

THE GEOGRAPHY OF THE ALBERBURY BRECCIA

By I. D. MERCER, B.A.

Slapton Ley Field Centre, Devonshire
(formerly of Preston Montford Field Centre, Shropshire)

THE work on which this paper is based was undertaken as a demonstration of method. It is an example of a type of long-term project which could be carried out by student geographers at school, or, with successive contributions from different groups, at a Field Centre.

The present paper falls, therefore, into two parts: the first is a general discussion of the field methods and associated problems; the second, the essay which is the result of the demonstration project. The latter, by placing the conclusions in their proper geographical perspective, should serve to correct any suggestion of disproportion arising from the fact that very different amounts of field work are required for different aspects of the problem.

I. METHODS

In this particular case the equivalent of reconnaissance—essential to any serious fieldwork—was accomplished almost accidentally. During the course of routine field excursions, a fairly local concentration of the use of a particular building stone became apparent; and the precise delimitation of the area involved suggested itself as a subject for investigation. Subsequently the special advantages of the Alberbury Breccia for this sort of study also appeared; these advantages are enumerated below, for their significance from a student's point of view cannot be over-estimated.

(i) Probably the most important advantage is the absolutely distinctive appearance of the rock itself. It is impossible to confuse the Breccia with any other rock in Shropshire, so that there is little room for speculation in the field—a time-absorbing process where students are concerned. Without geological technicalities at this stage, a slab of the Breccia appears as a large number of creamy-white fragments, some with hollow centres, cemented together by a purplish-red sandy material.

(ii) The small extent of the Breccia's single outcrop makes it easily comprehended in the landscape, and obviously limits the sources of building stone.

(iii) Proximity to the base—in this case the Field Centre—is an obvious advantage, almost a necessity.

(iv) Accessibility of exposures is an advantage in cutting down time taken in obtaining permission for examination by students.

(v) Finally, an advantage of building stone studies in general is that most buildings are readily accessible in the landscape. Thus they rarely afford the temptation to trespass, unlike parallel projects in land utilization, morphological mapping, etc.



Top: Blocks of Alberbury Breccia in a boundary wall (*left*) compared with blocks of Grinshill stone in a farm building to demonstrate varying freestone qualities. Compare size of Grinshill stone blocks with bricks in the eaves of the building.

Right: Section of a quarry face at Cardeston showing relatively thin bedding of the Breccia, and the size of some of the limestone fragments.



The Alberbury Breccia may well be a rare example in possessing all these advantages, but they are only advantages and by no means all essential for successful completion of such a project. Indeed, there are other rocks in Shropshire which, possessing one or two of these qualities, lend themselves to similar studies (e.g. Horderley Sandstone, Stiperstones Quartzite and the Clew Hills Dolerite). Outside Shropshire one or two examples come readily to mind, such as the Upper Greensand, Horsham Stone, Stonesfield Slate and Hornton Stone.

Having confirmed the suitability of the project, the main fieldwork begins. It consists of two major tasks which can obviously proceed concurrently: first, the accurate plotting of every building in which the stone has been used; second, studying the influence of the outcrop in the physical and cultural landscape.

The first survey establishes the boundary of what might be called the "use area". The Ordnance Survey Six-inch Provisional Edition on National Grid sheet lines are the most appropriate field sheets; with careful plotting every individual building may be qualified (Fig. 1). Convenient mapping units for small student groups can be based on the Grid, and the results transferred to the 1:25,000 map for analysis.

Bearing in mind the need to explain as well as merely record the distribution, appropriate extensions must be made to the mapping procedure:

(a) To define accurately the boundary of the "use area" of the stone a considerable amount of peripheral negative mapping must be done, and even within the area a negative record should be made to obviate the continual rechecking of unmarked buildings.

(b) The type of building concerned may conceivably affect the use of the stone, or at least some of the factors controlling the overall distribution. To this end the following simple classification of buildings was evolved to cover all possibilities in the present area:

Category	Mapping symbol
Dwelling, of any size	D or d
Farmstead, i.e. set of outbuildings	F or f
Outbuilding, alone or one of a set	O or o
Church	C
School	S
Other minor uses, e.g. paving—p, and stiles—s.	
Boundary walls and bridges indicated by line on the map.	

In the first three categories capital letters indicate that the whole building, small letters that only part of it, is constructed of the stone: this distinction may have had a bearing on the original decision to use the stone. On the map each letter must touch the building in question and no other; otherwise confusion can easily arise, even on the six-inch scale, when dealing with a nucleated settlement.

(c) Other data which may possibly qualify distributional factors can be collected in the field. For example, a particular factor may vary in different periods, therefore any dates on buildings, or architectural features which might aid dating, should be recorded.

