

sites. They show at least 100 limekilns still in use, while subsequent revisions of the 1920s and 1930s record the demise of lime-burning in Dorset, despite the building of some new limekilns in that period. Less widely available, the first edition 25-inch maps of the 1860s and 1880s record a few limekilns which had vanished by 1900.

Tithe Maps, surveyed around 1840, provide further information, but their quality varies between parishes. For example, the well-presented Langton Herring Tithe Map, surveyed in 1837 by George Moss, shows three limekilns which were still standing in 1900, while a fourth had been replaced by one in an adjoining field. A fifth limekiln is shown at Langton Cross (site 183), just inside neighbouring Portesham, and one which that parish's surveyor failed to mark on his map. Bearing this in mind, a full investigation of all the county's Tithe Maps was not undertaken for this survey.

Past sites are indicated by place-names, such as 'Limekiln Coppice' or 'Limekiln Farm', but a lane named 'Lime Hill' between Powerstock and South Poorton is more suggestive of transport than a kiln site.

Appendix 1, which lists all identified limekilns, shows the status of 259 kilns standing in 1900-2, and the disappearance by that date of 26 known only from earlier maps. Thirteen new kilns were built in the twentieth century. Appendix 2 lists fourteen other sites known from place-names, documentary or other sources, including one of the twentieth century.

### Limekilns and Geology

The limekilns have been related to geology in Figure 2. Table 2 assumes that the nearest limestone or chalk was burnt, but there is uncertainty on geological boundaries or where there is no quarry, as with the Cornbrash or Forest Marble. On Portland and elsewhere, the Portland and overlying Purbeck beds were both burnt.

Being the dominant rock type, Chalk accounts for just over a third of all limekilns. Its 109 limekilns are distributed thus: Lower Chalk (55), Lower/Middle Chalk (7), Middle Chalk (12) and Upper Chalk (35). The dominance of the softer Lower Chalk may be significant, for it outcrops on the lower escarpment or valley-side slopes which were convenient sites for opening quarries. It was also easier to dig (although not necessarily better for burning). Elsewhere, the many chalk pits found on the Upper Chalk hills, would seem to have been the common source of 'lime' without resort to burning. Figure 2 shows a grouping on the Corallian outcrop between Marnhull and Gillingham in north

Dorset, while in the west, the small outcrops of Inferior Oolite were much exploited from Broadwindsor and Beaminster south to Loders and Shipton Gorge. Where Cornbrash and Forest Marble lie close together between Abbotsbury and Chickerell, preference is shown for the former, but this is reversed around Swyre in the west (Figure 3). Cornbrash is again favoured among the scattered outcrops in north Dorset from Ryme Intrinsica and Yetminster eastwards to Stalbridge.

The Lias of west Dorset includes a variety of limestone beds. The Blue Lias was quarried at Lyme Regis, while 'shinglestone lime' was produced from limestone washed onto the shore at Charmouth. These were hydraulic limes.

The early limekilns on the sandy heaths at Ower, Bushey and Wytch must have burnt chalk from the Purbeck ridge just to the south. Other limekiln sites off the limestone or chalk have different explanations. Some produced lime for the building trades around the growing towns of Poole, Bournemouth and Christchurch (sites 174-9 and A2-A3), while one limekiln in Weymouth was clearly connected with the gas works. A limekiln on the quay at West Bay (site 41) may have burnt local Inferior Oolite or Forest Marble, or was perhaps supplied with better quality limestone shipped from south Devon. Another coastal limekiln (site 240) was on Christchurch Harbour, then in Hampshire, where fuel and limestone had to be imported, the latter perhaps from Purbeck.

