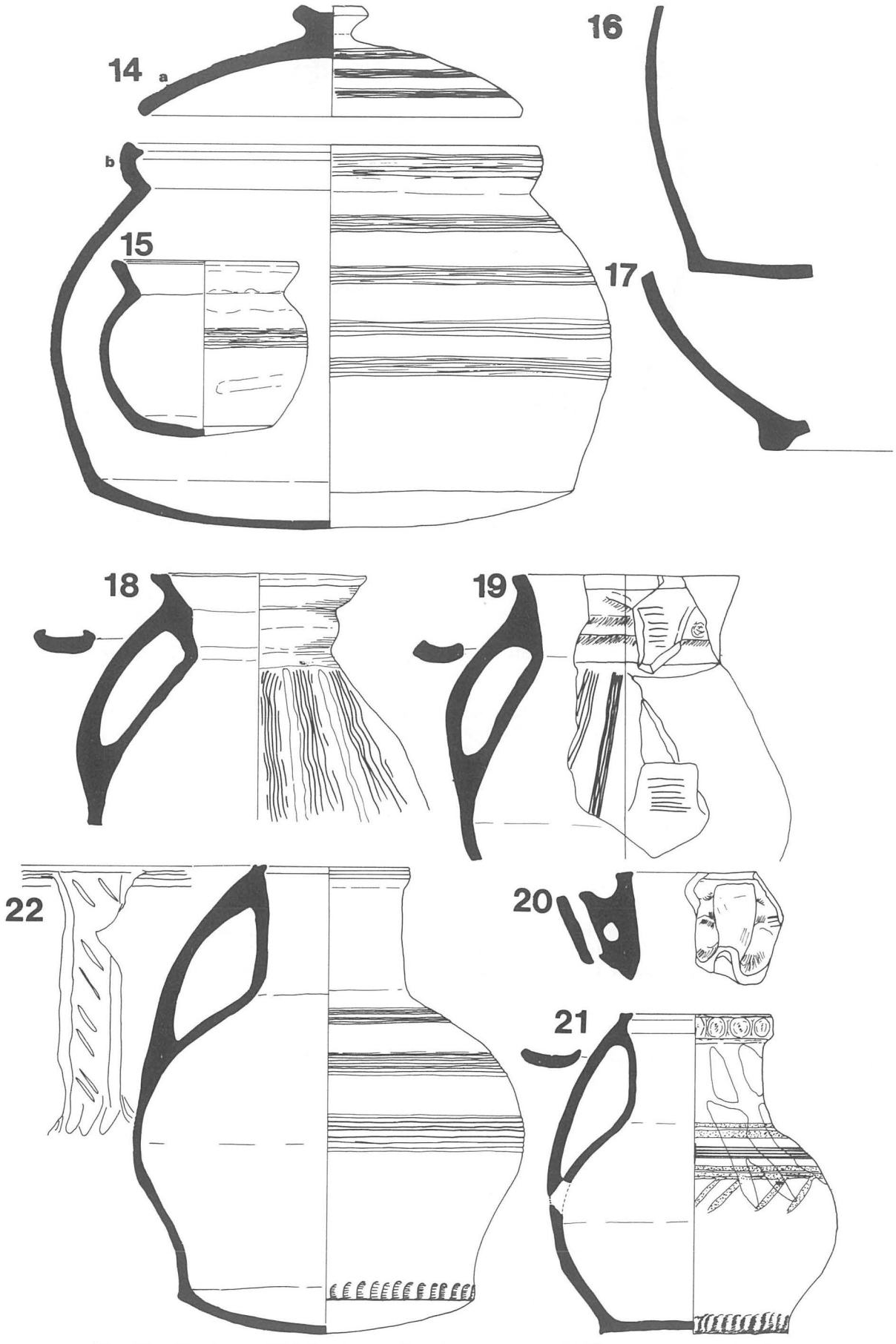


Fig. 46. Sherborne Old Castle: medieval pottery nos. 14-22, at quarter reduction.

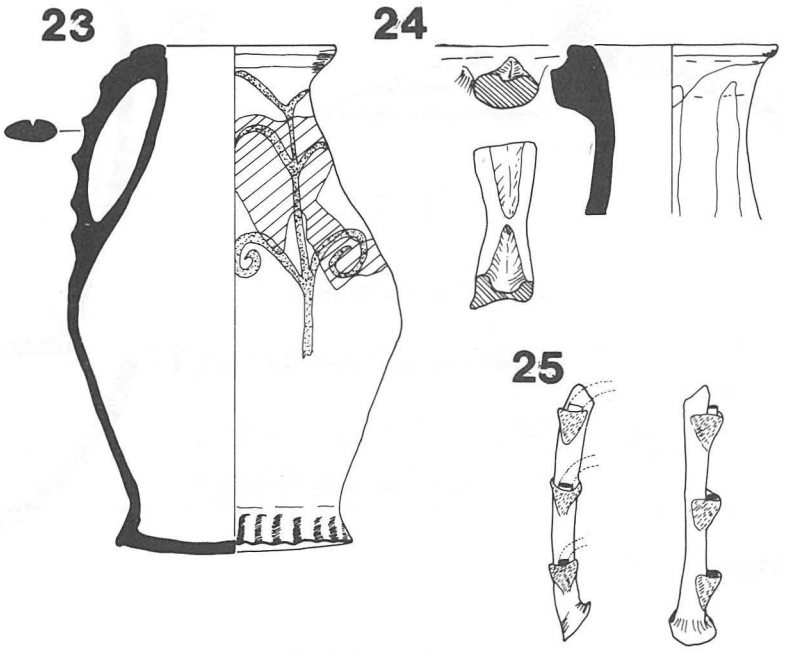


Fig. 47. Sherborne Old Castle: medieval pottery nos. 23-25, at quarter reduction.

Fig. 23. Class 9 with paint decoration, glazed over the top. Fabric: E ware. 14th century.

No. 24. Neck fragment of a class 9 Donyatt ware jug. Very hard fabric. Late 13th, but more likely to be 14th century.

No. 25. Fragment of 14th century decoration, possibly from around the neck. Light green glaze, with red clay used for some of the decoration. Assumed to be Bristol Redcliffe ware.

BPH. would like to thank J. G. Hunt and J. Musty for reading the typescript and commenting on it.

General Bibliography

Shephard, A.: *Ceramics for the archaeologist*, (Carnegie Institution of Washington) (1954).
Hodges, H.: '*Artifacts*' (1964), Chapters 1, 2 and 18.
Harris, E. C.: 'The stratigraphic sequence: a question of time', *World Archaeology*, Vol. 7, No. 1 (1975).

This report is published with the aid of a grant from the Department of the Environment.

THE VERWOOD POTTERIES

DONALD YOUNG

This article was submitted for publication in 1974, and it is here published as submitted, merely with the addition of a list cross-referencing the kiln site numbers (Young on the list) to those in The Verwood and District Potteries *by David Algar, Anthony Light and Penny Trehane (1979) (A.L.&T. on the list). Although there is a little duplication between this article and* The Verwood and District Potteries, *it was felt that there is a great deal of new material in this article, which justifies its publication. The author died in April 1980.*

Introduction

The history and extent of pottery making in East Dorset has long been an interest to the author, and active investigations began at Verwood in the summer of 1972. With the assistance of the Dorset County Museum, contact was made with Miss Marjory H. Bailey, the daughter of the late Herbert John Bailey the last Verwood potter, and this account developed as a result of her enthusiastic help and co-operation.

Miss Bailey has a fine collection of pottery wares, most of which were made by her father, also photographs pertaining to the industry in Verwood, and a wide circle of relatives and friends including several with first hand knowledge of pottery manufacture. Much information was forthcoming from all these kind people, and a small collection of traditional type pottery was presented by them to the County Museum.

Documentary research followed which, in additon to revealing useful primary sources, also turned up a substantial but unpublished thesis by J. Sims, a short article published by J. P. Kendrick, and other items by J. Musty and Miss K. S. Woods, all of which have been drawn upon in compiling this account. Selective fieldwork on some of the remaining kiln sites produced a quantity of sherds from which a provisional type-series of nineteenth century pottery has been built up, and minor excavation has enabled a tentative diagram to be made of the traditional wood-burning kiln.

This account, by drawing on the most readily available evidence, is inevitably focused on the recent past. However, it is abundantly clear from the documentary records that there remains much to be discovered in the field, perhaps not at Verwood, where extensive development has taken place, but in the surrounding countryside where the memory of the potter's trade still lingers, and where the clay lies in abundance, stretching eastwards to the sites of the Roman kilns in the New Forest, eight miles from Verwood. Pottery and brickmaking are natural industries for this area, and offer a rich field for future research.

Topography

Old Verwood was a scattered heathland village mainly concerned with agriculture, but for hundreds of years also one of a group of settlements producing simple pottery wares for the outside world. The Tythe Map of 1847[1] shows the ancient form of the village with each dwelling surrounded by its holding of a few tiny fields won from the wild heath and woodland. Settlement here probably originated as a result of medieval expansion, since it is not recorded until 1377, when it was known as Fairwoud.[2] There was a chapel-of-ease on an unknown site here in medieval times, but this was ruinous and had all but disappeared by the mid-seventeenth century; ecclesiastical affairs were administered from Cranborne until the present church was built about 1830 on land presented by William Fryer of Wimborne.[3]

At the pottery sites three kiln mounds and some old mud-walled buildings survive, together with several of the cottages which were once the homes of the potters. The mounds are on the

[1] Verwood Tythe 1847. Dorset County Record Office, Dorchester (DCRO).
[2] A survey of moorlands near Verwood, by Heywood Sumner, *Proceedings*, Vol. 54, 1932, pp. 233-256.
[3] Hutchins' *History of Dorset*, Third Edition, 1869.

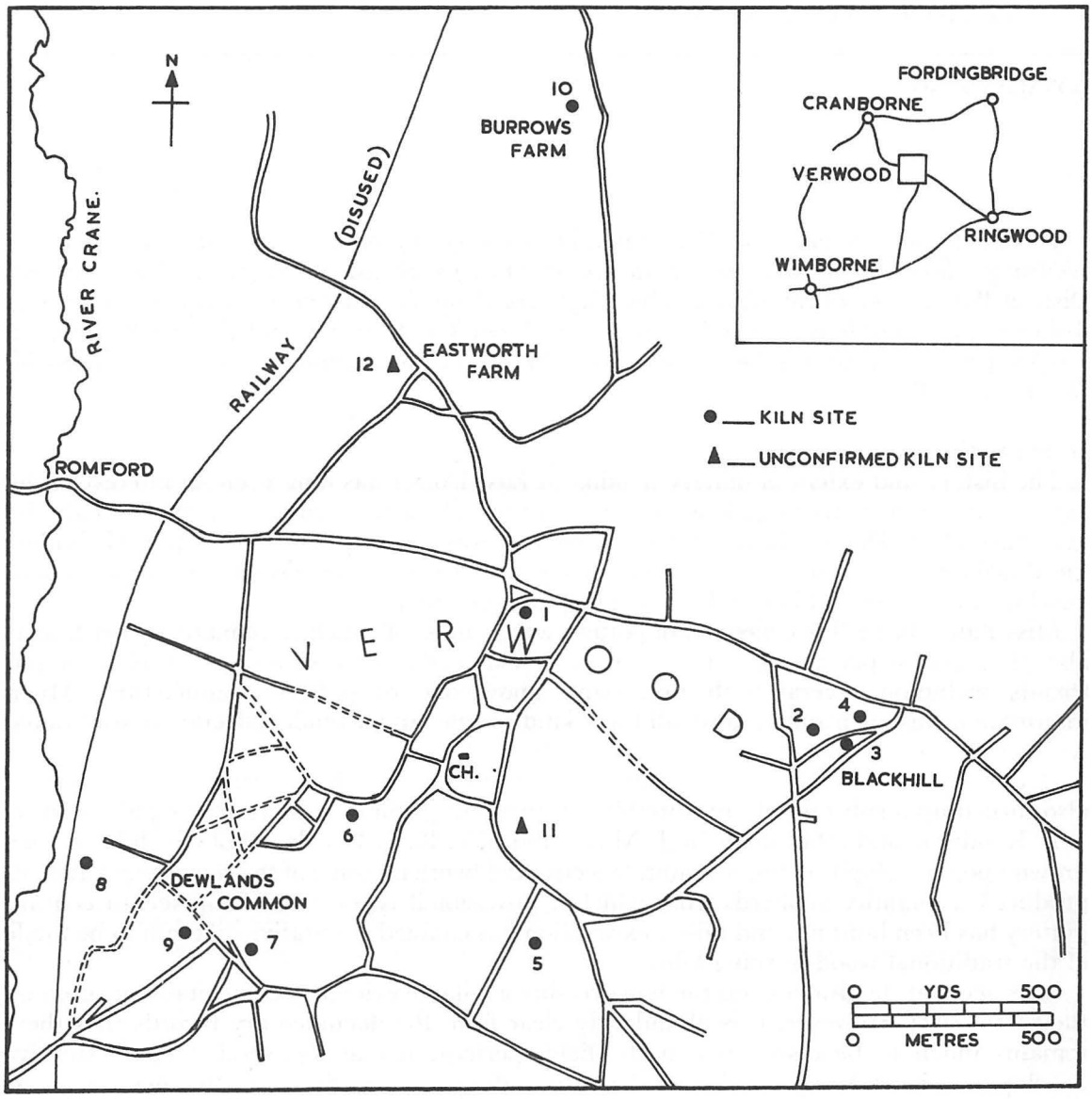


Fig. 48. Verwood, showing the location of known and probable kiln sites.

properties now known as Moor Lodge (SU 094088), Sandalholme (SU 079082) and Prairie Farm (SU 075084) (Fig. 48, sites 4, 7 and 8). All that is visible are mounds of earth about the size and shape of prehistoric round barrows overgrown with bracken and trees, and with little to confirm their identity beyond the presence of many sherds of pottery and the few small buildings nearby in which the pottery was once made and stored.

These buildings are mainly single storied, long and narrow, with walls built of a mixture of mud, clay and chopped furze, and roofed with slate, thatch or sheet iron. At Sandalholme (site 4) and Prairie Farm (site 7) the walls contain many pottery sherds, and at the former the horizontal lines of the shuttering used to form each 'lift' during the construction can still be seen. A building at the Cross Roads Pottery (site 1), also of mud wall construction, is of two stories with a tiled roof. Here the wares were made on the ground floor and the upper storey was used for drying and storing pots before firing. Other single storied buildings remain intact in the gardens of Purbeck House and Moor Lodge in the Blackhill area (sites 3 and 4). Some of these mud walled buildings are almost certainly a hundred or more years old and have withstood time and weather extraordinarily well.

Mud walling is a craft once extensively practiced in the Dorset heathland and the adjacent New Forest area, and Heywood Summer, writing in 1924, gives an account of the technique

derived at first hand from a local builder at Sutton Holmes.[4] Many mud walled houses and cottages survive today throughout the area. One of these is Pottery Cottage at the Cross Roads Verwood, which was formerly the home of the potter Herbert Bailey. Here the rendered mud walls are as straight and upright today as when they were built more than a century ago. In Burnbake Road is a similar cottage, formerly the home of another potter, Mesheck Sims, whilst the cottage at Prairie Farm now belonging to Mr. T. Kershaw is probably of eighteenth century origin with a major nineteenth century addition, and was the home of the Henning family of potters.

Verwood is now an expanding dormitory area for Bournemouth and Poole, and new estates are rapidly filling up the open spaces in the village. Many of the old cottages are well cared for, but the remains of the potteries are now largely ignored, neglected, and in constant danger of decay and destruction. A kiln mound was demolished at Purbeck House Blackhill (site 3) in 1972, and a new estate is about to be developed which will destroy the rural isolation of Margards Lane to within a short distance of the Sandalholme kiln (site 7), and will ultimately threaten the kiln site itself.

The other sites inspected in 1972 (Fig. 48, sites 2, 5, 6, 9, 10) do not appear to retain any substantial relics of their former use, and site 11 is included only because the field name, quoted in the 1847 Tythe Schedule as 'kiln ground' strongly suggests the former presence of a pottery. A kiln mound used to exist at Eastworth Farm (site 12) and was recalled a few years ago by a local resident Mr. Bob Sims. It is recorded here as an unconfirmed site because the location, given as 'opposite Eastworth Farm' is uncertain.[5]

History

Pottery was produced in at least five places in the Cranborne area: Alderholt, Daggons, Crendell, Eastworth and Verwood. All were in Cranborne parish until the late nineteenth century, and all formed part of the Cecil family estates.

The earliest reference to pottery manufacture relates to Alderholt in 1503-4 when seven residents were fined for taking clay and heath from the Common to make and burn pots. In the 1520s there were several presentments at the Manorial Court for taking clay for an unspecified purpose from Crendell Common. Later, licences to do so for pottery making were granted. In the mid-1600s the Henning family were potters at Alderholt, and by 1743 there were eighteen potters mentioned in the Clay Rentals. By the time the Tythe and Enclosure Award Schedules were compiled in 1847 and 1858, there were only five potters left at Alderholt, and the industry seems to have died out here between about 1870 and 1900. One of the few remaining pots from this period is a pitcher owned by Mr. S. Read of Sandleheath near Fordingbridge, which is inscribed 'Samuel Read Alderholt Dorset Aug 30th 1869'.[6]

At Crendell in 1530 John Gould was licensed to dig clay, but it is not clear whether he was a potter or a brick and tile maker, or even if he was a local resident. A fascinating map of this area drawn in the early seventeenth century shows 'pitts of potters clay' on Crendell Common with ten cottages nearby.[7] These cottages have long since vanished, and the site is now woodland, but it seems highly probable that there were kilns here, particularly as in 1708 John Vincent of Crendell describes himself as a potter in an Agreement for renting farm land, and there are other references to potters in 1716 and 1799. In the early nineteenth century the Fry family were potters here, as was James Vincent (a descendant of John?) in 1810, and James Thorne in 1844. In 1861 the name of James Shearing appears in the Census Returns, and in 1880 John Shearing, probably the last potter in Crendell, appears in the Trade Directory. An old kiln marked on the 1902 OS map may have been his. Unfortunately it was demolished to make way for new farm buildings about ten years ago.

Potteries at Daggons seem to have operated from about 1670 to 1830 or later, together with brickworks. The potteries are marked on Greenwood's Map of Dorset (1825), but nothing is

[4] *New Forest* by Heywood Sumner, 1924.
[5] Noted in *Heath Potters in the Cranborne District* by J. Sims.
[6] In this section the historical background prior to approximately 1700 has been taken from *Heath Potters in the Cranborne District* by J. Sims. The Alderholt pitcher was seen by the present author in 1969.
[7] Photocopy of Map 476 from Cecil Papers, DCRO.

known of their history or products, which might have been drainpipes, architectural and horticultural wares rather than domestic pottery.

There have been potters at Eastworth, now part of Verwood, possibly since the 1620s, and certainly from the late 1600s when Thomas Sims worked here. Sims died in 1707 but his family continued the business until at least 1780 when his descendant and namesake, also a potter, made his will. There are still Sims living at Eastworth Farm, although whether they are directly related to Thomas is not known. As recently as 1935 the farm included a kiln and other pottery buildings.[8] Another family of potters named Foreman appears in the Clay Rentals along with the Gibbs family from 1663, but neither are confirmed as resident in Eastworth before 1695. The will of Henry Foreman, potter of Eastworth, which was made on 13th November, 1728, is the last known record of this family.

The earliest direct reference to Verwood is the will of James Thorne 'of ffayerwood in the p(ar)ish of Crandborne, potter' in 1682.[9] Later, in the 1720s, a potter member of the Henning family of Alderholt appears here and his successors are recorded until 1861, although it is believed they ceased potting about 1840. The Henning pottery was at Prairie Farm (site 8) which is just in Horton parish, but on the east side of the River Crane and thus geographically on the outskirts of Verwood village, to which it is linked by a network of lanes and paths.[10] Pottery from this kiln has been recovered and is recorded later in this report.

Other potter families in Verwood were the Hurles who are recorded in 1724, the Shearings, a large family with several branches known to have been potting from at least 1821 to 1903, and the Andrews who were working another kiln on Dewlands Common (site 7) from before 1841 to about 1906. The present owner of this site, Mr. D. Scriven, has lived there for about twenty-eight years, and recalls a former local resident who, as a boy at the turn of the century, was in the habit of sleeping at the pottery during the winter when the kiln was burning because it was warmer than at home.

The Bailey family is first recorded in the trade at Verwood with James Bailey, potter, born in 1795, and continues until the retirement of Herbert J. Bailey in 1952, but the family relationships are not known. Finally, members of the Sims family, long established in Verwood, appear to have become potters in the late nineteenth century, and Fred Sims ran the Cross Roads Pottery in the centre of the village from the early 1900s until 1925.[11] Another branch of this family has already been mentioned in connection with Eastworth.

There were five potteries in Verwood in 1847 which were worked by Henry Shearing, Robert Shearing, James Bailey, Thomas Bailey and Henry Andrews.[12] The locations of these are Fig. 48, sites 6, 1, 4, 5 and 7 respectively. By the turn of the century the industry had reached its peak. The Trade Directory lists six potters in 1885 and seven in 1903, but this fell to four by 1911, three by 1915, and to one—the Cross Roads Pottery (site 1) by 1920. This decline arose from several causes: the gradual replacement of pottery by tinned sheet iron wares, and cheap enamelled bowls for domestic and dairy use (e.g. wash pans, jugs, cream setting pans, etc.), and improved transport by rail and road leading to greater penetration of rural areas by competitive factory-made ceramics.[13]

Following this decline in demand for functional ware came the First World War which halted the developing trade in 'art' and horticultural wares, and absorbed the men into the armed services. A pottery at Truro in Cornwall very similar in character to Verwood lost six of its nine men this way, and they were not immediately replaced when the war ended. At Verwood however, in 1921-22 it was reported by a visitor that the one remaining pottery was flourishing, and the hardworking proprietor, Fred Fry, was himself teaching apprentices the trade and had hopes of expanding the business.[14] Alas, his hopes did not materialise, he sold up a few years later in 1925, and for a while the pottery ceased to function and the Verwood tradition seemed to have come to an abrupt end.

The purchaser was Robert Thorne, a timber merchant of Verwood, and he had no direct interest in the pottery business. There was, however, a considerable stock of wares, and this

[8] Vesting Assent relating to Anna Sims, 1935, Dorset County Council Archives.
[9] Will of James Thorne of Verwood, DCRO, W1682(BC).
[10] Horton Tythe 1841, DCRO.
[11] From sale catalogue of Cross Roads Pottery, 1925, in possession of Mr. Kenneth Thorne, Verwood, and Trade Directories.
[12] Verwood Tythe 1847, DCRO.
[13] Miss M. H. Bailey of Verwood, *The Verwood Pottery* by T. P. Kendrick, *Rural Crafts* by K. S. Woods.
[14] *Rural Crafts* by H. E. Fitzrandolph and M. Doriel Hay, and author's manuscript. Also Miss K. S. Woods of Oxford.

Fig. 49. This photograph, taken in 1927, shows the employees at the Cross Roads Pottery with a display of some of their wares. From left to right are: Jim Scammel, Herbert John Bailey (potter), Mesheck Sims (potter), Alfred J. Sims and Harold A. Churchill. The pottery includes large two-handled vases marked at three shillings each, tall vases, bedroom sets, bird baths and rustic pots on pedestals, candlesticks and a casserole. Another photograph taken at about the same time but not reproduced here shows a collection of the pans and pitchers of traditional forms which were still in production.

Fig. 50. Most of the wares in this picture were made by Herbert Bailey at the Cross Roads Pottery in the 1920s and 1930s. Amongst the items shown are jugs, pancheons, bowls, plates, posy rings, a butter dish, ash trays, a money box dated 1921 and a bowl belonging to 'Bonzo', Mr. Bailey's dog, who lies buried a few yards from where this photograph was taken. Most of the pottery is now owned by Miss M. H. Bailey.

was being sold off. The continuing demand impressed Mr. Thorne's son Horace and his wife, and with their father's consent they arranged for work to restart. This is probably when one of the best-known of the Verwood potters, Mesheck Sims (1878-1960) came to the Cross Roads as a potter having previously worked for his father Seth Sims elsewhere in Verwood, probably at Blackhill.[15] This reprieve gave the Cross Roads Pottery another quarter century of life.

Trade varied during the 1920s and 1930s, and several temporary closures were experienced. These were due to fluctuations in demand and to bad debts incurred by the hawkers who still formed the principal trading outlet, although the Thornes themselves took some of the wares to the shops in Bournemouth and elsewhere.[16] In the early 1900s there were about a dozen hawkers selling Verwood pottery and besom brooms made at Verwood and Three Legged Cross. They bought in bulk and travelled the countryside with horse and waggon selling direct to householders as well as to local shops. They ranged from Dorchester to Shaftesbury, Salisbury, Wimborne, Bournemouth and Southampton, and would commonly be away from Verwood from Monday morning until Saturday evening, being careful however to be home in time for church or chapel on Sunday. Their wanderings were referred to locally as 'going on a journey', and in the hard times between the wars, financial credit was often provided by the pottery to enable them to keep going. This system of trading seems, naturally enough, to have been at its peak in the early 1900s at the time when the potteries were enjoying a prosperous period, and it continued into the motor age with vans replacing the horses and waggons, the journeying being thereby reduced to daily runs. At least one potter from Dewlands Common appears to have sold his own wares. He had a waggon covered with a canvas tilt in the manner of a carrier's cart, and he made regular journeys in the early 1900s, going as far as Yeovil to sell his jugs for 6d. and 1s. each, and large pans for 2s. 6d. and 3s. 6d. On his return journeys he would bring Vinney cheeses from the outlying farms and sell them in Bournemouth.[17]

The range of pottery produced in the 1920s and 1930s was very wide (see Figs. 49 and 50). The traditional large pans, pitchers, bowls, jugs and harvest jars continued to be made, as indeed they were until the pottery closed in 1952. There was also a range of rhubarb and seakale pots and 'rustic' garden vases, whilst on the domestic side ornamental flower baskets and bowls, posy rings, candlesticks and bedroom sets (including chamber pots allegedly 'made to measure') were introduced. Other new items were perfumed wares, 'fancy lines' the potters called them, which were small unglazed pots, either impregnated with perfume essence or used as containers for pot-pourri, a mixture of dried sweet-smelling herbs and flowers. These were prepared at a perfumery at Broadstone and sold at Liberty's store in London.[18] The perfumery—Rivers Hill & Company, grew acres of lavender, white roses, rosemary, thyme, etc., at Lavender Farm, Corfe Mullen, and had a distillery in an old chapel at Broadstone. The vogue for these scented pottery trifles had arisen on a national scale during the First World War, and they were being produced very cheaply by many potteries including the Art Pottery at Poole which used Verwood clay, and at least one pottery in Devon which employed fifty people mostly women and juveniles. Their wares were sold at seaside resorts at 6d. and 1s. each, and quantities were shipped to the Colonies. Some were decorated with slip, oil paint or even transfers and paper coats-of-arms. The shapes were simple and the wares popular because they were inexpensive and novel. The market for the Verwood products, which as far as is known were undecorated, was probably along the South Coast, but no examples have yet been traced.[19]

Perfume Bricks were also produced at Verwood at this time. These were miniature clay bricks smaller than a matchbox, each moulded separately in a brass mould and stacked inside an inverted pan lid for firing, after which they were impregnated at Broadstone with perfume—probably lavender water—and used in the domestic linen cupboard. These bricks

[15] Miss M. H. Bailey, Mr. Kenneth Thorne, Mr. Alfred Sims, all of Verwood. *Heath Potters in the Cranborne District* by J. Sims. *Water Mills on the River Bourne* by J. Musty.
[16] Miss M. H. Bailey, Mr. D. Scriven, both of Verwood.
[17] As Ref. 16 above, also Miss J. Robson of Bournemouth and Trade Directories.
[18] From published photographs and others in possession of Miss Bailey and Mr. Alfred Sims both of Verwood.
[19] As Ref. 14, also Lavender Farm, Corfe Mullen by Olive Knott, *Dorset Year Book 1956-57*, and Trade Directories.

probably originated well before the First World War. Miss Bailey's grandfather Samuel Bailey, who was a potter *circa* 1885-1911 made them, but presumably not until after 1907 when the Perfumery at Broadstone was established, and Mr. A. Sims remembers they were still being made in the 1920s.[20]

It was early diversification into these new lines which probably enabled the Cross Roads Pottery to carry on after others with a less flexible outlook who clung to their traditional products had been forced out of business. In the early years of this century when Herbert John Bailey (1888-1966) first started work at the age of 13, there was a labour force of ten men and boys using two wheels. In the early 1920s there were still eight including the proprietor, by 1926 there were about five, and in the early 1940s this dropped to two, Mr. Bailey and his assistant Alfred Sims, both of whom continued working until the Pottery closed in 1952. Mesheck Sims, with whom they had worked for so long, retired in 1943.[21]

During the years 1948-1950 an attempt was made to introduce a new line of high quality pottery aimed at a wider and more sophisticated market than the traditional wares. An experienced studio potter, Miss Gertrude Gilham, was brought in from Poole where she had just completed 29 years with Carter's Pottery. At Verwood she created a new and distinctive range of wares using clay from Stoke (Staffordshire) finished with matt glazes. She worked in a separate room in the Pottery, using a powered wheel and an electric kiln. Her methods were different from those of Herbert Bailey and Alfie Sims, and caused a few raised eyebrows, but she was accepted by, and on very good terms with both of them, and was permitted to try her skill on the traditional Verwood pole-driven wheel with Mr. Sims as assistant.