The other main field task, the examination of the outcrop concerned, involves

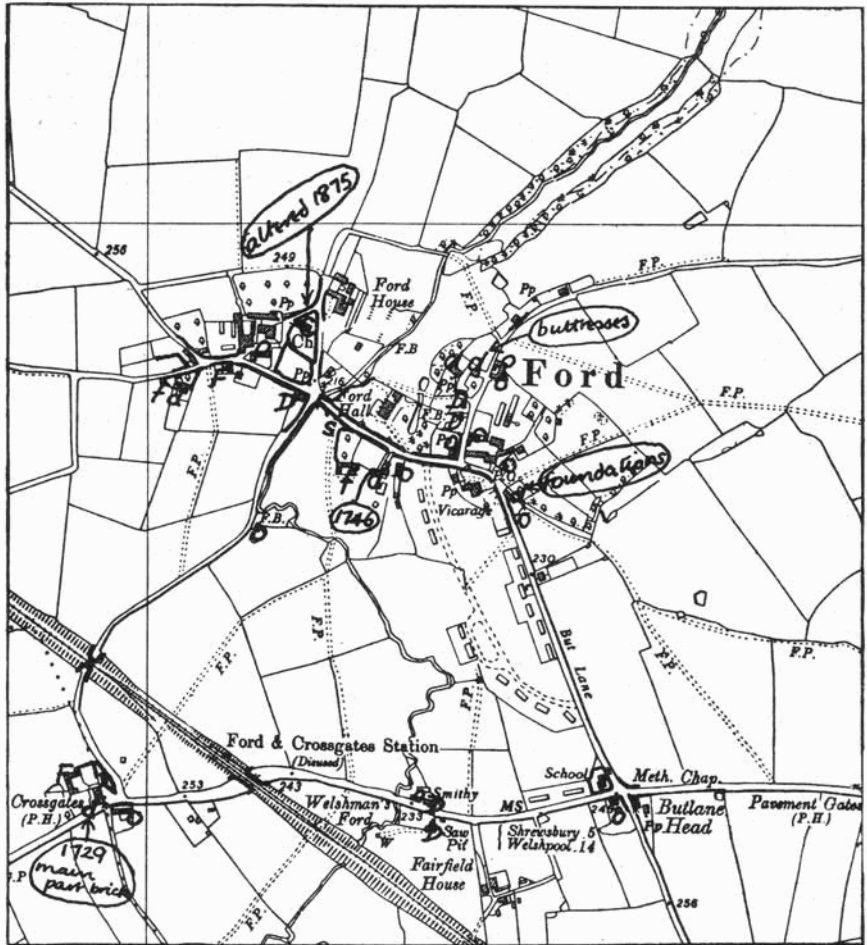


FIG. 1.

A fragment of a field sheet used in the present project. In practice coloured pencils are a great advantage when using the monochrome Six Inch map.

(Reproduced from the Ordnance Survey Map with the permission of the Controller of H.M. Stationery Office Crown copyright reserved.)

two processes. First to analyse the effect of this outcrop on the physical landscape, as only by this means can the complete geographical picture be established. Second, to map accurately the position of every quarry or pit—used or disused—which may have been a source of building stone; and at the same time to ascertain whether or not the outcrop has had any other bearing upon the development of the cultural landscape. Apart from fieldwork, this part of the project naturally calls for the use of geological maps and literature.

Each of the processes so far dealt with affords good practice for the student, in the observation and recording of natural and cultural phenomena, which is the essence of field geography. Any further progress towards the elucidation of the problem must involve documentary research. In a long-term project at school, this is feasible in so far as such secondary evidence can be found locally. For this reason documentary evidence used in the present project is similarly limited: the main sources are tithe maps, and other parish records, estate maps held by local landowners, and any relevant material held in local reference libraries. As the prime function of the whole exercise is to give fieldwork experience to the student, little harm is done by staff participation in the documentary work. Such participation is also necessary in the co-ordination of the fieldwork and the written account. It is quite essential for continuity in a project carried out at a Field Centre during a series of courses.

At this point it is perhaps worth mentioning that a long-term project of a similar nature was carried out by students at Juniper Hall Field Centre during the 1958 teaching season. Although experimental, the original aim was accomplished, and the validity of the "contribution" incentive proved. The extra effort involved was amply repaid by the partial solution of a perennial problem—that of finding worthwhile projects for student geographers to complete in one day.

II. THE PROJECT

The brief essay that follows is an attempt to set out the results of the actual project which gave rise to the discussion in Part I. The implication of the title is a complete analysis of the influence of the Alberbury Breccia on the whole landscape, physical and cultural—as a factor lending unity to a particular human environment. Figure 2 shows the regional setting of the area studied.