Table 2: Dorset Limekilns and Geology

Source Rock Type	No. of Limekilns	% of Total
Chalk	109	36.6
Cornbrash	45	15.1
Inferior Oolite	44	14.8
Portland/Purbeck	32	10.7
Corallian	24	8.0
Forest Marble	13	4.4
Lower & Middle Lias (various)	6	2.1
Fullers Earth Rock	6	2.0
Cornbrash/Forest Marble	4	1.3
Outside limestone areas	14	4.7
	297	

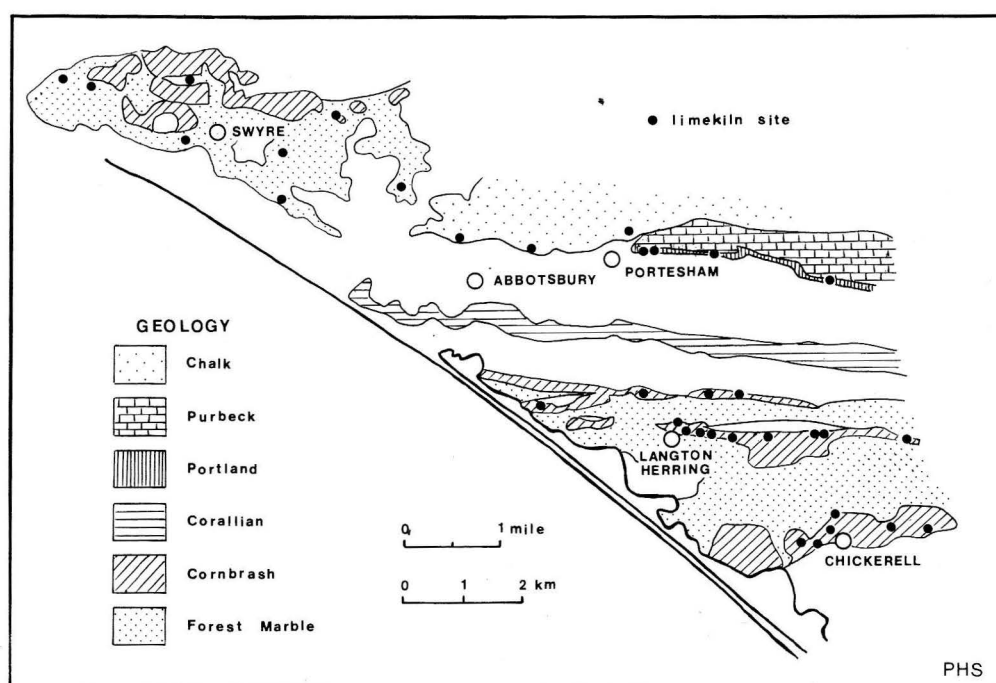


Figure 3. Limekilns and geology around Abbotsbury (Swyre - Chickerell).

### Limekiln sites and their archaeology

The small rural limekilns were erected near where they were needed, with little regard to more distant markets. Most were built in or near the quarry from which they obtained their raw material. Of the actual site, there are three main types:

1. A freestanding structure, with a loading ramp to the top of the kiln, as at Droop (site 106), Lawnswood (site 138) or Downs Lane (site 294).

2. More commonly, the limekiln was built partly into a bank so the kiln head was below or level with the quarry floor, to facilitate loading; good examples are at the Bishop's (site 3), Bucknowle (site 65) or the large kilns at Shillingstone (site 228-32) and Whitesheet Hill (site 259-60).

3. The kiln might be built entirely into a hillside or bank, with the pot surrounded by bedrock or rubble, requiring masonry only for the front wall and draw-arch. Examples are at Chaldon Down, East Compton and The Batch (sites 47, 68 and 293), while the wall at Perwen Farm (site 132) included the solid bedrock. Haydon Hill Wood limekiln (site 105) was built into a quarry face, so that the limestone had to be carried up and around to the kiln head.

Sometimes the source quarry is not always apparent, or some distance away. At Hill Farm (site 289), the kiln was built on the Upper Greensand and chalk had to be barrowed down and across a lane from a pit 100m uphill. Coastal limekilns which could be supplied with fuel and/or limestone directly by sea are more common in Cornwall, Devon or Somerset, but they are known at Lyme Regis, Charmouth, West Bay, Lulworth and Christchurch Harbour. One limekiln was built into the West Cliff at Lulworth Cove (site 271), where coal could be supplied from the sea and chalk was readily available from the cliff. The writer recorded a perfect section of this kiln in March 1977, when half the brick pot was still clinging to the fast-eroding cliff, with which it has since vanished.

