

Traditional Building Materials in the Chilterns : A Survey based on Random Sampling

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SAMPLING has rarely been used in surveying elements in the cultural landscape, and yet it can in certain cases provide an effective means of covering an extensive area which would otherwise be well beyond the limits of the single research worker. Such a survey of traditional building materials was carried out over the 800 square miles of the Chilterns during 1961-62. This paper outlines the survey method employed and some of the considerations relevant to the interpretation of the results.

SURVEY METHOD

The aim of any sampling procedure is, of course, to draw sample units which, when grouped together, are representative of the area as a whole. The most suitable size of sample unit is large enough to smooth out local anomalies and yet sufficiently small to allow enough units to give a representative areal coverage. In the case of the Chilterns rectangular areas each a quarter of an Ordnance Survey 'Six Inch' grid sheet (6.25 square kilometres) were selected as providing a satisfactory compromise. It was clear from pilot surveys that there were certain regions within the Chilterns which might be expected on *prima facie* grounds to have characteristic building materials, and care was therefore taken to ensure that these were adequately represented in the sample. For this purpose the regions indicated in FIG. 1 were recognized. The main physiographic distinction is between the Chiltern Plateau or dip slope and the Icknield Belt or scarp-foot. The Chiltern Plateau and Icknield Belt have been further subdivided largely on a physiographic basis. Sample areas falling on the boundaries of regions were eliminated. For this purpose the Thames and Colne valleys and the Vale of St. Albans were treated as regional boundaries since they lack sufficient breadth to justify representation by separate sample areas. Areas containing settlements of 250 or more dwellings were also eliminated from the selection of samples since for practical reasons it was necessary to confine attention to the smaller and essentially rural settlements. A random 25% sample was taken of the remaining areas in each region. This meant, for example, that out of the forty-two possible sample areas in the North-east Plateau (the largest region) ten were chosen for survey. The total number of sample areas for all the

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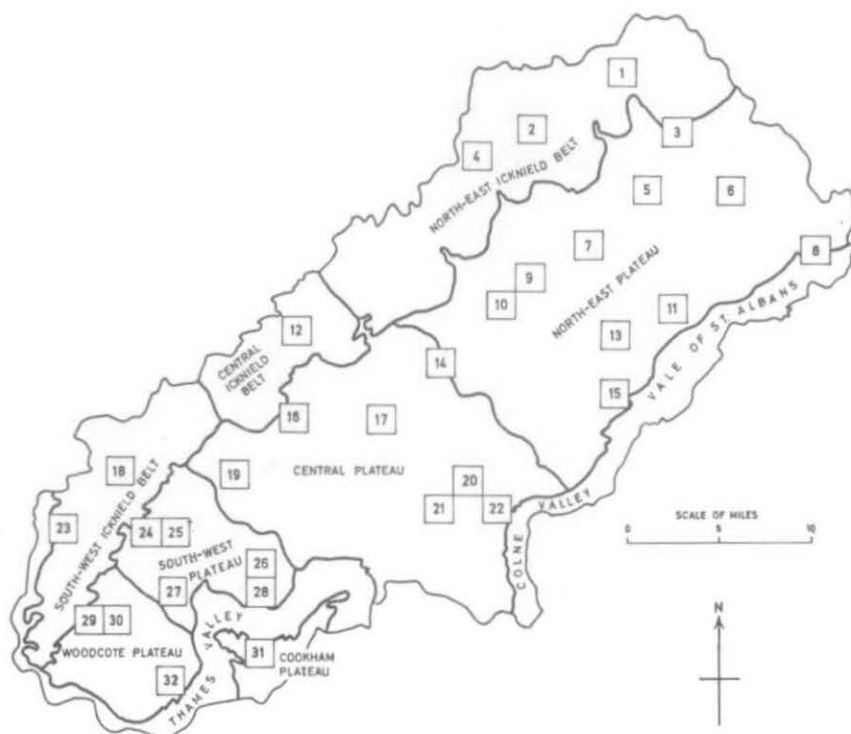


FIG. 1

Location of sample areas in relation to regional subdivisions.