Miss Gilham realised that the traditional pottery was being underfired in the big wood-burning kiln, and consequently was not developing its proper hardness and beauty. On one occasion she stayed at the Pottery all night and persuaded the men to fire the kiln at a higher temperature than usual. They were understandably concerned for the fate of their precious load of pots which represented several weeks work, but the experiment was a success, the wares had a distinctly better 'ring' when tapped, indicating that they were much harder and less porous and the colours were richer and darker. Some of these pots were subsequently exhibited at a local show and attracted favourable comment.

Miss Gilham's stay at Verwood was limited to about eighteen months, during which time she produced coffee sets, bowls, jugs, mugs, etc. Much of her work was sold through Heal's of London. On one occasion an order worth £280 was obtained and the future seemed bright, but personal differences with the Thornes led to dispute, and she left about the middle of 1950. None of her Verwood-made pots have been traced, nor are any photographs available. During this period much of the pottery, probably including that made by Miss Gilham, was impressed with a distinctive 'Verwood' mark. Herbert Bailey continued to make pots until the Pottery closed for the last time in 1952.[22] The kiln was then demolished and a new bungalow 'April Cottage' was built on the site. Only the pottery manufacturing building and a storage shed—still containing a few pots—now survive. Herbert Bailey died in 1966 aged 78, but his assistant Alfie Sims still lives in Verwood.

Dating the Kilns

The remaining kiln mounds are difficult to date precisely, and it has not proved possible to estimate their life span. There seems no reason why the brickwork should not have been renewed indefinitely, thus the mounds and therefore some of the pottery sherds they contain might already have been very old when production ceased.

Of the three kilns examined, Moor Lodge (site 4) and Sandalholme (site 7) were operating in the early years of this century,[23] but Prairie Farm (site 8) probably ceased work about 1840. The evidence for this is principally derived from the 1841 Tythe Award for Horton parish, in which the property is described as a house and buildings, and not as a pottery. This is in contrast with the clear identification of the potteries listed in the Verwood Tythe. The

[20] Examples and information from Mr. Alfred Sims, Miss Bailey, Mrs. B. Brewer and Mr. F. C. Bailey, all of Verwood.
[21] Miss M. H. Bailey and Mr. Alfred Sims both of Verwood supplied information and photographic evidence. Mr. Thorne of Verwood was able to recall the approximate date of Mesheck Sims retirement. Other evidence obtained from *Rural Crafts* by H. E. Fitzrandolph and M. Doriel Hay, and *The Verwood Pottery* by T. P. Kendrick.
[22] Miss G. Gilham of Poole and Miss M. H. Bailey, Mr. Alfred Sims, Mr. K. Thorne, all of Verwood.
[23] Miss Bailey, Mr. Alfred Sims, both of Verwood.

occupier of site 8 at this time was Richard Henning, aged 69. He had been listed as a potter in the 1821 Census Returns, but described himself as a yeoman in his will which was made just before his death in 1843. He was a man of some substance, leasing a considerable amount of land and several cottages in Verwood which he left to his four sons at his death. This suggests that the pottery was only one of his interests, and was possibly abandoned late in life when trade was bad, and not resumed by any of his sons, although the youngest, John, occupied the property until at least the 1860s.

The gap between 1821 when the pottery was working and 1841 when it was not, can probably be narrowed considerably because one of Richard's other sons, Job (or Joab) spent a month in Dorchester Gaol in 1839 for trespassing and poaching, and he was then described as a potter, whilst in 1849 he is described in his father's will as a labourer.[24] Assuming that Job worked for his father, this strongly suggests that pottery making ceased between 1839 and 1841, and this view is reinforced by examination of the site. The kiln mound now has three large trees growing on its slopes, and one of these is an oak with a girth of 124 inches, which by virtue of its position 15 feet from the mouth of the kiln, must post-date the last firing. This tree is estimated to be 120-150 years old, which is consistent with the documentary evidence.[25]

Manufacturing Processes

For over 450 years clay for the manufacture of pottery, tiles and bricks was taken from tertiary deposits in the Crendell-Howell-Alderholt area, a few miles east of Cranborne village.

The earliest references relate to Alderholt Common in 1503 and Crendell Common in the 1520s. The latter, in constant use in the seventeenth century, was exhausted by about 1742 and new workings were opened a little further westwards in the vicinity of Pye Lane, where clay was first dug in 1726. During the hundred years up to the mid-eighteenth century, the potters had often been before the Manor Court at Cranborne for failing to fill up the abandoned clay pits and for damaging and obstructing the highway through Crendell which at that time was the main route between Cranborne and Fordingbridge.[26]

The workings gradually moved westwards from Pye Lane into what is now woodland but marked on the 1900 edition of the OS maps as Old Claygrounds. Part of this area was in use in the early and middle decades of the nineteenth century, and the surface beneath the trees is still pockmarked with the pits and hollows of the old diggings. In the latter part of the nineteenth century and in the early twentieth, pits at Jordan Hill west of Old Claygrounds were in use. One of the potters on Dewlands Common obtained both clay and timber for fuel from here, and it was also serving at least one brick kiln at Cripplestyle.[27] The only reference to the quantity of clay being taken is in 1694 when each potter took twenty cartloads per year.[28]

The Cross Roads Pottery at Verwood had its own clay pits in the late nineteenth century. These were situated a few yards north of the pottery in the triangular plot of land which is now used as a car park. Later, supplies of plastic yellow clay came from a tile-making yard in the village, and in the mid-twentieth century from a brickyard at Corfe Mullen, but the best clay came from Holwell Farm where a seam three to twelve inches thick and six to seven feet below ground level was worked. The blue-grey clay was dug out and the land backfilled so that no surface traces remain today. Mr. Alfie Sims remembers the clay being carried the six miles to Verwood in a waggon. The route involved the ascent of Roke Hill on the Cranborne to Fordingbridge road, for which extra horses were required. If these were not available, only half a load could be carried and double the number of time-consuming journeys had to be made.[29]

[24] The documents referred to are in DCRO. The deductions are from *Heath Potters in the Cranborne District* by J. Sims.
[25] This estimate was arrived at in consultation with a tree expert in the County Land Agent's Department Dorset County Council.
[26] Mainly from *Heath Potters in the Cranborne District* by J. Sims. The diversion of the main Cranborne to Fordingbridge road is noted in *The Old Roads of Dorset* by R. Good.
[27] The mid-nineteenth century workings are noted on the Cranborne Tythe Map 1844, DCRO. Clay digging at Jordan Hill and Holwell Farm was confirmed by Mr. Alfred Sims and Mr. D. Scriven, both of Verwood, and Mr. S. R. Read of Sandalheath formerly of Alderholt.
[28] *Heath Potters in the Cranborne District* by J. Sims.
[29] OS Map 1886, and personal recollections of Mr. Alfred Sims of Verwood.

When the clay arrived at the Cross Roads Pottery the raw lumps were stacked in a shed until required, then soaked in water in a shallow pit in the corner of the pottery building for about three days before being spread on the brick floor which had previously been coated with a thin layer of sand. The clay was then worked by treading with bare feet. By this means it was made uniformly plastic, the sand was incorporated into the body of the clay and small stones and other impurities located and removed. The 'treader' used a stick to steady himself on the slippery clay, and another with a nail in the end as a tool for cutting it into strips which were then rolled up. This process of sanding, treading and rolling was repeated three times to secure the correct degree of tempering and an absolutely even texture, after which the clay was passed through a pug mill which two men turned by hand. It was then in a workable condition ready for weighing off into balls of various sizes according to the work in hand.

Fig. 51. The potter in this picture, taken in 1927, is Herbert Bailey and his assistant is Harold Churchill who still lives in Verwood. They are making flower pots on the primitive pole-operated wheel.

All the traditional wares at Verwood were made on the wheel using a minimum of additional equipment. The profiles of the pots were judged by eye, no templates or formers were used, only a stick set in a lump of wet clay on the frame of the wheel to act as a height gauge. The type of wheel normally used at Verwood was rotated by the potter's assistant via a pole attached to the throw of the crank on which the wheel-head was mounted (Fig. 51). Alfred Sims was assistant to Herbert Bailey for twenty-two years, and performed this duty along with many others. An understanding grew up between the two men so that a raised eyebrow or a slight nod of the head was sufficient signal to change the speed of the wheel according to the stage reached—fast for centering the clay, and slower for drawing up and for finishing a rim. Often no signal was needed at all and work could proceed for hours at a time without a word being spoken. In all the years they worked together there was never any friction between them, friends said they could never quarrel as they hardly ever spoke!

In later years a modified type of wheel was used which incorporated a rotating handle driving the wheel head via a bicycle chain and gearing instead of the pole. The employment of

two men at the wheel enabled the potter to concentrate on throwing wares which, in the case of a big pan eighteen inches or more in diameter and involving 35 lbs. to 40 lbs. of stiff clay, was a distinct asset. The pots were thrown direct on the wheel head, cut off with a wire, and the large pans were lifted onto a board by the two men encircling them with their arms. No Verwood pot was ever finished by turning and the bases were always left wire-cut. Handles were pulled and fixed by the potter's assistant, and he also did the glazing and tended the drying of the newly-made wares, as well as preparing the clay. Decoration was very limited on Cross Roads wares, and when used consisted of impressed patterns formed with pieces of wood and odds and ends such as clock wheels. Slipware was never made.

Drying was normally carried out in the open, the pots being brought in at night or if bad weather threatened. A slow combustion 'tortoise' stove kept the building warm in winter and the flue pipe from it ran horizontally along the upper floor to distribute its heat among the pots stored there for drying. At one time a homeless old man used to sleep at the pottery and kept the stove stoked up at night. Herbert Bailey lived in the adjacent cottage and his wife used to take the old man a pot of tea first thing in the morning. The warm and snug building was also a resting place for the local postman on his extensive country rounds.

Glaze was originally made on the site by converting metallic lead into lead oxide (litharge), but from the 1920s onwards it was purchased in powder form from a national supplier. In both cases the powder was mixed with water to form a paste which was applied to the leather-hard pots with a paint brush. The pottery was thus only fired once. The old home-made glaze produced the characteristic orange-brown speckled finish, whilst the later factory product gave clearer brighter glazes in a wider range of colours.[30]

The type of kiln used at Verwood consisted of an open-topped brick-built cylinder of 10 feet to 15 feet internal diameter, and 15 feet high, surrounded by a mound of earth and broken pottery to within a few feet of the top. The summit of the mound formed a working area for loading and unloading the kiln, and at the Cross Roads kiln (site 1) this area was paved with bricks. A single flue ran from outside the mound at ground level into the bottom of the kiln. The fire burned in the mouth of the flue and the hot gases passed into the kiln through apertures in a brick floor supported on brick arches, up through the pottery wares and out of the open top. A shed or shelter erected at the mouth of the flue provided weather protection during firing, and timber and corrugated iron sheets were set up temporarily to screen the open top from the wind. Although three of these kilns remain in Verwood, unfortunately they have all been severely damaged, the brickwork has been extensively robbed and the mounds plundered to provide hardcore for building and road foundations. A number of other kilns have been entirely demolished including those at the Cross Roads.

Limited excavation of the kiln mound at Prairie Farm (site 8) has revealed part of the kiln floor and main flue still *in situ,* and this, together with a survey of the mound itself, has made it possible to sketch the general arrangement shown in Fig. 52. Further details have been added on the basis of photographs of a similar kiln at the Cross Roads, and from inspection of the other kiln mounds at sites 4 and 7.

Setting the kiln to ensure an even flow of gases and distribution of heat was a critical job carried out by the potter himself. The wares were taken to the top of the earth mound via a wooden staircase, and passed into the kiln through a temporary opening in the brickwork and down a ladder. Nests of up to six pans of different sizes were arranged one inside the other in an inverted position on the kiln floor, and in successive layers to the top of the kiln, the layers staggered so that each pot rested across two or three of those in the layer below, and where necessary because of glazing, the pots were separated one from the other by parting sherds. Small pots were fitted into the gaps between the larger ones. The man doing the setting and loading was actually standing on the unfired pots, but his weight was distributed by means of boards, and according to one visitor to the Cross Roads Pottery in the 1920s, a few fired pans were used in critical places to take the weight. No saggars or kiln furniture were used.

[30] Information on the manufacturing processes came from Miss M. H. Bailey and Mr. Alfred Sims, both of Verwood, supplemented by photographs, and from *Rural Crafts* by H. E. Fitzrandolph and M. Doriel Hay. The account was obtained before the author was aware of J. P. Kendrick's article 'The Verwood Pottery'. The two accounts correspond closely but several additional facts from Kendrick's work have been incorporated.

When the kiln was full, the temporary opening was bricked up and the open top protected by a layer of large sherds of broken pottery, followed by layers of smaller ones, thus providing an insulating blanket through which the smoke and hot gases could pass freely.

The fuel used was always wood. The Pottery purchased the tops and loppings resulting from tree felling in the surrounding area, and the timber was stored in the yard until needed. In recent times between three and four lorry loads were used for each firing.

Firing started with faggots of small twigs and continued for two days and nights, the temperature gradually increasing as larger branches and split logs were fed in. A further one day's 'burning off' to 'flash the glaze' followed in which small wood and furze was used and the flames emerged several feet from the top of the kiln. The firehole was then sealed off and the kiln allowed to cool for three days before unloading. Temperatures were judged by eye. Herbert Bailey used to watch certain bricks in the kiln structure until they glowed at the correct red heat, also a yellowish coating would appear on the roofing sherds, and sometimes a small pot was so placed that it could be removed for inspection during firing. The kiln at Cross Roads which was about fifteen feet in diameter was replaced, probably in the late 1920s or 1930s by a smaller one about ten feet internal diameter, but constructed and used in the

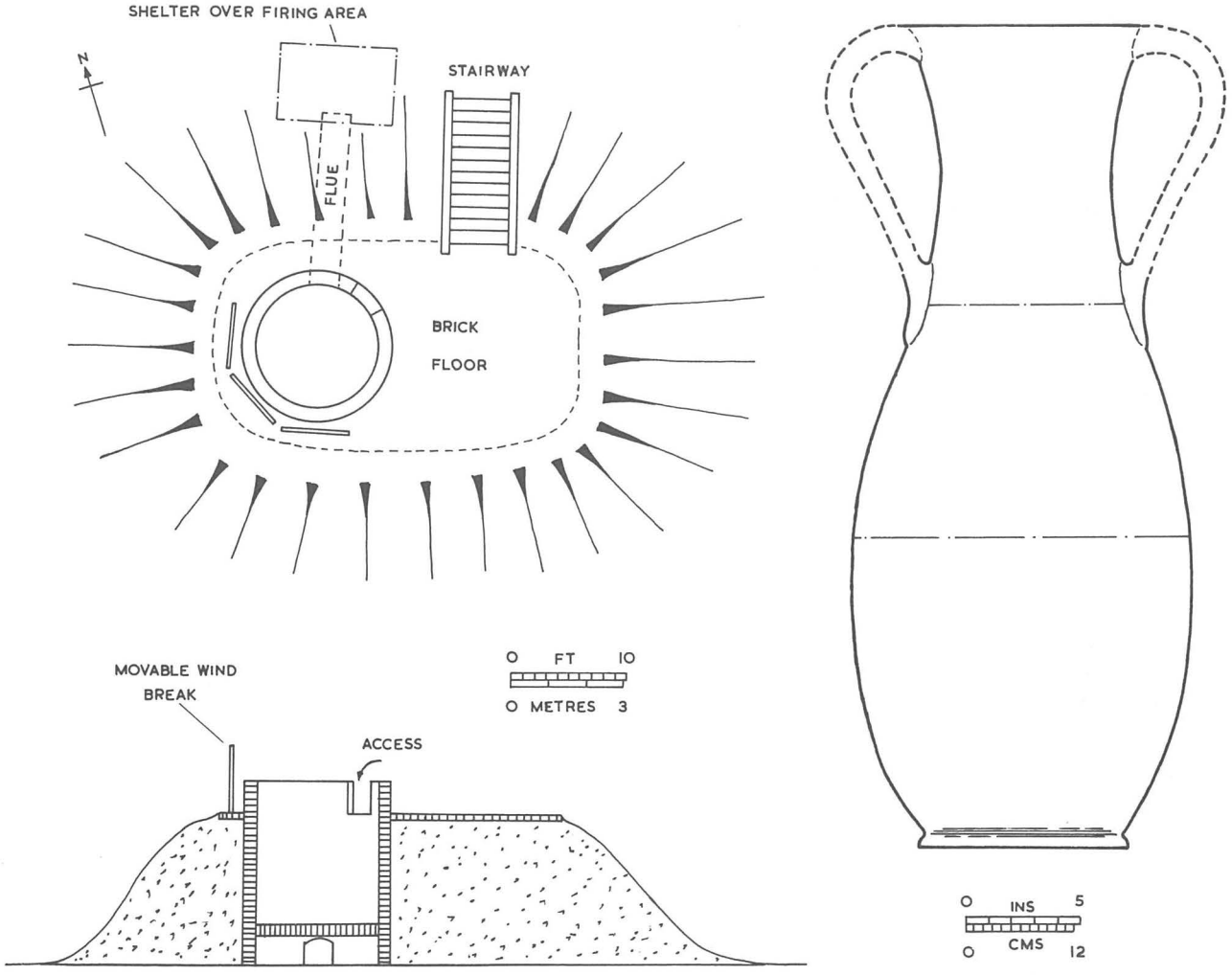


Fig. 52. This reconstruction of a Verwood pottery kiln is based on the measurements and layout of the surviving kiln mound at Prairie Farm, supplemented by photographic evidence of a similar kiln at the Cross Roads Pottery and on information from Miss Bailey and Mr. A. L. Sims.

Fig. 53. This pot is three feet high and was made as a show piece by Herbert Bailey and Alfred Sims. The broken lines indicate the joints between the three sections from which the pot was built up. Scale: one-eighth.

traditional manner. The kilns at Dewlands Common also appear to have been about ten feet in diameter.[31]

The potters, who were essentially craftsmen, had learned their trade at the bench and wheel and regarded it as a job of work aimed at creating useful articles rather than works of art. However, because of their feeling for the medium, they created things of beauty and grace, probably coming nearest to perfection in the traditional wares, the pans, dishes, jugs, beakers and jars which had evolved through the years, possibly centuries. This feeling continued in some of the vases and domestic wares which were made at the Cross Roads in the period after the First World War. The pottery was then quite widely known and was visited by Bernard Leach and many others, and a number of photographs and short articles appeared in local and national newspapers and periodicals.

Late in the life of the Cross Roads Pottery, probably between 1945 and 1948, a unique large pot was made by Herbert Bailey and Alfie Sims (Fig. 53). It was three feet high and fifteen inches in diameter and glazed inside—the largest vessel ever made at Verwood. Miss Bailey writes in a letter 'as far as I can remember my father made this in three pieces which possibly took about a week to make and semi-harden, they were then welded together with moist clay, the handles added and allowed to dry. The pot would have stood in the centre of the kiln with the other wares round it for burning'. The pot was used as a display piece in the little showroom adjoining the pottery, and when rediscovered in 1972 after twenty years of neglect, it was found to be badly damaged, both handles and all the rim were broken off. However, one sherd of rim was found to complete the profile, and Mr. Sims, who made the handles, was able to confirm their shape and to locate without any difficulty the joints between the three sections of the body by running his fingers over the inside surface. The pot is at present in the author's possession, but is destined for the Dorchester Museum collection.

The Nineteenth Century Wares

The pottery described and illustrated (Figs 54-57) in this section is representative of the range of brownware made in Verwood during the nineteenth century.[32] It all derives directly from the village, some presented by local people to the Dorchester Museum, the remainder recovered by the author as surface finds at the kiln sites in the Blackhill area (sites 2, 3, 4) and from the kilns at Sandalholme and Prairie Farm (sites 7 and 8) where minor excavations were carried out. All these kilns had ceased production by the early 1900s, at which time the local traditions and technology were still vigorous, thus the forms illustrated are those developed during the previous two centuries or even longer, which fulfilled local needs and were subject only to minor changes in a slowly evolving rural community. Later pottery from the Cross Roads kiln, the only site to continue working after the end of the First World War, can be seen to reflect outside influences in design and materials, e.g. new shapes, the use of coloured glazes and far more non-utilitarian items such as ash trays, vases, etc. (Fig. 49).

The Prairie Farm kiln mound (site 8) was sampled in five places and produced a wide variety of sherds, but no complete or restorable vessels. The Sandalholme kiln mound (site 7) was dug in only one place which was found to be solidly packed with pottery including many large sherds and several restorable pots. Additionally, at both places a single example of a large pancheon has survived substantially intact within the buildings. At Sandalholme this was used in the outside privy and is badly pitted and corroded, it is of the form shown in Fig. 55 No. 2, but with an impressed zig-zag decoration below the rim. The specimen at Prairie Farm is a medium-sized yellow glazed pan similar in form to Fig. 55 No. 1; it is built into the mud wall of the cottage outhouse to form a cupboard and is still in use.

The variety of wares recorded has been greater than was anticipated when the study commenced. Many forms appear to be common to all the kilns, although further study might suggest families of vessels with similar characteristics emanating from particular kilns or potters. However, for the present it is assumed that the nineteenth century wares from all kilns can be regarded as a single group. Almost all the pots examined have a uniform

[31] Information from Miss Bailey, Mr. Alfred Sims and Mr. Arthur J. Bailey, all of Verwood and Miss G. Gilham of Poole, also from photographs and from site explorations and excavation by the author. The visitor in the 1920s was from the Agricultural Economics Research Institute Oxford.

[32] Verwood potters are referred to as brownware manufacturers in the late nineteenth century Trade Directories. The description was presumably their own and in common use.

moderately hard grey-pink fabric, usually with few inclusions. This is consistent with other evidence that all the potters drew their clay from the same geological strata, and at any given date probably from the same actual diggings. The principal exceptions to the above are two sherds from Prairie Farm (not illustrated) which are of hard brown fabric with black glaze and which feel and look different from all other sherds. No explanation for these can yet be offered beyond the suggestion that they might be strays from a superficial deposit of domestic rubbish on the site. Other minor variations in fabric are attributable to errors in firing.

The largest vessels produced in quantity at Verwood appear to have been pancheons about fifteen inches high and eighteen inches in diameter at the Cross Roads and Blackhill Potteries, and twenty-two inches in diameter at Sandalholme and Prairie Farm. The pots were all wheel-thrown with no subsequent turning or finishing except for glazing and occasional decoration with incised lines or simple moulded patterns (Fig. 55 Nos. 4-7). The bases were wire-cut and there are no potter's marks. The typical glaze of the period is a glossy orange-brown with darker spots or speckles, but colours range from pale yellow to a rich dark brown, spotted or clear, and from apple green to dark olive green and black. These colours are seen on wasters at the kiln sites, but it is probable that they also appear on goods which reached the market. The variations are due to impurities in the glaze and to differences in firing temperatures—the higher the temperature the darker the glaze.

Pots are variously glazed inside only, or both inside and out, in which case parting sherds were used to separate the vessels during firing, often leaving nasty scars. At its best the glaze is smooth and lustrous, but can be thin, porous and apt to flake. Severe overfiring seems to burn the surface to a dull finish with a sandpaper-like texture. Faulty glazing seems to have been the main source of wastage, although many sherds, especially from Prairie Farm, show glaze running over broken edges indicating cracking and splitting during firing. Examples of this were seen at Moor Lodge (site 4) where two small pans had split from top to bottom whilst in the kiln.

Fig. 54. Artist's impression of a collection of typical nineteenth century Verwood pottery.

Hardly any soft underfired sherds were found at any of the sites, but some distortion and lamination of the clay body was noted among the wasters. Despite the various faults listed here, the general impression is that firing was consistent and well-controlled, particularly when the size and crude nature of the kilns is taken into account.

Pancheons were produced in great numbers at all the kilns. There were two basic shapes, illustrated here by Fig. 55 Nos. 1 and 2. They were made in a range of sizes with rim diameters from eight inches to twenty-two inches, and with matching lids. The largest size made at the Cross Roads Pottery had a capacity of one bushel and was eighteen inches in diameter and fifteen inches deep. The general design of these pans was probably unchanged for centuries, and production did not stop until 1952. One of the last examples, made by Herbert Bailey, is at present in the author's possession and bears the 'Verwood' stamp which dates it to the 1948-52 period.

Pans are generally unglazed, or glazed on the inside only, but occasional examples are glazed all over. Rims are of many forms, a selection of which is illustrated in Fig. 55. Some of these appear to have been formed by rolling over the lip of the pot rather than by drawing it up, this sometimes resulted in imperfect fusion of the clay, and sections of the rims were then prone to crack or flake off. Many sherds from all kiln sites show this fault, which is indicated by the white line in sherds Nos. 9, 14, 18 and 19 in Fig. 55.

Bowls, mostly glazed on the inside only, occur in large numbers and in a wide variety of shapes, among them a mixing bowl with a horizontal out-turned rim (Fig. 56 No. 27) from Sandalholme and Prairie Farm. Small shallow pans ('dog bowls') and pie dishes also occur at these sites in a range of sizes from eight to fifteen inches in diameter, whilst at Prairie Farm a few small sherds of a very thin ware with a lustrous orange-yellow glaze form the basis for the tentative reconstruction of a bowl (Fig. 56 No. 35) clearly intended for table use. Another well-finished but more robust bowl (Fig. 56. No. 31) came from Moor Lodge (site 4). It has not been possible to complete the profiles of the shallow bowls or dishes with a very broad rim (Fig. 56 Nos. 24-26) which come from Prairie Farm and Sandalholme.

The large shallow pan, probably used for setting cream (Fig. 56 No. 38) is from Prairie Farm, where sherds of this type are plentiful. One similar sherd was found at Sandalholme, but none elsewhere. These pans range in diameter from about thirteen inches to twenty-one inches, and are up to five inches deep. Typical rims sections are shown in Fig. 56 Nos. 39-43. Most pans are glazed inside only, but some are glazed both inside and out. From the runs in the glaze it would appear that some were inverted and others were standing vertically in the kiln during firing.