### Building materials

Structural evidence survives at 126 sites in Dorset, but only 81 are in a condition suitable for making observations on building materials and style. Most Dorset limekilns were rectangular in plan. Others were circular or semi-circular, the best survivor being at North Poorton (site 167). Local stone was the usual material for the walls, although brick was combined with stone or flint at East Compton, Bubbs Down Farm and Druce Higher Barn, (sites 68, 155 and 212), all in chalk areas. The only limekilns known to have been built entirely of brick were at Stanbridge, Oakford Farm and the Apsley Limeworks, (sites 111, 153 and 174-5). Draw-arches were built in stone, but brick was used where suitable stone was unavailable, such as in some chalk areas. Some brick arches were built to a very high standard, as at Langton Herring (site 116).

The twentieth-century commercial limekilns at Inmosthay on Portland and at Shillingstone were built in stone with brick-lined pots. At Whitesheet Hill, a bank of two limekilns was built on the site of two others (sites 261 and A13), using concrete blocks and shuttered concrete to form the rectangular draw-arches. Although larger than before, the styles of these limekilns were still based on the traditional type of draw-kilns.

### Classification

The limekilns are difficult to group according to style, because each was built individually and there is little evidence that any two were built by the same hand (see Figures 5 and 6). However, some general styles can be identified from the most prominent architectural feature, the draw arch. Using this classification, Table 3 groups the known limekilns into seven types (A-G), with the addition of two minor exceptions (types H and I). The arches vary within this simple scheme. For example, pointed arches may have straight or curved sides.

Some regional groupings are apparent in Figure 4. For example, the Type C pointed arch (Plate 2) is common in west Dorset, where Stevenson described early lime-burning. The view that this is an early style is supported by evidence from Warren Bay in Somerset, where a kiln with a pointed arch was shown to be older than two round-arched kilns (Daniel and Murless 1993, 5). Geology could be a factor, as many Type C kilns are found on

the Inferior Oolite and Cornbrash/Forest Marble, reflecting those stones' suitability for constructing this simple form of arch. Type B round brick arches are common on the chalk, where flint could not be used. Four of the well-built kilns in the Langton Herring area have double brick arches (see Plate 5). Two remarkably low-centred Type B brick arches were noted in west Dorset, at Gribb Farm (site 128), which has a stone keystone, and at Cogden Farm (site 39), where the bricks have been removed.

Type A round stone arches are more common around Sherborne in north Dorset (Plate 6). This is also an area noted for Type D timber lintels, which were cheaper to build in terms of materials. At Melbury Hill (site 154), a timber lintel was replaced by a brick arch, indicating the former style was an early one. The Bishop's limekiln has double timber lintels (Figure 6).

The access tunnel Type F, where the arch continues in to form a deep recess, is confined to the larger commercial kilns (sites 174-5 and 228-32).

While many limekilns had a lime shed, at least four had a tunnel approach. The finest is at Whitmore Coppice (Plates 3 and 4, and Figure 6), with others at Penn Wood, Lake and Ridgeway (sites 160, 256 and 279). These kilns could be given their own classification because of such distinct features.

### The draw arch recess

Some recesses have a broad apsidal or 'beehive' form, the most impressive being at Bucknowle and Hill Farm (sites 65 and 289). The recess can be deep, shallow, square or tapered; it may narrow to the width of the draw-hole at the back, as at East Compton (site 68). The arched ceiling, in brick or stone, is horizontal or slopes down towards the back. Most of the original recess floors are hidden by an accumulation of soil, rubble and general rubbish. Nevertheless, three floor materials were observed: stone slabs at Hill Farm (site 289), brick at Melbury Hill (site 154) and stone or beaten lime at Bell House (site 127).



Plate 2. New Lane, Swyre. A small pointed arch Type C limekiln. July 1993.