1—Hexton, 2—Chalton, 3—Austage End, 4—Tilsworth, 5—Breachwood Green, 6—Langley, 7—Friar's Wash, 8—Bramfield, 9—Beechwood Park, 10—Nettleden, 11—Sandridge, 12—Terrick, 13—Gorhambury, 14—Rossway, 15—Sergehill Green, 16—Speen, 17—South Heath, 18—Shirburn, 19—Beacon's Bottom, 20—Pollard's Wood, 21—Hodgemoor Wood, 22—Newland Park, 23—Ewelme, 24—Greenfield, 25—Turville Heath, 26—Chisbridge Cross, 27—Bix, 28—Bockmer, 29—Checkendon, 30—Stoke Row, 31—Warren Row, 32—Binfield Heath.

regions together was thirty-three. The location and areal extent of these sample areas is shown in FIG. 1. All the dwellings in settlements in the thirty-three sample areas were surveyed. A certain standardization was necessary in dealing with settlements on the boundaries of sample areas. For the sake of uniformity where only part of a settlement was within a sample area the settlement was surveyed in its entirety, providing that its southernmost point was included in the sample area and at least one-third of its dwellings.

In rural areas of lowland Britain traditional building materials, in the sense of those with long established local associations, gradually ceased to be used with the spread of the railways. In the Chilterns it was clear from

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pilot surveys that in places traditional materials continued to be used into the Victorian period and therefore all Victorian as well as pre-Victorian dwellings were recorded. However, the data for the two periods have been separately mapped, since in Victorian buildings the great predominance of machine-made bricks and other materials of the industrial era tends to obscure regional variations in the use of traditional materials. For each dwelling the predominant walling material was recorded. Roofing materials were not recorded, since the pilot surveys indicated that plain tiles were virtually the universal traditional roofing material apart from the occasional use of thatch. As in most of Britain, slate roofing is virtually universal in 19th-century buildings.

The field survey had necessarily to be carried out largely on foot, but in spite of this it was possible for a single worker to cover one, and sometimes two, sample areas in a day. Since the sample areas are of equal size but contain varying numbers of dwellings, the data are for comparative purposes best expressed as the proportion of dwellings built of various materials. These proportions can be shown visually in the form of divided circles located on maps of the Chilterns. Maps have been constructed for pre-Victorian (FIG. 2) and Victorian dwellings (FIG. 3) and these form the basis for an interpretation of distribution patterns.

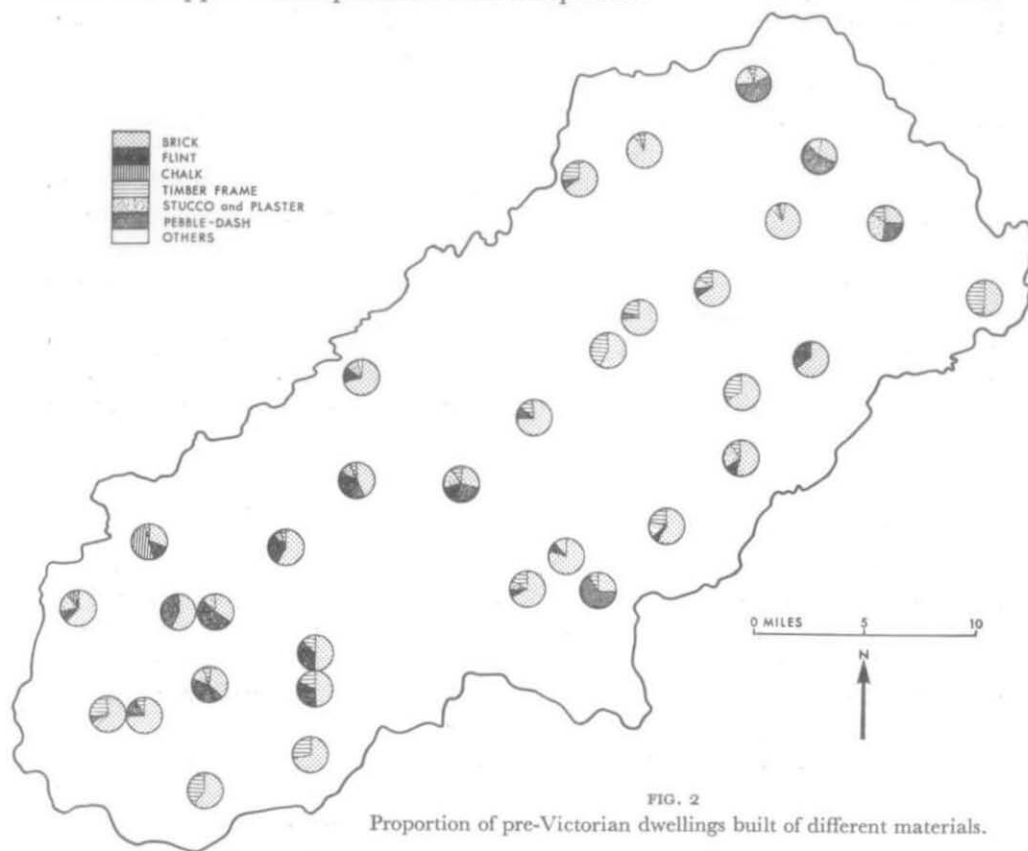
DISTRIBUTION OF FLINT AS A BUILDING MATERIAL

