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# INFORMATION

BRITISH BRICK SOCIETY

## INFORMATION 34 NOVEMBER 1984

EDITORIAL: HILLINGDON CENTRE

A recent poll has shown that the most popular recent building amongst London people is the new Civic Centre at Hillingdon, Uxbridge. When it was first 'unveiled' some years ago the building created something of a furore, partly because of the cost and partly because the building itself presented something new and strange. Designed by the architectural firm of Robert Matthew, Johnson-Marshall, and Partners, with Andrew Derbyshire as architect in charge of the project (1971-6), Hillingdon exhibits a fascinating use of brickwork, and also raises exciting questions about the present and future state of English architecture. It has been considered an example of 'Post-Modernism', as, that is, an instance of the turning away from all that one tends to think of as 'Modern Architecture' - exposed concrete, large areas of glass, flat-roofed tower-blocks, and the rest. As a blanket term to cover certain architectural trends of recent years, 'Post-Modernism' has some use, but,

like all such terms, lumps together too many buildings of too much diversity to be of any real value. Arthur Drexler considers the building within a section on 'Vernacular', yet notes that it 'is too artful to be taken as vernacular work,' and adds that that fact 'seems as much its character as not.' The judgement is surely right: as we shall note, influences are as much from 'architecture proper' (if John Harvey's term be permitted) as from the vernacular tradition. Echoes of Suburbia, however, are certainly present - deliberately so, for the Hillingdon team looked extensively at local housing for inspiration. Nor is this in itself regrettable. As Gavin Stamp has remarked in connexion with this building, 'debased and diluted from the prototypes of Norman Shaw, Lutyens or Voysey though they may be, these houses arguably represent the true tradition of the Arts and Crafts much more than turbine factories in Berlin.'

The building is basically pyramidal in its forms, with the ascents emphasised by the hipped roofs. The overall impression is of a series of interrelated and interconnecting blocks of varying size and height, many arranged at 45° to give an organic feeling to the ensemble. It is here, indeed, that one might think of the vernacular, or of the Arts and Crafts, for the building may in part be 'read', not implausibly, as a grouping of hipped-roof houses. The basically humane approach thus imparted to a large-scale project is furthered by the windows with their traditional glazing bars and their relatively small scale. What is more, there is a return to a restrained ornament on the surface of the building: the slightly recessed panels in which the windows are set and the dentillated brick courses which run across the panel-heads are reminiscent of the late fifteenth-century brickwork of Oxburgh Hall or the Deanery Tower at Hadleigh, though the effect is more simply achieved at Hillingdon. Equally traditional are the articulating brick pilaster-buttresses. But these traditional elements have been transmitted via the late nineteenth- and early twentieth-century revivalists such as J. Harold Gibbons and H. R. Goodhart-Rendel, whose work was studied by the Hillingdon team. Gavin Stamp has drawn attention to these and other influences. We might add, perhaps, that of the early Charles Holden, which seems to be present, at least unconsciously, together with that of James Brooks, in particular his superb St Columba's Church, Kingsland Road, London.

The Hillingdon Centre has been dismissed by some critics as 'backward looking'. And 'higgledy-piggledy Victorianesque of-course-brick,' comments Charles Jencks in his of-course-clever style. Even the architect in charge of the project - who emerged in a recent television interview as a modest and unassuming man - sometimes sounds a little self-conscious and defensive when talking about the building. Edward Jones and Christopher Woodward see in the imagery of the building 'a sad comment on the times and evidence of an architectural loss of nerve,' but have to concede that 'the building is very popular and a relief from the banal office blocks normally associated with local authorities.' In view of this observation, in combination with the fact that this was the kind of structure demanded by the clients (on pain of taking the commission elsewhere!), it is difficult to see how such criticism can hold. Meeting a client's demands and at the same time pleasing the general public - not just the cognoscenti - is, after all, not a bad achievement for any architect!

The architect of Hillingdon has indeed looked back - just as, say, Wren, Hawksmoor, Pugin, James Brooks, Philip Webb, Voysey, and many others did - but back to a tradition which can then be developed into something properly original. And certainly in the whole of historic brick architecture one will not find anything quite like Hillingdon: it is an original creative work rooted in a strong



where his family had farming roots. Here he found the time and energy to devote to his many hobbies and interests: The National Trust (he had a great love of and expertise on Penrhyn Castle); The Welsh Folk Museum, which had the benefit of his knowledge of wind and water mills (flint mills were his speciality); Holkham Estates and the eighteenth-century Brick and Tile Works (where mathematical tiles were made for local use and for export); Samuel Wyatt and his works; Roman encampments in Anglesey; and of course mathematical tiles.