Geology

The Alberbury Breccia is the youngest member of the Carboniferous sequence in Shropshire; coming thus at the top of the succession, it is affected considerably at the surface by the unconformity at the base of the Triassic rocks which overlie it. This, together with some minor faulting, has resulted in an extremely restricted outcrop of the Breccia. The crescentic shape of the outcrop is dictated by the broad structural features of a much wider area: the axis of the great Shropshire-Cheshire syncline—continued south-westward in the Long Mountain—bisects the outcrop. Approximately three miles long and nowhere more than half a mile wide, the outcrop runs from the edge of the Severn alluvium three-quarters of a mile north-west of Alberbury south-eastwards to Rowton Castle, and from there in a direction a little east of south to Cardeston, where the Cardeston fault throws the Breccia against the Triassic Bunter Pebble Beds. An important dip fault running north-eastwards through Rowton Castle effects a further limitation by halving the width of the outcrop east of the fault. The maximum thickness of the formation displayed at the surface is 250 feet, consisting of three groups of Breccia beds separated by two beds of marl. The dip of these beds, fairly constant at 10°, gradually changes direction from east-north-east at Alberbury to almost due north at Cardeston, conforming with the structure described above.

The breccias consist of angular and sub-angular fragments of Carboniferous Limestone, with some quartzite pebbles, contained in a highly calcareous sandy matrix. The fragments vary greatly in size, averaging two or three inches in length but occasionally reaching a foot or more. The origin of the Breccia may be attributed to the onset of the arid terrestrial conditions which were later to prevail in New Red Sandstone times. Its situation at the edge of the great Triassic basin, and only a mile or two from the outcrop of the source-rock (the Carboniferous Limestone, probably south of Llanymynech—SJ/267208), suggests deposition under sporadically violent erosional conditions, akin to the sheet floods experienced in present day deserts. This process resulted in very limited local facies, and may account in part for the lithological singularity of the Breccia in this area.

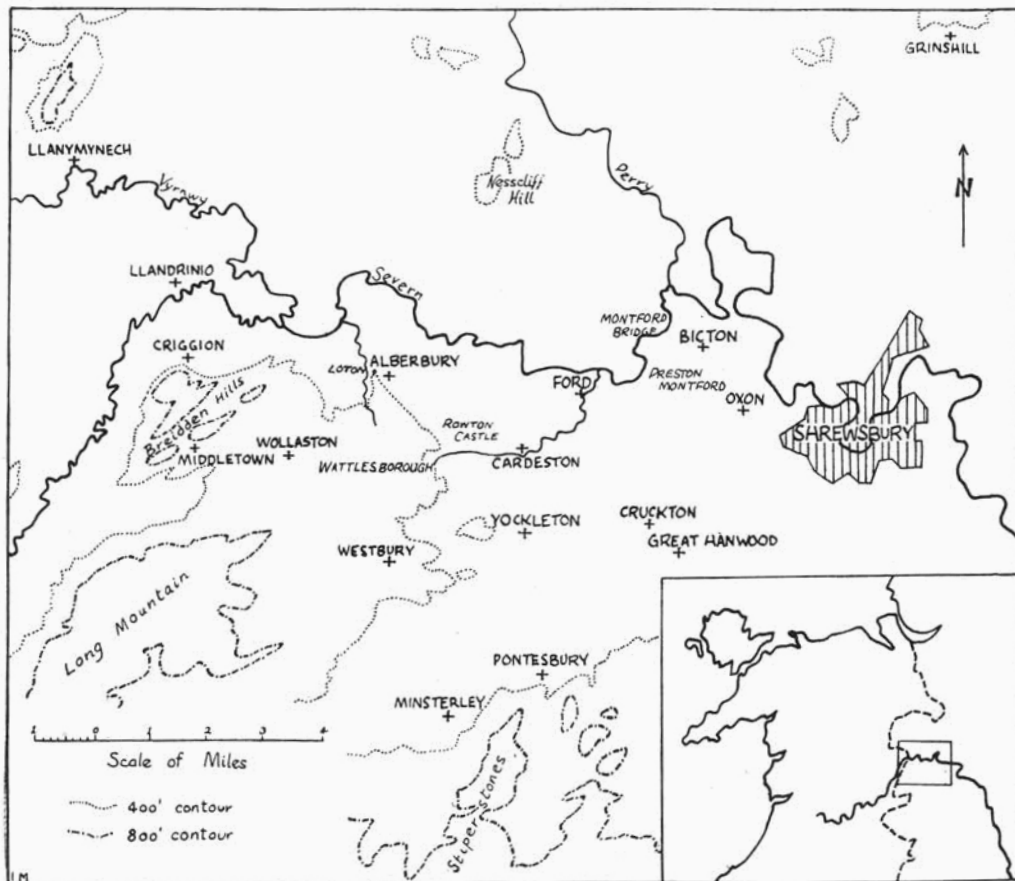


FIG. 2.
The regional setting.

Below the Breccia in the succession, and thus outcropping to the south and west of it, come the Keele Beds of the Upper Coal Measures, a succession of sandstones and marls, approximately 1,500 feet thick, dipping gently east and north-eastwards; their outcrop is nowhere less than a mile wide. East and north of the Breccia's curving outcrop lie the Lower Mottled Sandstones of the Trias. Each of these groups disappears in the north under the Severn alluvium.

