

SUFFOLK'S CRAG CHURCHES: WITH OBSERVATIONS ON OTHER CRAG BUILDING STRUCTURES

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INTRODUCTION

AS PART OF the process of examining and describing the building fabrics of the churches of the London Basin (Potter 1987; 1998; 1999; 2000a; 2000b; 2001a; 2001b; 2002), a number of ecclesiastical buildings on the eastern borders of Suffolk have been studied. The London Basin studies have enabled the types and sources of the stones utilised in the construction of the church building fabrics to be determined; and by the geographical distribution patterns of different stones, historic communication routes together with settlement patterns have been postulated. In the Suffolk area, the definition of the London Basin, chosen in the previous studies approximately at the Cretaceous-Tertiary (Palaeogene) geological boundary, is less clearly defined. Here, Neogene and Quaternary sediments rest unconformably upon the underlying Cretaceous and Palaeogene rocks to make their precise contact hidden from view, and therefore, difficult to determine. In particular, the Neogene portion of the overlying sequence contains beds which have, in some instances, been sufficiently indurated for them occasionally to be used as building stones. This paper describes those rocks from this Neogene source which have been utilised in the fabric of the early buildings of the area, thus extending the church fabric studies which might contain this material, to all built structures – agricultural through to military.

As with the church fabric studies the accuracy of identification and the determination of quantity of rock types have been restricted by the accessibility (particularly height), degree of rendering, weathering, and lichen and moss cover on the rocks as they occur in the church and other walls.

THE CRAG DEPOSITS

The earliest descriptions of the Neogene and Quaternary rocks of East Anglia stem from Charlesworth (1835). Recent contributions by authors, such as Greensmith *et al.* (1973), Dixon (1979), Bristow (1983), Zalasiewicz and Mathers (1985), Mathers and Zalasiewicz (1988), Balson *et al.* (1993), Hamblin *et al.* (1997) and Jones *et al.* (2000) describe the rocks, their fossil content, and possible stratigraphical correlations, in more detail.

Nearly the whole of the area of Suffolk depicted in Fig. 102 is overlain by Crag or younger deposits, so that the underlying Palaeogene (Lower Tertiary) and Upper Cretaceous deposits are very rarely apparent at the surface. The Crag deposits of East Anglia are currently classified both within the Neogene (*i.e.* Upper Tertiary) and the Quaternary (Table I), although the more indurated and cemented Crag deposits are generally confined to the Neogene. In the southern part of Suffolk the uppermost of the four identified Crag, the Wroxham Crag, is absent. The lowest Crag, the Coralline Crag, is believed to be almost entirely restricted to an area around Aldeburgh. It occurs as an elongated, partially buried, N.N.E.–S.S.W. ridge (Harmer 1898; 1910), which extends offshore to the north-east of Aldeburgh (Balson *et al.* 1993). The deposit of the Coralline Crag is normally 15 to 20m thick, but it thins rapidly towards the margins.

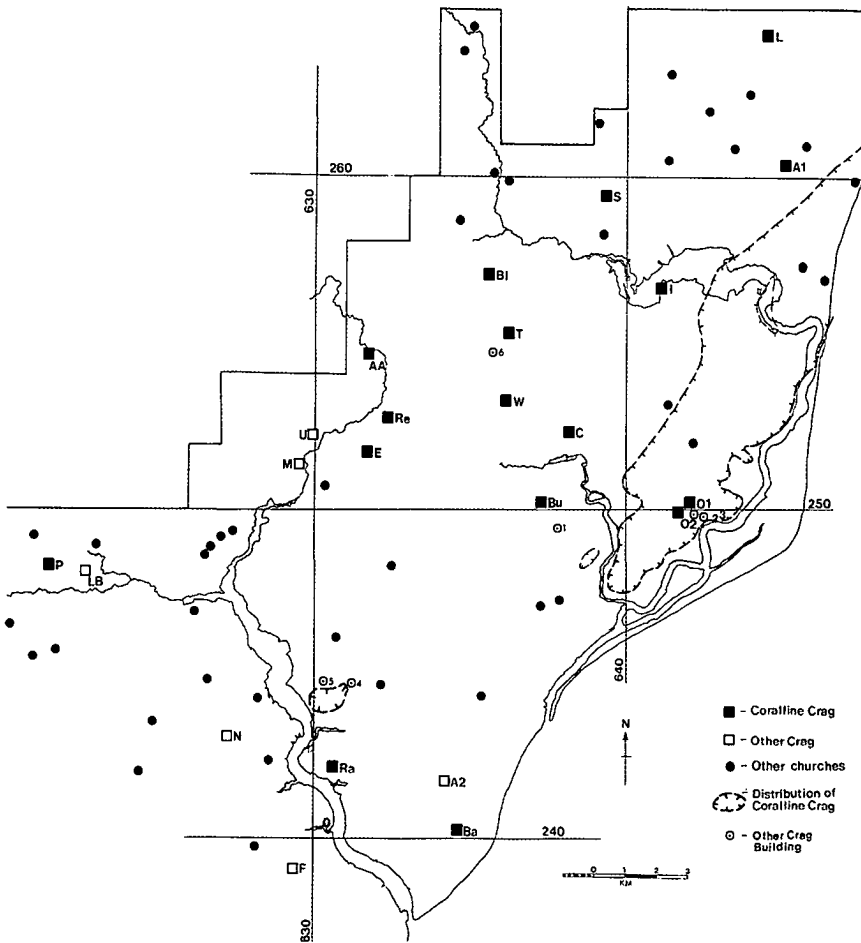


FIG. 102 – The use of Suffolk Crag materials as a building stone. The distribution of the Coralline Crag is based on the work of Zalasiewicz *et al.* (1988). All ecclesiastical buildings within the area of the thick solid line have been examined.