Pitchers and jugs are well represented, although far less numerous than pans and bowls. Some pitchers are of noticeably heavier form than others of similar capacity. The heavier type is illustrated in Fig. 57 No. 45, but the profile is common to both types. All pitchers appear to have a foot rim, most are unglazed except for the outside of the neck, but some sherds with internal glazing have been noted. Two jug forms have been noted (Fig. 57 Nos. 44 and 46), and a range of more rotund jugs is indicated from Prairie Farm (Fig. 57 Nos. 48 and 49), but insufficient sherds have been recovered to permit a reconstruction. Circular-section rolled handles of various sizes occur at this site as well as the pulled oval-section handles normally found on Verwood products. Jugs and pitchers from all sites commonly, but not exclusively, have the lip formed for pouring in the manner shown in Fig. 57 No. 46. Handles are located in a wide variety of positions between the rim and the base of the vessel.

Sherds of harvest, cider or wine jars as they are variously known, occur at Sandalholme and Prairie Farm, and these wares were also made at the Cross Roads Pottery at least as late as the 1920s. The profile is generally as shown in Fig. 57 No. 47 with varying degrees of obesity. Strap handles as drawn, or lug handles were used. Glazing was restricted to the outside of the neck and was usually yellow in colour, indicating a low firing temperature. It is worth noting that these jars, which are probably the most widely known of Verwood products, are sparsely represented among the sherds from the kiln sites, a total from all sites of only two necks and a handful of other fragments were found in a total of several hundred sherds examined. There is no evidence at all from Verwood of the small squat form of jar with pierced lug handles usually known as an 'owl', and fairly plentiful in private and museum collections. Even the nickname is unknown in the village today.

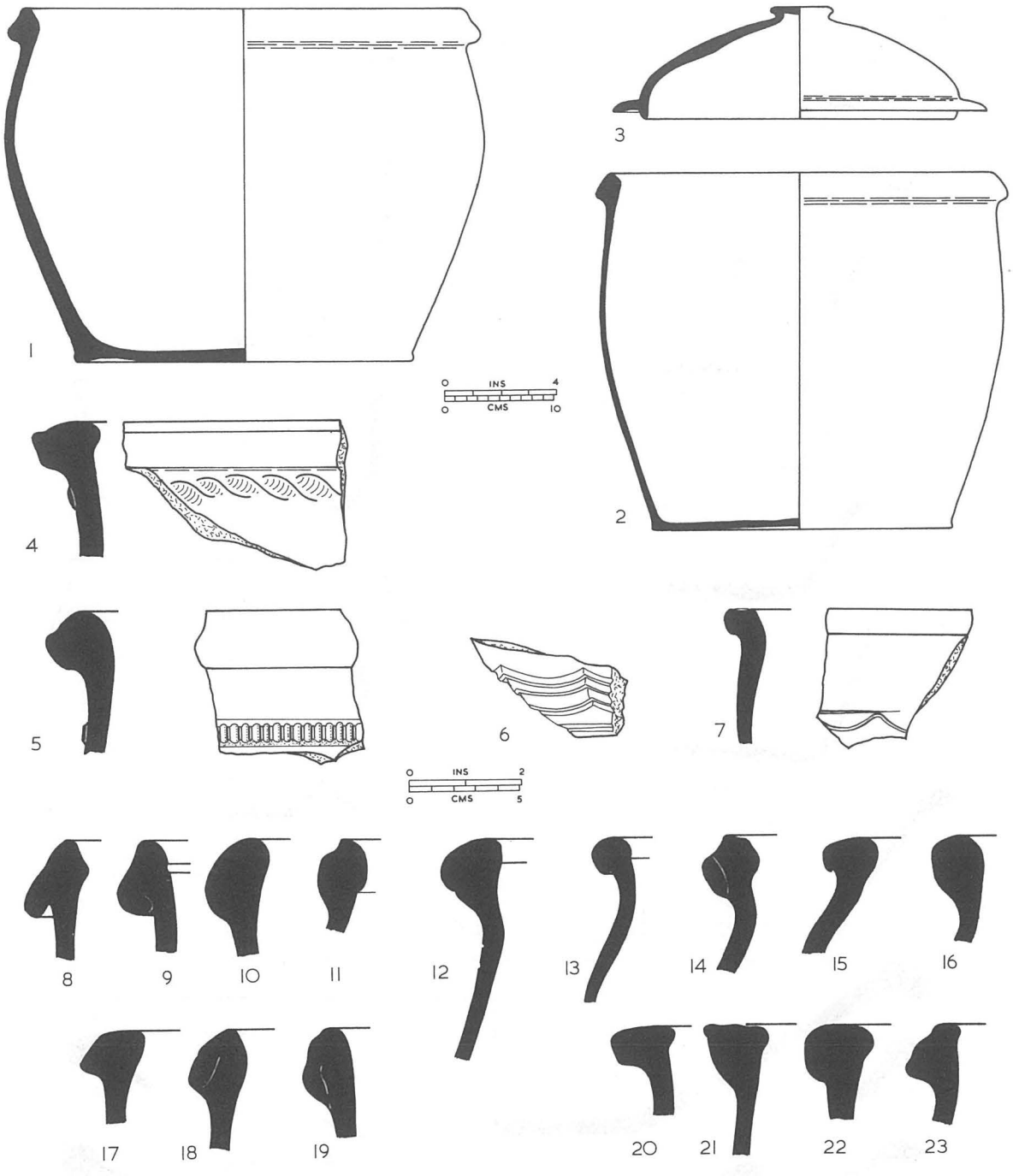


Fig. 55. Nineteenth Century Pancheons

1. Glazed inside only. From kiln site 8.
2. Unglazed. This profile is actually taken from a twentieth century example made at site 1, but earlier sherds are similar in form.
3. Pan lid. Glazed externally only. Probably from site 1.
4. Pan rim showing decoration in the form of a cable moulding. Glazed inside and out. From kiln site 8.
5. Pan rim showing decorative toothed moulding. Glazed inside and out. From kiln site 7.
6. Pan body sherd showing incised decoration. Glazed inside only. From kiln site 8.
7. Pan rim showing incised decoration. Unglazed. From kiln site 8.

8, 9, 10, 11, 14. Pan rims. Glazed inside only. From kiln site 7.

12, 13, 15, 16, 20, 21, 22. Pan rims. Glazed inside only. From kiln site 8.

17, 18, 19, 23. Pan rims. Glazed inside only. From Blackhill area. Sites 2, 3 or 4.

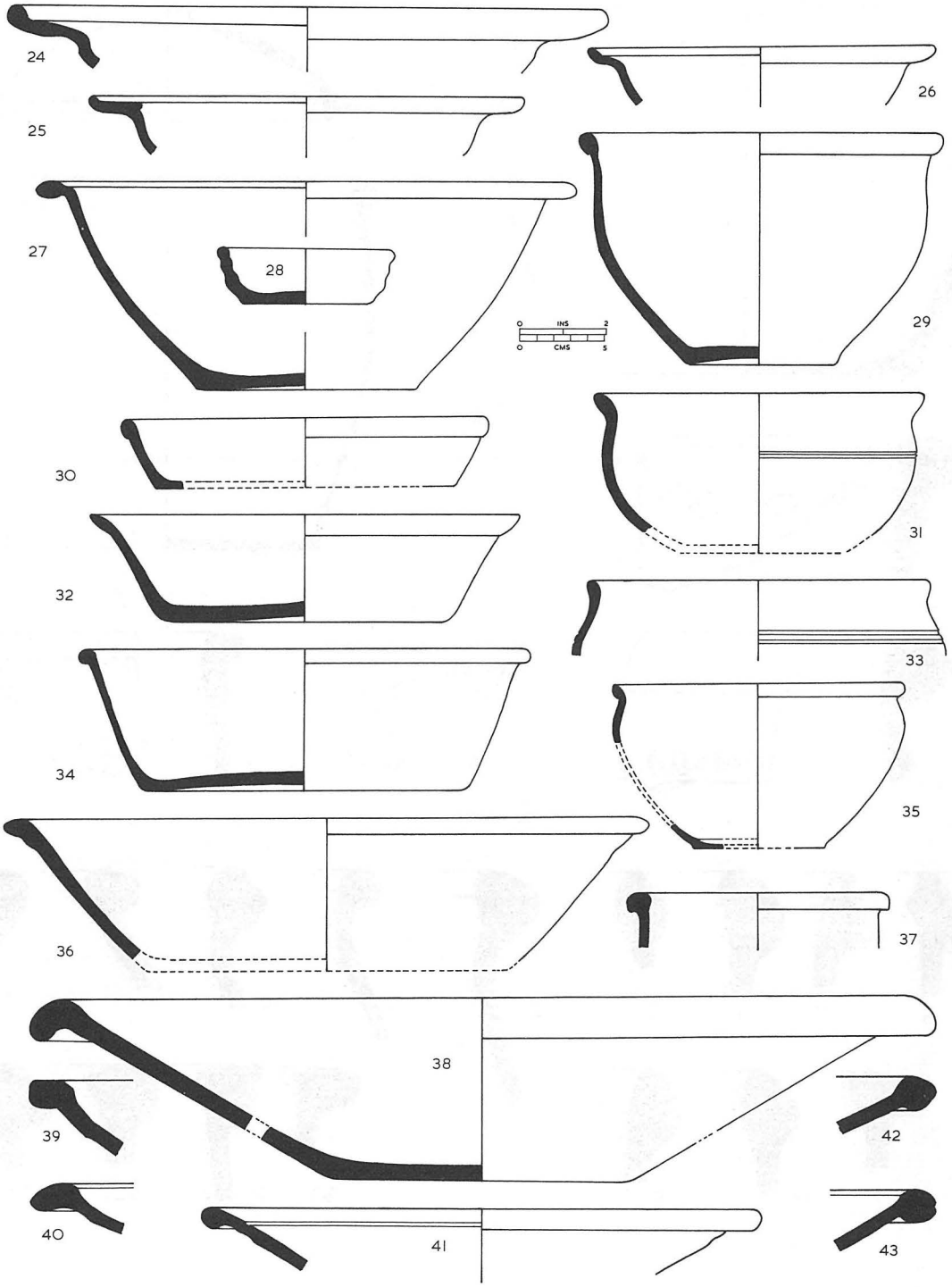


Fig. 56. Nineteenth Century Bowls
24, 25, 29, 30, 33, 34, 35, 37. Glazed inside only. From kiln site 8.
26, 32. Glazed inside only. From kiln site 7.
27. Glazed inside only. From kiln site 7.
28. Unglazed. From kiln site 8.
31. Glazed inside only. From kiln site 4.
36. Glazed inside only. From Blackhill area, sites 2, 3 or 4.
38, 42. Glazed inside and out. From kiln site 8.
39, 40, 41, 43. Glazed inside only. From kiln site 8.

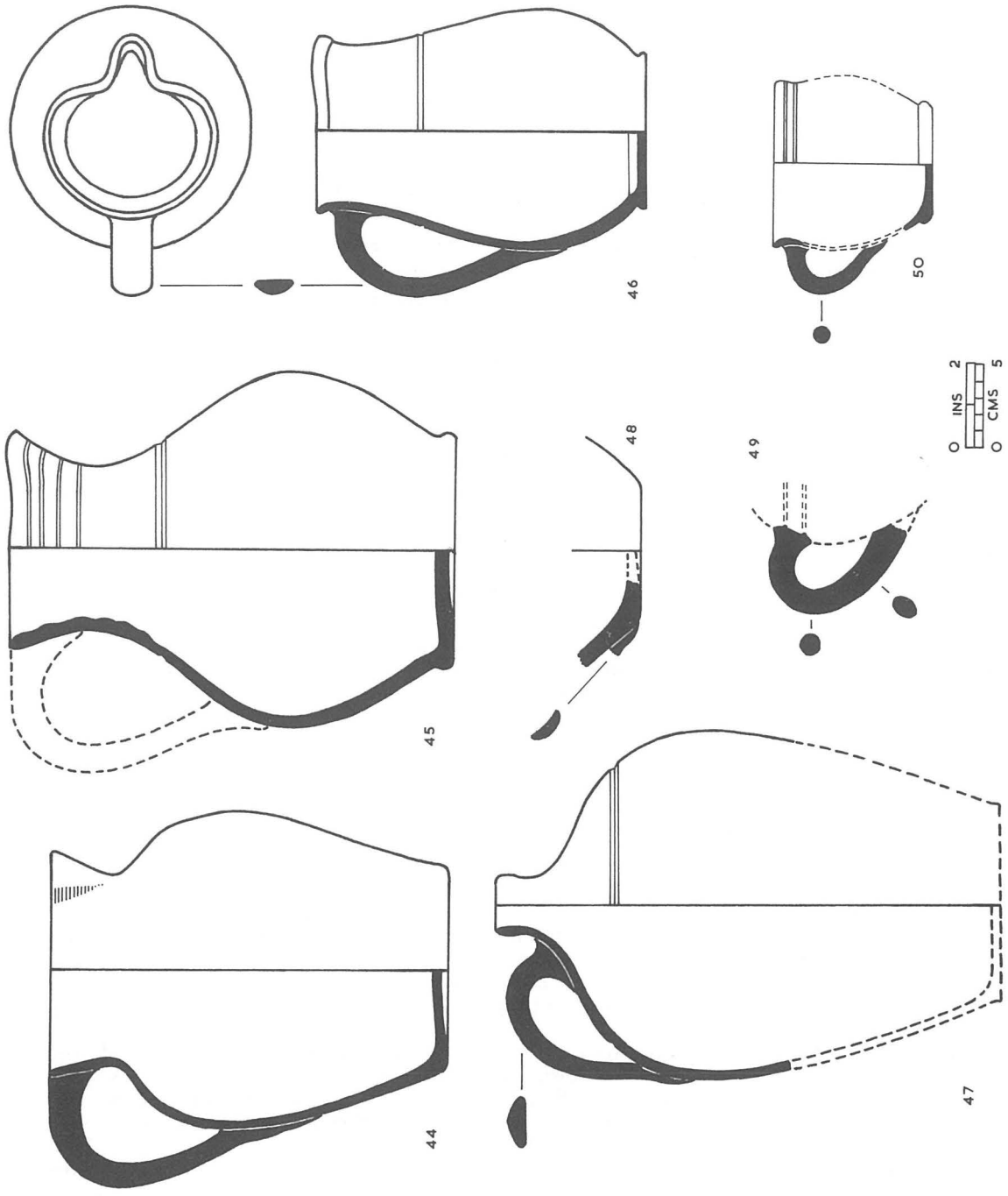


Fig. 57. Nineteenth Century Jugs, etc.
44. Jug. Glazed inside and out. Kiln of origin unknown.
45. Pitcher. Glazed on outside of neck only. This profile is a composite one derived from sherds from kiln sites 1 and 4.
46. Jug. Glazed on outside of neck only. From kiln site 7.
47. Harvest jar. Glazed on outside of neck only. From kiln site 7.
48. Jug (presumed). Glazed inside only. From kiln site 8.
49. Jug handle (presumed). Unglazed. From kiln site 8.
50. Mug (presumed). Glazed all over. From kiln site 8.

Among the sherds from Prairie Farm were a number of rolled circular-section handles, too small for any vessel except a tankard or a mug, of which a tentative reconstruction is shown in Fig. 57 No. 50. This is an unusual item for Verwood, although vessels of this type were made at the Cross Roads Pottery in the early twentieth century.

Flower or plant pot sherds are plentiful on all sites except Prairie Farm, where only one unglazed example with a pierced base has been found, although several rims of similar form but glazed, suggesting household rather than horticultural use have been noted, along with several plant saucers of the type shown in Fig. 56 No. 28.

The provenance as far as is known for all the pottery illustrated and described here is noted below. Where the kiln of origin is stated as unknown or uncertain, this is because the item in question is a gift from a local resident and has usually been in the family so long that its source has been forgotten. The sherds noted as coming from the Blackhill area (sites 2, 3, 4) were surface finds and could have derived from either site.

List of Sites

Young site 1:	Cross Roads	A., L., & T., Verwood 3
Young site 2:	Blackhills	A., L., & T., Verwood 6
Young site 3:	Purbeck House; Blackhills	A., L., & T., Verwood 5
Young site 4:	Blackhills; Moor Lodge	A., L., & T., Verwood 4
Young site 5:		A., L., & T., Verwood 7
Young site 6:	Dewlands Common	A., L., & T., Verwood 10
Young site 7:	Sandalholme; Dewlands Common	A., L., & T., Verwood 9
Young site 8:	Prairie Farm	A., L., & T., Horton 4
Young site 9:	Dewlands Common	A., L., & T., Horton 5
Young site 10:	Burrows Farm	A., L., & T., East Worth 1
Young site 11:		
Young site 12:	Eastworth Farm	A., L., & T., East Worth 2

Acknowledgements

This account was made possible by the generosity of Miss M. H. Bailey, who devoted much time and energy to tracing sources of information and materials in her native Verwood. Other people from the village who have given unstinting help are Mr. Alfred L. Sims, Mr. Arthur J. Bailey, Mr. and Mrs. F. C. Bailey, Mr. Ken Thorne and family, Mr. D. Scriven, Mr. and Mrs. T. Kershaw, Mrs. B. Brewer, and Mr. Harold A. Churchill. Several of these people have also enriched the Museum at Dorchester with gifts of pottery.

Assistance has also been gratefully received from Miss G. Gilham of Poole, Miss J. Robson of Bournemouth and Miss K. S. Woods of Oxford, and I have benefited greatly from the work of the two principle researchers who preceded me—J. Sims and T. Kendrick, and from help and advice from Miss M. Holmes and her staff at the Dorset County Record Office and Mr. R. N. R. Peers at the Museum.

Figs. 49 and 51 are from Miss Bailey's collection of photographs. Fig. 50 is one of a series of photographs taken by my colleague Mr. F. W. Clark in 1972.

Bibliography

The Verwood Pottery by T. P. Kendrick, *Pottery Quarterly 1959,* pp. 127-131 and pls. 4-6.

The English Country Pottery by Peter C. D. Brears, 1971.

Rural Crafts of England by K. S. Woods, 1949.

The Rural Crafts of England and Wales—a survey on behalf of the Agricultural Economics Research Institute, Oxford, by H. E. Fitzrandolph and M. Doriel Hay, 1926. (The MS of this work is also available for study at Oxford.)

Water Mills on the River Bourne South Wiltshire with a Note on Post-medieval Pottery, by John Musty. *Wiltshire Archaeological and Natural History Magazine,* Vol. 63, 1968, pp. 46-53.

Unpublished MS: *Heath Potters in the Cranborne District* by J. Sims, *circa* 1968. The principle copy of this thesis is in the library of the Farnham (Surrey) School of Art, but there is a copy of the text without maps or illustrations at the DCRO, Dorchester and it is this copy which has been consulted.

CHANGES IN THE HABITATS OF THE DORSET FLORA SINCE 1931
PART 1. THE ISLE OF PURBECK 1979

A. HORSFALL

Summary

Professor Good's stands or botanical sites of the 1930s have been revisited in the Isle of Purbeck. Habitat changes have been recorded. The pattern of change is described and discussed.

This paper was the Mansel-Pleydell Prize Essay 1979.

INTRODUCTION

This is an account of botanical work in south-east Dorset in the summer months of 1979. The purpose was to find out the extent of change in the plant habitats since the 1930s when Professor R. Good made his comprehensive botanical survey of the county. In his 'Geographical Handbook of the Dorset Flora' Good (1948) describes the flora and its distribution; this work is well known to botanists and other wild flower observers.

Among the many contributors to our knowledge of Dorset plants, described fully by Carter (1957), the part played by Good is unique. The Handbook is based to a large extent on the plant records he compiled from his own observations between 1931 and 1939, and when the book was published in 1948 it became the successor to the two floras of J. C. Mansel-Pleydell in the late nineteenth century (Mansel-Pleydell, 1874 and 1895).

The records, now lodged at the Institute of Terrestrial Ecology at Furzebrook near Wareham, are an impressive collection. There are over 7,500 plant lists totalling more than 250,000 plant names and details on the occurrence of every plant species in the Dorset flora. There are also many maps showing the distribution of particular plants and a set of 6-in. Ordnance Survey Maps showing the precise location of each stand.

The term stand as defined by Good (1936) means a list of plants forming "a single example of a plant association in a definite and recognisable spot". The stands were selected not at random but for their botanical interest and were as numerous and as widely distributed as possible. Most sites were small: a single field, a part of woodland, a stretch of hedgerow or cliff top. Larger sites were expanses of dry heathland or chalk downs. On average there were seven or eight stands for every square mile throughout Dorset but rather more in botanically rich areas such as Purbeck where most habitat types were represented.

One of the plant lists might include as many as 130 species in an ancient woodland site or as few as nine species in a fir-wood of *Pinus sylvestris*. An average list had about 40 species. Here are two examples from Good's records with up-to-date names added where necessary:

date 14.8.37 — Stoborough Heath
stand number 6859
9 Boggy heath, W of 6858

Ulex europea
Erica cinerea
Eric tetralix
Calluna vulgaris
Potentilla erecta
Agrostis setacea
Juncus squarrosus
Hypochoeris radicata
Viola lactea
Hypericum pulchrum
Orchis latifolia
Gentiana pneumonanthe
Juncus supinus = *J. bulbosus*
Molinia caerulea
Scabiosa succisa = *Succisa pratensis*
Triodia = *Sieglingia decumbens*
Polygala vulgaris
Ulex nanus = *U. minor*
Quercus seedlings

stand number 6860

10 Old clay pit in SE part of last (6859)

Juncus effusus
Eriophorum latifolium
Eriophorum angustifolium
Molinia caerulea
Erica tetralix
Narthecium
Heleocharis multicaulis = *Eleocharis multicaulis*
Drosera rotundifolia
Juncus lampocarpus = *J. articulatus*
Juncus supinus = *J. bulbosus*
Carex stellulata = *C. echinata*
Rhyncospora alba
Lycopodium inundatum

There were 17 more stands on Stoborough Heath at that time and by the end of the following year the total for the whole county was over 7500.

Such meticulous records and maps make it possible to compare Good's original stands with the identical sites today. As a start the Isle of Purbeck has been selected for this purpose because of its variety of habitats and wealth of plants. An island only in name, this small area of south-east Dorset covers 140 sq. km and is a part of the much larger modern district of Purbeck. It includes three of Good's botanical areas: part of the Poole Basin South together with North Purbeck; Purbeck Chalk; and South Purbeck. The only towns are Swanage and Corfe Castle.

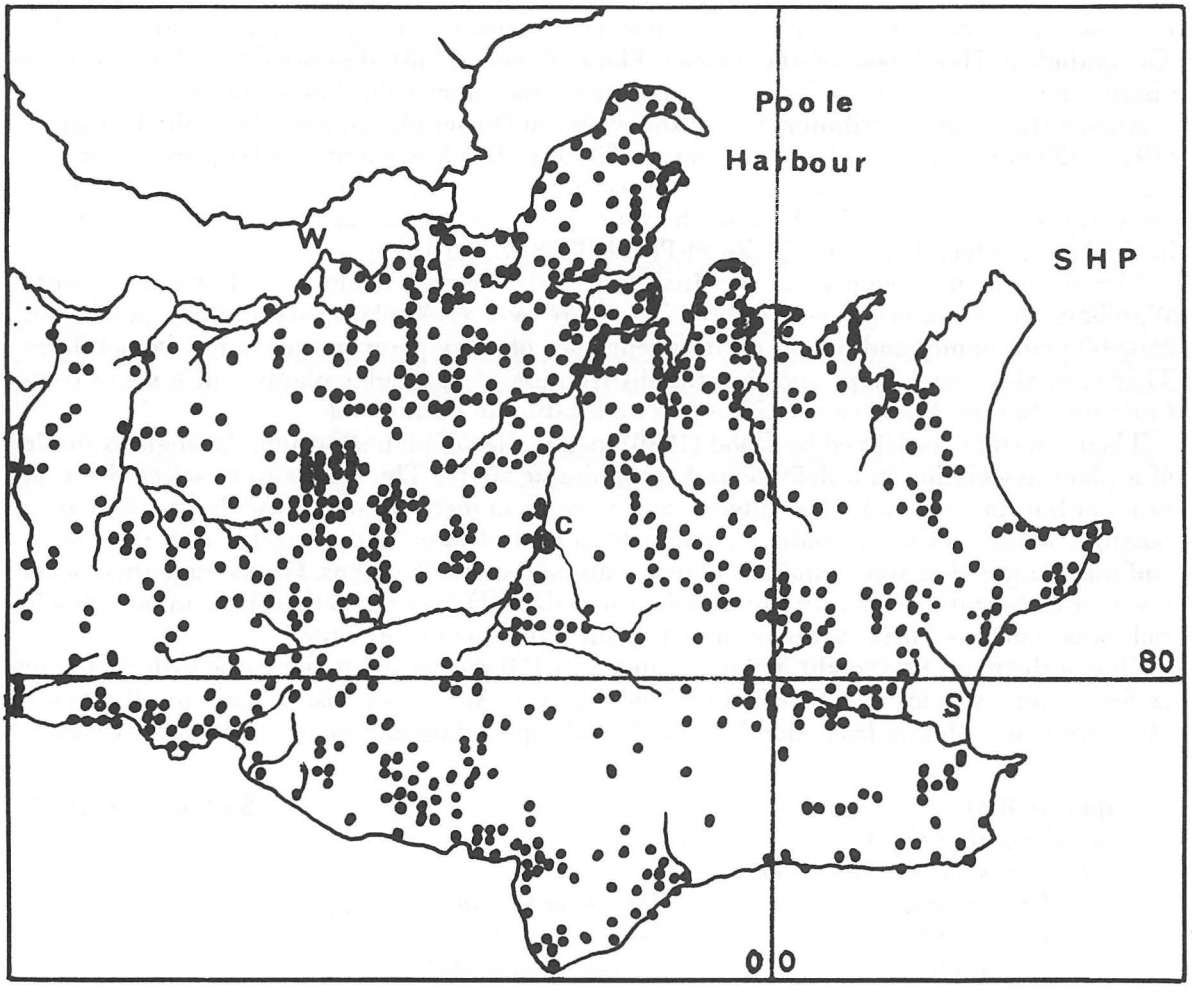


Fig. 58. Dorset: Isle of Purbeck.

from Professor Good's map showing his original botanical sites.

SHP = South Haven Peninsula—sites omitted
W = Wareham
C = Corfe Castle
S = Swanage

All the original Isle of Purbeck sites have now been reviewed except for those on the South Haven Peninsula near Studland where only a detailed survey would be appropriate. This small but important area includes a popular stretch of sandy beach as well as a part of the Studland National Nature Reserve. The plants found there in the 1930s have been described by Good (1935) in his botanical survey of South Haven, and includes uncommon species such as *Elatine hexandra, Eleocharis parvula* and *Utricularia neglecta*. The general appearance of the vegetation in the South Haven sites suggests little change since the 1930s but a detailed re-examination might show that habitat change is in fact considerable (Teagle, 1966).

Excluding South Haven, 836 sites were observed. With so large a number, and with the emphasis on habitat rather than on species change, botanical lists were compiled at only a few sites. Records of species known to be uncommon were sent to the Dorset Environmental Records Centre in Dorchester but few of the rare species mentioned by Ranwell (1969) were found.