Geomorphology

Its high content of limestone fragments lends a certain durability to the Alberbury Breccia compared with the adjacent outcrops. From the structural attitude of all these beds, a tendency to scarp and dip forms in the landscape is to be expected; the Breccia, because of its resistant quality, exhibits this tendency most strongly. The Keele Beds however, appear to be more resistant than the Triassic sandstones, and this differential between the flanking outcrops causes the dip-slope of the Breccia to appear more prominent in the landscape than its scarp. Figures 3 and 4 illustrate this point.

Only west and south-west of Alberbury is a conspicuous escarpment developed, formed by the capping of resistant Breccia on massive Keele Beds sandstone. It may be noted that the Pecknall Brook has an asymmetrical valley section, possibly due to lateral migration down-dip, the steeper side coinciding with the escarpment. A similar situation, on a smaller scale, is found just south of Cardeston, where a small scarp-like feature faces south across a stream flowing eastwards to join the Severn near Ford.

The dip-slope shows a series of minor scarp and dip features, due to the alternation of breccia and marl within the formation. Approached from the east this slope from Alberbury to Rowton Castle dominates the landscape: it rises 200 feet above the general level of the drift-covered surface of the Trias, achieving this rise in little more than a quarter of a mile. The crest of the slope maintains a height above 400 feet O.D. throughout this stretch, and reaches 500 feet O.D. in Alberbury Deer Park. Westward, however, the undulating surface of the Upper Coal Measures remains within the range 400-475 feet O.D. Thus the Alberbury Breccia outcrop separates two areas with distinct ranges of relief, and this is probably the most valuable way of considering its influence in the present landscape; it may be thought of as the resistant edge of a Carboniferous "step" down from the slopes of the Breiddens and Long Mountain (essentially parts of the Lower Palaeozoic "Highland") towards the Triassic "Lowland". Little morphological work has been done in either area. Both are mantled with glacial drift, while it is notable that the Breccia is relatively drift-free. In the immediately adjacent lowland, however, the existence of a widespread surface at about 225 feet O.D. suggests some sort of post-glacial planation—possibly fluvio-glacial, possibly the work of a proto-Severn. Whatever its origin, it is conceivable that the Breccia has protected the "step" to the west and south-west from such planation.

The Cultural Landscape

Having such a limited outcrop, the Alberbury Breccia cannot be said to have exercised an important primary influence upon man's activity in this particular environment. Two details of the present landscape, however, might to some extent be attributed to such an influence.

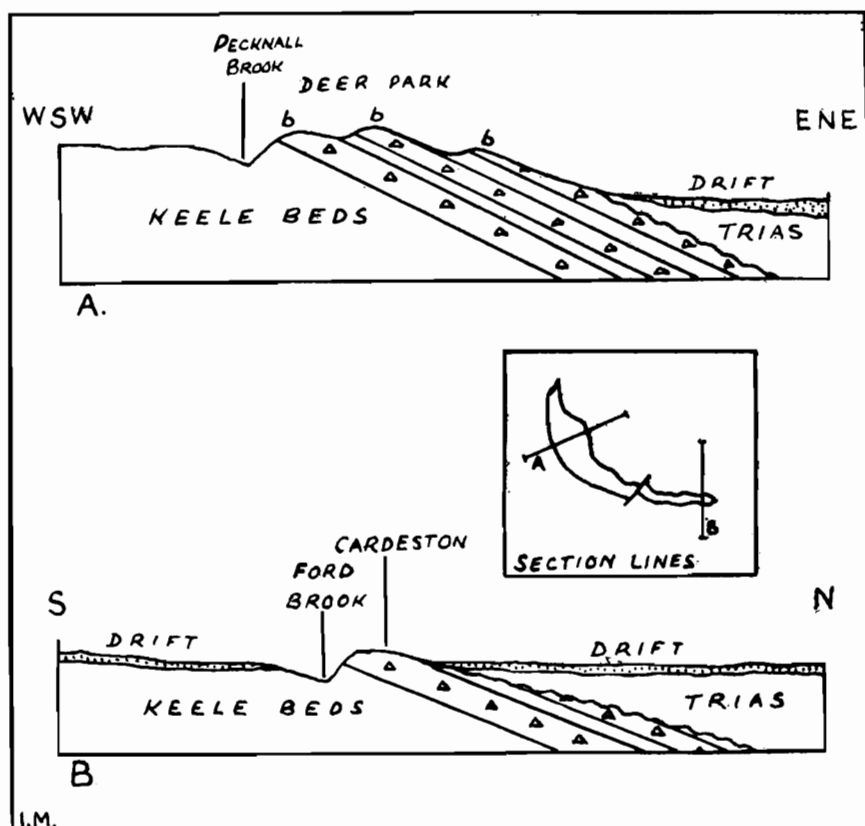


FIG. 3.