Localities: A1, Aldringham; A2, Alderton; AA, Ash Priory; Ba, Bawdsey; Bl, Blaxhall; Bu, Butley; C, Chillesford; E, Eyke; F, Falkenham; I, Iken; L, Leiston Abbey; LB, Little Bealings; M, Melton; N, Newbourne; O1, Orford Church; O2, Orford Castle; P, Playford; Ra, Ramsholt; Re, Rendlesham; S, Snape; T, Tunstall; U, Ufford; W, Wantisden. Dunwich and Sibton occur just to the north of the area shown.

Geologically, only the principal sources of the Crag building stones can be identified. The most significant of these is in the higher deposits of the Coralline Crag where calcite, derived from the dissolution of aragonite shell debris, cements the rock. Quarries, such as the one at Richmond Farm, Gedgrave (6412 2492), reveal the harder, cross-stratified, fragmental limestones within the Sudbourne Member (Balson *et al.* 1993) of the Coralline Crag. Comminuted fragments of bryozoa are particularly evident on many of the weathered surfaces of this rock, both in the field exposures and in church and other walls, so that the dark cream-coloured, hardened rock has also been described as the 'Bryozoan Rock-bed' (Boswell 1928). To the north of the Sudbourne Crag area of occurrence, the highest Aldeburgh Member of the Coralline Crag also becomes lithified occasionally with CaCO₃ and the term 'Bryozoan Rock-bed' has been extended to parts of this highest member (Moorlock *et al.* 2000). The extent of the field outcrop of the Coralline Crag is shown in Fig. 102.

TABLE I
 OUTLINE STRATIGRAPHY OF THE EAST ANGLIAN CRAGS
 (PARTLY AFTER JONES *et al.*, 2000)

	STAGE	LITHOSTRATIGRAPHIC	UNITS
		FORMATION	MEMBER
QUATERNARY	PASTONIAN	WROXHAM CRAG	Paston
			Sheringham
	PRE-PASTONIAN		Sidestrand
	BAVENTIAN	NORWICH CRAG	Westleton Beds
			Easton Bavents Clay
	BRAMERTONIAN		Chillesford Clay
ANTIAN	Chillesford Sand		
	THURNIAN		Thorpeness
NEOGENE	LUDHAMIAN	RED CRAG	
	PRE-LUDHAMIAN		Sizewell
		CORALLINE CRAG	Aldeburgh
			'Bryozoan Rock-bed'
			Sudbourne
		Ramsholt	
	PALAEOGENE	and	UPPER CRETACEOUS

The younger Red Crag outcrops in many localities in Suffolk south of the latitude of Aldeburgh. It is generally an unconsolidated sand, sometimes cross-stratified and frequently rich in shell debris. Near-surface water percolation has occasionally caused ferruginous cementation and where this has occurred the harder iron-enriched sediment has very infrequently been worked as a building stone. In both this Red Crag and the Coralline Crag extraction, the rock has frequently been sawn from the rock face. Less commonly, Crag building stones have been gathered as boulders from field or river debris and in these instances their exact stratigraphical and geographical origins tend to be less certain.

ROCK EXTRACTION

It has mistakenly been believed that the Coralline Crag building stone extracted for building purposes could be related in its source with precision to individual quarries (*e.g.* Morley 1933). For this reason all known records and maps of this critical area of Suffolk were scrutinised. These date from as early as the 16th century (as, Appleton 1588), and together they provide a reasonably comprehensive cover of the Coralline Crag outcrop area illustrated in Fig. 102. Regrettably, most records fail to indicate the presence of any quarries or pits. The earliest map to portray any indication of rock extraction in the area is that of Norden (1600–01). This illustrates a brick-pit due east of Chillesford church (not, it should be noted, in the locality of more recent pits). A 1631 map of the Shottisham area

(Anon. 1631) displays a 'sand pitte', and an early map by Parker (1778), three doubtful sand pits. The earliest map to show the presence of Crag pits is that of the Ordnance Survey (1837), and these are detailed in the area around Sudbourne.