Method of survey

The location of each site was found by referring to Good's original maps. The former habitat type and plant assocation were found from the manuscript records. Access was by public ways or with consent of land owners. Certain inaccessible parts of the Army Ranges had to be viewed from afar. Some sites were explored very thoroughly; others had only a brief inspection where the habitat change appeared obvious. A record card was completed for each site, using the original place names and site number. Metric grid references were added. The main entries on each card were the habitat types, past and present, with dates, plant notes, land usage and where appropriate the proportion of change within the site. The set of 836 completed cards was then analysed to provide the information summarised below as well as the results described in the nine main habitat groups.

TABLE 1

CHANGE IN PLANT HABITATS SINCE 1931

Present status of former botanical sites, now totally (T) or partly (P) changed.

		(T)	(P)
A.	Agriculture and forestry		
	1. improved grassland and arable land	66.0%	42.0%
	2. conifer plantations	10.0%	11.0%
B.	Development, residential and industrial		
	1. roads, buildings, caravan sites, moorings, rubbish tips, cleared sites	9.0%	15.5%
	2. clay mining, oil drilling, quarrying	6.5%	3.5%
C.	Ecological change		
	1. spread of gorse, brambles, rhododendron, reeds	6.5%	20.0%
	2. natural regeneration of birch and pine	1.0%	7.0%
	3. erosion by landslip	1.0%	1.0%

Assessment of habitat change

At each site the habitat was recorded as either unchanged, partially changed or completely changed by estimating how far it could still support the same type of plant association which was there some 45 years ago. Every site must have been modified by environmental change of one sort or another during this period. But in examples like deciduous woodland, where continuous change is apparent, the habitat is considered unchanged provided that the ground flora and trees are essentially of the same species.

Habitats were found to be partially changed in two ways: either a part of the original site had been totally altered, for example by quarrying or planting conifers, so that a certain proportion of plants and including perhaps rarities had been eliminated; or the whole site had partly changed, like a marshy meadow which had been more or less drained leaving only those plants of the original plant association which are adapted to drier conditions. In both cases the natural flora is under threat.

Totally changed habitats were often quickly identified: a pine plantation, a tarmac road, a caravan site, a ploughed field, an open clay pit, an oil well and so on. Most of the former sheep pastures are now seeded grassland or arable fields with little or no trace of the original flora. These sites also are considered totally changed from a botanical point of view.

Habitat groups

1. Aquatic (aq)
   rivers, streams, ponds, lakes, pools including claypit pools
2. Marsh vegetation (ms)
   marshes, marshy meadows, swamps
3. Maritime vegetation (ma)
   cliffs—chalk cliffs, other cliffs, undercliffs; shores—shingle beach, sand and dunes, beach waste, salt marsh
4. Heath vegetation (he)
   dry heath including grass heath and bracken heath, wet heath including boggy heath and bogs
5. Grassland (gr)
   meadows and hayfields, bracken grassland, grassland on sandy soils, grassland of medium and calcareous soils
6. Hedgebanks (hb)
7. Thicket vegetation (th)
   thickets, thickets with grass, heath or bracken
8. Woodland (wo)
   conifers, mixed woodland, deciduous
9. Other (o)
   all minor habitats:
   fields, arable or fallow; walls; roadsides and tracks; quarries and rocks; chalk pits, quarries and chalk waste; rabbit warrens; former railway tracks.

The extent of change in the main habitats is summarised in Fig. 1, followed by descriptions of each group. Some of the less common plants from Good's records have been added to illustrate the botanical interest, with names altered where necessary to conform with Clapham, Tutin and Warburg (1962).

Pattern of habitat change since 1931

The pattern of change shown in Fig. 59 is based on these figures:

Number of sites in each group of habitats

aq	ms	ma	he	gr	hb	th	wo	o	habitats:
2	9	0	51	81	4	17	3	18	totally changed
4	12	3	11	32	3	4	0	12	partly changed
37	55	82	122	39	57	23	105	50	unchanged
43	76	85	184	152	64	44	108	80	totals

Of the original 836 sites observed in 1979, 185 sites are totally changed (22 per cent), 81 sites are partly changed (10 per cent) and 570 sites are basically unchanged (68 per cent).

MAIN HABITATS

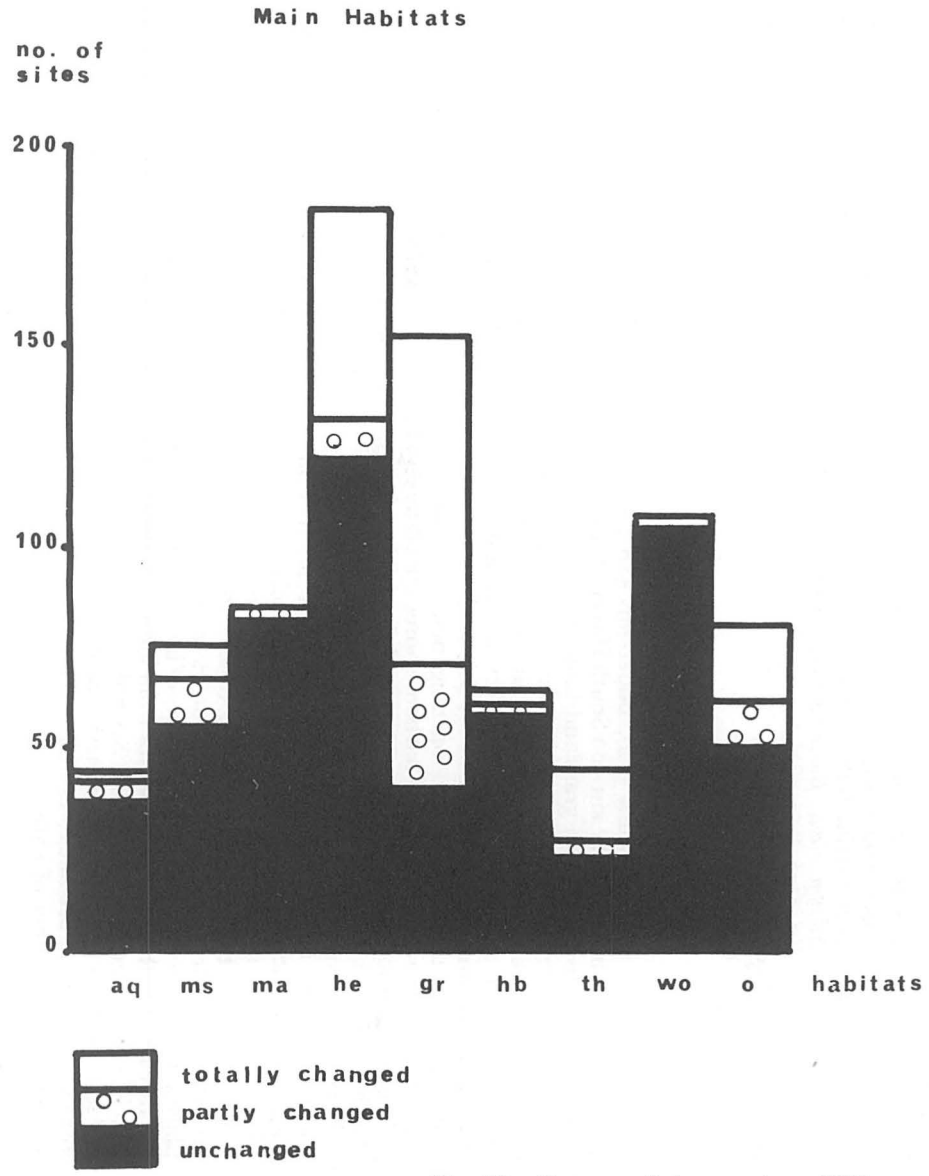
1. Aquatic

Number of sites: 43

Aquatic sites	totally changed	5%
	partly changed	9%
	unchanged	86%

Two groups are represented: rivers, riversides and streams (12), and lakes, ponds and pools (31).

The river and stream sites are mostly in secluded parts of heathland or near the chalk hills and show little evidence of change. The site on the River Frome still has characteristic riverside vegetation. The permanent water-filled drains of the moors continue to support a rich flora including a number of uncommon species. Two sites are in accessible parts of the Lulworth Army Ranges but appear



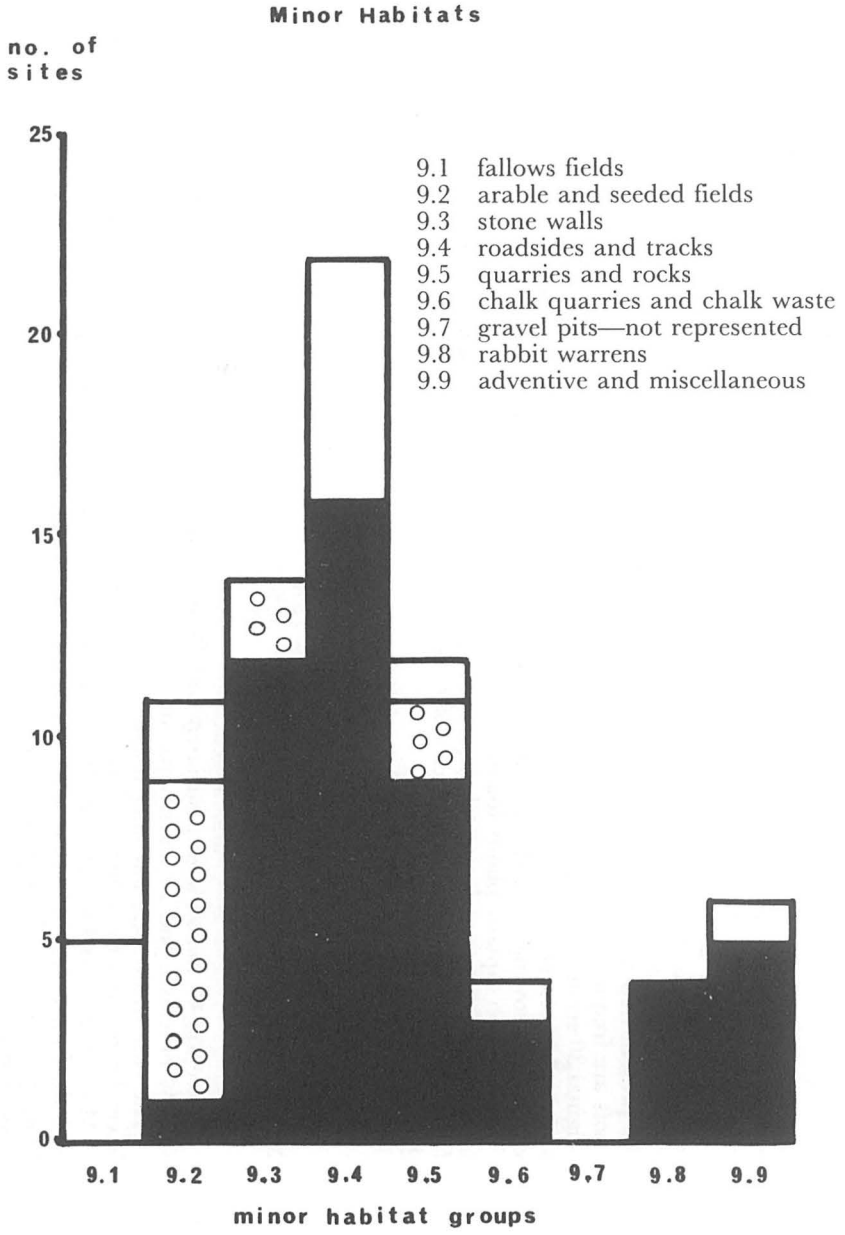


Fig. 59. Pattern of change since 1931.
Isle of Purbeck 1979.

unaltered. Two other sites are partly changed: one near the coast is periodically choked with rubbish in holiday seasons, the other is heavily shaded by conifers. Apparently none of the river and stream sites is totally changed.

In the second group a former cattle pond is now abandoned and the habitat partly changed to become a permanently marshy spot. All the other pond, pool and lake sites, located in many parts of the heathland, are former clay pits. Many are several hundred years old. The vegetation depends on the present depth of water and the amount of back-filling done when the pits were abandoned. The pools are frequently in secluded places, often concealed amongst gorse or birch trees, and 26 of the original 30 seem unchanged. One is a famous beauty spot and the others are frequented by fishermen and bird watchers. The four sites variously changed are now: a rubbish tip with relic aquatic vegetation growing through the junk; part of a pine plantation; a marsh; a new clay-mining area.

Uncommon aquatic plants found by Good in the area are:
Ceratophyllum demersum, Lemna polyrhiza, Lemna gibba, Apium inundatum, Cladium mariscus, Oenanthe fistulosa, Potamogeton acutifolius and five species of *Utricularia.*

2. Marsh vegetation

Total number of sites: 76

Marsh and swamp sites	totally changed	12%
	partly changed	16%
	unchanged	72%
Marsh pastures	totally changed	35%
	partly changed	35%
	unchanged	30%

There are 49 marsh sites associated with several soil types, three swamp sites where the water is slightly brackish, and 24 marshy pastures or wet meadows.

The swamp sites are unchanged and are likely to remain so. One is a *Phragmites* reed swamp on the River Frome and the other two are swampy woods near Ower where *Alnus* and *Salix* predominate.

Most of the marshy places are low-lying and also unchanged. The high water table in some areas and the impervious subsoil of others makes the draining of the wetter sites difficult and expensive. Only five sites have been much changed and are now: roads (two), riverside moorings (two) and wet grassland (one).

In contrast the marsh meadows are greatly altered. With improved drainage, permanent seeded grassland is now established at 13 of the original 24 sites and the characteristic plants are mostly absent. Another four sites have now become: wet woodland (two), a clay mine (one), and a *Phragmites* swamp (one).

In one group of marshes and wet meadows uncommon plants from Good's records are:
Carum verticillatum, Scorzonera humilis, Cirsium dissectum, Thalictrum flavum, Oenanthe fistulosa, Oenanthe pimpinelloides, Lychnis flos cucili, Galium palustre, Rorippa sylvestris, Achillea ptarmica, Sanguisorba officinalis, Valerina officinalis, Silaum silaus, Baldellia ranunculoides, Utricularia major, Samolus valeriana, Lythrum sali, Ranunculus lingua, Valeriana dioica, Triglochin palustris, Osmunda regalis.

3. Maritime vegetation

Number of sites: 85

Maritime sites	totally changed	none
	partly changed	4%
	unchanged	96%

The maritime sites are cliffs (15), undercliffs (18), shores (35), and salt marshes (17), diverse habitats of great interest. The sites on South Haven Peninsula are not included and the pasture sites on cliff tops are considered with grassland habitats.

Good's selected sites are remarkably unchanged considering the abundant evidence of environmental change in the maritime areas. The cliffs, variously composed of chalk, limestone, sandstone, shale and mudstone are subject to constant erosion. Minor cliff falls continue, notably at Gad Cliff, Kimmeridge, Chapman's Pool, and Winspit, and some of the landslip areas of the undercliffs are still slipping and opening new sites for colonising plants. Among the halophyte vegetation of the salt marshes and harbour shores are craters and iron and concrete relics of wartime as well as the plastic jetsam of recent years, and the tidal shift of mud and silt in Poole Harbour modifies the shoreline and alters the pattern of vegetation (Hubbard, 1965; Hepburn, 1952).

In three sites the area has been reduced: one at the cliff top by Old Harry Rocks where grasses from seeded grassland have invaded up to the cliff edge; another on the sandy shores of Arne where a bund has been constructed to prevent pollution from a clay pit; and a third on the muddy harbour shores at Cleavel Point at the site of the Wytch oilfield water pump.

The apparent lack of change does not mean that every maritime plant found in the 1930s will be growing on the identical site today, but the abundance of maritime plants is still a feature of these places. Their survival is due to the efforts of landowners and conservation authorities who are aware of the threats of pollution, the pressures from industrial development and the spread of tourism to areas which were formerly inaccessible. Several of Good's sites may now be at risk. Cliff top plants are endangered from trampling, from herbicide drift from adjacent fields, and from erosion. Whilst plants lost by erosion may become re-established on ledges or undercliffs below, on the cliff tops there remain a diminishing number of native plants, particularly in those places where cultivation is close to the edge.

Among the numerous plants which Good found in the various maritime habitats are:
Artemisia maritima, Apium graveolens, Limonium binervum, Ruppia maritima, Ruppia spiralis, Agropyron pungens, Elymus arenarius, Suaeda fruticosa, Euphorbia paralias, Euphorbia portlandica, Crassula tillaea; Brassica oleracea, Salvia horminoides, Crithmum maritimum, Cynoglossum officinale as well as several different orchids.

4. Heath vegetation

Total number of sites: 184

Dry heath sites	totally changed	45%	Wet heath sites	totally changed	14%
	partly changed	7%		partly changed	5%
	unchanged	48%		unchanged	81%

Good selected more sites in heathland than in any other habitat group in the Isle of Purbeck, perhaps an indication of the higher proportion of heathland at that time, and his records have been invaluable for much recent research.

The 82 dry heath sites also include grass heath (11) and bracken heath (4). Sand tracks on heaths are considered with the minor habitats in group nine. The 102 wet heath sites are either boggy heath (41) or bogs (61).

The pattern of change corresponds with the general decline in the area of Dorset heathlands (Webb and Haskins, 1980). The dry heath sites have fared worse: only 39 of the original 82 sites remain unchanged. The other 43 include only six which have some relic heath vegetation and are now:

seeded grassland or rough pasture	(16)	arable	(2)
conifer plantations	(13)	buildings	(1)
gorse, with or without bracken	(6)	clay mining	(1)
natural woodland	(3)	oil well	(1)

Of the 102 original wet heath sites there still remain 31 on boggy heaths and 53 in bogs. Most are in conservation areas or on the Army Ranges, otherwise many would have been drained and their unique vegetation destroyed. The large number of surviving sites represents only a relatively small area of heathland because the sites are typically much smaller than those on dry heaths. Some boggy heaths have been partly affected by the spread of birch and pine and the sites which are totally changed are now:

seeded grassland or rough pasture	(8)	buildings	(2)
woodland and plantations	(7)	clay mining	(2)

Selected from Good's lists, local or uncommon species of dry heaths include:
Ulex minor, Ulex gallii, Erica ciliaris, Erica x *watsonii, Agrostis setacea, Erigeron acris, Jasione montana, Corydalis claviculata, Potentilla argentea, Pulicaria vulgaris.*

Among dozens from wet heaths and bogs are:
Gentiana pneumonanthe, Rhyncospora fusca, Drosera anglica, Eriophorum angustifolium, Menyanthes trifoliata, Lycopodium inundatum, Equisetum variegatum, Pinguicula lusitanica, Hammarbya palusdosa, Viola lactea, Parentucellia viscosa, Eriophorum latifolium, Osmunda regalis, and several species of *Utricularia* and *Dactylorchis.*

5. Grassland

Number of sites: 152

Grassland sites	totally changed	53%
	partly changed	21%
	unchanged	26%

Most of the grassland sites were formerly unimproved pastures on the calcareous and medium soils of the Purbeck Hills and South Purbeck. A few were meadows or hayfields (9), and others on more acid soil and particularly in North Purbeck were bracken grassland (15) and grassland on sandy soils (16). Marshy pastures or wet grasslands are considered in group two.

Grassland has been altered more drastically than any other habitat and all types of grassland are affected. 81 sites are no longer the habitats of the original native plants and another 32 are sufficiently changed to reduce the flora both in quantity and variety.

Nearly all the changes have been brought about by decades of improved farming methods. Pastures of the 1930s, first ploughed in the 1940s are now arable or seeded grasslands producing high quality or fodder. Modern techniques including the use of herbicides and large applications of fertilizers have eradicated all but the hardiest 'weeds' of cultivation. Surviving plants may occur along field edges, footpaths and roadside verges, cliff tops and waste places, but all these sites are vulnerable.

Further changes, notably on the calcareous hillsides, have resulted from undergrazing on those slopes where sheep and rabbits are used to keep the turf close-cropped, and on 18 sites gorse appears to be more extensive. Other sites are now:

quarries	(3)	oil well	(1)
woodland	(2)	clay pit	(1)
landslip areas	(2)	rubbish tip	(1)

The pattern was found to be similar in every grassland category. Only 40 sites of the original 153 appear more or less unchanged: meadows (2), bracken grassland (4), acid grassland (3), neutral and calcareous grassland (31). Fortunately the surviving sites are mostly in conservation areas and the remaining flora of chalk and limestone pasture is to some extent protected.

Plants found by Good on a dry pasture near the coast in 1933 included:
Origanum vulgare, Inula conyza, Centaurea scabiosa, Euphorbia portlandica, Lactuca virosa, Pimpinella saxifraga,

Allium oleraceum, Iris foetidissima, Carlina vulgaris, Cirsium acaulis, Anthyllis vulneraria, Helianthemum vulgare.

Among very many other pasture plants were several thistles, notably *Cirsium eriophorum* and *Carduus tenuiflorus,* a number of orchids, and many legume species.

6. Hedgebanks

Number of sites: 64

Hedgebank	totally changed	6%
	partly changed	5%
	unchanged	89%

Hedgebanks are particularly important botanical sites and continue to be a familiar feature of the Purbeck landscape. The banks have been built up of stones from adjacent land whether pasture, arable or woodland, and plants from these different habitats including both sun and shade species may grow together. Drainage ditches along the banks often provide an additional habitat for marsh plants. The hedges in most of the hedgebank sites are typically composed of several shrub species in contrast to single species hawthorn hedges elsewhere.

Fifty-seven sites remain, no doubt because hedgebanks have proved to be more durable and less expensive than wall or wire. Seven have been reduced to some extent and replaced by wire (3), cleared for building (2) or to enlarge a field (1) or destroyed by browsing and trampling.

The sites of greatest interest are along parish boundaries or by old lanes and former sheep droves where the hedgebanks were established centuries ago, judging from the large numbers of native shrub species which occur together, Pollard *et al.* (1974). These are commonly sallow, hazel, hawthorn, blackthorn, bullace, dogwood, privet and wayfaring tree as well as a tangle of several species of rose and bramble and climbers such as one or other bryony, and perhaps clematis. Oak and ash trees are also common and usually have their origin in branches laid horizontally when the hedge was being maintained in traditional manner.

Mechanised hedge-cutting may be a threat to the vegetation of both hedge and bank although the destructive effects are reduced when the cutting is done only at the end of the summer. Herbicides are not used on the banks and roadside verges but there is sometimes a danger of drift from adjacent fields.

The variety of hedgebank plants is so great that only a few representative ones are mentioned here: from woodlands, *Campanula trachelium;* from pastures, *Geranium pratense, Linaria vulgaris* and *Lathyrus apaca;* from arable land, *Stachys arvensis, Cichorium intybus, Verbena officinalis* and *Legousia hybrida;* on walls, *Cotyledon umbilicus;* adventive, *Artemesia vulgaris* and *Smyrnium olusatrum;* wet places, *Sanguisorba officinalis.*

7. Thickets

Number of sites: 44

Thicket sites	totally changed	39%
	partly changed	9%
	unchanged	52%

The original sites were small areas of hawthorn, blackthorn, birch, alder, gorse, brambles and other species which may form more or less dense thickets sometimes combined with grass, heath or bracken. They occur on all soil types and like hedgebanks are habitats for a very wide variety of plants and especially shade-tolerant species.

Seventeen sites have now gone completely and another four have been partly cleared. Predictably the grass-thickets have suffered most. Changed sites are now: seeded grassland or rough pasture (12), arable land (2), birch wood (1), buildings (1), clay mine waste (1). Surviving sites are mostly in conservation areas such as the RSPB Reserve at Arne and along the coast and also on Corfe Common.

8. Woodland

Number of sites: 108

Woodland sites	totally changed	3%
	unchanged	97%

Habitat changed in woodland has been difficult to assess. Most of the 108 sites are still the same woodland type today although the composition of all the woods has inevitably been modified in some way whether by thinning, felling, clearing, re-planting and other normal woodland practices, or from being left unmanaged. The effects on the flora are not known and comparative botanical lists are wanted particularly for woodland sites.

There are three categories: conifers (6), mixed woodland (27) and deciduous woods (75).

Conifers are represented by stands of very limited botanical interest. One only has been cleared, making way for the massive installations associated with the Wytch oilfield. The remaining five are still stands of *Pinus sylvestris* and little else.

Mixed woodland consists of either blocks of conifers planted among broad-leaved species or a true mixture of exotic ever-green trees with native species. Conifers have frequently been planted inside woods to replace the drastic wartime fellings but where there are sufficient broad-leaf trees much of the original flora seems to survive. At three sites which are now pine woods or grassland woodland plants have gone.

75 of the 76 deciduous woodland sites still exist and the only one which has gone was already derelict in the 1930s. They are either tallwood or coppice-with-standard woodland. Most tallwoods consist of

oak or ash or else sweet chestnut or sycamore and the understorey shrub layer is sparse or absent. In the numerous coppice-with-standard sites the spreading standards are typically oak and ash trees which over-shadow the coppiced hazel below.

In spite of the apparent lack of change woodland plants may be fewer. In five sites the area for ground flora has been reduced by conifer plantations. In several others *Rhododendron ponticum* has become so densely established that all other vegetation except for mature trees is totally excluded. Hazel is no longer coppiced regularly in any of the woods and in consequence there is increased shading and accumulation of brushwood. These conditions may favour the establishment of holly, brambles or ivy. It has been demonstrated, Ford and Newbould (1977), in uncut sweet chestnut coppices that the quantity of the ground flora declines and eventually certain species become less frequent. The same may be true of hazel coppices.

Several of the sites are believed to be ancient woodland which means that the localities have been tree-covered continuously since woods became established in Southern Britain at the end of the last Ice Age. Any wood shown on Isaac Taylor's *Map of Dorset* (1765) is likely to be ancient woodland because few new woods were planted before that time. Old estate records may confirm this view. A number of plants are confined almost exclusively to habitats in old woodland and may be useful indicators of ancient sites, Peterkin (1977). These included attractive native species such as:
wood anemone, wood garlic, wood melick, wood millet, woodruff, wood sorrel, wood sanicle, wood sedge, wood speedwell, yellow pimpernel, yellow arcangel, moschatel, bugle and several woodland orchids. On one ancient woodland site, Good listed no less than 130 different ferns and flowers, including the above, suggesting the exceptional interest of such places.

Additional and rather uncommon woodland plants in Purbeck are:
Hypericum androsaceum, Campanula trachelium, Carex pendula, Chrysosplenium oppositifolium, Allium ursinum, Melampyrum pratense, Euphorbia amygdaloides, Viburnum opulus, Malus sylvestris, Frangula alnus.

9. Minor habitats

Number of sites: 80

Minor habitats	totally changed	22%
	partly changed	15%
	unchanged	63%

The pattern of change in the very varied minor habitats is shown in Figure 59.

9.1 *Fallow fields*

All of Good's six original sites must be considered totally changed. They are now seeded pastures or arable land where only few weeds of cultivation survive.

Plants of a former fallow field on Ballard Down were:
Spergula arvensis, Euphorbia exigua, Silene gallica, Scleranthus annuus, Chaenorhinum minus, Stachys arvensis, Lycopsis arvensis, Legousia hybrida, Odonites rubra.

9.2 *Arable and seeded fields*

The 11 sites are mostly on poor soils. One has the same weed flora, eight are partly improved grassland with some familiar weeds of cultivation, and two are seeded grassland which is almost weed-free.

In addition to the above, Good also records:
Anthemis arvensis, Viola tricolor, Kickxia elatine, Kickxia spuria, Chrysanthemum segetum, Geum columbinum, Agrostemma githago, Scandix pecten-veneris, Papaver hybridum, Galeopsis angustifolia, Arnoseris minimus, Torilis nodosa, Ranunculus arvensis, Lithospermum arvense, Ornithopus perpusillus, Misopates orontium.

9.3 *Stone walls*

Reassuringly all the old walls selected by Good are still standing except in two localities where they have been partly destroyed by military activities. Characteristic plants include at least five ferns and:
Cymbalaria muralis, Erophila verna, Saxifraga tridactylites, Geranium lucidium, Parietaria judaica, Arabidopsis thaliana, Cotyledon umbilicus.