Flint is often regarded as the traditional building material in the Chilterns, but the sample survey indicates that only 12% of pre-Victorian dwellings are of flint and only in parts of the South-west Plateau does flint predominate among pre-Victorian dwellings. This concentration of flint in the South-west Plateau is common also to Victorian dwellings and farm outbuildings, and is almost certainly related to the breadth of the Upper Chalk outcrop which is the major source of flints in the Chilterns. No dwellings in the South-west Plateau are far from this outcrop, since the plateau surface has been deeply dissected so that broad outcrops of Upper Chalk occur near the surface in the valley sides and only narrow residual interfluvial surfaces remain covered by superficial deposits. Further north-east, where flint buildings are much less common, the extensive undissected interfluvial surfaces have a superficial capping of clay-with-flints or related deposits which cover the Upper Chalk often to a depth of over 50 feet. It is unlikely that the flints within this superficial cover have ever been numerous enough to warrant systematic exploitation for building. In the extreme south-west, where again there are few flint buildings, the Upper Chalk is largely obscured by gravels.

The presence of flint dwellings on the Lower Chalk of the South-west and

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Central Icknield Belt, especially in the Terrick area, is less readily explained. Here there are neither brick-clays nor flints and the hard bands in the Lower Chalk, though used in buildings, tend to weather rapidly. With this lack of materials on the spot it seems probable that flints were transported downhill from the Upper Chalk portion of the scarp-face.



Farm outbuildings of flint occur more frequently in the Central Plateau than flint dwellings and this may be explained by the nature of the flints used. More outbuildings than dwellings are of undressed flints and these may have been gathered from the fields as they were turned up by the plough. Higher standards of walling would usually have been required in dwellings, thus necessitating access to quarries in the Upper Chalk to obtain easily-dressed flints. Such access would have been more difficult in this extensively drift-covered area, and in these circumstances brick was probably preferred. How-

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ever, it is possible that more farm outbuildings than dwellings have survived, since a number of cases were observed of outbuildings remaining in use long after the associated farmstead had been abandoned.

The fact that the main concentration of Victorian flint dwellings (FIG. 3) is further north-east than the main concentration of pre-Victorian flint dwellings may be related to the expansion of brickmaking in Victorian times. On the other hand, it should be noted that areas further south-west were closer to the old-established brick-works of the Woodcote Plateau, in particular those at Nettlebed where bricks were being made as early as the 15th-century.¹ Nearly all the Victorian flint dwellings are small labourers' dwellings and individual estate owners had considerable influence on the choice of materials for these buildings. However, although individual whims in giving buildings a 'traditional' flint facing were important, flint must in the main still have been regarded in early-Victorian times as an economic building material in certain areas further from the brick-fields.