He made several contributions to BBS Information: on special bricks in Barnes (issue 24), Anglesey clay and field drains (30), brick works in Anglesey (31).

Sadly, we shall see no more from the hand of this lively personality.

Maurice Exwood

## EIGEN HAARD BONDING

Terence Paul Smith

The block of housing known as Eigen Haard, filling the triangle formed by Hembrugstraat, Zaanstraat, and Oost Zaanstraat in the north-west of Amsterdam (fig.1), is perhaps the finest product of the so-called 'Amsterdam School' of architects. This group, reacting against the work of H.P.Berlage (1856-1934),<sup>1</sup> developed an idiosyncratic plasticity of form using traditional materials.<sup>2</sup> In Amsterdam, of course, traditional materials means principally architectural ceramics: bricks and pantiles were the favourite materials of these architects, though with timber commonly used for windows, door-frames, and the like. The use of traditional materials helped to temper the striking - even deliberately shocking - outlines of some of the buildings, to place them more acceptably in a Dutch setting. Foremost amongst the architects involved was Michel de Klerk, born in Amsterdam in 1884.<sup>3</sup> After his untimely death in 1923 the movement failed to develop - there were stronger winds blowing across the architectural landscape - though there has been continued localised influence down to our own time.<sup>4</sup> Like many of the architects of the early twentieth century, de Klerk and his fellow workers were very much concerned with the social aspects of architecture, particularly of housing.<sup>5</sup> These issues, together with the more formally architectural ideas of the group, were put forward in the journal Wendingen (Turnings; Windings) which the Dutch Expressionists produced.<sup>6</sup>

The Eigen Haard housing project was designed by de Klerk and built between 1913 and 1919, though incorporating the slightly earlier Openbare Voorbereidende School building on Oost Zaanstraat.<sup>7</sup> The very name of the block testifies to the social concern of the architect - 'Eigen Haard' means 'a hearth of one's own' - and at the time of de Klerk's death the newspaper Het Volk carried a eulogy by an ordinary Amsterdam housewife living in Eigen Haard - there can be few modern designers of housing schemes who have received such appreciation from those whose homes they provided!<sup>8</sup> In part, at least, the welcoming aspect of the blocks is due to the superb brickwork, and it seems churlish - or perhaps just doctrinaire - to criticise the 'fixation

on brick' whereby the Amsterdam School architects 'deliberately ignored the possibilities of reinforced concrete'.<sup>9</sup> Not only does the brick give a warmth to the buildings, but it picks up, in its brickwork patterning, typically Dutch themes, although these derive more from the horizontal designs of roads and pavements than from the vertical faces of buildings.<sup>10</sup>

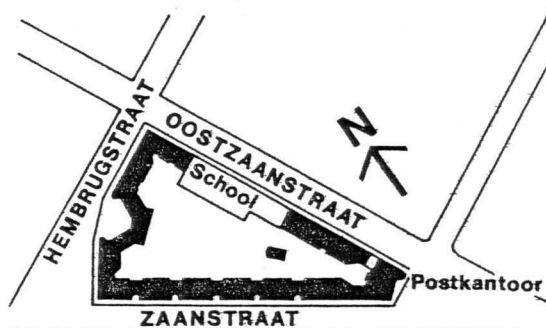
It is this patterning - in other words the bondings employed - which helps give interest and animation to the façades, for different bonds are used on different parts of the building and, in bands, across the larger stretches. It is this aspect of the building which is recorded in this article.

The accompanying diagrams (fig.2) show the different bonds that are used. In all periods, 'English' Bond has been the normal one for Dutch buildings, even on those Classical façades where, it would seem, English builders considered 'Flemish' Bond to be more appropriate.<sup>11</sup> But 'English' Bond was not used by de Klerk on the Eigen Haard scheme, a combination of the traditional (brickwork using narrow bricks) and the non-traditional (new bonds, or bonds 'lifted' from street pavings) which is typical of de Klerk's approach to architecture as a whole. In the building as we now have it, in fact, 'English' Bond occurs only on the earlier school building, on Oost Zaanstraat, which de Klerk had to incorporate into his block (fig.2.8). The whole wall is constructed in this bond above a patterned footing using bricks set with their faces in the wallface (fig.2.9).

The general bond favoured by de Klerk (and by other early twentieth-century Dutch architects, such as W.H.Dudok)<sup>12</sup> is Monk Bond - that is, a form of Flemish Bond but with two stretchers between the headers in each course, the headers being placed above the perpendicular between the two stretchers of the course beneath (fig.2.1). Most of the walling is in this bond, and other bonds appear mostly at key points of emphasis.