Table 3. A typology of Dorset limekilns according to draw arch style

Type	Description	Examples known
A.	Round arch (Stone)	12
B.	Round arch (Brick)	25
B1.	(with double arches)	5
C.	Pointed arch (Stone)	20
C1.	(in brick)	1
D.	Timber lintel	4
D1.	(with double lintels)	2
E.	Miscellaneous (brick opening)	1
F.	Access tunnel type (brick)	7
G.	Concrete arch (bank of 2)	2
H.	Suffolk brick kiln (converted)	4
I.	Steel cylinder type	1

Draw-holes were usually rectangular, in stone or with a round brick arch (Plates 5, 6 and 7) and some kilns have evidence of an iron fire door. At Hill Farm (site 289), there was also a lower door for drawing out ash. The smaller poking holes were likewise built in stone or brick (Plates 6 and 7), and show signs of wear if used over long periods.

#### The kiln head

Workers and animals attending the charging of a limekiln were usually prevented from straying over the edge of the kiln head by



Plate 3. Whitmore Coppice limekiln at Langton Herring from the south, showing the retaining wall (restored) around the kiln head and pot. June 1993.



Plate 4. Whitmore Coppice limekiln from the north, showing the unusual tunnel approach to the draw arch area. June 1993.

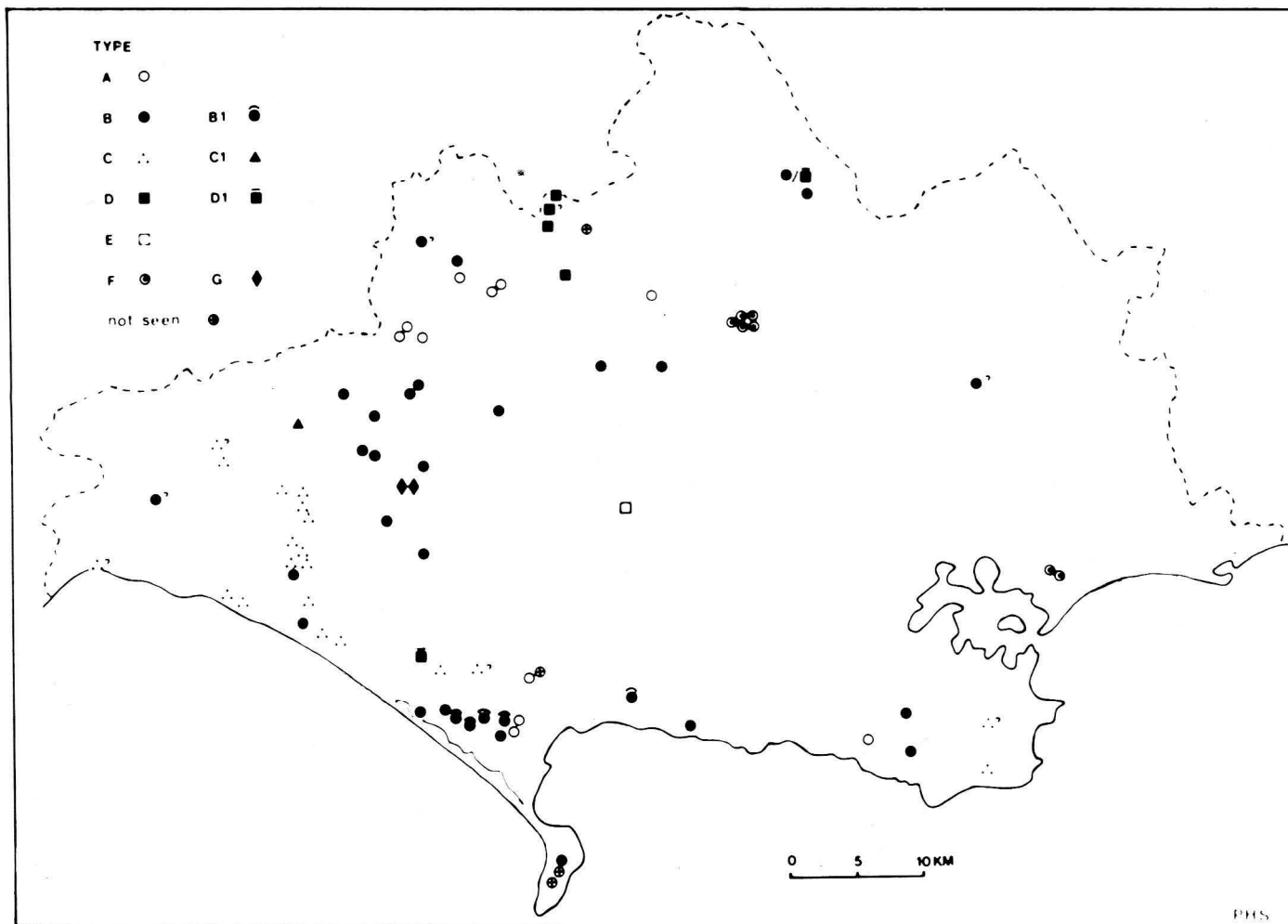


Figure 4. Distribution of surviving limekiln types according to draw arch style (see Table 3).



surrounding walls. These are often now ruinous, but enough survive to show they could be low, as at Rodden Ridge (site 4) or Limekiln Hill (site 214), or there was a much higher wall to give protection from the elements, as at Whitmore Coppice (Plate 3), Willwood and Nottingham (sites 77 and 277).

### The kiln pot

To ensure good insulation and prevent unnecessary loss of heat, the pot was surrounded by a thick rubble infill behind the kiln walls or was built entirely within the ground. The pot was always built of header-bonded bricks, with the exception of two stone-lined examples at Caundle Wake and Haydon Hill Wood (sites 18 and 105). These two might have been flare kilns for very intermittent firing. The Haydon Quarry kiln (site 141) was finished in stone near the base.