DISTRIBUTION OF OTHER TRADITIONAL BUILDING MATERIALS

Since late-Victorian times brick has been the almost universal building material, and the greater part of it has been obtained from outside the Chilterns. In pre-Victorian times the only economic source of brick was local. Most parts of the Chilterns had brick- and tile-works. These were generally small-scale exploitations of the brick-earths occurring in irregular patches in the clay-with-flints, although in the extreme south-west the Reading Beds and London Clay outliers were utilized. Over the Chilterns as a whole, brick is the predominant material in over half the pre-Victorian dwellings. The area where brick dwellings are least important, the flint zone of the South-west Plateau, is the only extensive area lacking suitable deposits for brick making. This area may have been characterized by relatively smaller proportions of brick buildings than surrounding areas ever since late-medieval times when brick began to be used in the Chilterns.² Smaller areas where the proportion of pre-Victorian brick is small are often associated with the whims of individual estate owners, as in the Newland Park area where many of the pre-Victorian dwellings have been faced with pebble-dash. Most of the pre-Victorian dwellings that are entirely of brick date from the 18th and early 19th centuries.

Most of the timber-framed buildings in the Chilterns date from the

1. HOSKINS, W. G. and JOPE, E. M., 'The Medieval Period', Chapter 11 in A. F. Martin and R. W. Steel (eds.), *The Oxford Region*, British Association for the Advancement of Science, 1954, 116.
2. HOSKINS, W. G. and JOPE, E. M., op. cit., fig. 41, 116.

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16th and 17th centuries. This was a period when the Chiltern woodlands were probably even more extensive than they are today,³ and most of the recorded uses of timber at this time are for building.⁴ It is therefore not surprising that 12% of the pre-Victorian dwellings that survive in the Chilterns today are timber-framed. However, most timber frames are

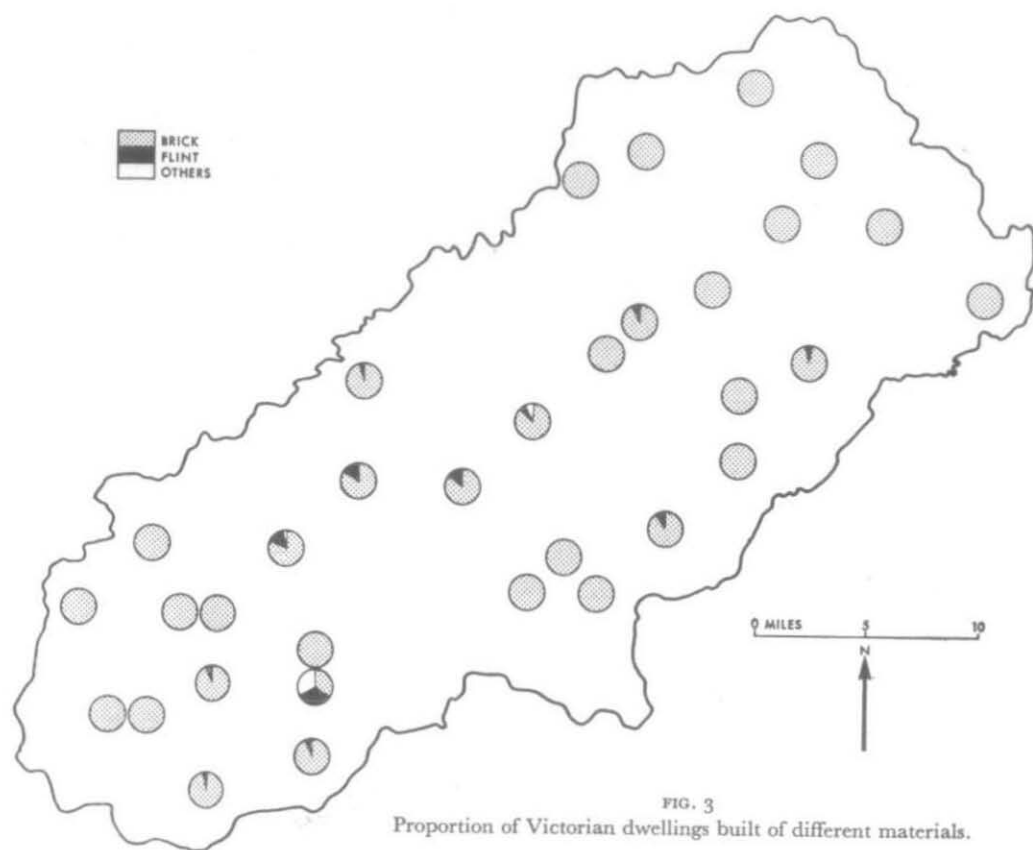


FIG. 3
Proportion of Victorian dwellings built of different materials.