9.4 *Roadside and tracks*

In spite of tarmac and the greater use and maintenance of roads 12 of the 14 roadside sites have not greatly altered whilst two have made way for drainage ditches. The old roads on heathland are of special interest because their foundations are thick layers of calcareous stone and the roadside flora is both calicole and calcifuge and includes some aquatics as well. The result is an outstanding variety of plants of chalk downland and wet heaths. These sites are well known and ideally the verges are cut only in autumn but they are at all times vulnerable from the wheels of vehicles and from passersby.

Only three of the eight sandy tracks remain because the others have been upgraded to become tarmac roads. The sites were on heathland and although there are similar places today they are constantly being eroded by excessive use by walkers, riders and motor cyclists. Small plants of interest which Good recorded from sandy tracks are:
Cicendia filiformis, Radiola linoides, Centunculus minimus, Filago minima, Crassula tillaea, Montia fontana, Scirpus setaceus.

9.5 *Quarries and rocks*

The original sites were abandoned areas of the Purbeck and Portland stone quarries apart from one where brick-clay had been extracted. They include cliffs, stone heaps and grassy hollows and fortunately most are in conservation areas and 9 of the 12 sites have survived. Two of the others have been partly cleared for building land and one is a chicken farm. The flora of the quarries is calcicole with maritime and adventive species as well.

9.6 *Chalk quarries and chalk waste*

Good chose four small sites on the Purbeck Hills between Stonehill and Ballard Down. Three remain but extensive quarrying has obliterated the fourth. All the old quarries which flank the hills are important sites for flowers of the chalk now that the chalk downland has been severely reduced.

9.7 *Gravel pits*—not represented in the area.

9.8 *Rabbit warrens*

The four sites selected had a flora which included plants of the immediate locality and others possibly introduced from the rabbit droppings. Change cannot be assessed because the warrens at the sites are not necessarily the same ones, but there is no great difference in the general area of the warrens: rabbits are about and the plant lists are similar.

9.9 *Adventive and miscellaneous*

The six sites of adventive plants are along the old heathland tramways and railways. The plants may have been introduced during construction or when clay was transported from the heathland pits to the now abandoned quays on Poole Harbour. Only one of the sites has changed: it is now overgrown with grass, bracken and brambles. The others still have an interesting flora. One miscellaneous site, the only example of mixed habitats, is still rough pasture and hedgerow.

CONCLUSION

The pattern of habitat change which has been described applies only to Professor Good's stands and not necessarily to the Isle of Purbeck as a whole, where overall change may have been more extensive than the results suggest. His habitats show total change in about one-fifth (22%) of the original sites, whilst about two-thirds (68%) are basically unchanged. The remaining 10% are between the two extremes.

The greatest transformations have occurred in grassland, arable fields and heathland. Table 1 shows that three-quarters of all the sites which are totally changed as well as half the partly changed sites, have been altered by developments in agriculture and to a lesser extent forestry, a case perhaps of 'two ears of corn or two blades of grass . . .'.

Most of the lost habitats were formerly downland, sandy pastures, wet meadows, dry heathland, grass thickets, and untreated arable land. In contrast, the habitats least affected are woodland, maritime and hedgebank, and still plentiful are those sites on boggy heaths and in aquatic and marshy places (though not including marshy meadows which often have been drained). Together these last six habitats show a total change of only 12%, much less than was expected before the survey began.

The relative lack of change in these vulnerable places may be explained in two ways. The first is economic. As long as it is cheaper to keep an old hedgebank than it is to replace it, the hedgebank will stay. And if it is unprofitable to drain wet places or replant old woodland then such 'unproductive' areas will be tolerated. The second reason concerns conservation. The natural history and landscape of Purbeck has long been recognised as outstanding and effective conservation measures are taken by landowners and by influential organisations which include the Countryside Commission, Heritage Coast, Nature Conservancy Council, Dorset County Council, National Trust, Dorset Naturalists' Trust, Royal Society for the Protection of Birds, Council for the Protection of Rural England, together with a number of smaller groups and individuals.

All the maritime sites are in conservation areas, also many of the remaining heaths whilst a few important quarry, woodland and chalk pasture sites are in nature reserves of one sort or another. (See Table 2). Unfortunately the protection of these places cannot always be guaranteed. Those described as sites of special scientific interest (SSSI) are under voluntary management agreements which cannot necessarily be enforced, and developments considered to be in the national interest cause small but steady losses which may not be of great consequence individually but collectively are a threat to plants which are already uncommon.

Other threats to plant life have been noted during this survey. Excessive tidiness and a sort of suburban approach to the countryside may affect hedgebanks, roadside verges, thickets and overgrown places, whilst areas which have been left to grow wild have attracted litter. A common problem is too much traffic on narrow roads and subsequent damage to the vegetation of the verges, and a new threat comes from motor bike scramblers who create numerous tracks on heaths, downland, and in woods and old claypits. Vandalism of a different kind occurs when rare species are picked, reportedly bunches of bee and spider orchids, or when plants are dug up. Plants are also destroyed by trampling especially along the coastal cliffs where summer visitors come in hundreds.

As so many habitats are under threat and so many grassland and arable sites are lost, other places which formerly were considered less significant are now becoming more important. Obvious examples are all hedgebanks, roadside verges, disused railway tracks, and many of the footpaths and bridleways. Overgrown chalk pits and stone quarries and waysides on foundations of calcareous stone are important sites for downland plants. Bomb craters, like old clay pools, are useful aquatic sites on heathland and the harbour shores. Disturbed ground if left and not flattened and seeded is soon colonised by a succession of interesting plants. It is worth remembering that some of the best botanical areas today are in places where once there were traditional methods of excavation.

All these observations must be familiar to anyone who knows the area or who has read some of the many publications on its ecology. Particularly interesting is the publication by the Dorset Naturalist Trust, *Wildlife Conservation in the Isle of Purbeck,* 1977, where the ecology of the area is described.

There is now a need for more up-to-date plant records to add to those regularly collected by the county recorders for the BSBI (Botanical Society of the British Isles) and DERC (The Dorset Environmental Records Centre). Professor Good's comprehensive plants lists, briefly referred to here, still provide the only complete records for most places. Now that 22% of his stands in the Isle of Purbeck have gone, and another 10% are partly changed, more botanical work is clearly necessary.

Perhaps this preliminary habitat survey, the first of a series planned for reviewing all Good's original stands in Dorset, will encourage a renewed search for the plants of Purbeck and elsewhere in the country. This would help to provide the kind of information which is the basis of conservation policies. It is worth considering that our native plants are 'that part of wildlife which represents its greatest asset'.

TABLE 2

ORIGINAL BOTANICAL SITES NOW IN CONSERVATION AREAS:

		approx.
A.	Sites where access is restricted	
	Hartland Moor NNR	3%
	Arne RSPB and others	10%
	Bovington and Lulworth Army Ranges (part)	2%
B.	Maritime sites	
	Poole Harbour SSSI, access mostly private	5%
	Coast path and Army Range walks	7%
C.	All other SSSI, usually some public access and DNT reserves	
	Woods, downs, quarries, heathland, etc.	17%
	Original sites now in conservation areas	44%

Notes

1. NNR National Nature Reserve.
   RSPB Royal Society for the Protection of Birds.
   SSSI Site of special scientific interest.
   DNT Dorset Naturalists' Trust.
2. Nearly all the original sites which are in conservation areas are unchanged; exceptions are mainly chalk and limestone pastures.
3. South Haven Peninsula, not a part of this survey, is partly NNR and partly SSSI.

Acknowledgements

Professor R. Good, Dr. F. H. Perring, Dr. N. R. Webb and Miss E. Dennis for much advice and encouragement; Dr. M. G. Morris for access to Professor Good's manuscripts and the library at Furzebrook; Miss E. Dennis and the Nature Conservancy Council for record cards; Staff of the Dorset Environmental Records Office for information on recent plant records in Purbeck; the Staff of the County Records Office in Dorchester; and to all who kindly gave permission to visit otherwise inaccessible places in Purbeck.

REFERENCES

Carter, P. W. (1957). The botanical exploration of Dorset. *Proceedings* 79: 73-98.

Clapham, A. R., Tutin, T. G. and Warburg, E. F. (1962). *Flora of the British Isles*, 2nd Edn. Cambridge, 1269 pp.

Ford, E. D. and Newbould, P. J. (1977). The biomass and production of ground vegetation and its relation to tree cover through a deciduous woodland cycle. *J. Ecol.* 65: 201-212.

Good, R. (1935). Contributions towards a survey of the plants and animals of South Haven Peninsula, Studland Heath Dorset. *J. Ecol.* 23: 361-405.

Good, R. (1937). An account of a botanical survey of Dorset. *Proc. Linn. Soc.*, London., 149: 114-116.

Good, R. (1948). *A Geographical Handbook of the Dorset Flora.* Dorchester.

Good, R. (1955). First addendum to the hand-list of the Dorset Flora. *Proceedings* 75: 157-163.

Good, R. (1961). Hand-list of the Dorset flora (second addendum). *Proceedings* 83: 71-78.

Hepburn, I. (1952). *Flowers of the Coast.* Collins, London, 236 pp.

Hubbard, J. C. E. (1965). Spartina marshes in southern England VI. *J. Ecol.* 53: 799-813.

Mansel-Pleydell, J. C. (1874). *Flora of Dorset,* 1st Edn. Dorchester.

Mansel-Pleydell, J. C. (1895). *Flora of Dorset,* 2nd Edn. Dorchester.

Peterkin, G. F. (1974). A method for assessing woodland flora for conservation using indicator species. *Biol. Conserv.* 6: 239-245.

Pollard, E., Hooper, M. D. and Moore, N. W. (1974). *Hedges.* Collins, London, 256 pp.

Ranwell, D. S. (1969). Losses and gains in the wetland and coastal flora of Dorset. *Proceedings* 91: 134-146.

Teagle, W. G. (1966). *Public Pressure on South Haven Peninsula and its effects on Studland Heath National Nature Reserve.* Unpublished Nature Conservancy Report, 57 pp.

Webb, N. R. and Haskins, L. E. (1980). An ecological survey of heathlands in the Poole Basin, Dorset in 1978. *Biol. Conserv.* 17: 281-296.

DORSET ARCHAEOLOGY IN 1979

Compiled by LAURENCE KEEN

This account of excavations and discoveries in the county is the final one I will compile. I would like to thank all those individuals who have kindly submitted reports over the last four years and in so doing have added significant information to the archaeological content of the Proceedings. *L.J.K.*

ARNE. R. A. H. Farrar reports that the excavation at *Redcliff* near Wareham in 1979 yielded the most important results to date, although its scope was limited by lack of volunteers and hampered by the need to pump at lower levels. The flimsy wall foundation already known across the site was traced in both directions, for a total, now, of nearly 9 m, without sign of either corner or party walls, and its interpretation as a sleeper wall to carry a light timber structure such as a drying-shed is a likely one. This phase might be as late as AD 130-160 on the evidence of a samian sherd in 1975.

Immediately beneath this foundation, part of a rounded floor of brilliant red burnt soil laminated with jet black seams, some 4 m in diameter if it continues as a complete circle, was unaccompanied by any sign of structure, and is assumed to represent the 'bonfire' base on which several pottery firings were carried out. If so it is the first positive evidence for what is suspected as standard procedure in the firing of Purbeck black-burnished ware (BBI). Examples of flat-rimmed bowls and dishes ('pie-dishes') in early civil deposits at Exeter suggest that the first activity at Redcliff may have been as early as *c.* AD 80. It is intended to expose more of this feature in 1980 with assistance from DoE soil experts.

BRADFORD PEVERELL (SY 3661109278). Excavation of the late 7th-/early 8th-century inhumation cemetery at *Frome View* was continued by L. J. Keen and J. B. Hawthorne. Two graves were excavated bringing the total to 12. The first burial was in a shallow grave cut into natural chalk for 0.15 m to 0.30 m, having a small iron knife at the head end of the grave towards the top of the grave filling. The second burial was in a deeper grave cut to an average of 0.50 m into the chalk and the width was very narrow, no more than an average of 0.40 m. Large flints marked the top and bottom of the grave and beneath those were small pits at least 0.30 m deep and the full width of the grave: it is suggested that these were probably to hold marker posts. The burial was accompanied by an iron knife laid across the skeleton's left forearm.

BROADWEY (SY 667320). During road widening operations at *Lorton Farm,* A. J. Boulter and B. Squibb found medieval and post-medieval pottery and a possible metalled floor. Features recorded in section might have been pits or drainage ditches. Finds are held by A. Boulter pending transfer to an appropriate museum. Notes are deposited in Dorset County Museum.

CORFE CASTLE (SY 954815). Excavations by J. Collins and N. Field continued at *Bucknowle Farm.* Excavations over four seasons have provided the plan of a tripartite villa range, comprising corridor, domestic and service rooms, dating to AD 270-350. Much of the building exists only as foundations robbed to below original ground level, but Room V retained part of a plain red tesselated floor, while fragments were found of a black and white patterned pavement in the central part of the corridor (III). The heated room (IV) had had an *opus signinum* floor over *pilæ* of local limestone. The hypocaust furnace was stoked from service room VI. Important surviving features of this building were the doorways between Rooms VI and VII, VII and IX (incomplete) leading outside from Room XI. Double post-sockets took the door-frame on each side of the threshold and this is apparently a local structural development known from two other sites in Purbeck. Work in 1979 confirmed details of an earlier phase of the villa, partly incorporated in the later phase and demolished when the corridor was extended to link with another building range lying at right angles (XIV, XV).

——————————— During works to convert the old parish church at *Kingston* into a dwelling, L. J. Keen observed the removal of floors and the lowering of ground level to accommodate a new concrete floor-slab. All material removed was associated with the 19th-century stone floor and so earlier levels survive undisturbed.

DORCHESTER (SY 685911). The final season of excavations at *Poundbury,* directed by C. J. S. Green, was carried out from June 1979 to January 1980 by kind permission of the landowners, the Southern Electricity Board, and with funds provided by the Department of the Environment and the Manpower Services Commission. Mr. Green reports that on site E, first cleared in 1976, work continued on the Iron Age and early Roman settlement, the northern edge of both the late Roman cemetery and the post-Roman settlement. Two new areas, F and G, in the north-east corner of the development area, revealed the E side of the Iron Age enclosure and later occupation and burials.

The Iron Age settlement lay within an approximately rectangular enclosure adjoining the scarp northwards to the river Frome, the occupation of the early Roman period occupying a terrace overlying the south side of the enclosure. Approximately half the interior area was excavated.

The first phase of the enclosure consisted of a V-cut ditch enclosing 0.13 ha., the western side following the line of an earlier Bronze Age boundary, part of the system investigated in previous seasons. Within this enclosure one centrally placed pit contained pottery, including imported northern French ware, of the 4th century BC.

In the second phase the east side was extended to enclose an additional 0.03 ha. The re-cut ditch contained pottery of the 2nd or 3rd centuries BC in its base but there were no identifiable features in the interior. A slighter ditch running east from the south east corner of the enclosure may have formed part of a more extensive enclosure previously traced to the south.

By the 1st century AD two round-houses of approximately 6 m diameter had been erected in the western, uphill end of the enclosure, each hut passing through at least three phases of re-building. Of 19 pits on or around their site, 9 beehive pits were ranged along the inside of the south and west sides of the interior, set back from the inside lip as if respecting a bank since eroded away. A further storage pit outside the enclosure was dug in 1976. Finds included large quantities of Durotrigian pottery, briquetage, burnt clay and animal bones, suggesting the process of food stuffs including salt, meat and milk products. Flotation samples from pit-fillings contained cereal remains. A destruction level in the enclosure ditch and some pits may mark the end of this phase.

In the mid-1st century AD a group of 16 burials (Cemetery 1B) as laid out on the east of the settlement. All were crouched inhumations and were accompanied by either pottery of the early Roman period, including *terra nigra,* Durotrigian ware and copies of early Roman forms, or bronze brooches or rings of similar date.

The southern hut was rebuilt at least five times during this period until in the late 1st or early 2nd century it was replaced by a rectangular house 5 m by 7 m. A terrace for a further badly disturbed structure lay to the north.

Occupation ceased in the late 2nd century when the settlement on site C, lower down the hillside, first came into use. The downhill part of site E and site F was now encroached upon by an enclosure containing burials of cemetery 2B, which served this later occupation. The 35 extended inhumations were arranged around at least three sides of a ditched enclosure 20 m wide by at least 40 m long, the graves in some cases encroaching upon the ditch or lying just outside it. Orientation varied with the enclosure boundary alignment and grave-goods accompanied the bodies, pottery of late Roman date, hobnails and offerings of sheep heads or bird skeletons occurring in many cases. A possible cess-pit and a substantial key-hole oven of late Roman date lay within the enclosure. Limited excavation to the north-east on site G revealed an irregular N-S ditch and traces of a posthole structure on a slight terrace, within the angle of a slight L-shaped ditch. These features, very similar to those in the post-Roman settlement, were associated, however, with apparently unabraded late 4th-century pottery. Further elements of this late to post-Roman occupation lie sealed beneath existing structures in this area.

The northern edge of the main late Roman cemetery (cemetery 3) yielded a further 99 graves, making a total of 1,117 excavated. The northern boundary on the west was marked by two parallel ditches 10 m apart, possibly the two sides of a drove-way serving the field system within which the cemetery grew up. To the east the cemetery 2B enclosure formed the limit. With few exceptions the burials were simple, extended inhumations, head east, with nails from wooden coffins. The only special burial, adjoining one dug in 1976, consisted of a lead-lined coffin containing the body of a woman surrounded by plaster. Quantities of hair survived and, beneath the head, a pillow of leaves. One exceptional burial lay at the north end of a relatively grave-free strip running through the cemetery, the body here was contained in a simple wooden coffin furnished with a carefully made Y-shaped iron fitting at the head end. Whatever the significance of this symbol, the position alone suggests this was a focus for those visiting the site.

On the northern edge of the post-Roman settlement, two ditch systems bounded the occupation. One system consisted of a linear trench aligned NW-SE with the Roman boundaries and set back 15 m from the scarp. Another parallel boundary may have existed 10 m to the north. The other system consisted of two discontinuous irregular ditches running SW-NE across the site and overlapping complex PR 11. Although the relationship of these two systems was not clear, both have been previously noted and may indicate two main phases of settlement, the one comprising rectangular structures within a regular enclosure on the Roman layout, the other a more haphazard layout of huts and irregular enclosures within a large enclosure set diagonally across the first. Three structures or feature complexes were investigated within the northern edge of the settlement. The major complex PR 11 consisted of firstly a trampled floor, possibly for threshing into which had been inserted a corn-drier containing large quantities of carbonised grain. Later a group of shallow pits or hollows was cut into these features before the diagonal boundary cut across the complex. Two more rectangular pits in this area may also have served as corn-driers. Immediately to the east numerous postholes suggest a substantial structure, PR 12, the plan of which is as yet unclear. To the south, a curving ditch formed the north side of the PR 13, an irregular enclosure approximately 30 m square found in 1976 to contain pits and a stakehole structure.

On site F further boundary ditches were traced and two more possible corn-driers. Beside the late or post-Roman boundaries already noted on site G, a pair of corn-driers containing carbonised grain certainly belonged to this phase. Radiocarobon dates from two corn-driers and a pit dug in previous

seasons have now provided dates of between ad. 360 ± 80 and ad. 500 ± 100 (HAR 2281, 3079-3081). These consistently early dates and the lowly character of the settlement demonstrate not only the speed but the scale of decline in late Roman culture in Dorchester, and provide the first clear insight into the nature of sub-Roman continuity in this area.

———————— C. J. S. Green reports that the cutting of a 1.2 m deep trench for the renewal of gas mains in *South Street* confirmed the existence of a Roman building crossing the street opposite the Antelope Hotel, bounded to north and south by open areas (SY 69259068). Further south opposite the Methodist Church, a metalled road 7-8 m wide continued the line of an E-W road already recorded in the western half of the town (SY 69259064). This was flanked on the south by a substantial building with chalk floors and flint and mortar walls extending 35-40 m to the south. Traces of earlier, slighter structures underlay it. In front of the National Westminster Bank an area floored with chalk extended south until at the south-east corner of the Bank a large oven was crossed (SY 69249058). Further south only disturbed levels survived until at the General Post Office the north-west corner of a substantial flint and mortar building was hit (SY 69239049). For much of the lower part of the street south of the junction with New Street, the Roman levels were largely below the trench. Instead, super-imposed metalling layers of sand and cobbles underlay the present tarmac to a depth of nearly 1 m, the black soil and late Roman destruction lying beneath this. Near the bottom of South Street Roman levels re-appeared and outside Pitfield's butchers an oven was crossed (SY 69219038). At the end of the street the line of the south defences was crossed but no trace of either bank or wall survived. The northern lip of the inner ditch was observed at SY 69209035, beyond which was dark soil and rubble filling the upper part of the ditch.

In *Acland Road*, another trench revealed a north-south metalled road beneath the west side of the present road. The western edge of the metalling had previously been recorded along the east side of Ling's store, to the west of the road (SY 69369060-69369063). The metalling consisted of two distinct levels of sand and gravel metalling overlying a chalk foundation. Unabraded late Roman pottery was recovered from the upper road foundation.

Further north in *Church Street* a fragment of the east-west road previously recorded outside the Methodist Church in South Street was encountered (SY 69379066). In the north section of Church Street traces of foundations and superimposed chalk and mortar floors and occupation levels were noted to a depth of nearly 1 m.

———————— Mr. C. J. S. Green observed the widening of a road serving a new car park of Hardye's School and reports that this revealed the more westerly of the *Two Barrows*, lost since the 19th century. The low mound survives beneath the south side of the road and the northern boundary of the school grounds (SY 69658979). The turf core of the barrow overlain by a spread chalk mound was visible, sealing an old turf-line, the estimated diameter of the whole being 14 to 18 m. Traces of one or possibly two slight ditches existed on the western side of the mound. The surface beneath the turf core was covered in fresh flint-knapping debris and the core itself produced a fine barbed and tanged arrow head.

The other barrow survives as a low mound 35 m in diameter in pasture to the east (SY 69788979).

———————— (SY 703898). Mrs. E. Trim reports the finding of an Æ *sestertius* of Gallienus, AD 260-8, RIC 180, reverse with antelope left, in allotment garden south-west of the Wareham road.

GUSSAGE ST. MICHAEL. Martin Green reports on excavations at *Down Farm* (Fig. 60). The Middle Bronze Age enclosure excavated at Down Farm between June 1976 and December 1979, which was discovered when a water main was being laid, had not been detected previously by aerial photography. Once the extent of the ditch had been established by trial trenching, it was decided to strip the whole of the interior to see if any traces of occupation had survived the extensive ploughing of the present century. An area of 1,660 sq. metres was completely stripped.

Neolithic. Underlying the MBA earthwork a rich Grooved Ware occupation was revealed, represented by 16 pits and possibly a number of stake holes. The pits were in two main clusters except for one outlier, and depths varied between 10 to 70 cms. They contained a rich assemblage of finds including red and roe deer antlers, ox skulls, stone axes, boars' tusks, Grooved Ware and much flint work including transverse arrowheads. Pig bones were dominant amongst the animal bones. One pit had been all but obliterated by the MBA ditch and a number of residual finds in the ditch suggested others had been totally destroyed. It seems certain that this phase of occupation was in some way connected with the Dorset Cursus which is only 140 metres away.

Middle Bronze Age. The ditch proved to be a three-sided rectilinear enclosure and was only 75 cms deep by 2 m across. It was V-profiled and contained all the main varieties of Deverel Rimbury ceramics. The open side of the enclosure was bounded by a substantial fence with an entrance close to the northern terminal of the ditch. Inside the enclosure a remarkably preserved and clear settlement plan was uncovered; this has three main elements, a series of five round houses, a number of internal fence lines and a unique rectangular building. Few of these features overlap one another and the site may not have had a long occupation.

The principal structure towards the south of the site (hut A) was a substantial round house, 6 m in diameter with a four-post porch. The enclosure ditch appears to curve round the south wall of this building; even after ploughing, the post-holes were of considerable dimensions. The four other round

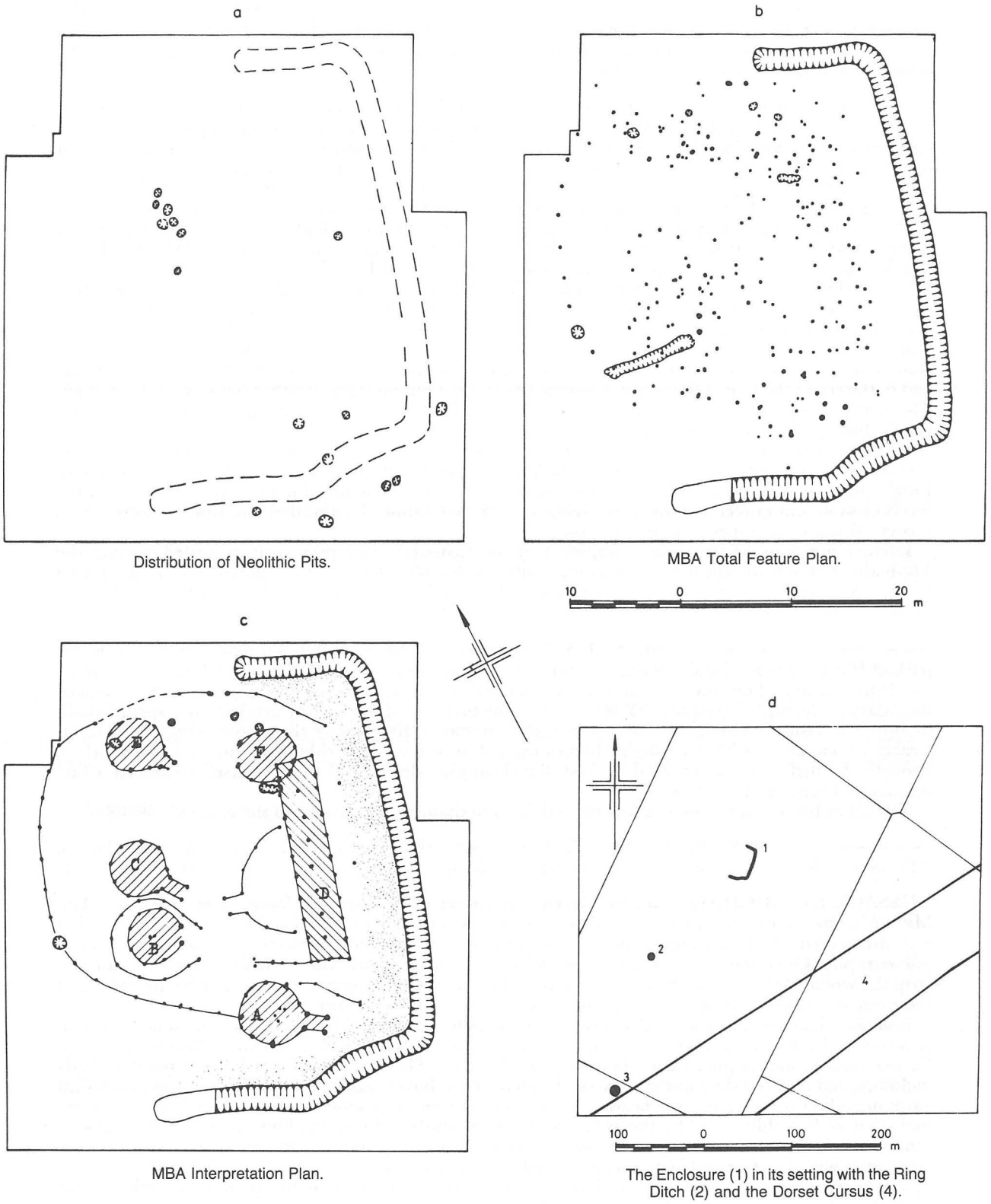


Fig. 60. Gussage St. Michael, Down Farm. *Drawn by John Arnold.*

houses were approximately 5 m in diameter and were less substantial, although two others also had porches (huts C and E). Hut B was enclosed by a horseshoe-shaped fence and had been cut by a shallow gully containing the base of a barrel urn. Hut C is so close to hut B that they could not have been contemporary and it is most likely that hut C replaced hut B. Huts E and F oppose each other, close to the entrance of the enclosure and hut F was demolished when the rectangular building (structure D) was built. This building runs parallel to the east side of the enclosure and is over 18 m long by 4 m wide. The central post-holes were deeper than the others and one contained sherds of Deverel Rimbury pottery. To the south, this building is attached to one of the fence lines, whilst from the inner side of a semi-circular line of post-holes indicated an enclosure or yard with larger post-holes set out from it forming a possible entrance. So far this building has no British counterpart. Similar structures, however, are found in the Low Countries. Most long houses are larger than this but there are striking parallels in the BA settlements at Deventer and Hoogskarpel.