Harmer (1898) described thirty localities where, at that time, Coralline Crag was visible, and more recently, Daley and Balson (1999), eleven localities, six having been previously described by Harmer. The present author examined sixty-six quarry site areas on the main Coralline Crag outcrop (Fig. 102). These represented sites noted in a wide range of documents since the occasion of the first historically recorded quarries (Ordnance Survey 1837). Only eleven of the sixty-six exhibited exposures of rock at the time of examination, the vast majority having been in-filled, overgrown or ploughed over. Only three quarry sites appear to have been worked over a significant duration and into modern times. Broom Hill quarry, Gedgrave (6406 2500) provided a source of fossils for Wood (1848), and is referred to in the literature of Prestwich (1871), Harmer (1898), Boswell (1928), and Daley and Balson (1999). The rock now visible in the pit is only weakly lithified and unsuitable for building purposes. Pits in Sudbourne Park, in the neighbourhood of the Hall (6407 2514), although described as a 'Crag pit' by Galland (1841), have subsequently mainly been worked for sand, indicating the variability of the deposit's lithology and hardness. The current pit is overgrown. Only the quarries in the immediate area of Crag Farm, Sudbourne (6429 2523), first indicated on the tithe map of 1841 (and Galland 1841 as a 'sand pit'), have shown any fairly continuous use as a source of building stone. Certain old rock faces suggest that they were once sawn and Victorian farm buildings now stand on parts of the quarry floor. Today, an adjoining pit to the west (6427 2523) is worked occasionally for sand.

Although certain moderately recent source quarries for the Coralline Crag can be geographically located, and tithe and early Ordnance Survey maps show some of these, no records of actual quarrying or quarry accounts have yet been discovered. The lack of such records is not, however, surprising, for prior to the 19th century most landowners quarried their own land for suitable stone, wherever it could be located. All major landowners in the area were approached, but none could provide documentation or historic information related to past quarry operation. Quarries operated on a small scale often under individual ownership. Similarly, to enable satisfactory watering of livestock, farmers excavated pits to hold water in nearly every field. The extracted stone, if suitable, may then have been utilised for building purposes.

CORALLINE CRAG AS A BUILDING STONE

That the tower of Chillesford church was built of an unusual stone was noted as early as 1872 (Anon. 1886, 119). Morley (1933) subsequently reported that the towers of both Chillesford and Wantisden churches (Fig. 103) were constructed of Coralline Crag 'probably dug about 1360 at Richmond-farm in Gedrave'. As has been illustrated above, geologically there is no way of confirming such a precise origin. Richmond Farm quarry is of relatively modern origin (the quarry is first detailed on the Ordnance Survey map of 1880) and some of its quarry faces show evidence of having been sawn by mechanised equipment. Reference to the two Crag church towers was made by both Clifton-Taylor (1972, 60) and Pevsner and Radcliffe (1996, 15). These more recent references (Clifton-Taylor is stated as having provided the information for Pevsner and Radcliffe) also observe that the stone 'was formerly used at Aldeburgh, Orford and inland as far as Framlingham'. However, the present author has not been able to identify Crag material in the older buildings of either Aldeburgh or Framlingham. Markham (in Greensmith *et al.* 1973, 5) described one further ecclesiastical occurrence of the stone, recording 'a small amount of



FIG. 103 – The 14th-century tower of St John the Baptist, Wantisden (6363 2533) is built largely of Coralline Crag from local Neogene deposits.

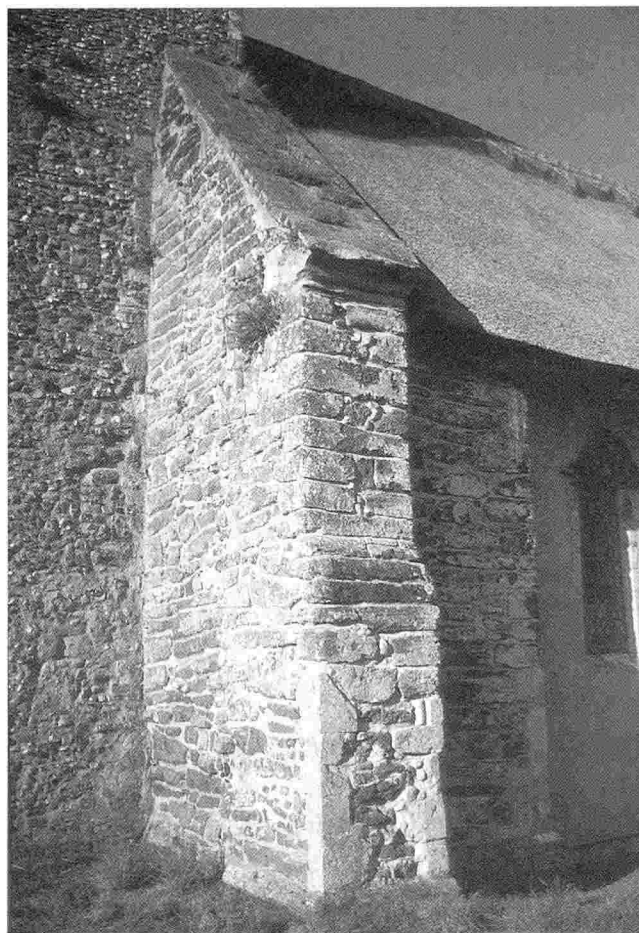


FIG. 104 – The church of St John the Baptist, Butley (6374 2502), to show the (south-) west wall of the nave and adjoining buttress built of slabs of Coralline Crag.