of oak, which comprises only a small proportion of the present Chiltern woodland. This relative scarcity of oak today may, of course, itself have been partly brought about by its widespread use in buildings in earlier centuries. The relatively low proportion of timber-framed buildings in the Icknield

3. PLOT, R., *Natural History of Oxfordshire*, 1676, 51.

4. MANSFIELD, A. J., *An Historical Geography of the Woodlands of the Southern Chilterns*, unpublished M.Sc. thesis, University of London, 1952.

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Belt and in the extreme north-east coincides with areas of relatively sparse woodland today, and it is likely that these areas were largely cleared of woodland well before the period when most surviving timber-framed buildings were constructed. More local variations are much more likely to be related to the individual preferences and economic circumstances of landowners. The attention of owners to preservation and restoration must have been of particular importance. Such factors might account for the considerable proportion of large houses that are timber-framed in the North-east Chilterns, the smaller timber-framed dwelling standing less chance of survival.

Chalk, which is the bedrock throughout most of the Chilterns, is of variable durability as an exterior building material. Although well-preserved examples of medieval walling of hard chalk occur at Woolstone in Berkshires and in the Vale of White Horse,⁶ in the Chilterns chalk is not generally a satisfactory building material. It has often been used in the interior of flint-faced walls, but has been used extensively for the exterior of walls in pre-Victorian dwellings only in the South-west Icknield Belt. Here the Lower Chalk comprises some relatively hard bands, but its use here is presumably due in the main to the absence locally of any alternative material. It has weathered considerably in nearly every case. The Upper and Middle Chalk are generally unsuitable for building, although the Chalk Rock which divides these two strata has been used as late as c. 1900 in labourers' dwellings at Bockmer (PL.1A) and in the nearby country house of Danesfield. However, the choice of material here was the whim of the local estate owner, and was obtained from a quarry some distance away.

Stucco and plaster were included together in the survey for ease of identification, although they differ considerably in their origins. Only two examples of plaster facing were recorded in the sample survey, although a small number of examples were noted elsewhere. Normally it is a facing for wattle and daub walling and occurs in some of the oldest buildings in the Chilterns, frequently accompanied by a thatched roof. This is the traditional building material of the original squatters' cottages in the heathlands of the Woodcote Plateau, although it has often been partially or entirely replaced by brick as in the example at Chazey Heath shown in PL. 1B.

Stucco is normally of much later origin. It has in most cases been used to face large brick buildings dating from the first half of the 19th century. Occasionally it occurs on earlier buildings but in these cases it is probably a later addition. Its distribution contrasts with most other pre-Victorian

5. JOPE, E. M., 'The Saxon Building-Stone Industry in Southern and Midland England', *Medieval Archaeology*, VIII, 1964, 101, n. 74.

6. HOSKINS, W. G. and JOPE, E. M., *op. cit.*, 118.

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materials in being largely of localized occurrence. Lime and sand were more or less ubiquitous and the determining factor was usually the local landowner or builder, although in farmsteads it seems to have been more generally favoured.

As with stucco, the distribution of pebble-dash is not satisfactorily revealed by the sample survey. Both in Victorian and pre-Victorian buildings the incidence of pebble-dash is extremely localized, and it is clear that personal whims have been of paramount importance. In general pebble-dash does not seem to have been fashionable for farmsteads and larger dwellings. In most cases the pebble-dash facing has been added to pre-Victorian brick dwellings in Victorian or later times. Occasionally a roughcast facing is of much older origin and covers a timber frame and wattle and daub walling.