Diagrammatic sections through Alberbury Deer Park (A), and Cardeston (B), to illustrate the effect of the Breccia on the surface, and the influence of the Triassic unconformity.

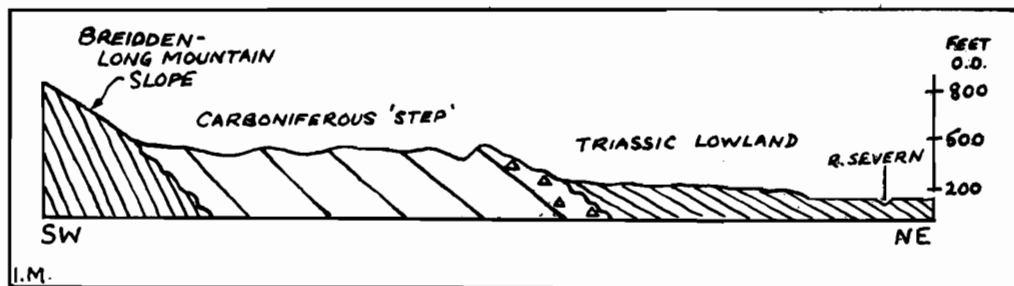


FIG. 4.

Diagrammatic section illustrating suggested role of the Alberbury Breccia in the zone between "Highland" and "Lowland".

Firstly, the suffix -bury in the name Alberbury suggests a defensive site; this function is borne out by documentary evidence, and is still demonstrated by the castle ruins (reported as ruins in A.D. 1226). The upstanding nature of the Breccia makes this the most easily defensible site on the routeway from Shrewsbury to the river-crossing at Llandrinio. The relative importance of this route historically is not clear. Accurate dating of the Llandrinio crossing and the road-cutting at Alberbury might go far to providing the answer. Another aspect of the matter is that in the twelfth century Alberbury Castle came under the indirect control of the Corbetts of Cause Castle, on the eastern flank of the Long Mountain; it may be considered therefore as a minor link in the chain of "border forts" or baronial strongholds which dominated the military geography of the area at that time. The importance of the site, arising then in a military context, persisted for some considerable time in an ecclesiastical one, and so the original influence of the outcrop was continued.

Secondly, the slopes involved, coupled with the lack of drift and the generally shallow soil developed on the weathered Breccia, are fairly obvious factors affecting the persistence of the greater part of the outcrop as agriculturally unproductive land. Alberbury Deer Park is the largest single enclosure on the outcrop, and this characteristic development is repeated in Loton Park and Rowton Castle. Thus geological distinctiveness is reflected in the cultural landscape—as a unit of woodland and parkland in a predominantly agricultural countryside.

Far outweighing these primary controls, it is as a source of building stone that the Alberbury Breccia has had its greatest effect upon the present landscape—extending its influence far beyond the limits of the actual outcrop. The extent of the "use area" of the Breccia is indicated in Fig. 5 and it is the analysis and explanation of this distribution upon which the project, discussed earlier, hinges.

The broken line on Fig. 5 encloses the area within which the Breccia has been used in more than half the buildings existing in the present landscape. Beyond this line occurrences of the stone are very sporadic. Here individual rather than collective explanations are probably necessary. There are in fact, only seven buildings entirely constructed of Alberbury Breccia outside the line: three are churches (at Bicton, Cruckton and Oxon), one is a school, and one the lodge of a hospital, the remaining two are cottages, one at Montford Bridge, the other at Preston Montford. In addition there are six cottages partly built of Breccia and twenty outbuildings, together with a considerable length of walling. Most of these occurrences are to the east and south-east of the main "use area".

An analysis of the buildings within the broken line on Fig. 5 (the main "use area") is shown below:

Total number of buildings in the landscape ..	491		
Total of these incorporating Breccia	283		
Analysis of the second total:			
Buildings	Entirely Breccia	Partly Breccia	Total
Dwellings ..	105	44	149
Farmsteads ..	12	5	17
Outbuildings ..	87	23	110
Churches ..	4	—	4
Schools ..	3	—	3
Total	211	72	283