TABLE II
THE USE OF CORALLINE CRAG, BRYOZOAN ROCK-BED MATERIAL AS A BUILDING STONE IN SUFFOLK ECCLESIASTICAL
BUILDINGS (SEE ALSO FIGS 104 AND 105)

Locality	Dedication or building type	Grid ref ¹	Fig. 102 ¹ Symbol	Occurrence and particulars	Possible date of use
Aldringham	St Andrew	6452 2603	A1	Re-used E end chancel and high NE chancel wall.	Church much rebuilt just after 1842 (when in ruins) when mid 15th century tower demolished. Material might be re-used from tower.
Ash	Priory	6317 2545	AA	Re-used in modern rebuilt walls.	Founded about 1195. Suppression 1536. All material re-used in modern walls.
Blaxhall	St Peter	6356 2569	B1	Top 1½m of N nave wall*, and in buttresses.	Wall is about 1300; the Crag is probably post this date when the roof was altered to introduce an early 16th-century (Cautley, 1982, 225) hammerbeam structure.
Butley	St John the Baptist	6374 2502	Bu	Repair to W wall of nave.	Nave is Norman, repair post this date.
Chillesford	St Peter	6383 2523	C	Common, tower*. Some S wall of chancel.	Tower built and dated early 14th-century (Cautley, 1982). Morley (1933) suggested 1360 (see text).
Dunwich	Greyfriars Friary	6475 2701	-	E wall to site; blocks in two areas, largest section over about 10m*.	This wall is known to have been built post 1290 (when Friary built).
Eyke	All Saints	6317 2517	E	1½m E extension to chancel*.	The chancel is Norman, the extension later. Other building on the site occurred early 14th-century.
Iken	St Botolph	6412 2566	I	Re-used, repair to Norman N and S nave walls (inside and out, S only). Use above late 13th/14th century chancel arch.	Post Norman repairs. Use above late 13th/14th-century chancel arch (West et al., 1981) might suggest all repairs of same date.
Leiston	Abbey	6444 2642	L	Base to Tudor gatehouse.	Abbey built on site 1363, rebuilt (post fire) 1389. Brick gatehouse is early 16th century but possibly Crag re-used.
Orford	St Bartholomew	6423 2500	O1	Few blocks re-used in E end of N transept (aisle). Two blocks N wall of ex N transept.	Post Norman repairs.
Orford ²	Castle Keep	6419 2499	O2	Internal; fireplace hoods in main chambers, altar in chapel, ceiling vaulting in many wall corridors and rooms.	Castle built 1167. Material post that date possibly 13th and 15th century.
Playford	St Mary	6217 2482	P	Common, S and W nave walls (where re-used). In S tower/porch, W, S and E walls and buttresses where partly as quoins (where probably re-used).	Tower/porch probably of 1350-1530 (Perpendicular) period. Cautley (1982, 339) stated late 14th-century tower.
Ramsholt	All Saints	6306 2422	Ra	Used high in N wall of integral nave/chancel and for repair in oval tower above 6m.	Post Norman tower repairs. Nave/chancel are dated about 1300 and Crag presumably introduced at a time of roof modification post this date.
Rendlesham	St Gregory	6324 2528	Re	High, above render, S wall of nave*. One block high W wall of tower (?repair).	Nave has Perpendicular windows. High use in walls again suggests use occurred at time of roof alterations (?late 14th century, Cautley, 1982, 92-3).
Sibton	Abbey (ruins)	6366 2698	-	Blocks used to repair walls of outbuildings* (St. John Hope, 1894), and for doorway infill.	Cistercian Abbey founded 1150.
Snape	St John the Baptist	6394 2593	S	Internal, for rood staircase.	Rood staircase possibly 14th-century.
Tunstall	St Michael & All Angels	6364 2552	T	S wall nave, highest 1m*, infilled window same wall*. N wall of chancel where blocks slightly curved*.	The chancel (older) and nave material may be of different dates. Both probably pre-date the 15th-century tower and post-date 14th-century (as priest's door). Infilled window appears to have been Early English (1190-1250).
Wantisden	St John the Baptist	6363 2533	W	Common, tower*. On S side some blocks shaped with re-entrant angle*.	The tower is post Norman. Morley (1933) suggested 1360 (see text).

* Coralline Crag visible as sawn blocks

Notes: 1. These columns relate to Fig. 102.

2. Orford Castle included here because Crag first observed in Castle chapel (Greensmith *et al.*, 1973)

Coralline Crag' as being present in the chapel of Orford Castle.

Those church buildings containing Coralline Crag of the Bryozoan Rock-bed variety identified by the present author are detailed in Table II and indicated (with two northern exceptions) on Fig. 102. Supplementary to these eighteen buildings a very limited quantity of doubtful Coralline Crag may also be present in the churches at Alderton (in the ruinous and now very ivy-clad tower) and Ufford (tower, south face at 3m).