Weatherboard, probably largely derived from the local woodlands is ubiquitous in barns and other farm outbuildings. It must have been dominant until the late-Victorian period, when the production of corrugated iron provided a cheaper alternative. More recently still asbestos has become important, especially in dutch barns. The relative importance of corrugated iron and asbestos compared with weatherboard appears in most cases to be a reflection of the prosperity of individual farmers. Often the most modern farm outbuildings belong to 'gentlemen farmers' who run farms as a means of avoiding tax. Although at the present time there is a transition in the Chilterns from mixed farming with a dairying emphasis in the south-west to a cash-crop emphasis in the north-east,⁷ in general there is no noticeable corresponding change in the materials or external appearance of the farm outbuildings.

CONCLUSION

Until the late-Victorian period the choice between flint and brick as a building material was governed largely by the accessibility of these two materials. These tend to be mutually exclusive, but where both are available brick has generally been preferred. Similarly the distribution of timber-framed buildings is probably related to the availability of oak in the 16th and 17th centuries. In the late-Victorian period, however, fashion and personal whim were sometimes decisive factors, as in the use of chalk by R. Hudson, Esq., on his estate north of Medmenham. In this case both brick and flint were available locally, and in pre-Victorian times either of these materials would have been used in preference to chalk, which has weathered poorly wherever it has been used in the Chilterns. Similarly, it is not uncommon to

7. COPPOCK, J. T., *The Agricultural Geography of the Chilterns*, unpublished Ph.D. thesis, University of London, 1960.

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find in comparatively recent buildings a facing of 'traditional' flint, and the incidence of pebble-dash and stucco reflects to a large extent the personal preference of land-owners.

The building materials characterizing any area are subject to important economic controls—the cost of obtaining building materials and the economics of construction, maintenance and replacement are factors of prime importance. Such factors as fashion and personal whim, though important in detail, are by comparison subsidiary in determining broad distributions. All these controlling factors are constantly changing with time—a new building technique, for example, may make it economical to employ materials that could not previously be exploited. Thus, the present distribution of building materials is merely a stage in a long evolution and a recognition of this is fundamental in trying to interpret distribution patterns. The absence of buildings of a certain material may be due to replacement rather than the fact that they never existed in the area. For example, timber-framed buildings were virtually universal in England in medieval times, but generally survive today only in those areas where oak remained plentiful during the 16th and 17th centuries. Where local supplies of oak were exhausted early on or where it later became more economic to exploit alternatives, such as stone, virtually no timber-framed buildings remain.

The choice of material for the construction or modification of a building is related in part to the size and function of the building—the greater incidence of stucco in the larger buildings in the North-east Chilterns appears to be an instance of this. However, it is clear that size and function are also factors affecting the survival rate of buildings—larger dwellings such as farmhouses are, on the whole, more likely to survive than labourers' dwellings.

The value of sampling in investigations of the cultural landscape depends to a considerable extent on the nature of the distributions to be studied. This is clear even from a study limited entirely to building materials. With flint, brick, timber frames and chalk, sample areas with approximately the same proportions tend to be grouped together. This has made it possible to generalize with confidence about their overall distribution. With pebble-dash and stucco this can be done with less certainty since areas with low and high proportions are more intermixed. Both pebble-dash and stucco are characterized by having a localized distribution, although they do to some extent correlate with one another. A sample survey is clearly of more limited value with distributions of this kind.

* Fig. 1 was drawn by Mr. E. Quenet, Department of Geography, University of Newcastle upon Tyne, and Figs. 2 and 3 by Mr. A. Kelly, Department of Geography, University of Glasgow.

PLATE I



A. THE USE OF CHALK IN LATE-VICTORIAN COTTAGES AT BOCKMER, REFLECTING THE WHIM OF THE LOCAL ESTATE OWNER



B. SQUATTER'S COTTAGE AT CHAZEY HEATH, JUST NORTH-WEST OF CAVERSHAM. THE WALLS WERE FORMERLY OF WATTLE AND DAUB BUT THE EXTERIOR IS NOW ENTIRELY OF BRICK