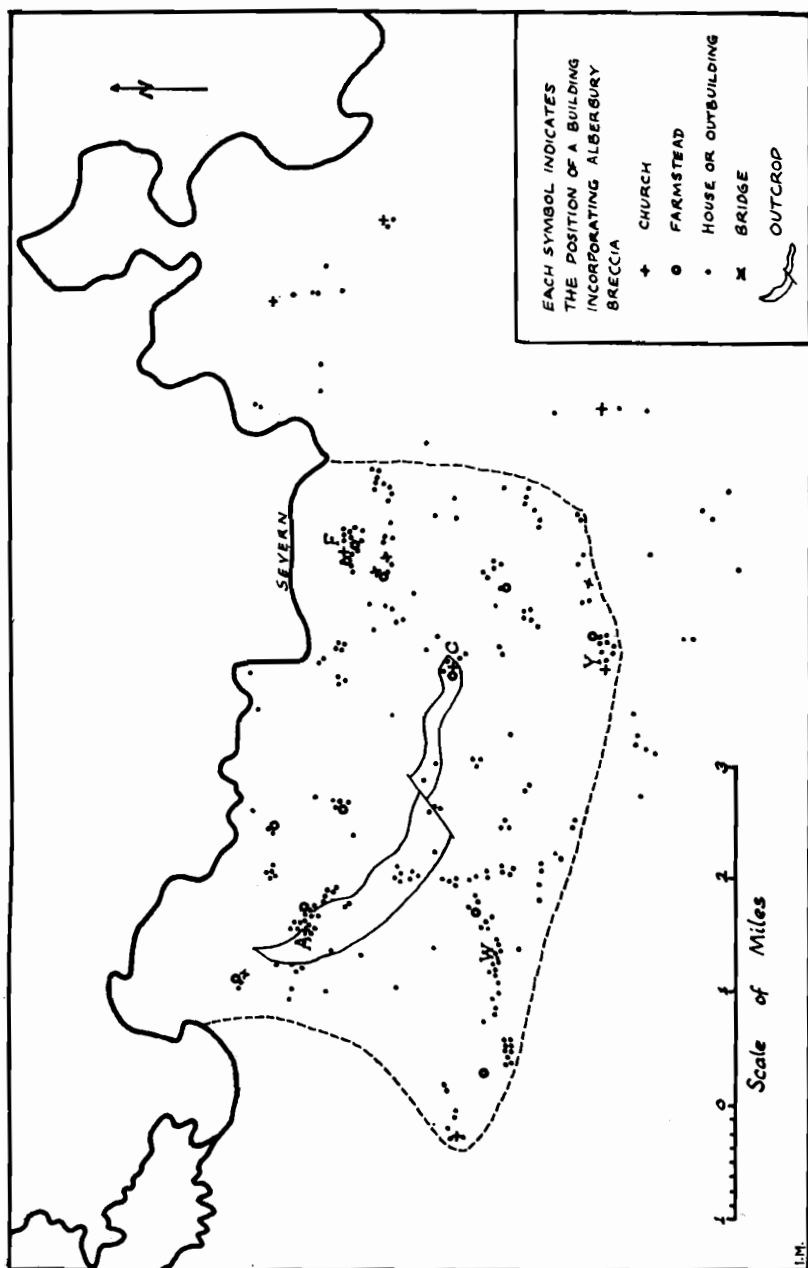


FIG. 5.
The Alberbury Breccia and the cultural landscape. A—Alberbury, C—Cardeston, F—Ford, W—Wattlesborough, Y—Yockleton.

These figures confirm the importance of the Alberbury Breccia as a contribution to the cultural landscape; the factors governing this contribution are a little less apparent. As in almost every aspect of human activity in the landscape, some historical research is necessary before an adequate appraisal of the present situation can be made. In this particular problem the dating of quarrying and building will obviously throw light on other factors which may control the limits of the use of the stone.

The sites of all the quarries in the Breccia are shown on Fig. 6; these comprise the only possible source of the building stone, and are all disused. None is very