Flemish Bond proper is not used, but Flemish Stack Bond - that is, Flemish Bond but with the courses running vertically (fig.2.3) - is used for the ground floor walling. This is also in a darker brick (purplish as opposed to the general red fabric) which is also of somewhat rougher texture. In a way it echoes the often rusticated basement stage, beneath the piano nobile, of the classical house.<sup>13</sup> Flemish Stack Bond reappears elsewhere, for example in a band above the first-floor windows on the principal (Hembrugstraat) entrance façade, in continuous bands above the first-, second-, and third-floor windows on the main façades, and on the small projecting balcony on the Postkantoor (Post Office) building on the Spaarndammerplantsoen. True Stack Bond (consisting entirely of vertical stretchers) is rarely used, although it does appear on some of the slightly projected decorative panels, for example on the Post Office turret.

Stretcher Bond (fig.2.6), too, is hardly used, but appears on the subsidiary chimney stacks; the larger stacks, which are made into architectural features at the ends of the principal blocks, however, are in Monk Bond on their straight portions and in Header Bond (fig. 2.2) on their curved portions. Elsewhere Header Bond is used on curves,



Woningbouw "Eigen Haard",  
Fig.1 Amsterdam

too, for example on the 'pepperpot' bartizan at the corner of Hembrugstraat and Zaanstraat. Here the Header Bond is in bands, alternating with bands of Flemish Stack Bond.

For the rest, it is a case of various patterned arrangements of bricks. The balconies directly above and to each side of the principal entrance are built in a 2:1 basket-weave bond (fig.2.4), giving a fairly animated appearance at these points. Elsewhere, other patterns are formed by the regular arrangement of headers and stretchers, including a sort of 'trilithon' arrangement (fig.2.7) and a variation on this (fig.2.5). The latter is used, for example, at the feet of the bowed window projections, whilst the former, simpler design is used, for instance, as the footing to the first floor in a number of places both on the outward façades and within the Post Office courtyard.

Although not part of the bonding patterns proper, use is made also of 'tumbling-in' in the entrance archway-jambs. But the greatest use of 'tumbling-in' occurs on the entire curved gable of the boat-roofed meeting-hall within the courtyard.

In addition to the bonding patterns, some use is made of special-purpose bricks - arrangements of quarter-circles in some of the re-