The Cemetery. A ring ditch 130 m south of this enclosure has since shown up on aerial photographs, and field walking over this area has now produced sherds of Deverel Rimbury pottery of similar character to some fabrics found in the enclosure. It seems very likely that this is the cemetery for the settlement and work in 1980 will concentrate on this aspect.

HALSTOCK (ST 533076). Work was carried out in three separate areas of the Roman villa site during 1979. The excavation was directed by R. N. Lucas who provided details. The north-west corner of Room XVII was further investigated, the area east of the barn partially examined in 1978 was re-opened and extended as far as the hedge on the north side of Common Lane, but the main excavation took place on the south side of the quadrangle to begin to determine the south wing of the villa complex.

The north wall of Room XVII is traversed by the hedge on the north side of the lane. Part of this hedge was removed to facilitate an extended re-examination of the north-west corner of the under-floor of the room. A covered drain cuts through the wall near the corner and as this wall seems otherwise anomalous it is clear that further examination is necessary: more of the hedge will be removed and the excavation extended in 1980.

Farm buildings continue east of and on the same alignment as the barn but the function of these buildings could not be determined. A complete plan of these buildings was not obtained but further excavation in the lane, south of the hedge may produce this. A very well built drain runs in an approximately south to north direction across these buildings. This has a flagstone bottom, stone sides and had flagstone capping which was removed in order to clean out the channel. The north wall of these buildings, which is in line with the north wall of the barn, has post-holes on either side of it, seven on the south side and three on the north side. Some of these post-holes are demonstrably later than the walls and floor levels of these buildings and the inference is that there was a structure of some sort post-dating the building but bearing some relationship to the alignment of the earlier north wall. This is an identical pattern to what occurs at the eastern end of the passageway and indicates an occupation later than the stone building. The floors relating to these post-holes have not survived and nothing has been found to indicate whether or not these are post-Roman features.

On the southern side of the site an area of 300 sq. m was excavated. Buildings were located suggesting a probable south wing to this villa complex but as no building was completely excavated their function can only be a matter of conjecture at this stage. In this area, the earliest feature is a ditch approximately south-west to north-east across the site beneath the west wall of the building at the southern end but alongside the wall at the northern end where the ditch was sectioned. Next in sequence comes the building at the north-east end of the excavated area, the south wall of which is the longer of the two overlapping walls. This wall later becomes the north wall of the building built south of the first building but at the western end of this wall another wall is built on its northern side. As this new wall progresses eastwards it converges with the original wall. Why this second wall is built adjacent to and merging with the first wall is difficult to understand, it would certainly suggest that a major reconstruction took place.

The most southern of the two buildings is probably a barn approximately 10 m wide overall with an aisle 2.5 m wide on its south side. The south wall of this building is built over a somewhat puzzling structure. This consists of a flagstone bottomed, stone-lined channel, 5 m in length, 0.55 m wide with two identical channels 2 m in length on the northern side. As excavated, the channels varied in depth from 0.09 to 0.19 m, both ends of the longer channel were open as was the end of the western channel, though this part was damaged by the foundations of the south wall of the barn, but the end of the eastern arm was finished off with a stone wall integral with the sides of the channel. It will not be confirmed until the 1980 excavations, but there is a possibility of a water channel leading to the western end of the long channel of this structure, but there is no indication of a drain leading from the eastern end. Also, the eastern end of this channel is 0.20 m lower than the western end so that if water was flowing west to east the rate of flow might mean that water would not flow into the side channels particularly as these slope downwards into the main channel.

Around this channel feature the area was excavated to natural but no sign of any structure around this feature was found. It was thought that this might be a latrine predating the barn but the cleansing operation presents problems that may negate this theory.

Two parallel walls 2.5 m apart project westward from the north-west corner of the barn. These walls appear to be integral with the barn wall.

HANFORD (ST 86291057). A metal-detector user reports the discovery of an Anglo-Saxon silver *sceat*, BMC 36 see Fig. 61.2.

———— (ST 86331079). Also found by a metal-detector another Anglo-Saxon silver *sceat* with 'Wodan' head, reverse monster, BMC 31 (var.), Fig. 61.3.

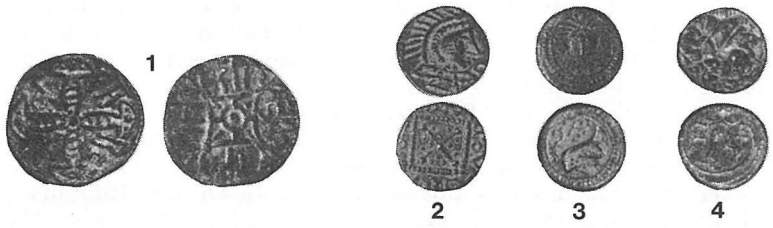


Fig. 61. Anglo-Saxon coins. (1) Penny of Offa from Stourpaine, (2) and (3) *sceattas* from Hanford, (4) *sceat* from Stourpaine. Scale 1:1.

IWERNE COURTNEY (ST 849122). Excavations at *Hambledon Hill*, directed by R. J. Mercer, were continued in 1979. Full details of this and earlier work are now available in R. Mercer, *Hambledon Hill A Neolithic Landscape* (Edinburgh University Press, 1980).

IWERNE MINSTER. A group of ten Roman coins, possibly from the site of the Roman villa, was reported to the County Museum. Identifications obtained by R. N. R. Peers show the coins to be late third to first half of 4th century in date.

KIMMERIDGE (SY 93157765). Excavations directed by P. J. Woodward were carried out on an Iron Age/Romano-British settlement site midway between Kimmeridge and Chapmans Pool on a gently sloping piece of high ground on the cliffs above *Rope Lake Hole*. The site showed continuity from the earlier Iron Age into the Roman period and was engaged in the exploitation of the local mineral deposits of shale, limestone, sea-salt and flint in particular. The Iron Age settlement was apparently uninterrupted, although buildings were replaced and relocated several times with a system of terraced fields and working areas. The settlement structures through to the 1st century AD were circular huts with dry limestone sill walls, ranging from 8-15 m diameter. These may have been unenclosed on the lynchet terraces. By the 1st century AD these fields had been considerably built up by soil movement and waste tipping (particularly as a result of shale working). The huts were protected from terrace movement by curved drystone revetment walls bowed against the accumulated soils above. These were laid with the hillside contours, and were probably an integral part of the hut structures. The width of the excavated terrace was some 14 m. This pattern of settlement was somewhat broken in the 2nd and 3rd centuries when a rectilinear stone sill-wall building and yard were laid out at 45 degrees across the earlier terrace. A large quantity of lathe shale waste (Calkin types C and D) and flint chisel tools were recovered from the yard level outside the building, suggesting that this was a working area for the manufacture of the well-known shale armlet of the period. The change in settlement pattern and the introduction of an efficient lathe suggests that the settlement may have developed into one primarily concerned with the specialist manufacture of lathe-turned shale products for the new Roman markets.

LANGTON LONG (ST 90700478). About 20 burials were located during machine stripping for an agricultural building at *Lophill Farm*, Long Langton, near Blandford. These were noted by the farmer, Mr. Becket, and the site was described by him to P. J. Woodward, who reports the find. It was not possible to make a detailed record of the site and the skeletal remains collected from some of the graves were not available for re-examination.

The burials were cut into chalk bedrock, sometimes to a depth of about 0.30 m. They were extended and randomly orientated, some in discrete groups over an area of some 500 m^2. None of the graves was apparently cut by another. Many of the burials were face down and the graves packed with chalk. Some had coffin nails present; these were flat-headed, hand-forged with a square stem section, and from 4-8 cm long. No burial goods were found.

The examination of a deep machine cut, to the north-west of the burial area, showed that the burials were cut into a 'field' lynchet which ran for about 150 m north-west and at right-angles to the parish boundary. This 'field' may be one in a continuation of that group of Celtic fields laid out to the south-west of Buzbury Rings between field tracks and banks, one of which may run down the parish boundary on the south-western side of the site. The burial area has no other defined boundary. These Celtic fields can be interpreted as being laid out earlier than, but in contemporary use with, the Buzbury Rings defended settlement, which was in continuous use from the Iron Age through to the end of the Roman period.

Since there were no grave-goods with these inhumations, and no contiguous settlement material, the dating evidence for the burials is extremely slight, but the presence of coffin nails suggests a Roman

date. If their location in one of the units of the Celtic field system is also accepted, then it is clear that at least one of these fields had gone out of arable use in the Roman period and this in turn may suggest that the enclosed settlement of Buzbury was changing to a more pastoral economy in its later phases.

The skeletal remains were not well preserved and were reinterred in a pit in a piece of adjoining woodland at approximately ST 90730486. The few well preserved nails are in the possession of the farmer.

MILBORNE ST. ANDREW. Mrs. V. Bone reports the discovery of an unassociated AR *antoninianus* of Trajan Decius, AD 249-251 at *7 Dark Hill*. Reverse shows Decius on horse pacing left, holding sceptre and raising right hand.

POOLE (SY 998990). Excavations by I. P. Horsey and K. Jarvis on this important early-Roman military site investigated the defences previously located by Mr. N. H. Field and Dr. G. Webster. The excavation of areas I and II revealed a sequence of extra-mural features, fort defences and timber buildings behind the defences. Area III, located 200 m north-east of areas I and II, revealed further timber structures. Areas I and II were located with the intention of giving a complete sequence across the putative defences close to the south-west corner of the fort as indicated by the earlier excavations. The following sequence across the defences of the fort was excavated: (i) extra-mural features (two phases) including an oven and possible water-leat, (ii) a single V-shaped military ditch measuring 3.6 m wide and 1.6 m deep, front at a distance of 6.4 m by a regular flat-bottomed ditch measuring 1.2 m wide and 0.9 m deep aligned parallel to the main ditch, (iii) an area with few features indicative of the position of the rampart prior to its deliberate back-filling into the ditch, (iv) a row of shallow pits, (v) an *intervallum* road, (vi) timber-slots representing the plan of part of a pair of barrack blocks measuring 10 m wide. Three archaeological periods were reflected in the pit groups: I—pre-dating the military defences; II—contemporary with the use of the barrack blocks, and III—following the demolition of the barrack blocks.

Area III excavations revealed two structural periods on the same alignment as those of areas I and II and a later period of pits. The earliest (period IIA) consisted of the corner of a timber building and two pits. In period IIB a large range of timber buildings 9.8 m wide has been provisionally identified as the *praetorium*. A nearby trial trench revealed a lead tank set in clay and a layer of clay blocks 9 m wide. In period III 10 pits cut the demolished building of period II.

There is still insufficient evidence to delimit the size of the fort but the present work suggests a large fort of perhaps half or full legionary size, with one main structural period. The date range of the site provisionally extends from soon after the conquest until *c.* AD 65. The finds include Durotrigian wares, products from the Corfe Mullen kiln and a wide range of imported pottery, as well as military bronzes.

K. Jarvis kindly provides the following details of work and finds in Poole.

——— (SZ 996907). Three trial trenches were excavated by Mr. K. Jarvis of Poole Museums during 1978 to establish the extent of Roman occupation at *Hamworthy*. These failed to reveal any evidence of Roman occupation and suggests that occupation at the south end of the Hamworthy peninsula is confined to the area of previous finds. The trenches are summarised below.

Trench 1 (SY 99619079). 12 m long, 4 m wide. Two 13th/15th-century ditches.

Trench 2 (SY 99649075). 12 m long, 4 m wide. No features.

Trench 3 (SY 99699069). 27 m long, 2 m wide. Two 13th/15th-century pits, a gulley and other undated features suggested medieval occupation. Full report in Poole Museums Site Archive PM 27.

——— (SY 9907891902). During 1978/79 Mr. K. Jarvis of Poole Museums excavated a machine trench 34 m long at *Vineyards Copse* across the Roman road from Hamworthy to Lake. This revealed a turf stack 6 m wide and 0.5 m high which was widened to 12 m and capped with gravel. There was no dating evidence. The results need not suggest more than one period of road construction. Full report in *PDNHAS* forthcoming. Poole Museums Site Archive PM 28.

——— (SZ 0038390402). A machine trench was excavated at *Pilkington Tiles Ltd.* in 1979 by Mr. K. Jarvis of Poole Museums and revealed a grey green silt layer 0.2 m thick containing small briquetage fragments. This sealed a small roughly circular hearth 0.5 m wide and 0.14 m deep of uncertain function. The silt and the hearth are not closely dated. The silt was at a height of 1.2-1.6 m Ordnance Datum which is above the modern mean high water spring of 0.8 m at Poole Bridge. Full report in Poole Museums Site Archive PM 33.

——— (SZ 0793). During 1978 a survey of the earthworks on *Talbot Heath* was undertaken by Mr. K. Jarvis of Poole Museums and some 40 features recorded. Three main periods of earthworks were recorded:

1. Enclosures shown on early 19th-century map, and hollow-ways.
2. An undated earlier period of enclosure.
3. Bronze Age round barrows. In addition to Fern Barrow another probable barrow was located (SZ 06929281). It is an unditched bowl barrow 8 m in diameter and 0.4 m high.

An undated oval mound 17 m long, 8 m wide and 1 m high was also recorded. Trial excavations were conducted near *Fern Barrow* in an area later destroyed by a radio aerial but these were negative.

Full report in Poole Museums Site Archive PM 29.

———— (*c.* SZ 030910). Æ Coin of Claudius. Found some time ago at *38 Orchard Avenue, Poole.* Coin in Museum's possession. This area would be worth further investigation.

———— (*c.* SZ 0297). Several Durotrigian sherds. Found during building in *Rempstone Road, Poole.*

———— (*c.* SZ 054920). Æ *sestertius* Marcus Aurelius (161—180). *20 Francis Road, Parkstone.* I/D 283 (1975).

———— (*c.* SZ 054920). Æ *antoninianus* of Valerian (253-9), *43 Langley Road, Branksome.* I/D 755 (1977). Perhaps this find and the find above indicate an RB site.

———— (SZ 0290). Coin of Valerian I (253-9), *Baiter* area. I/D 666 (1977).

STOURPAINE (ST 86501056). A metal-detector user reports the finding of a silver penny of Offa, king of Mercia (AD 757-96), moneyer WIHTRED, see Fig. 61.1.

————————————. Precise location not known but near Lazerton or Ash Farm. Found by a metal-detector user, an Anglo-Saxon silver *sceat*, BMC 23c, see Fig. 61.4.

STRATTON (SY 65519575). Mrs. S. Campbell notes that *Howdes Barrow* (RCHM monument 17) is mentioned in a 1606 survey of the manor of Charminster. A 1770 copy is in the DCRO, ref. D60/M5).

STUDLAND (SZ 045813). A stone axe *c.* 0.26 m long was found on *Ballard Down* 200 m east-north-east of the OS trig. point and reported to the County Museum which provided details.

———————————— The underwater site at *Brownsea Island* was discovered by the Island's Head Warden, Mr. A. T. Bromby, in 1973 and an interim note was published by H. C. Bowen in 1976 (*National Trust Year Book,* 42-43). The site lies off the north-east side of the island *c.* 80 m from the present sea-wall. It is only accessible at the lowest spring tides and then only for a short period. Salvage recording was undertaken by I. P. Horsey of Poole Museums during 1978 owing to the increasingly rapid erosion of the site which has now removed almost all traces of it. Mr. Horsey reports that a quantity of 3rd/4th-century Romano-British pottery was associated with worked wood and animal bone in a sandy layer above a linear peat feature which was slightly concave and measured *c.* 30 m, *c.* 0.75 m wide. It perhaps represents the base of a former ditch although interpretation is difficult. The peat, which was only 0.01 m-0.04 m thick, was sampled and has been examined by Dr. L. Haskins who reports that it describes a change from valley-bog to salt marsh conditions or possibly an amalgamation of transported peats from different origins.

Bowen drew attention to the site's possible implication of a rise in sea-level around Poole Harbour since the late Roman period. The peat deposit is 1.01 m below Ordnance Datum (Newlyn) or 1.41 m below the mean of the present MHWS and MHWN tides for the Poole Harbour Entrance. However, data relating to possible changes of sea-level must be treated cautiously and this aspect of the site will be dealt with more fully in the final report which is in prepration.

———————————— (SZ 0286387611). A small excavation in 1979 on *Brownsea Island* was directed by Mr. K. Jarvis on behalf of Poole Museums and the National Trust and investigated a site partially excavated by Mr. A. Bromby and Mr. N. H. Field in 1974. The excavation revealed four more graves, giving a total of seven, all aligned east-west and containing skeletons in an extended position with heads to the west and arms to the side. An analysis of the human bone suggested the presence of adults and children probably of both sexes. The cemetery was sealed by a 16th-century layer but is otherwise undated and a provisional C14 dating of one skeleton produced a date HAR 3865, ad. 1170 ± 70. There is little documentary evidence for the island but Leland writing in the 16th century records a tradition that a chapel dedicated to St. Andrew had existed. Full report in *PDNHAS* forthcoming.

TARRANT HINTON (ST 927118). Mr. A. G. Giles reports that Mr. Hooper, the landowner, having given his permission, the 1979 season at *Barton Field* began on 8th April and continued on Sundays, throughout the summer until 16th September. It was possible to open only a small area, some 100 ft. by 50 ft. as once again the field had growing wheat in it.

The object of this year's work was to excavate the remainder of the *bath-house* which was found in 1978 and an area to the north and east of it. This should have proved whether the south-eastern side of the courtyard was closed by a range of buildings.

At this point a low ridge runs across the field from north-east to south-west and it was felt that this may have derived from fallen building material. It was found, however, that modern ploughing had removed all evidence of any buildings that may have existed here, there being only a thin layer of plough-soil over the heavily scored chalk bedrock.

The easternmost end of the bath-house, however, was uncovered and this was shown to be as extensively robbed as the rest of the building. The only remaining piece of wall being situated at the

north-eastern end. This was built of flint and mortar directly on to the chalk which at this point had been cut away to accommodate the hypocaust of which very little remained. The overall size of the bath-house was 61 ft. long by 21 ft. wide at its widest part.

A further 80 ft. length of the Iron Age ditch, which crosses the site and passes beneath the bath-house was excavated. This V-shaped ditch, with an average depth of 5 ft., appears to have been filled all at once and no materials for firm dating have been found in it. However, a very fine example of a Durotrigian silver stater was found in the upper part of the filling close to the northern side of the ditch (Fig. 62). Mr. Shipp, digging on the site in 1845, excavated a well which he recorded as being 30 ft. deep but this has not yet been rediscovered. A second well, however, has been found by the present excavators. It is situated at the eastern corner of the bath-house and was presumably used for supplying water to this establishment.

Fig. 62. Durotrigian silver stater from Tarrant Hinton. Scale approx. 1:1.

The upper part of the well is shaped as an inverted cone. The width across the top at the level of the natural chalk being 16 ft., the well then tapers to a width of 5 ft. 6 ins. at a depth of 12 ft., from the present ground level, at a point where the shaft proper beings.

The cone may have been cut deliberately as the upper part of the chalk is somewhat loose and at the time of construction would have tended to fall on to the workers below. If not deliberately cut, it may have been caused by frost action if the well was abandoned for some time.

In either case, due to the slope of the cone walls, it would have been virtually impossible to extract water from the well, without some modification to its sides. In fact, from the point where the cone joins the shaft, rising more or less vertically, a 'tube' of loose filling with voids suggests that the upper part of the well may have been lined with timber. The filling outside this tube was more compact and of a different material than that within the well proper.

On the eastern side of the well, at a depth of 1 ft. 6 ins. from modern ground level and stretching from the outer side of the cone to the shaft, an area of beaten chalk floor was found. This was 1½ ins. thick and may indicate the ground level at the time when the well was in use.

In the shaft of the well, on the south and east, two rows of slots rise vertically up the walls. These were most probably used to accommodate wooden beams or planks of which one end could be placed in the slot and the other rested against the opposite wall. They would have been used by the workmen who constructed the well or subsequently by those who cleaned it. The slots are placed at an average of 1 ft. 6 in. centres, one above the other.

From the filling of the well five coins have been recovered. They are of the Emperors Constantine the First and Second, and of Constantius the Second and are all of the *Gloria Exercitus* type.

A depth of 32 ft. was reached before the excavation was closed due to the approach of winter and the farmer's desire to plough and sow the field.

The surface of the field in the vicinity of the well is virtually on the 300 ft. contour. During the winter, springs break out in the nearby Tarrant Valley on or about the 250 ft. contour. This would suggest a possible depth of 50 ft. before the water-table is reached and may indicate the depth at which the bottom of the well will be found. See *Britannia,* XI (1980), Fig. 20, p. 392 for plan.

WAREHAM LADY ST. MARY. Immediately to the west of *St. Martin's Church* urgent repairs to the retaining wall to the east of North Street necessitated the digging of two trenches between the retaining wall and the west wall of the church. L. J. Keen investigated these trenches (Fig. 63). The foundations of the west wall rested directly on natural white clay which was some 1.85 m above pavement level. No construction trench for the wall was discernible. Almost 0.20 m to the west of the bottom of the foundation the side of a north-south cut was found in both trenches. The cut, at least 0.60 m deep and 0.60 m wide, was seen in both trenches and had been truncated by the construction of the retaining wall. The cut was filled with gravel and had a smaller trench within it. While it cannot be demonstrated conclusively that this trench belongs to a structural phase of the church, its known length is within the width of the mid 11th-century nave and it is certainly earlier than the present west wall which belongs to the 15th century. It seems possible that the gradual deepening of North Street during the medieval period (the top of natural clay has been recorded 2 m above pavement level on the west side) may have caused the original west wall of the church to become unstable and necessitated the complete rebuilding of the west wall a little to the east.

———————————. During construction of the Wareham by-pass, P. Woodward and L. J. Keen observed works to establish if there was any evidence for the continuation of *Battery Banks*. No evidence was found.

WEYMOUTH (SY 672823). Building rubble, fragmentary remains of a metalled surface, and some Romano-British pottery were found by A. Boulter and B. Squibb during the excavation of drainage

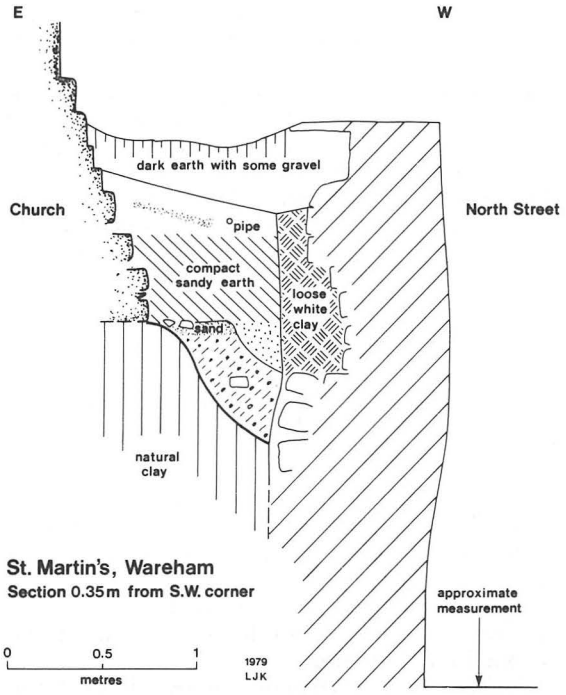


Fig. 63. Section against St. Martin's Church, Wareham. *Drawn by John Baker.*

trenches at *Redlands*. The rubble included burnt stone, tile and plaster fragments. Pottery included samian sherds. A *sestertius* of Trajan was retained by the foreman of works, the remainder of the finds being held by A. Boulter pending transfer to an appropriate museum. Notes are deposited in Dorset County Museum.

WIMBORNE MINSTER. Excavations at Wimborne during 1978-79 concentrated on sampling areas of the medieval town, within the constraints of development and archaeological survival, to examine its origins and growth. Four areas have been examined: to the north of *The Square* and on the *Corn Market* with formal archaeological trenches; on the *new library* site and by the *East Bridge* with small trial trenches prior to development. Otherwise, information was gathered from observation of ground disturbance during building works.

Excavations between the Minister Church and the *Corn Market* and observations during the construction of a new churchyard wall, took place as time allowed between building operations. 13th-century pits and structures followed by 16th-century stone buildings on the Corn Market frontage were found with open 'orchard' areas to the south-west. Below the existing churchyard wall an early 19th-century soakaway pit and a series of disturbed and discontinuous heathstone and flint walls were recorded well below the existing churchyard ground level and impinging on it. There was some evidence for post structures below the 13th-century pits on the Corn Market frontage and below the churchyard wall. The butt-end of a ditch aligned east-west and with a spread bank on its southern side was recorded between the George Hotel on the Corn Market and the Minster. This ditch was filled during the 17th century and could not be taken as evidence of an early ecclesiastical circuit.

Trial trenches on the site of the *new library* behind High Street prior to site work, and observations during building construction, showed that there was no defined town circuit and little evidence for medieval occupation. However, large quantities of medieval masonry and architectural fragments were found re-used in the footings of a 19th-century cottage on the High Street frontage of the library site, and brick/stone hearths below these. This suggests that there was a substantial medieval building to the west on High Street. It is not yet possible to define the street pattern at this point.

There was no evidence for any medieval urban development on the floodplain of the river. The small trial trench adjacent to *East Bridge* showed that all the land here was built up in the post-medieval period. No evidence for quays was found. Excavations on the site of the *Crown Hotel* to the north of The Square and on East Borough failed to define any town circuit here or any evidence for occupation prior to the 13th century. A series of stone footings, probably 15th century in date, for medium-sized rectangular buildings and an oven that was rebuilt at least twice were found on The Square frontage. These were immediately below the floor levels of the Crown Hotel and were considerably disturbed by the footings. Rubbish pits of 13th to 15th century date were found below this series of buildings; no evidence for earlier occupation was found. Behind this frontage on The Square a well of 16th century date and a series of open areas with a single-ditched boundary running parallel to East Borough was noted. The area on East Borough was used for the dumping of rubbish during the 16th to 19th century but was probably an open 'orchard' area in the medieval period. This suggests that East Borough was always the back street of a two street plan.

An area to the south-west of the site of *St. Catherine's Chapel* was observed during building works. No evidence for occupation was noted. If there was a medieval suburb on this side of Wimborne its buildings were almost certainly confined to the main road and the area immediately adjacent to the site of the chapel.