Original quarried stone may be observed in a number of church walls (Table II). Sawn blocks are perhaps displayed to their best advantage in Wantisden church where block lengths are variable (45 to 76cm) but thickness is most commonly 18cm (with some 'jumpers' twice this thickness). To accommodate the tower staircase certain blocks are carefully sawn with a re-entrant angle. Such craftsmanship suggests that, in their original construction, these walls were not externally rendered. Although there are records of a fire having occurred at both Iken church and Leiston Abbey, unusually in many of the other churches also, the Coralline Crag is reddened with iron oxides. The state of oxidisation of Coralline Crag does, however, vary in individual quarries and natural exposures.

An attempt has been made to determine the approximate period over which the Crag stone was regularly exploited for ecclesiastical building material (Table II). It is evident that the stone was not worked for church building by the Normans, but probably first came into use for this purpose about the early part of the 14th century. Intermittent quarrying for church walling generally seems to have continued until the early or middle part of the 16th century. These dates are suggested from the evidence of features such as cross-cutting structures, mortars, range of stone use, building techniques, etc., for in no instance is the Crag stone preserved as moulded or elaborately worked material, where such detail can be used for dating purposes.



FIG. 105 – The church of All Saints, Eyke (6317 2517). The extension to the Norman chancel, viewed here from the south-east, is of ashlar Coralline Crag built at a later date.

Fig. 102 displays the known geological extent of the Coralline Crag: it includes those areas that extend beneath the unconformable Red Crag cover, that is, those areas from which it could be quarried following the removal of the overlying Red Crag. Possible transportation distances for the Coralline Crag can then be considered. Overland, the distance of the farthest church (Playford) from potential quarries would have been in excess of 20km. However, there must have been significant use of water for transport purposes. Using the Rivers Ore, Deben and Fynn, the total overland transportation required to Playford, for instance, would have been reduced to less than one kilometre. Similarly, the River Deben, prior to the creation of the Melton weir, no doubt afforded the means of conveying the stone to Ash Priory and Eyke and Rendlesham churches. Crag for use at Sibton Abbey may well have been transported the greatest distance, but a route involving the River Ore, the sea and the Rivers Minsmere and Yox, could have restricted overland movement to but a few hundred metres. Transshipment to narrow, punt-like craft would have been necessary for the minor latter rivers. A summary of this mode of transportation in historic times, together with references, is given in Pearson and Potter (2002).

OTHER CORALLINE CRAG BUILDING

There is evidence that restricted working of the Coralline Crag continued beyond the 16th century until, very occasionally, the present time. Very recently, stone has been extracted to undertake repairs on Chillesford church tower. Prestwich (1871, 119), for instance, stated that an old quarry (at Rockhall Wood, Ramsholt, 6303 2441), when he 'first visited in 1836, had recently been extensively worked for rubble to form a river-wall'.

A further temporary pit in Rockhall Wood he described as having 'ceased working' in 1861. In the latter centuries of extraction (post-16th century), the Crag rock appears to have been used almost entirely as construction material for local buildings and walls, none of which, but for repairs, had direct ecclesiastical connections. The non-ecclesiastical instances recognised are detailed in Table III. Obviously, it has proved impossible to scrutinise all walls, domestic and agricultural, over such a widespread area, and no doubt others may yet be identified. The Anglo-Saxon pottery kiln discovered by Fenwick (*pers. comm.*) on Burrow Hill, Butley, appears to have been constructed from local field-derived fragments and boulders of Bryozoan Rock-bed and is omitted from Table III. Customarily, and as in this instance, the Anglo-Saxons, whenever possible, used very local stone for their structures (Potter 1987).

In the two occurrences listed near the village of Sutton (Table III) the stone was probably quarried from the local indurated 'Rock-bed' outlier of the Sudbourne Member of the Coralline Crag in Rockhall Wood (Balson and Long 1988; Balson 1999 and see above) and can be dated, therefore, to the first half of the 19th century. A date of 'about 1800' has been given by Pevsner and Radcliffe (1996) to the pavilion outbuilding to the Butley Priory gatehouse (6375 2494), which includes blocks of Bryozoan Rock-bed (Fig. 106).

Brown's Farm, Tunstall (6357 2547) is certainly faced with re-used stone. This is well displayed, for instance, by the large pieces of included Caen stone shafts. The Coralline Crag blocks in its walls, although ashlar, are irregular in disposition and setting. No ecclesiastical buildings are known to have existed on or near the site and the secondary origin of the re-used material must remain uncertain. It is possible to surmise that Tunstall church, like Chillesford and Wantisden, may once have possessed an earlier tower of Crag material from which building stone may have been derived. No records have as yet been traced.