The bricks were ordinary types which became highly vitrified and damaged with long periods of use, and most surviving pots show this evidence of intense heating. The heat could also cause structural damage to the kiln as a whole, and a builder's accounts refer to a limekiln being 'taken down' and rebuilt by two men from 23 August to 6 September 1866 (DRO.D449/5). Firebricks were found only at Gospel Ash Farm (site 217) and Waddon Hill (site 249). Some kilns had stretcher-bonded bricks laid outside the inner course for better strength and insulation. An economy measure was observed at North Hill limekiln (site 64), built entirely into a bank, where all the pot bricks had been cut in half. This suggests the kiln was intended for a short life, perhaps for an estate building project. The pot is choked with hardened lime, which hints of abandonment upon completion of the work.

There was always the danger of livestock falling into an unfenced kiln, and several farmers cited this as the reason for the draw-hole area being destroyed while rescuing some unfortunate animal. Many pots were filled with rubble to make them safe, although the top brick courses may still be exposed. More drastically, kilns were deliberately demolished (being a source of

building stone or road making material) and only a segment of the pot's back wall may survive. Three pots remaining fully open, at Bucknowle, Bell House and Limekiln Hill (sites 65, 127, and 214), result from restoration.

All the pots of the recorded kilns are cylindrical with diameters from 1.2m to 2m (Table 4). The most common shape has vertical sides, tapering towards the bottom. However, the Haydon Quarry pot has an irregular profile, while the firebrick pot at Gospel Ash has a swollen shape narrowing at the top where it is held by a cast-iron rim (Figure 5). The Willwood limekiln (site 77) also has an iron band to hold the top brick course, to prevent damage.

### Size and capacity

Relative capacities can be compared using an approximate formula devised by David Bick (1984, 91):

$$\text{Volume } V = 0.75\pi \frac{d^2 h}{4}$$

(d = diameter of pot; h = height of kiln)

The small size of 26 Dorset limekilns is immediately apparent when compared with examples from other counties in Table 4. These figures suggest that most Dorset limekilns were for local farmers' use only. Despite its pretensions, the Bucknowle limekiln (Figure 6) had a relatively small pot and capacity. The only exceptions are the industrial-scale kilns. One of the four kilns presently burning at Shillingstone has a height of 9.1m, while the two banks of kilns at Apsley Limeworks and Whitesheet Hill were respectively 8.6m and 6.7m high.