The work above was carried out and reported by Peter J. Woodward and Peter Cox for the Dorset Archaeological Committee and was financed by the Department of the Environment. Considerable assistance was given during the excavation of the Corn Market site by Wimborne District Council, students from the Dorset Institute of Higher Education, Weymouth, Norman Field and the Wimborne Archaeological Group who initiated the excavation. Norman Field and the Wimborne Archaeological Group carried out excavation and observation work during the demolition of the churchyard wall and on the library site. The Avon Valley Archaeological Group has also assisted during many of the excavations, and Miss Coles of Wimborne Museum has also been a great help during observation of building works.

WHITCOMBE (SY 716883). A. Hunt reports that during November, 1979, an external drain was dug around the base of the tower of the parish church. The drainage trench, about 35 cm deep and 80 cm wide, was examined, to the north of the tower only, by A. M. Hunt and I. Brooks. It revealed two off-sets, both of mortared Portland rubble. No other features were visible.

A plan, section and notes are deposited at the Diocese of Salisbury Record Office and at the Dorset County Museum.

WORTH MATRAVERS (SY 96797838). Durotrigian stater photographed by Museum and retained by finder. Poole Museums Identification 590—1979.

DORSET RAINFALL 1979

D. J. PAXMAN

STATISTICS

Dorset's general rainfall in 1979 was 39.56 inches, 7 per cent over the recent average of 36.84 inches.

Monthly summary:

	Rainfall in inches	Average for 1945-69
January	4.1	3.5
February	3.3	2.7
March	4.8	2.6
April	2.4	2.2
May	5.5	2.6
June	1.6	2.1
July	1.6	2.3
August	3.1	3.1
September	1.0	3.6
October	3.1	3.7
November	1.9	4.2
December	7.2	4.1

The wettest stations were Mapperton (54.29 inches) and Wraxall (52.67 inches), though the observer at Mapperton suggests that the gauge in use in the early months of the year may have been over-reading. The driest station was Portland with 28.63 inches, little more than half the fall at Mapperton and Wraxall.

GENERAL REPORT

December 1978 had been unusually wet and this trend continued through the early months of 1979. It was the wettest March in Dorset since 1947 and the wettest May on record (5.48 inches, compared with the previous highest totals of 5.24 inches in 1924 and 5.23 in 1967). By the end of May the year's rainfall was 48 per cent above average, but then came six relatively dry months from June to November, and it was only the very wet December that caused the year's total rainfall to be slightly above the average.

In more northerly parts of Britain the winter of 1978-79 saw some very cold weather and considerable accretions of snow on high ground. January in Dorset was very cold. On 5th the temperature at Beaminster fell to 0.03F, the lowest ever recorded there, but in most respects Dorset escaped severe conditions. Snowfall, though frequent in January and February, was usually light and only in a few places was the snow cover ever as much as 2 inches. Dorchester had snow on May 5th, an unusually late date.

HEAVY FALLS OF RAIN

January 19th

A complex depression south west of the British Isles moved slowly northwards and associated frontal troughs crossed southern districts. Much of Dorset had 1 to 1½ inches of rain and snow.

March 24th

An Atlantic depression gave some heavy rain. Stations in the hilly area of central Dorset had over an inch of rain (1.36 inches at Melbury).

May 30th

During May 29th a small wave of depression formed over the Bay of Biscay on a trailing cold front. It crossed southern England during 30th. While east Dorset had only light rainfall (.09 inch at Hurn) there was very heavy rain and thunderstorms in the west. The heaviest fall was 2.55 inches at Netherbury. Flooding was widespread. At Beaminster 1.55 out of a total of 2.39 inches fell in the four hours from 0900, causing considerable flooding and damage in the town. At Blandford the floods were the worst that could be remembered, though they were to be surpassed by those of December 27th.

Rainfall in Dorset 1979

STATION	OBSERVER	Greatest Fall in 24 hours		Days with .01 in. or more	Days with 1 in. or more	DEPTH OF RAINFALL IN INCHES												
		Depth	Date			Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total for Year
Abbotsbury (Rodden Row)	Miss A. M. Hutchins	1.89	27/12	188	4	3.97	3.78	3.98	2.65	5.07	1.25	1.54	2.76	.84	3.21	1.56	6.55	37.16
Beaminster (East Street)	W. A. Stiby	2.79	27/12	191	10	5.08	3.53	5.87	3.33	6.36	.94	2.47	4.37	1.07	3.93	2.37	7.51	46.82
Blandford (Bryanston)	Miss A. M. Jaques	2.48	27/12	177	5	3.96	3.20	4.80	2.30	5.39	1.18	1.16	2.60	.76	2.60	1.68	7.91	37.54
Blandford (Tarrant Launceston)	—	—	—	—	—	3.60	3.23	4.93	2.17	4.84	1.39	1.22	2.43	.72	2.44	1.71	7.43	36.10
Blandford (Tarrant Rawston)	J. H. Cossins	2.02	27/12	175	3	3.92	3.48	5.33	2.50	5.06	1.35	1.14	2.31	.84	3.53	.75	7.16	37.37
Bournemouth (Alderney Reservoir)	B'mouth & Dist. Water Co.	1.95	27/12	172	2	3.78	2.81	4.25	1.91	4.67	1.56	1.45	1.89	.58	2.65	1.52	5.86	32.93
Bournemouth (Hurn Airport)	Met. Office	1.88	27/12	176	2	3.85	2.65	3.70	2.21	4.48	1.39	1.28	1.90	.44	2.47	1.49	5.82	31.68
Branksome (Bourne Valley)	W. R. Coles	2.05	27/12	163	2	4.13	2.94	4.00	2.04	4.45	1.53	1.67	1.85	.58	2.75	1.62	6.04	33.60
Bridport (Bradpole)	G. R. Smith	2.27	27/12	101	5	3.30	3.63	4.86	2.71	5.70	1.42	1.58	4.40	1.04	3.87	2.33	7.01	41.85
Bridport (North Chideock)	H. J. F. Smith	—	—	—	—	3.73	2.80	3.44	2.69	5.46	1.18	1.60	4.04	.85	4.26	1.88	5.25	37.18
Buckland Newton (Brockhampton Gate)	Major A. M. Hall	2.55	27/12	217	5	4.55	3.41	5.22	1.97	5.58	1.96	1.14	3.69	1.89	2.78	1.86	7.95	42.00
Cattistock (Manor Farm)	R. J. Bere	2.99	27/12	165	9	4.16	4.28	5.54	2.64	5.74	2.49	1.78	5.18	1.13	4.04	2.67	8.58	48.23
Charminster (Forston Pumping Station)	E. R. Fox	2.64	27/12	187	6	4.90	3.97	5.33	2.47	5.59	1.23	1.62	3.87	1.19	3.35	2.05	8.76	44.33
Corfe Castle (Waterworks)	Wessex Water	2.83	27/12	172	2	4.47	3.89	4.83	1.99	4.94	1.51	1.62	3.18	.78	3.44	1.70	7.37	39.72
Dewlish (Parsonage Farm)	M. Britton	2.89	27/12	138	6	3.33	3.76	5.64	3.01	6.18	1.55	1.49	3.36	1.12	3.68	2.38	8.48	43.98
Dorchester (Queen's Avenue)	Miss A. M. Yeatman	2.15	27/12	—	4	4.44	4.08	4.80	2.50	6.04	1.34	1.75	3.20	1.31	3.05	2.35	7.48	42.34
Dorchester (Waterworks)	Wessex Water	2.19	27/12	179	5	4.51	4.15	4.69	2.17	5.59	1.11	1.81	3.68	1.27	3.55	2.11	7.85	42.50
Dorchester (Weatherbury Way)	J. R. Oliver	2.17	27/12	185	4	4.57	3.85	4.79	2.56	5.56	1.23	1.66	3.59	1.35	3.60	2.26	7.49	42.51
Evershot (Melbury House)	F. Prince	3.55	27/12	191	6	5.17	3.34	5.91	2.34	6.71	1.77	2.00	4.81	1.30	3.53	2.17	9.15	48.20
Forde Abbey	G. D. Roper	2.08	27/12	113	6	3.96	4.07	5.92	3.24	5.71	1.53	1.77	4.00	1.09	4.70	2.04	6.95	44.97
Gillingham	—	—	—	—	—	3.19	2.28	4.69	2.07	5.71	1.49	2.42	2.65	1.23	1.81	2.02	5.57	35.02
Lyme Regis (Pinhay, Devon)	Mrs. K. D. Allhusen	1.71	27/12	178	5	4.26	3.87	5.47	3.81	5.49	1.89	1.69	3.73	1.19	4.36	2.43	7.06	45.25
Maiden Newton (Wraxall, Manor Farm)	Lt. Col. J. T. A. Wilson	—	—	—	—	4.91	4.19	6.19	3.18	6.75	2.34	2.35	4.61	1.70	4.02	3.30	9.13	52.67
Mapperton	V. Montagu	2.52	19/1	175	8	6.02	3.66	3.46	3.58	9.53	5.47	2.95	4.72	1.11	3.41	2.49	7.86	54.29
Marnhull (Great Down Lane)	Mrs. E. M. Payne	1.85	27/12	205	3	3.28	2.77	4.61	2.63	6.43	1.62	1.67	2.77	1.04	2.35	1.83	6.28	37.28
Milborne St. Andrew (Pumping Station)	Wessex Water	2.81	27/12	179	5	4.30	4.05	4.96	2.46	5.71	1.56	1.82	2.89	.96	2.91	2.09	8.58	42.29
Minterne	The Lord Digby	3.05	27/12	181	8	4.95	4.12	6.20	2.65	7.54	1.66	1.58	4.34	1.27	3.60	2.37	10.10	50.38
Netherbury (The Garden House)	J. K. Newsom Davis	2.55	30/5	187	5	4.56	3.22	5.10	3.11	6.64	.92	2.01	4.68	1.01	3.91	2.11	7.57	44.83
Okeford Fitzpaine (Pumping Station)	Wessex Water	3.02	27/12	201	3	3.86	2.91	5.37	2.24	5.78	1.26	1.24	2.32	.59	2.65	1.76	9.28	39.26
Owermoigne (The Mill House)	J. Whatmoor	1.95	27/12	202	4	3.83	3.57	4.52	2.52	5.86	1.14	1.66	3.11	.95	3.74	1.88	6.36	39.14
Parkstone (Lilliput)	K. J. O. Crew	1.78	27/12	171	2	4.36	3.09	4.17	1.66	4.21	1.59	1.26	1.91	.60	2.40	1.41	5.51	32.17
Poole (Pitwine's Gasworks)	W. R. Coles	1.91	27/12	—	—	4.38	3.05	4.98	1.98	4.31	1.60	1.49	1.99	.54	3.01	1.48	6.01	34.82
Portland (RN Air Station)	Met. Office	1.65	9/12	152	3	1.91	2.28	3.54	1.37	4.36	.98	1.53	2.00	1.09	2.57	1.28	5.70	28.63
Shaftesbury (Coombe Hill, Wilts.)	P. S. Cooper	1.64	12/12	181	4	3.49	2.39	5.11	2.70	6.26	1.24	1.96	3.36	.75	2.24	2.02	6.06	37.58
Shillingstone (Green Hills)	E. Nimmo	3.02	27/12	—	—	3.89	3.05	5.17	2.39	6.08	1.14	1.20	2.47	.65	2.38	1.64	8.71	38.78
Swanage	K. Moore	1.86	27/12	175	2	3.80	2.60	4.06	1.86	4.49	1.76	1.82	2.40	1.02	2.90	1.85	5.93	34.49
Upwey (Friar Waddon)	Wessex Water	1.95	27/12	184	4	4.46	4.07	4.40	2.46	5.85	.94	1.62	3.16	1.24	3.24	2.03	6.67	40.13
Wareham (East Stoke, River Laboratory)	J. Morgan	2.45	27/12	180	5	4.84	3.20	4.33	1.98	4.76	1.11	1.73	2.04	.90	3.50	1.99	7.24	37.60
Wareham (Trigon)	G. P. Sturdy	1.58	27/12	164	6	4.60	3.48	4.42	1.65	4.65	1.01	1.54	3.32	.86	3.05	1.83	7.12	37.53
Weymouth (Cranford Avenue)	H. F. Middleton	1.76	27/12	156	3	3.53	3.21	4.28	1.61	4.54	.79	1.44	2.07	.84	2.94	1.39	5.12	31.71
Wimborne (Clevedon Lodge)	Dr. E. H. Markby	2.17	27/12	—	3	4.72	3.33	5.19	2.51	4.39	1.45	1.52	2.26	.67	2.35	1.81	7.19	37.38
Wimborne (Corfe Mullen, Central Avenue)	A. H. Dunn	2.03	27/12	195	3	3.83	2.75	4.21	2.04	4.66	1.78	1.59	2.46	.84	3.14	1.80	7.23	36.33
Wimborne (Corfe Mullen, Pumping Station)	Wessex Water	2.33	27/12	171	3	3.93	3.08	4.33	1.96	4.63	1.51	1.59	1.95	.63	2.55	1.58	6.98	34.72
Wimborne (Stanbridge Mill Pumping Station)	B'mouth & Dist. Water Co.	—	—	—	—	3.35	2.49	4.93	2.73	4.35	1.75	1.07	2.13	.65	1.88	1.68	6.07	33.07
Wimborne (Walsford Bridge Pumping Station)	B'mouth & Dist. Water Co.	2.33	27/12	186	3	3.99	3.02	4.60	2.43	4.39	1.34	1.50	1.96	.63	2.41	1.60	6.59	34.44
Winfrith (Atomic Energy Establishment)	D. C. Fraser	2.44	27/12	165	4	4.52	3.57	4.43	2.14	5.16	1.16	1.58	2.78	.83	3.36	1.95	6.91	38.41
Yetminster (The Mill House)	R. M. Clarkson	2.85	27/12	—	2	4.56	2.68	4.31	1.91	6.05	2.05	1.23	2.96	.56	2.81	1.43	7.32	37.87
AVERAGE FOR THE COUNTY				175	4	4.14	3.34	4.78	2.40	5.48	1.57	1.63	3.07	.95	3.13	1.91	7.16	39.56

December 13th

A deep depression moved from mid Atlantic on 12th and became quasi-stationary near Iceland on 13th. A secondary depression moved northeastwards and crossed Dorset on the evening of 13th. At this time the centre was of 988 millibars and still deepening. Over much of the county there was over an inch of rain (1.86 inches at Abbotsbury).

December 27th

At 0600 a multi-centred area of low pressure covered the north Atlantic between Greenland and Norway, with a trailing frontal system across the British Isles, a depression centre over the Irish Sea and a vigorous secondary south west of Ireland. During the day this last system moved eastwards across northern France while the complex frontal troughs of both depressions gave very heavy rain. Over England and Wales as a whole this was the wettest day since July 1959, with a 6-inch rainfall over the Devon moors on 26th/27th. Every part of Dorset had at least 1.50 inches of rain, the greater part had over 2 inches, and an area measuring about 20 miles by 6 miles, from Evershot to Shillingstone, had 3 inches. The heaviest fall was 3.55 inches at Melbury.

RAINFALL STATIONS

These stations have closed: Dorchester (Monmouth Road), Maiden Newton (Toller Porcorum), Owermoigne (The Mill House).

Upwey (Friar Waddon) returns to these pages for the first time since 1968. Thirteen other stations appear for the first time and details of most of them are given in the table which follows. It should be noticed that Lyme Regis (Pinhay) and Shaftesbury (Coombe Hill) are just in Devon and Wiltshire respectively. Both stations are representative of adjacent areas of Dorset in which we have no station.

Station	Site (NGR)	Height above MSL feet
Blandford (Tarrant Launceston)	ST 945092	190
Blandford (Tarrant Rawston)	ST 938066	165
Bournemouth (Hurn Airport)	SZ 118987	33
Bridport (Bradpole)	SY 476944	120
Dewlish (Parsonage Farm)	SY 781979	380
Dorchester (Weatherbury Way)	SY 693891	195
Gillingham	ST 818261	246
Lyme Regis (Pinhay), Devon	SY 315912	c. 500
Maiden Newton (Wraxall, Manor Farm)	ST 567010	c. 500
Milborne St. Andrew (Pumping Station)	SY 804983	249
Portland (Royal Naval Air Station)	SY 682742	8
Shaftesbury (Coombe Hill), Wiltshire	ST 896227	564
Yetminster (The Mill House)	ST 597102	200

CORRECTIONS TO VOLUME 99

On page 134 the word at the end of line 12 should read 'county', and the rainfall at Trigon on November 5th was 1.37 inches.

JOHN C. W. COPE

Ichthyosaur from the Belemnite Marls

Mr. C. Kennedy reports on his discovery of an ichthyosaur on January 23rd. His record of the horizon is from the base of a 2 foot thick bed of densely packed belemnites at SY 402919, 2½ miles east of Charmouth. The specimen was about 3 feet long and relatively complete, lacking some 2-3 inches of tail and much of the upper jaw. Three paddles were preserved. Stomach contents consisted of a mass of scales and bones and a possible fish head. Photographs have been sent to Mr. J. B. Delair for his comments.

Punfield Marine Band

Mr. G. Bate reports that around the time of the storms of February 13th beach level was considerably lowered and showed this Lower Greensand horizon well at Punfield Cove. A surface some 10 m long and some 0.2 to 0.4 m thick was visible. Fossils recovered included *Cassiope* sp. and *Deshayesites* sp. Confirmation of the horizon was given by Mr. R. Cleevely of the British Museum (Natural History) who visited the exposure.

Bryozoa in the Dorset Jurassic

Dr. P. D. Taylor, who contributed a report on Portlandian Bryozoa to the 1978 Geology Report, accompanied the writer to various localities in Dorset in a search for further bryozoans. Intraclasts in the Middle Lias coast sections between Seatown and Eypemouth yielded a few specimens. Abundant bryozoans were found on large intraclasts in the Forest Marble exposed on the Fleet shore near the Moonfleet Hotel. The Portlandian Shell Bed yielded bryozoa from Grove Cliff (in fallen blocks). These included *Hyporosopora portlandica* and *H.* sp. This locality should therefore be added to those given by Dr. Taylor in his 1978 account. Bryozoa were also found on the sponges of the Sponge Beds of the Upper Inferior Oolite at Burton Bradstock. The sponges were also found to be encrusted by numerous thecidean brachiopods.

Oyster Bed at Langton Herring

The occurrence of a Fuller's Earth oyster 'lumachelle'—a thick accummulation of oysters—round Langton Herring has long been known. However, apart from oysters no other fossils seem to have been recorded. In the company of Dr. Taylor and Mr. P. C. Ensom, several crushed rhynchonellids, valves of *Radulopecten* and small gastropods were obtained. It was also noted that the oysters were not infrequently encrusted by the foraminiferan *Nubeculinella*.

Corallian Beds

The oysters of the Osmington Oolite in the Corallian Beds near Osmington Mills were found to frequently bear marks left by grazing by other organisms. In particular the stellate pattern left by the teeth of echinoids covers some of these oysters. These belong to the trace fossil genus *Gnathichnus*.

Higher up the Corallian it was observed that the Ringstead Coral Bed was better exposed than it had been for several years.

Fossil Garden on Portland

For many years the Bath and Portland Stone Company's 'Fossil Garden' provided a view of the giant ammonites of the Portland Beds and the silicified trees of the Purbeck Beds, which was a useful 'demonstration piece' for visitors. The 'garden', however, was spoilt some years ago by the building of an office block across part of it. Now it has been completely removed, but the better specimens are preserved around the new Portland Heights Hotel at the summit of the hill above Fortuneswell where they can again be seen by the visitor.

Cornbrash at Nottington

A very good section excavated in the Cornbrash near Nottington (SY 662825) was examined by the writer. Mr. Ensom has measured the sections in detail and it is hoped that a full account of this exposure will be published shortly.

J. M. FITZPATRICK

The following Angiosperm species have been selected for their rarity in the county by Dr. H. Bowen, the BSBI Recorder for Dorset. An analysis has been made of their occurrence in the records from pre-1900 to 1979. The sites are known and appear on the record cards held in the Dorset Environmental Records Centre at the County Museum. The numbers in the columns refer to the number of localities in which the species were recorded. I am very grateful to Miss S. Gowers for searching for this information. The following table gives some idea of the trend of the species selected.

Species	Number of sites where recorded					Probable no. sites in 80 yrs.
	Pre-1900	Pre-1930	Pre-1960	1960-69	1970-79	
Allium babingtonii Borrer		1		1	1	3
Asarum europaeum L.		1		1	1	2
Carex montana L.		1			2	2*
Centaurium tenuiflorum (Hoffmanns & Link) Fritsch		1	1	1	1	4
Centaurium capitatum (Willd.) Borbas				1	1	2
Chenopodium urbicum L.		2	2	1		4
Cynodon dactylon (L.) Pers.	1	1	1	2	3	5
Daphne mezereum L.			1			1
Eleocharis parvula (Roem. & Schult.)	1		2	1	1	2*
Eriophorum gracile Roth.		1	2	2		2
Fritillaria meleagris L.	2	1	2		1	3
Geranium purpuream Vill.	3		1	2	1	6*
Gnaphalium luteoalbum L.					1	1*
Hammarbya paludosa (L.) O. Kuntze			1	2	5	7
Hyoscyamus niger L.		12	14	7	7	25*
Iris spuria L.			1	1		2
Lathyrus hirsutus L.				1		1
Lathyrus japonicus Willd.		1	3	3	1	6
Lathyrus sylvestris L.		3	5	5	6	11
Leersia oryzoides (L.) Sw.	1		1		1	1†
Leucojum vernum L.		2		1	2	4
Lobelia urens L.		2	2	2	2	4
Marrubium vulgare L.		10	8	4	1	16
Melittis melissophyllum L.		3	1		1	4*
Ophrys sphegodes Mill.			2	3	5	6*
Orobanche rapum-genistae Thuill.		5	3	1	1	6
Polycarpon tetraphyllum (L.)	1	1			2	4*
Polygonum raii Bab.		1	3	1		5
Potamogeton nodosus Poir.		1		4	1	4
Pulicaria vulgaris Gaertn.		1	2		2	4
Pulmonaria longifolia (Bast.) Bor.		3	4	6	7	7
Rumex rupestris Le Gall		3		3	2	6
Scorzonera humilis L.		1	1	4	2	7
Silybum marianum (L.) Gaertn.	1	8	11	3	6	8*
Teesdalia nudicaulis (L.) R. Br.		1	2			3
Tulipa sylvestris L.				5		5
Valerianella eriocarpa Desv.		1	3	2		3

*Recorded in 1979. †The only site now destroyed.

MARINE INVERTEBRATES

J. B. HAWTHORNE

The report of the Joint Working Party of the Nature Conservancy Council (NCC) and the Natural Environment Research Council (NERC) on Marine Wildlife Conservation was published in October (*Nature Conservation in the Marine Environment*, NCC/NERC, 1979).

The report asks that the Government should make provision for statutory marine nature reserves in its Wildlife and Countryside Bill, which is in preparation at the time of writing of these notes. The most damaging impact on the coast that is identified in the report is the reclamation of mud and sand flats. Other threats include some modern fishing practices, which may cause great damage to bottom-living marine organisms, and the selective collection of marine species by divers, educational groups and bait diggers. Impacts such as those of oil and gas exploitation; construction of coastal and offshore structures; mineral extraction; industrial and domestic wastes; invasive alien seaweeds, and increased recreational activities are highlighted.

The report recommends that the NCC should have a greater involvement in marine wildlife conservation; develop a formal marine conservation policy; establish marine conservation areas to protect sites and species; seek to extend its powers at present limited to low water mark, and seek additional resources to enable it to develop an effective strategy for marine conservation.

Many of the impacts and threats discussed in the NCC/NERC report are relevant to the Purbeck coastal area and it is good to record continued support for the voluntary Purbeck Marine Wildlife Reserve. Dorset Naturalists' Trust conducted an experiment in wardening the reserve during 1979 and this has led to grants being made from several sources to continue wardening temporarily. Grants have also enabled the Trust to provide an information centre to serve visitors to Kimmeridge Bay.

Terrestrial conservation in this country concerns the management of organisms which have survived major human interference and which are adapted to habitats in a landscape produced by man. Our marine wildlife is being subjected to major human influence for the first time, and the rate of change may be much more rapid than has been the case on land. If the abundance, variety, beauty and commercial and scientific values of our marine life are to be maintained we must be alert:

> Poole Harbour shores are a coastal wetland of international importance. They are threatened by piecemeal reclamation and the effects of mineral extraction, industrial and domestic wastes, Japanese seaweed, bait digging and increasing recreational activity.
>
> The Fleet shores and waters are a fragile system of habitats supporting wildlife of high value, but this may not be well understood by potential developers who may assess sites according to financial parameters.
>
> Beam trawls are used in Dorset waters. Our shores and near-shore waters are popular with educational groups and divers from many parts of the country. Bait digging probably limits the fauna of the sands at Small Mouth (Fleet). Oil exploration licences for Dorset waters are to be allocated soon; there may be attempts to win gravel from the local sea bed, and inshore waters are used for sewage disposal and in West Bay this may be combined with heat pollution from a proposed power station. Japanese seaweed has a foothold in the county. Peak visitor impact may well become spread over a longer time period.

Nature Conservation in the Marine Environment is an important contribution to the spread of understanding of the threats to marine wildlife values. Its recommendations are particularly relevant to Dorset, and most welcome.

LAND ARTHROPODS OTHER THAN LEPIDOPTERA

A. J. BROWN

Records have been received from E. M. Austin, R. Burden, G. Clarke, H. Clarke, E. F. C. Coetzee, P. Darley, P. Donovan, B. Gillan, M. Jaeger and M. D. Pirie.

Several of these records are for more common species, but it should be noted that these are of equal importance when it comes to compiling records on a county basis, as is being done at the Environmental Records Centre.

The following records are of particular interest.

Orthoptera
Conocephalus dorsalis (Latreille), Luscombe Valley and Hatch Pond, Poole. No dates. (P. Darley).

Odonata
Records for 22 species have been received from various localities. Of particular interest is *Sympetrum scoticum* (Donovan), Hatch Pond, Poole. No date. (P. Darley).

Mecoptera
Panorpa communis L., DNHAS Riverside Reserve , 4 vi 79. (E. F. C. Coetzee).

Coleoptera
Coccinella 7-punctata L., DNHAS Riverside Reserve, 30 viii 79; *Thea 22-punctata* (L.), Herbury Gore, Fleet, 2 ix 79. (E. F. C. Coetzee).

Araneae
Dolomedes fimbriatus (Clerck), Hatch Pond, Poole, 8 viii 79. (P. Darley).

LEPIDOPTERA

ALAN T. BROMBY

Species of particular interest include: *Apatura iris, Leucania unipuncta, Leucania vitellina* and *Rhodometra sacraria.*

The following field workers supplied records from which this report is compiled: D. N. Arnold; Dorset Biological Records Centre; E. F. C. Coetzee; J. Rees Cox; G. S. E. Cross; A. H. Dunn; Dr. J. K. Hasler; Milton Abbey School Natural History Society; A. J. Wise.

Anthocharis cardamines L. Orange-tip White. Radipole, 7 between 8.5. and 20.7. (D.N.A.) Corfe Mullen, 12 between 19.5. and 22.6. (A.H.D.) Studland Heath, 15.5. (J.R.C.) Weymouth, 8.5. Dorchester, 4.6. (E.F.C.C.) Brownsea, 27.5. and 27.6. (A.J.W.)

Colias croceus Fourc. Common Clouded Yellow. Studland Heath, 12.8. (J.R.C.) Brownsea, 15.8. and 22.8. (A.J.W.)

Apatura iris L. Purple Emperor. Recorded in county, details witheld (D.E.R.C.)

Limenitis camilla L. White Admiral. Sherford Bridge, 30.7. Holt, 3 on 6.8. (A.H.D.) Studland Heath, maximum of 14 (J.R.C.) Dorchester area 16.7. (J.K.H.)