The fabric of Orford Castle (Table II) has been specifically the subject of a detailed

TABLE III
THE OCCURRENCE OF CORALLINE CRAG IN NON-ECCLESIASTICAL BUILDINGS IN SUFFOLK

Locality	Building description	Grid ref'	Fig. 102' Symbol	Occurrence and particulars	Possible date of use
Butley	Priory gatehouse	6375 2494	1	E end of gatehouse. Described as a 'summerhouse', lower part of cottage wall in ashlar sawn blocks. Caroë (1933, 230) described the building as a 'Georgian pavillion'.	Caroë (1933, 230) and Pevsner and Radcliffe (1996) suggested date as 'about 1800'.
Butley	Priory, landing stage	6375 2493 and 6375 2491	1	'Crag blocks' recorded by Myres (1933, 259) in site excavation. Part of a Crag wall recorded by Ward Perkins (1933, 260) in 'landing stage' site excavation.	Priory founded 1171. Standing ruins of 13th and 14th centuries and Crag wall structure suggests later re-use.
Orford	Excavation, Castle Lane	6422 2497	2	Site reported as that of 15th/16th-century house (Markham, pers. com.). Nothing now visible.	?15th/16th century.
Orford	Quay Street, garden walls	6424 2497	3	Front garden walls – lower portions, generally ashlar blocks.	Associated with some Jurassic limestone blocks, septarian nodules, flint and quartz cobbles. Appear re-used, possibly after one of town's long-demolished churches.
Sutton	Wood Hall, garden wall	6313 2447	4	Large irregular Crag lumps and sawn ashlar blocks make up front garden wall.	The house is Jacobean, but the wall in which the Crag blocks occur may date from about 1830 when local working quarries existed.
Sutton	Pettistree Hall, farm buildings	6303 2446	5	Farmyard walls, irregular pieces associated with medieval bricks and a few Purbeck 'featherbed' (35mm thick).	The 'featherbed' inclusions suggest a possible tomb or floor slab and the Crag material might also be re-used. However, in terms of quantity, local working quarries in Rockhall Wood are more likely to have provided the Crag material in the mid19th century.
Tunstall	Brown's Farm	6357 2547	6	Main farmhouse and garden wall. As ashlar blocks but not in courses.	With the Coralline Crag in the house walls are blocks of ashlar Caen and one ?Barnack limestone, septarian nodules, flints, iron furnace slag and a lava quern fragment, all suggesting re-use. Re-used Caen is particularly obvious.

Note: 1. These columns relate to Fig. 102.

Localities: 1, Butley Priory; 2, Orford, Castle Lane; 3, Orford, Quay Street; 4, Sutton, Wood Hall; 5, Sutton, Pettistree Hall; 6, Tunstall, Brown's Farm.

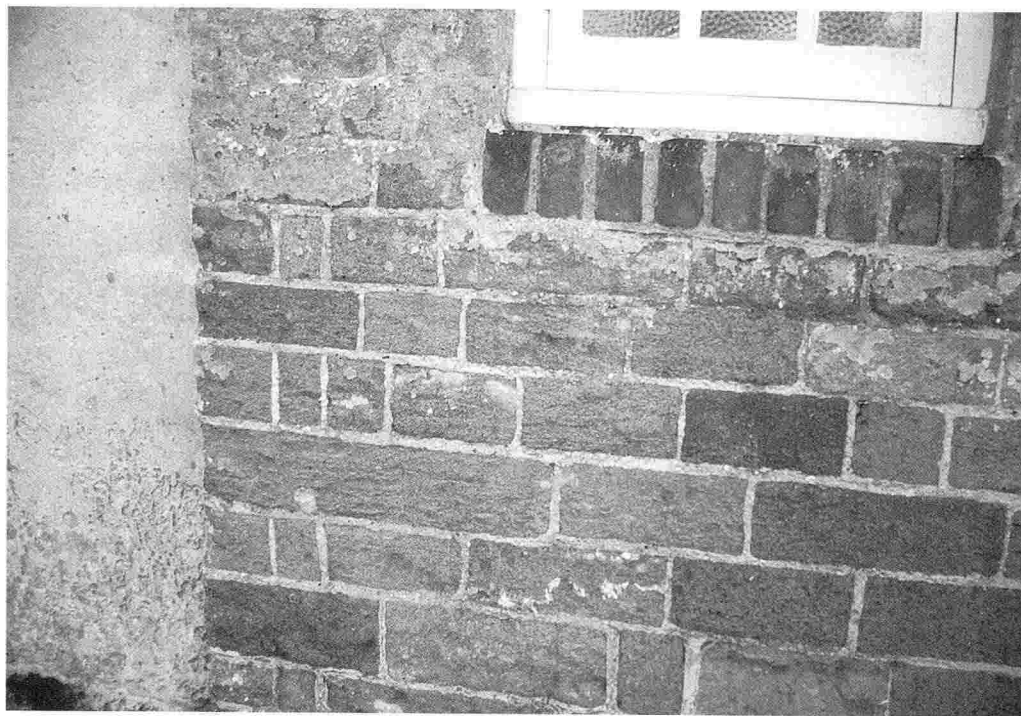


FIG. 106 – Cut blocks of Coralline Crag make up the lower part of the 'Georgian pavilion' at the east end of the Butley Priory gatehouse (6375 2494). For such domestic use, these blocks were probably hewn from a nearby quarry in Rockhall Wood 'about 1800'.