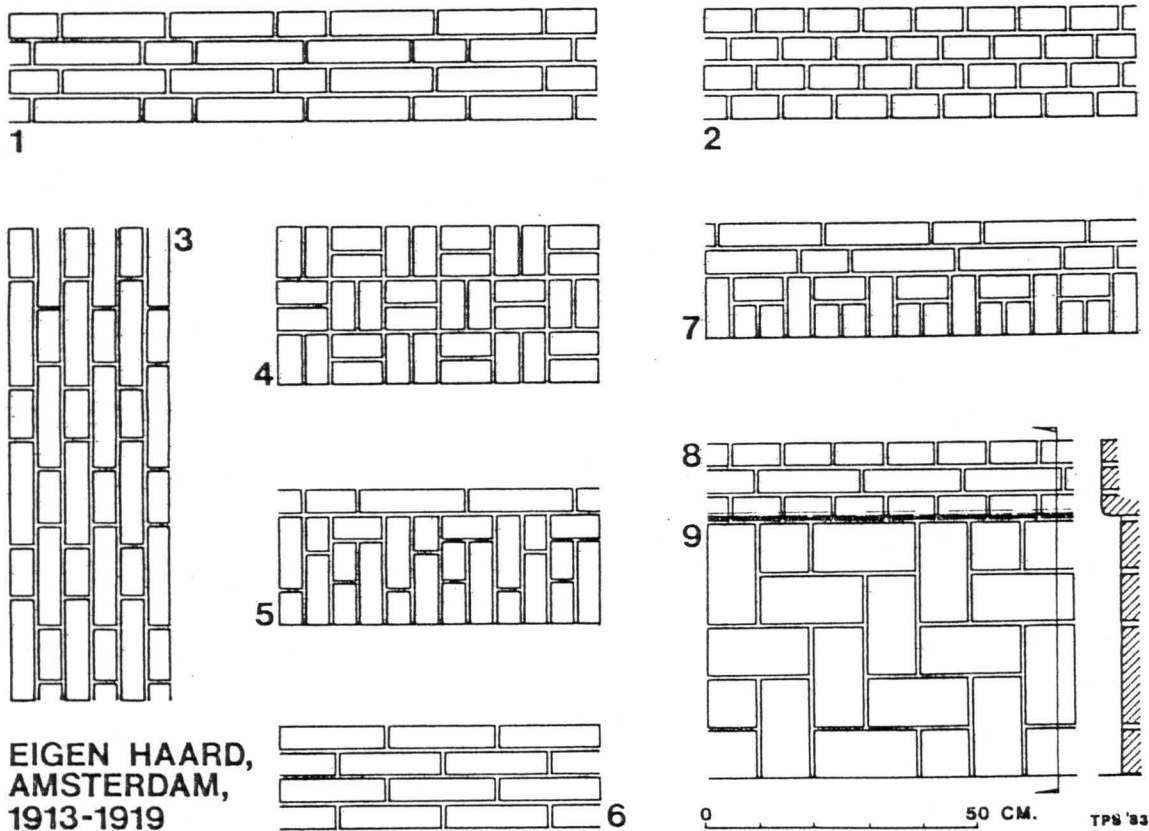


Fig. 2

entrant angles, for example. As well as using these 'specials', de Klerk also required the normal fabric bricks to be made in a number of sizes, to fit the modular patterns (see, for example, fig. 2.7). Although Holland was neutral during the First World War, times were nevertheless difficult, and there was some criticism of this aspect of the design, which of course increased the cost.

cont./

Notes and References

1. Best known for his Beurs (Exchange) building in the Damrak, Amsterdam of 1884-5. Brief material by J.S.Curl in M.Emmanuel, ed., Contemporary Architects, London, 1980, pp.88-90. P.Singelberg, H.P. Berlage: Idea and Style, Utrecht, 1972. Berlage himself was influenced by the Amsterdam School in some of his later works, notably the flats and shopping arcade of 1925 in Amsterdam's Mercatorplein.
2. The Amsterdam School is dealt with in most of the histories of modern architecture, for example in that most balanced of surveys, A.Whittick, European Architecture in the Twentieth Century, Aylesbury, 1974, pp.117-21. The relevant Open University unit (A 305, 9-10) is, as always, a most useful introduction: T.Benton with C. Benton and D.Sharp, Expressionism, Milton Keynes, 1975. R.Banham, Theory and Design in the First Machine Age, London, 1960, pp.163-6, usefully places the movement in its context; W.Pehnt, Expressionist Architecture, ET, London, 1973, pp.181-93 is fuller but rather less sympathetic. A valuable guide to the buildings is the broadsheet, with map, Amsterdamse School, prepared by the Amsterdams Stedelijk Museum, n.d.; many of the buildings are illustrated in I.Haagsma et al., Amsterdamse Gebouwen 1880-1980, Utrecht and Antwerp, 1981, which also contains a short introduction, pp.14-16. Fuller studies in A.Venema et al., 1910-1930: De Amsterdamse School, Monografieën van de Stichting Architectuur Museum, Amsterdam, 2nd ed., Amsterdam, 1979, and in W. de Wit, ed., The Amsterdam School: Dutch Expressionist Architecture, 1915-1930, New York, 1983. For the specialised application in bridge building see W. de Boer and P.Evers, Amsterdamse Bruggen 1910-1950, Amsterdam, 1983. The term 'Amsterdam School' was coined by the architect Jan Gratama: Haagsma et al., op.cit., p.14.
3. Brief material, with bibliography, by J.S.Curl in Emmanuel, op.cit., pp.198-9; see also de Wit, op.cit., p.166 and passim.
4. The style belongs mainly to the capital, but there are examples elsewhere, for example in Haarlem, Utrecht, and even as far away as Groningen.
5. See, for example, A.Venema, 'Sociaal-Economische Aspecten van de Amsterdamse School', in Venema et al., op.cit., pp.3-14, and for the legislative background: K.Gaillard, 'The Amsterdam School and Public Housing: Housing Policy in the Netherlands between 1850 and 1925', in de Wit, op.cit., pp.145-60. Not all the buildings have been successful socially; for comments by one who spent much of his childhood in one see H.Konig, Amsterdam, Amsterdam, 1977, pp.182-3.
6. The architects 'kregen een spreekbuis voor hun opvattingen in het door H.Th.Wijdeveld opgerichte tijdschrift Wendingen dat van 1918 tot 1931 verscheen' ('had a mouthpiece for their ideas in the periodical Wendingen, founded by H.Th.Wijdeveld, which appeared from 1918 to 1931'): Haagsma et al., op.cit., p.14.
7. Y.Futagawa and W.Holzbauer, Michel de Klerk: Eigen Haard Housing, Amsterdam, 1913-1919..., Global Architecture, 56, Tokyo, 1980, is a beautifully illustrated study of the building, together with another of de Klerk's projects, on the Henriette Ronnerplein. The block known as Eigen Haard, the brick bonding of which is considered in the present paper, was in fact the third built by de Klerk for the Eigen Haard Housing Society on the Spaarndammerplantsoen; excellent photographs of the first two blocks - facing onto the plantsoen (garden; square) itself - accompany M.Casciato, 'Michel