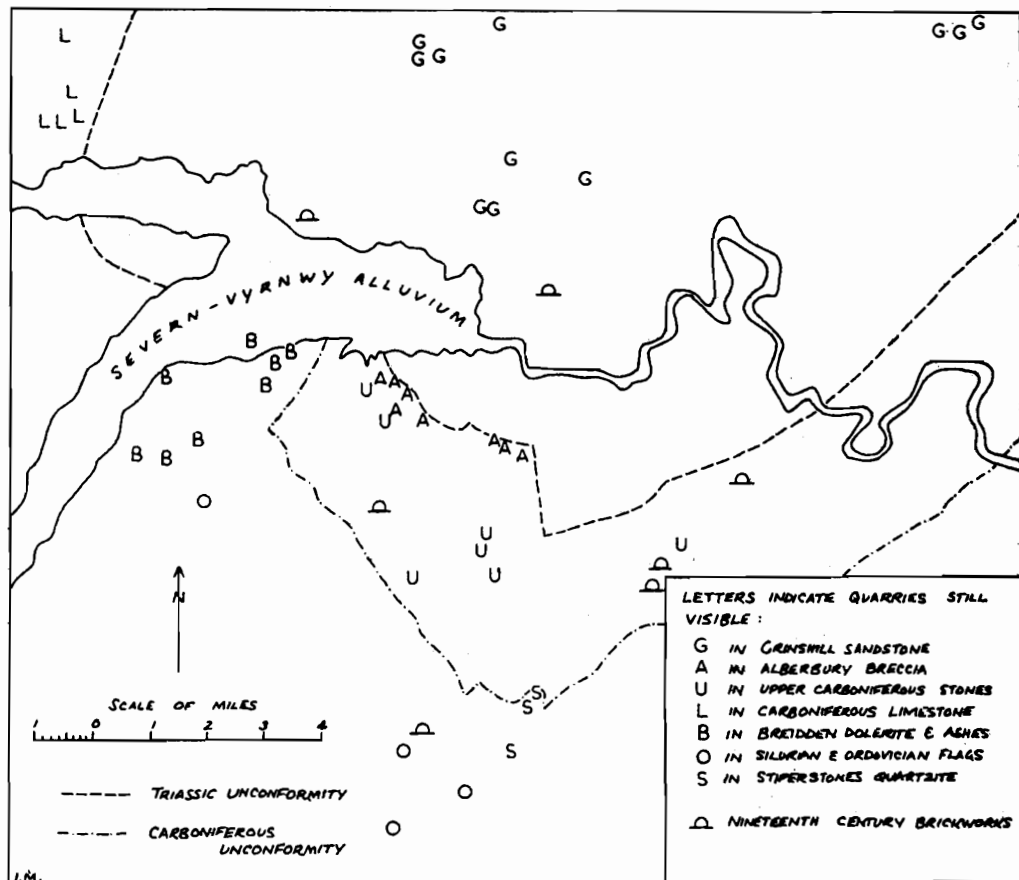


FIG. 6.

The geological background of building materials. A geological key is provided by the quarry symbols.

extensive; the largest are just south of Alberbury, and just west of Cardeston, and working has obviously been fairly limited throughout the quarrying period, however long. The fact that the Breccia in buildings is now known locally as the "Cardeston stone" may indicate the site of the most recent working.

The absence of any reference to quarries in the Domesday record may at least indicate that it was not a source of income at that time. From the eleventh century onwards intermittent references to the "right to get stone", "taking of stone" and to "standelfs" or stone delves, occur in various documents relating to Alberbury parish, notably in 1232, 1461, 1568, 1587 and 1749. All of these except the first have some connection with religious houses and the conversion or repair of their buildings; the first includes a reference to Alberbury Castle. In this connection it is quite likely that small pits were opened up to cater only for the task in hand. Indeed, from the size of the quarries and the lack of any documentary reference to intensive quarrying, it seems likely that the Alberbury Breccia has always been obtained in this way: for an immediate purpose, and never worked commercially.

Plymley, writing in 1800 under the title "A General View of the Agriculture of Salop", has a formidable list of Shropshire building stones with no mention of the Breccia. As he talks at some length of the Cardeston stone being quarried at Alberbury and Cardeston for lime-burning and the marling of arable land, this negative evidence would seem fairly sound. It obviously supports the idea of intermittent working for building stone, and adds weight to the dating discussed below.

The large houses in the area, most of them pre-nineteenth century structures, are all built of brick with the occasional use of Triassic sandstone where stone was needed. Brick seems to have been the fashionable building material in the seventeenth and eighteenth century Shropshire, suggesting that the Breccia was not acceptable for work of architectural quality, mainly because it is not a good freestone. It is significant in this respect that all the dwellings incorporating the Breccia, except one, are small cottages, and its universal use in outbuildings emphasizes this restriction to the poorer end of the building scale. The schools, churches and the exception just mentioned, Cardeston Rectory, were built or altered by public bodies or benefactors, neither of whom would indulge in expensive materials.

All the churches incorporating Alberbury Breccia—indeed all the churches in the area—were built or remodelled in the nineteenth century: Cardeston 1843, Wollaston 1851, Oxon 1854, Yockleton 1861, Ford 1875 and Bicton 1886 (Alberbury Church, repaired in the nineteenth century, dates mainly from the fourteenth). The same is true of the schools: Cardeston 1828 and Wattlesborough 1837, Wattlesborough had a classroom added in 1871, another and the school-house in 1904, all built of Breccia. This last is the most recent record of the use of fresh stone.

Many of the cottages bear dates which are still visible and many more have been accurately dated from records in the Loton estate office. From this, and the evidence of the churches, it is clear that the main spread of the building stone to its present limits took place in the nineteenth century, and that a large part of the domestic "use area" is coincident with the extent of the Loton Estate

at that time. The landowner concerned carried out a systematic replacement of wattle-and-daub hovels by stone cottages. Accounts for many of these are still extant, and often the whole process was entirely an internal affair: the tenant carted the stone himself, a fact which almost removes transport costs as a possible limiting factor.

The use of the stone outside the Loton estate, on which all the quarries are situated, obviously involves those factors which control the use of any building stone. Briefly, they are suitability, availability, the location of quarries, and transport facilities, all relative to the job in hand; together these factors define the power of the stone to compete with rival building materials; and as in every aspect of the cultural landscape, there is an important human variable.