review, and it is hoped that with further study, it will be possible to provide a separate and more comprehensive interpretation of the modifications to the building as a supplement to the work of Heslop (1991). From an analysis of the castle's internal walls and fabric it seems likely that all Bryozoa Rock-bed material included in the structure was inserted at some dates subsequent to the building of the original keep, which was probably constructed by 1167. The irregularly hewn lumps of Crag material present in the vaulting of many ceilings within the thick keep walls can in every instance be interpreted as supplementary to the main structure. This material seems likely to have been added during the first hundred years of the castle's history, and as such would pre-date Crag workmanship in the churches of the area. The high fireplace hoods (chimney breasts) in the halls of the castle were possibly of 15th-century construction. It has been proposed that the Crag rock utilised in the keep was extracted from an adjoining quarry. The Orford Castle quarry (6418 2498) was not initially documented until 1928 (Boswell 1928), and although the adjoining ground is much disturbed there is no record of previous quarrying, so that the exact stone source, although probably very close, should remain uncertain. The original walls of the keep's basement contain no Crag material, and even the well, which also must have passed through the Coralline Crag, is lined with Caen stone.

OTHER SUFFOLK CRAG BUILDING STONES

Suffolk Crag building stones which are of a lithology other than that of the Coralline Crag Bryozoa Rock-bed are listed in Table IV. Several small pieces of a possible ferruginously-

TABLE IV
 INSTANCES OF OTHER CRAG MATERIAL IN SUFFOLK CHURCHES, THESE
 SUPPLEMENTING THE 'BRYOZOAN ROCK-BED' CORALLINE CRAG MATERIAL
 DETAILED IN TABLE II (SEE ALSO FIGS 107 AND 108)

Locality	Dedication	Grid ref'	Fig. 1 Symbol'	Occurrence and particulars
Alderton	St Andrew	6343 2416	A2	High in inaccessible tower. SE buttress to chancel (1 piece) ?Red Crag.
Bawdsey	St Mary	6347 2402	Ba	High S face of tower, two pieces of Crag.
Falkenham	St Ethelbert	6293 2390	F	Rounded pieces of Red Crag in S porch (?early 19th century) (cobble size).
Little Bealings	All Saints	6229 2480	LB	Fragments of Crag, 1m high in S wall of nave, pre-date early Tudor brick.
Melton	Old St Andrew	6295 2513	M	Small pieces of ?Red Crag N and S faces of nave.
Newbourne	St Mary	6273 2431	N	Fragments in SE buttress (repaired late 1830s) of ?Red Crag. Possible fragments E end of chancel (rebuilt 1987).
Ufford	St Mary of the Assumption	6298 2522	U	Ferruginously-cemented Red Crag as E quoins to nave (cut). Herringbone pieces in N wall to nave (pre-date buttresses) and over N door. Small pieces elsewhere, as in tower. Church nave has definite Norman aspects but nave quoins may be Anglo-Saxon and chancel post-dates these quoins.

Note: 1. These columns relate to Fig. 102.

Localities: For localities key, see caption to Fig. 102.

cemented Red Crag rock also occur in the S.W. tower buttress of All Saints' church, Kesgrave (6219 2457): the identification of the material is, however, indefinite and its presence is omitted from the Table.

In most of the instances in Table IV the material incorporated into the church fabric was probably gathered from random field debris. Only at Ufford church (Fig. 108) does the ferruginously-cemented sand occur in abundance. In this church small blocks of the Red Crag involved are placed in the north nave wall in herringbone fashion and the wall has been considered as of Norman age (Cautley 1982; Pevsner and Radcliffe 1996). The remnant east quoins of the nave, however, are composed of originally cut blocks and set in a long-and-short style indicating a late Anglo-Saxon period (Taylor and Taylor 1980). The chancel clearly post-dates the nave quoins. The manner in which this ferruginous Red Crag is used is identical to that in which ferruginously-cemented superficial gravels and sands have been utilised elsewhere in the London Basin (Potter 1987; 2001b) and where a comparable age of use has been advocated.

CONCLUSIONS

Within the United Kingdom, the use of Neogene sediments as a building stone of dimension-stone quality is exceptional. Close to the Neogene, Coralline Crag outcrop in Suffolk, such rocks have been utilised in the partial construction of a limited number of ecclesiastical buildings. Evidence suggests that the stone, the Bryozoan Rock-bed of the Coralline Crag, was used for church building purposes mainly during the period of the early 14th to the early 16th century. Although this rock is found in the fabric of a number of Norman buildings, in all known instances its presence relates only to later patching or