Vanessa atalanta L. Red Admiral. Radipole, 4 between 18.6. and 1.10. (D.N.A.) Corfe Mullen, 5 between 22.8. and 25.10. (A.H.D.) Weymouth, 12 between 24.6. and 14.10. (E.F.C.C.)

Vanessa cardui L. Painted Lady. Radipole, not recorded (D.N.A.) Corfe Mullen, 19.8., 23.8. and 15.9. (A.H.D.) Studland Heath, 12.8. (J.R.C.) Weymouth, 9 between 4.8. and 26.8. (E.F.C.C.) Dorchester, 15.8., and 2 on 29.8. (J.K.H.) Brownsea, 5.6., 19 between 14.8. and 22.8. (A.J.W.)

Polygonia c-album L. Comma. Radipole, 12 between 25.4. and 31.10. (D.N.A.) Corfe Mullen, 8 between 15.7. and 19.10. (A.H.D.) Weymouth, 5 between 14.7. and 26.8. (E.F.C.C.) Dorchester area, 7 between 24.4. and 29.8. (J.K.H.)

Argynnis paphia L. Silver-washed Fritillary. Corfe Mullen, 27.7., 19.8. and 26.8., Morden, 30.7. (A.H.D.) Studland Heath maximum of 7, one *valesina* on 17.7. (J.R.C.) Dorchester area, 32 between 16.7. and 21.8. including one *valesina* (J.K.H.) Brownsea, 8 between 28.7. and 15.8. (A.J.W.) Milton Abbey, 12.8. numerous (M.A.S.N.H.S.)

Clossiana euphrosyne L. Large Pearl-bordered Fritillary. Bloxworth, 18.6. (M.A.S.N.H.S.)

Clossiana selene Schiff. Small Pearl-bordered Fritillary. Stubhampton, 27.6. (A.H.D.) Bloxworth, 18.6. (M.A.S.N.H.S.)

Strymonidia w-album Knoch. White-letter Hairstreak. Radipole, not recorded (D.N.A.)

Plebejus argus L. Silver-studded Blue. Morden, 10 on 9.7. (A.H.D.) Godlingstone, at least 140 on 17.7. (J.R.C.)

Celastrina argiolus L. Holly Blue. Radipole, 13 between 8.5. and 27.7. (D.N.A.) Corfe Mullen, 2 on 19.5., 24.5. and 29.8. (A.H.D.)

Thymelicus lineola Ochs. New Small Skipper. Tollard Royal, no dates given. (D.E.R.C.)

Hesperia comma L. Silver-spotted Skipper. Near Weymouth (exact locality witheld), 17.6. (E.F.C.C.)

Acherontia atropos L. Death's Head Hawk. Weymouth, a larva, 23.8. (E.F.C.C.)

Macroglossum stellatarum L. Humming Bird Hawk. Swanage, 16.4. (J.R.C.) Brownsea, 19.7. (A.J.W.)
Hemaris fuciformis L. Broad-bordered Bee Hawk. Corfe Mullen, at Valerian, 6.7. (A.H.D.) Studland Heath, 13.5., 2 on 5.6., 16.6. and 15.7. (J.R.C.) Brownsea, a larva on 14.8. (A.J.W.)
Harpya furcula Clerck. Swallow Kitten. Radipole, 13.6. (D.N.A.)
Stauropus fagi L. Lobster Prominent. Radipole, 20.6. (D.N.A.)
Tethea ocularis L. Figure of Eighty. Radipole, 21 between 10.7. and 19.7. (D.N.A.)
Lymantria monacha L. Black-arched Tussock. Milton Abbey, 12.9. (M.A.S.N.H.S.)
Gastropacha quercifolia L. Lappet. Radipole, 20.7. and 23.7. (D.N.A.)
Trichiura crataegi L. Pale Eggar. Radipole, 18.9. (D.N.A.) Milton Abbey, 12.9. and 10.10. (M.A.S.N.H.S.)
Atolmis rubricollis L. Red-necked Footman. Radipole, 18.6. (D.N.A.)
Parasemia plantaginis L. Wood Tiger. Milton Abbey, 17.6. (M.A.S.N.H.S.)
Arctia villica L. Cream-spot Tiger. Radipole, 11.7. (D.N.A.)
Panaxia dominula L. Scarlet Tiger. Monmouth Hill, between 2.7. and 8.7. (M.A.S.N.H.S.)
Apoda avellana L. Festoon. Studland Heath, larva 30.9. (J.R.C.)
Zeuzera pyrina L. Wood Leopard. Radipole, 24.7. (D.N.A.) Stour Row 27.7. (M.A.S.N.H.S.)
Agrotis ipsilon Hufn. L. Dark Sword-grass. Radipole, 66 between 21.6. and 23.11. (D.N.A.)
Peridroma porphyrea Schiff. Pearly Underwing. Radipole, 4 between 15.10. and 17.10. (D.N.A.)
Lampra fimbriata Schreber. Broad-bordered Yellow-underwing. Radipole, 7 between 19.6. and 17.9. (D.N.A.)
Pyrrhia umbra Hufn. Bordered Orange. Radipole, 19.6. and 20.6. (D.N.A.)
Leucania unipuncta Haw. White-speck Wainscot. Radipole, 29.10. (D.N.A.)
Leucania l-album L. L. album Wainscot. Radipole, 9 between 20.11. and 28.10. (D.N.A.)
Leucania vitellina Hubn. Delicate Wainscot. Radipole, 3 between 20.10. and 27.10. (D.N.A.)
Nonagria typhae Thumb. Bulrush Wainscot. Radipole, 1.9. (D.N.A.)
Apamea ophiogramma Esp. Double-lobed. Radipole, 28.7. (D.N.A.)
Cosmia affinis L. Lesser-spotted Pinion. Radipole, 2.9. (D.N.A.)
Cucullia verbasci L. Mullein Shark. Radipole, 10.5. (D.N.A.)
Lithophane socia Hufn. Pale Pinion. Radipole, 7.5. (D.N.A.)
Lithophane leautieri Boisd. Blair's Pinion. Radipole, 21 between 9.10. and 7.12. (D.N.A.)
Brachionycha sphinx Hufn. Sprawler. Radipole, 22.11. (D.N.A.) Milton Abbey, 20.10. (M.A.S.N.H.S.)
Dasypolia templi Thumb. Brindled Ochre. Radipole, 20.10. (D.N.A.)
Eupsilia transversa Hufn. Satellite. Radipole, 26.10. and 24.11. (D.N.A.)
Tiliacea aurago Schiff. Barred Sallow. Milton Abbey, 30.10. (M.A.S.N.H.S.)
Ectypa glyphica L. Burnet Companion. Radipole, 13.6. (D.N.A.) Milton Abbey, 17.6. (M.A.S.N.H.S.)
Colocasia coryli L. Nut-tree Tuffet. Radipole, 24.7. (D.N.A.)
Episema caeruleocephala L. Figure of Eight. Radipole, 10.10. and 26.10. (D.N.A.)
Polychrisia moneta F. Silver Eight. Radipole, 18.7. (D.N.A.)
Plusia gamma L. Silver Y. Radipole, 207 between 4.6. and 10.10. (D.N.A.)
Lygephila pastinum Treits. Plain Blackneck. Radipole, 14.7. (D.N.A.) Near Weymouth, 23.7. (E.F.C.C.)
Rhodometra sacraria L. Vestal. Bridport, a female on 12.10. (G.S.E.C.)
Nycterosea obstipata F. Narrow-barred Carpet. Radipole, 24.10. (D.N.A.)
Anticlea derivata Schiff. Streamer Carpet. Radipole, 8.6. (D.N.A.)
Orthonama lignata Hubn. Oblique Carpet. Radipole, 2 on 1.9. (D.N.A.)
Ortholitha mucronata Scop. Lead-belle. Radipole, 13.7. (D.N.A.)
Eupithecia venosata F. Netted Peg. Radipole, 8.7. (D.N.A.)
Palpita unionalis Hubn. Scarce Olive-tree Pearl. Radipole, 8.10. (D.N.A.)

FISH

M. LADLE

One of the most notable features of the past year (1979-80) was the great number of large Roach caught by anglers, from the lower, tidal, reaches of the River Frome in the early part of 1980. The catches included numerous fish of between 2 lbs. and 2½ lbs. It is possible that these fish represent the offspring of one or two years soon after the 1965 pollution of the lower Frome, and are thus between 10 and 15 years of age and approaching the end of their lives. A number of Carp were again reported from the lower Frome, and, in the past three years their capture has become almost a regular occurrence.

In the past year it was possible to confirm the presence of a population of stunted Rudd in a pond to the north of Corfe Castle. Rudd are, in common with many other still water species, rather rare in the Purbeck area.

A large run of small Salmon entered the River Frome from mid July 1979 onwards.

I am grateful to Jon Bass for records received this year.

MARINE FISH

Rajidae

Raja clavata (L.) Thornback Ray. November, 1979. A fish of 12 lb. from Poole.

Squatinidae

Squatina squatina (L.) Monkfish. October, 1979. 39 lb. off Southbourne.

Congridae

Conger conger (L.) Conger Eel. August, 1979, 22 lb. off Durlston. September, 1979, 28 lb. off Durlston, 31 lb., 25 lb. and 17 lb. Poole. November, 1979, 38 lb. and 19 lb., Durdle Door. January, 1980, 29 lb., Bournemouth.

Gadidae

Gadus morrhua (L.) Cod. November, 1979, fish of 10 lb. to 21 lb. reported from Bournemouth and Poole.

Blenniidae

Blennius gattorugine L. May, 1979, Kimmeridge.

Pholis gunnellus (L.) February, 1980, Kimmeridge.

Gobiidae

Chaparrudo flavescens (Fabricius). Two-spot Goby. February, 1980, Weymouth.

Cyclopteridae

Cyclopterus lumpus L. Lumpsucker. February-March, 1980, Poole Harbour (numerous).

Centrarchidae

Dicentrarchus labrax (L.) Bass. September, 1979, 10 lb. Ballard. Several specimens of up to 8 lbs. in Kimmeridge-Chapmans Pool area.

Mugilidae

Crenimugil labrosus (Risso). Thick-lipped Grey Mullet. Numerous in Kimmeridge area.

Pleuronectidae

Pleuronectes platessa L. Plaice. August-September, 1979, several 3-4 lb. fish from Poole Harbour.

Platichthys flesus (L.) Flounder. Numerous in Poole Harbour in winter.

Soleidae

Solea solea (L.) Sole. September, 1979, 1½ lb. Taddiford.

Many of the common fish such as Mackerel, Pouting, Poor-cod and Black Bream were again reported this year.

FRESHWATER FISH

Scardinius erythrophthalmus (L.) Rudd. September, 1979, numerous small Rudd were examined from a pond north of Corfe Castle (NGR SY 960829).

AMPHIBIANS

ROBERT V. SKINNER

Smooth Newt. *Triturus vulgaris* L.
Abundant in a small pond in July in the Affpuddle area. (H. & G. Clarke)

Common Frog. *Rana temporaria* L.
Two clumps of spawn in a pond in Corfe Mullen on 4th March. (A. H. Dunn). Various sightings during the year included one at Weymouth SY 6579 (H. & G. Clarke), one at Rogers Hill SY 8194 in July (E. Hall) and one found dead on a road at Castle Estate, Dorchester in October SY 6889. P. Ensom)

Common Toad. *Bufo bufo* L.
Earliest arrival at a pond in Parkstone was on 9th March. 21 adults were seen mating in the same pond on 29th March. A number had arrived in a pond at Corfe Mullen by 23rd March. The first sign of spawn at this pond was on 25th April. Five adults were still present on 12th April. A half-grown specimen was seen at Morden Park on 9th July. (A. H. Dunn). Common toads were also reported from the following sites. The ground of Blandford High School ST 8707 (Blandford High School); One Acre Pool, Studland SZ 033859 (P. Donovon); Hatch Pond SZ 014939 on 8th August (P. Darley) and on the disused railway at Broadstone SZ 063961 on 19th August. (G. & H. Clarke)

REPTILES

ROBERT V. SKINNER

Viviparous Lizard. *Lacerta vivipara* Jacquin.
One seen on waste ground in Corfe Mullen on 3rd June and another on 26th June. (A. H. Dunn). An adult and young sighted on the disused railway at Broadstone SZ 003962 during August. One specimen seen at Upton SY 982932 also in August. A juvenile was seen at Hatch Pond SZ 014939 on 8th August and another at Piddle Wood, Bryantspuddle SY 8294 (G. & H. Clarke and P. Darley).

Sand Lizard. *Lacerta agilis* L.
A female seen at Creekmoor on 23rd June and another adult recorded in Wareham Forest on 22nd August . (A. H. Dunn). One was found on Holt Heath SU 0504 and another on Holton Heath SY 9490 in August. (H. J. M. Bowen). A gravid female seen on Upton Heath SY 9893 in June. Another specimen sighted on Dunyeats Hill SZ 0196 also in June. On 19th August one male, one female and a young individual was seen on the disused railway at Broadstone SZ 003962. (H. & G. Clarke). One seen at St. Ann's, Canford Cliffs on 14th June. (K. M. Godfrey).

Slow Worm. *Anguis fragilis* L.
One found in a disused farm building at Corfe Mullen on 5th September and an adult seen on Corfe Mullen Common on 17th October. (A. H. Dunn). One recorded below Weatherby Castle SY 809962 in June. Abundant under sheets of iron on the disused railway at Broadstone including two melanistic forms. One found at Upton SY 982932 in August and another at Corfe Castle SY 9682. Several were found on the roadside at Rogers Hill SY 8293 in September. One seen at Piddle Wood, Bryantspuddle SY 8294. (H. & G. Clarke). One seen on Studland Heath SZ 028843. (P. Donovon).

Grass Snake. *Natrix natrix* (Lacepede).
One seen at Broadstone in August SZ 063962. (H. & G. Clarke).

Smooth Snake. *Coronella austriaca* Laurenti.
One found under a wooden board and not hibernating. This was during December, 1978. A one-year-old specimen was seen on 23rd June and another, half-grown on 25th July. A full grown grey individual sighted on 30th June, two half-grown specimens seen on 8th August, another one-year-old seen on 15th August and two more recorded on 22nd August. A one-year-old was recorded on 5th September and another medium-sized specimen noted on 25th September. All these smooth snakes were recorded in East Dorset. (A. H. Dunn). One found on Studland Heath. (P. Donovon). Another seen at Affpuddle under a log and during August one was sighted at Rogers Hill. (H. & G. Clarke).

Adder. *Vipera berus* L.

Earliest record was for 18th April when a dark grey adult and a smaller darkish specimen were seen on Corfe Mullen Common. A young adult was recorded at Sixpenny Handley on 27th April. A very reddish young adder about ten inches long was seen crossing the gravel road in Stubhampton Bottom on 27th June. Also on this date a juvenile was seen at Corfe Mullen. Three females were seen on Corfe Mullen Common, two on 11th July and one on 25th July. (A. H. Dunn). One was recorded at Culpepper's Dish, grid ref. 8192 in April and another below Hardy's Monument, grid ref. 6187 in June. A young individual was seen at Broadstone SZ 003962 on 19th July. (H. & G. Clarke). Four sightings were made on the conifer plantation, Stubhampton Bottom during the year. (Tubb). One recording from Yellowham Wood SY 7393. (P. Ensom). A young specimen found dead at Kimmeridge SY 9079 was brought to the County Museum on 24th September. A gravid female was seen on Upton Heath SY 9849 in August. (H. & G. Clarke). One record from Studland Heath SZ 028843. (P. Donovon). A record was taken of five specimens, two of which were seen mating at Vernditch SU 0323 on 6th May. (M. Hutchinson).

SUMMARY OF THE DORSET BIRD REPORT 1979

J. V. BOYS, MA (Written July, 1980)

The 1979 Bird Report was prepared for the printers by 1st May, 1980 and published in mid-June, as a separate part of *Proceedings* Vol. CI. It contains an introduction, a list of contributors, the systematic list, a summary of wildfowl counts, the ringing and recovery reports and, in addition, there are papers on the House Martin Survey by Mrs. A. Russell and the Wintering Blackcap Enquiry by Col. E. D. V. Prendergast.

It is possible here to abstract and reproduce only a brief note on some aspects of the 1979. Some species have bred occasionally or erratically in recent years and there were no 1979 breeding reports for Great Crested Grebe, Pochard, Long-eared Owl, Raven, Redstart, Whinchat, Tree Sparrow, Crossbill or Cirl Bunting, and the following species are only just hanging on: Razorbill, Puffin, Stone Curlew, Woodlark, Yellow Wagtail and Wheatear. The exceptionally cold weather early in the year affected many common species locally, but Cetti's Warblers again bred and the Dartford Warbler situation, though grave, was not as disastrous as anticipated, while Bearded Tit numbers were substantially reduced. Hobbies and Sandwich Terns had quite a good year, but the status of the Little Tern is uncertain, and there are a few breeding successes deserving the protection of anonymity.

During the cold weather a number of species appeared in Dorset in much higher numbers than usual: Red-necked Grebe, Bittern, Bewick's and Whooper Swans, White-fronted and Brent Geese, Wigeon, Goldeneye, Smew, Goosander, Ruddy Duck, Woodcock, Short-eared Owl, and colossal movements of Lapwings, Skylarks and winter thrushes were apparent.

Spring passage was again late for many species and, though wader passage was unremarkable, there was a generally strong and varied autumn passage, most noticeable as usual at Portland Bill. Separate reports have been published by Portland Bird Observatory and Christchurch Harbour Ornithology Group.

The rarities list is headed by two species new to Dorset, a White-tailed Plover on 3rd June and a Blue-winged Teal on 23rd October, both near Abbotsbury, while records of a Slender-billed Gull and a Short-toed Tree Creeper are still under scrutiny at the time of writing. Some rare species are nowadays almost annual in Dorset, and there have been as many as 40 different Mediterranean Gulls, but a Yellow-billed Cuckoo was the first since 1895 and a Red-throated Pipit, a Pallas's Warbler and a Scarlet Rosefinch deserve special mention.

The Dorset Bird Club continues to flourish, holding indoor and field meetings and publishing a quarterly bulletin. After 7 years as Editor and 20 years involvement with the Annual Reports I have asked for a respite, and we are fortunate that Dr. G. P. Green has agreed to take on the task, but I have already been persuaded to consider preparation of a new Check-list for about 1982 now that the 1972 version is out-of-date and sold out.

MAMMALS

E. M. KEATS

Mammal observations have been recorded by a number of members and non-members of the Society and these records will help to provide fuller information on the status of mammal species in Dorset as the information accumulates at the Dorset Environmental Records Centre in the Dorset County Museum. All reports are filed in the Centre although only a small selection of the observations can be printed in this report. I am grateful to all who have submitted records.

The check list numbers and specific names are as listed in *The Identification of British Mammals*, by G. B. Corbett, British Museum (Natural History), 1969. In addition to the observations printed, the following species were also reported 1979:

1. Hedgehog, *Erinaceus europaeus*. 2. Mole, *Talpa europaea*. 3. Common Shrew, *Sorex araneus*. 12. Natterer's Bat, *Myotis nattereri*. 21. Common Long-eared Bat, *Plecotus auritus*. 22. Grey Long-eared Bat, *Plecotus austriacus*. 27. Stoat, *Mustela erminea*. 28. Weasel, *Mustela nivalis*. 32. Otter, *Lutra lutra*. 43. Sika Deer, *Cerus nippon*. 44. Fallow Deer, *Dama dama*. 45. Roe Deer, *Capreolus capreolus*. 53 Brown Hare, *Lepus capensis*. 55. Rabbit, *Oryctolagus cuniculus*. 57. Grey Squirrel, *Sciurus carolinensis*. 62. Long-tailed Field Mouse, *Apodemus sylvaticus*. 66. Brown Rat, *Rattus norvegicus*. 68. Water Vole, *Arvicola terrestris*.

8. **Greater Horseshoe Bat,** *Rhinolophus ferrumequinum*. A comprehensive research programme is continuing into the causes of the decline in this species and to try and find ways of increasing the numbers. The decline is probably the result of many factors including climate but the most serious factors are the loss of roost sites both for hibernation and breeding. In 1979, 77 bats were caught in south east Dorset, the total population in the region is now thought to be about 100. 1979 was a bad breeding year with cold May and June temperatures which delayed births and hence reduced the time for the young to be weaned and to put on fat before hibernation. It is thought that many of the weaned young died before the end of the year.
10. **Mouse-eared Bat,** *Myotis myotis*. One adult male was found in February, this one was originally ringed in February, 1975, also recorded in 1976 and 1977. The Mouse-eared colony tried to establish itself in Dorset in the 1950s but no females have been found since 1966. A total of 25 animals have been recorded in Dorset including two skeletons. The Sussex colony also appears to have died out so it seems that this species no longer breeds in Britain.
16. **Serotine,** *Eptesicus serotinus*. A male was rescued from a loft water tank in Langton Matravers by J. M. Overton on 26th August, 1979, SY 999789. It was identified and released by W. G. Teagle at Leeson House.
19. **Pipistrelle,** *Pipistrellus pipistrellus*. One was found dead in a wash basin at Leeson House on 31st May, 1979, identified by W. G. Teagle, SZ 005787. Bats are almost impossible to identify in flight and are not easy to identify in the hand so when specimens are found dead it is worth having them identified to increase our knowledge of their distribution. Specimens can be sent or taken to the Dorset County Museum in Dorchester. One bat, possibly a Pipistrelle was seen catching bees from an apiary in daylight at Corfe Mullen in June.
24. **Fox,** *Vulpes vulpes*. Milton Abbey School Natural History Society record large numbers of sightings in 1979 with up to six cubs in a litter. One fox was seen in December frolicking with a King Charles Spaniel in a new road in Corfe Mullen and only fled to its earth nearby on seeing the observer. Reports of foxes have also been sent in from Hamoon, Hilton, Town Bridge Weymouth, Puddletown, Mapperton, Wool and Vernditch.
31. **Badger,** *Meles meles*. 'Bovine Tuberculosis in Badgers', Third Report by the Ministry of Agriculture, Fisheries and Food, July, 1979, gives the results of work done so far on infected badgers, particularly in certain areas of south west England and including one area in south east Dorset. The Dorset Naturalists' Trust and other bodies have submitted comments on the MAFF work on Badgers and Bovine TB to Lord Zuckerman, who was asked to review the present procedures over gassing of badgers by the Ministry in the autumn, 1979.
56. **Red Squirrel,** *Sciurus vulgaris*. In 1979 Mrs. Parkyn and her fellow recorders on Brownsea Island reported 133 sightings, well down on the record year of 1978 but not a bad total compared with several earlier years. No large groups were seen but twelve groups of two each and one group of three were observed. As usual the records have been submitted with detailed grid references for each sighting as well as dates and weather conditions.
94. **Pilot Whale,** *Globicephala melaena*. A dead specimen was washed up at Golden Cap in mid December and washed away again. Probably the same specimen was washed up at the end of December at Freshwater Caravan Site, Burton Bradstock, its length was 15 ft. 8 ins. It was reported by Seatown Coastguard.

Records of Dorset Mammals for 1979 have been received from the following: A. Abbott, M. Blower, H. J. M. Bowen, R. H. Branwhite, R. Burden, Mrs. D. Chafer, H. G. Clarke, E. F. C. Coetzee, G. Darwall, P. Darley, A. H. Dunn, P. Ensom, R. A. Ford, Miss S. Gowers (DERC), P. J. Hamlyn, J. Hand, M. Hutchinson, J. G. Keylock, R. Legg, Milton Abbey School Natural History Society, J. M. Overton, Mrs. K. B. Parkyn, A. Perry, M. F. Robertson, Seatown Coastguard, R. E. Stebbings, C. A. Swan (MAFF), W. G. Teagle, Miss Wainwright, P. F. Williams, S. Winterbottom.

A. D. Mills, *The Place-Names of Dorset, Part II, The Hundreds of Cogdean, Loosebarrow, Rushmore, Combs Ditch, Pimperne, Badbury, Cranborne, Wimborne St. Giles, Knowlton, Monkton Up Wimborne* (English Place-Name Society, Volume LIII, 1980).

This is the second part of a series which will eventually provide a comprehensive survey of place- and field-names of the County. Part I, covering the eight Hundreds of the south-east of Dorset, was published in 1977, and reviewed in the *Proceedings,* Vol. XCVIII, 1976. This present volume deals with the eleven Hundreds of east Dorset, and judging by the extent of the County now covered, the complete series will probably consist of four volumes, or parts. Users of this and subsequent parts will need to have Part I available, for the Abbreviations, Bibliography, and Notes on Arrangement, are all contained in the publication of 1976.

The high standards of scholarship and research which readers have come to expect from the English Place-Name Society publications, are once more in evidence; and lovers of Dorset, and historians, will be delighted with the methodical care which the author has shown. Each Hundred is divided into parishes; each parish, prefaced by reference to documentary entries, contains a short etymology of place- and field-names. The towns of Poole, Blandford and Wimborne have entries covering street names and buildings. Interestingly, lost place-names are recorded, and it could be that planners might in future resurrect some of the lost names of Dorset as more suitable for new streets and housing developments than the sometimes inappropriate inventions or importations we now see. In these pages are the lost names of *Horsyth, Middlestreet, Baggeridge, Wysselay, Odenham, Crockern Stoke, Brownscroft* and *Vinter's Fee;* and all are attractive reminders of the County's past.

Because those who read Dorset's history so frequently refer to Hutchins, it is pleasing to note that the author has to make extensive use of the *History and Antiquities of the County of Dorset.* The few corrections to Hutchins' place-name interpretations are gently made, with only one uncharacteristic outburst of amusement at the 'antiquarian etymologising' of Durweston. Fägersten, though his study was less extensive than Hutchins, earned as many corrections, and pages 58, 67 and 235 provide good examples of revision.

The etymology of certain places, and prominent among these are Pimperne and Pamphill, proves difficult to resolve, but we are treated to a well documented explanation in each case, and the author makes every reasonable attempt to determine the derivation of the name. Some names of places and fields may never be resolved, and one can only sympathise with the plight of scholars who attempt a derivation only to conclude, somewhat sadly one feels, that a doubtful interpretation may be the result of a long forgotten surname. Inevitably, some interpretations, especially of field-names, may prove unsatisfactory. Place-name scholars are well grounded in the roots of language, but seem rather more insensitive to the influence of the region's recent economic life on field-names. Fields may have quite recently derived names, and it is no surprise to see 18th century clearings with names derived from smuggling (pp. 41, 115), Dragoons (p. 113) and Turnpikes (pp. 114, 121); though more surprisingly, derived from *Gulliver's Travels* (p. 40), and the poem *Jabberwocky* (p. 7). Why, when there is an acceptable transferred name of *Londonderry* (p. 198), should it not occur to the author to see *Newfoundland* (pp. 51, 65, 77) as derived from Dorset's chief overseas trade in the period *c.* 1650-1830? New England and Newfoundland were important centres for Dorset's trade, and to refer to the use of these as field-names, dismissively, as mere distant plots, is to ignore the significance of those places in the life of the County.

However, as Edward Baynard observed in 1706, '. . . *when a Book before a Critick lies,/He reads to carp, or filtches to be Wise!*'. This cavilling of a reviewer should not assume any significance, for the volume is rich in interest and scholarship, and the careful preparation for publication allows me only to carp at a few minor field-names of recent origin, and a few insignificant printer's errors on page 124. The publication is a worthy and excellently produced piece of work, and one can only be fascinated at ancestors who found pleasure in naming *Coward's Plot, Foolish Coppice, White Mice Field, Handkerchief Half, Dead Maids' Close, Flippings, Snuffhalf,* and *Lousy Ground* . . .

G.J.D.