### Lime sheds

The lime shed attached to the front of the structure is a feature of many Dorset limekilns (Plate 8), protecting the quicklime from the weather when being discharged from the kiln and handled by the lime-burner. A common form was a simple lean-to, with side

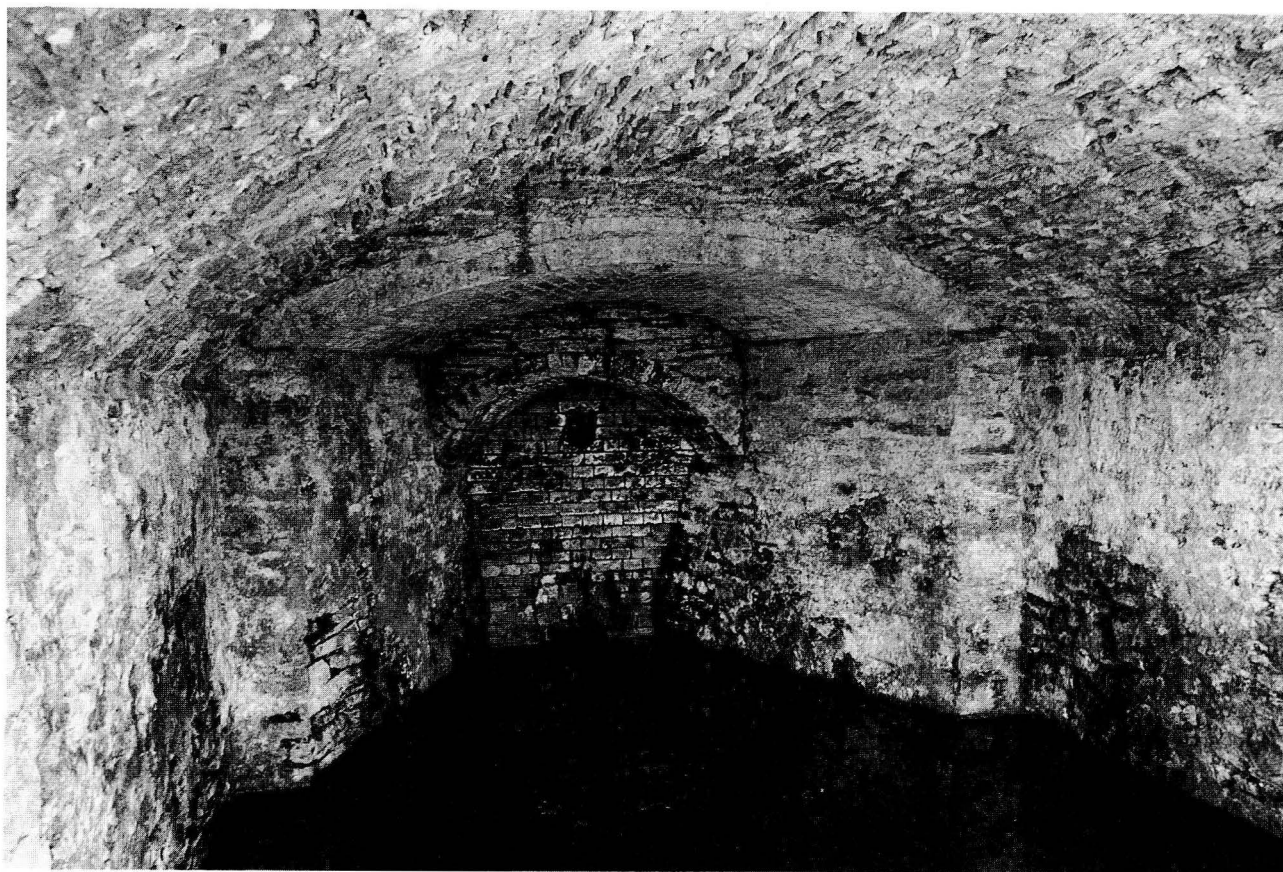


Plate 5. Double draw arches and a high quality of building seen at the Whitmore Coppice limekiln. The site was flooded on the day of the photograph. June 1993.

Figure 5. Some Dorset limekilns (part one).