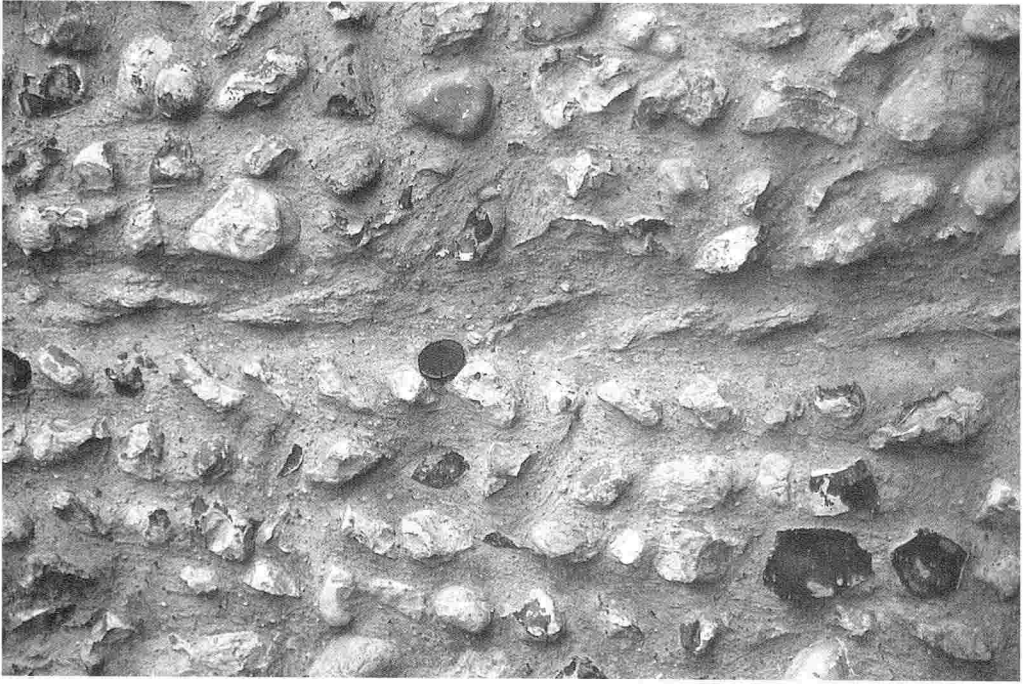


FIG. 107 – Fragments of Crag rock (centre course) occur in the south wall of the nave of All Saints church, Little Bealings (6229 2480).

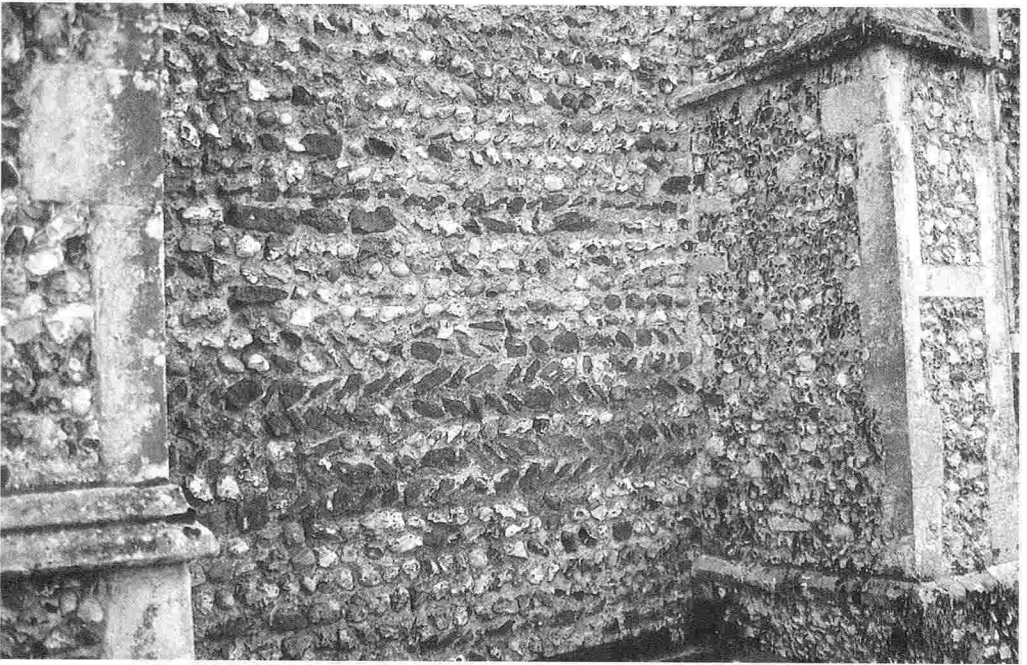


FIG. 108 – Courses of dark, ferruginously-cemented Red Crag, partially laid in herringbone pattern, in the north wall of the nave of St Mary of the Assumption, Ufford (6298 2522) are included within a largely flint wall. The (?early Norman) wall clearly pre-dates the later buttresses.

repair. Some fragmental Crag material may also have been incorporated into a small number of churches as a result of chance collection of field debris. The distribution of the stone suggests that the major means of its transportation, from quarry to church site, was by water.

The Crag material appears to have been occasionally utilised for local domestic architecture and walls until as recently as about the mid 19th century. It is used occasionally in modern times for repair work.

Ufford church carries in its fabric Red Crag rock which geologically appears to have been hardened by the action of supraphreatic waters and ferruginous cementation. In this instance only, it is suggested that the material is likely to have been utilised as a building stone in a church in the late Anglo-Saxon period.

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Abbreviations

S.R.O.I. Suffolk Record Office, Ipswich Branch.