Brick must figure largely in any discussion of building materials, and especially here as it was used throughout the "use area" of the Alberbury Breccia. Building suitability will obviously not arise as a factor in the relationship of stone and brick. Sources of brick are fairly dense around the "use area", Coal Measure marls, Silurian shales and even Boulder Clay being used for brick-making within a six-mile radius, in the nineteenth century. For some purposes brick was considered essential, in internal walls, presumably as a space-saver, in chimneys and sometimes around windows and doorways; most of the Alberbury Breccia cottages are so constructed. For external walls, however, a cost factor must have exercised some influence, and the price of bricks was high. This is indicated by the fact that stone involved the expense of mason and stone-cutter (see figures quoted below), and yet was still used. Two examples should suffice to illustrate this:

Nag's Head Cottage (1827)

	£	s.	d.
Cardeston stone	3	6	8
Brick ..	..	5	10 4
Mason ..	..	22	11 2

Hawthorn Bower (1836)

	£	s.	d.
Cardeston stone	3	7	4
Bricks ..	..	14	16 0
Mason ..	..	25	13 6
Stonecutter ..	..	11	14 0

In both these buildings all the external walls are of Cardeston stone, chimneys the only visible brick.

There is little evidence that bricks were ever made on the Loton Estate. It is likely therefore that when the systematic cottage building began, the estate's own stone was the most economical material to use. The building off the Estate again lends weight to the view that the Breccia was a serious competitor among rival materials for the smaller buildings.

A relative scale of quality can be drawn up for the Breccia and its rival building stones, whose sources are indicated on Fig. 6. Above the Breccia in the scale comes the Grinshill Stone of the Triassic, a complete freestone, which was once in great demand all over north Shropshire for large buildings. The Keele Beds sandstone would also be chosen before the Breccia if good freestone was needed. Below the Breccia in the scale come various local stones, dolerite from the Breiddens, Stiperstones Quartzite, and certain flags and mudstones from the Ordovician and Silurian outcrops occurring between those two limits. None of these has any freestone quality. This whole scale is nicely demonstrated by the interplay of materials in buildings on the edge of the Breccia's "use

area". In the west are cottages built of dolerite, but faced with Breccia, while elsewhere buildings of Breccia are faced with Grinshill Stone.

In one respect the Alberbury Breccia tops the scale. The thin-bedded nature of the stone leaves it unrivalled for paving, and for the construction of steps and stiles. Resistance to wear is an obvious point in its favour. The large size of slab used in various places indicates that the Breccia has a considerable strength. The earliest known use of the stone ably demonstrates this point. The site of a Bronze Age cist burial was discovered accidentally in 1942 near Alberbury (371138). The sides, lid, and bottom of the cist were each single slabs of Breccia, and the cist contained an adult male skeleton lying full length, which gives some indication of the size of the slabs.

The scale of quality to a large extent controls the other distributional factors. The stones below the Breccia on the scale hold their own competitively only near their sources, where accessibility is a dominant factor. Those above it are to some extent handicapped by the type of building concerned—"best quality" was not the first consideration in any of these buildings. It is possibly significant that the Breccia, though used right up to the south bank, never crossed the River Severn, while the Grinshill Stone was used extensively south of the river.

As a final illustration of the scale the accounts for the building of the Welsh Lodge of Loton Park in 1832 are set out below:

	£	s.	d.
Freestone—mullions, lintels, etc.	11	4	0
Cardeston stone—external walls	5	10	0
Bricks—internal walls, chimneys	5	6	4
Lime	15	8	1
Stonecutter	64	13	2
Mason	41	0	0
	<hr/>		
	£203	17	5

The Alberbury Breccia, then, exposed prominently in an otherwise drift-covered landscape, has few rivals as a building stone on its own ground. The Keele Beds are poorly exposed, and exposure has a great influence upon initial exploitation—a principle demonstrated in the Bronze Age as far as the Breccia is concerned. The excellence and therefore expense, of the Grinshill Stone, has left the Breccia relatively uncontested as a source of material for small domestic building. Whether or not the Breccia would have been used over so wide an area, if its outcrop had not been situated on a large estate whose owner took his tenants' welfare seriously, is a matter for conjecture. But the extensive use of the stone around Ford and Yockleton, off the Estate, indicates that it did have a certain power to compete with other materials for a particular type of building under an ordinary rural economy in the nineteenth century.

ACKNOWLEDGEMENTS

The writer acknowledges his indebtedness to the Vicars of Ford and Alberbury for allowing him access to parish records; and to Gordon Miller, Esq., the agent for the Loton Estate for information regarding nineteenth century building on the estate.

REFERENCES

Most of the documentary evidence used in this project was of a very local nature, and to a large extent unpublished; this will normally be the case in similar projects undertaken elsewhere. Reference should be made to the relevant publications of the Geological Survey, both memoirs and maps. In this particular case the New Series 1-inch Geological Sheet is unpublished, but the memoir of the adjacent sheet—152, Shrewsbury—has a section dealing with the Alberbury Breccia, illustrated by a small map in the text. For further geological discussion reference should be made to “The Paleogeography of the Midlands” by L. J. Wills (1950).