- de Klerk: Utopia Built', in de Wit, op.cit., pp.93-120.
8. The letter is quoted in Futagawa and Holzbauer, op.cit., unnumbered p.7.
  9. Pehnt, op.cit., p.192. After all, Amsterdam's experience with exposed concrete has not always been happy; witness the new (1966) University Library at Singel 425, and some others misplaced amongst the brick houses of the grachten: on this whole topic cf. T.Killiam and M. van der Zeijden with H.Tulleners, Amsterdam Canal Guide, ET, Utrecht and Antwerp, 1978, passim. Moreover, the potential of reinforced concrete for expressionist architecture had been considered by at least some of the Amsterdam School architects: cf., e.g., A.Eibink, 'De toepassing van gewapend beton' ('The Application of Reinforced Concrete'), Wendingen, 2, 11, 1919, 3. The technology of the material, however, was not at the time sufficiently developed, as Erich Mendelsohn discovered when his Einstein Tower at Potsdam (1920-24) had to be built in brick and then rendered to simulate concrete. One of the earliest instances of Amsterdam School building, the Scheepvaarthuis of 1911-16 on the corner of Prins Hendrikkade and Binnenkant, had its 'overdadig gedecoreerde bakstengevel' ('elaborately decorated brick façade') 'aangebracht op een skelet van nieuwerwets gewapend beton' ('applied to a frame of the newly fashionable reinforced concrete'): Haagsma et al., op.cit., p.14.
  10. Brick roads and pavements call for a study of their own; meanwhile, there are useful photographs and comments in C.C.Handisyde, Hard Landscape in Brick, London, 1976, passim. Brick patterning is occasionally found on earlier houses, for example in a narrow band over the shopfront at Niewendijk 24, Amsterdam, and had been used in the medieval period, for example in the gable of the Dutch Reform Church at Leermans, Groningen: illustrated in C.W.Mönnich, Kijk op Kerken, Amsterdam, 1979, p.114.
  11. Cf. T.P.Smith, 'The Size of a Brick - Holland', BBS Information, 31, November 1983, 12-13.
  12. W.M.Dudok (1884-1974): brief material by G.Goulden in Emmanuel, op.cit., pp.217-18; Dudok is best known for his Hilversum Raadhuis, beautifully illustrated in Y.Futagawa and W.Holzbauer, Willem Marinus Dudok, Town Hall, Hilversum, Netherlands, 1928-31., Global Architecture, 58, Tokyo, 1981.
  13. There may be genuine classical influence here, as too in the general symmetry of the façades. It is even stronger in the Hillehuis on the Joh. Vermeerplein, Amsterdam, of 1911-12: cf. W. de Wit, 'De Architectuur der Amsterdamse School', in Venema et al., op.cit., p.52 and caption to illus.35.

Garden Edging Tiles at Shugborough, Stafford. Cheryl Bates of the Staffordshire County Museum is currently developing the Walled Gardens and Gardener's House on the Shugborough Estate as a museum. She would like information about the garden tiles used as edging to the gravel paths around the geometrically arranged beds of the kitchen gardens. Only a few of these tiles remain. They measure 12 by 8 by c.1¼ inches, have a scalloped top, are made from a blue marl, and are unglazed. Miss Bates is keen to locate manufacturers still in operation and those who may have ceased production but still hold samples/stock. It may be possible to reinstate the tile edging at Shugborough, but should this prove impractical a collection of garden edging tiles in various styles could be an alternative. Replies to: Cheryl Bates, Staffordshire County Museum, Shugborough, Stafford ST17 0XB.

# HIORT'S PATENT BRICK CHIMNEYS

## Maurice Exwood

Last year my attention was drawn to a house near Weston Green, Thames Ditton, Surrey, where several bricks in the flank wall were clearly stamped 'HIORT PATENT'.

A study of published material on John William Hiort (1772-1861) helped to explain these stamped bricks and to date this part of the house; but also to throw light on this interesting personality of late Georgian days. Hiort, whose father was a Swede, started work at the age of 14 for the Chief Clerk of the Board of Works, predecessor of the Government Property Services Agency of nowadays. Helped by Sir William Chambers, also a Swede, he made promotion to Chief Examining Clerk of the Board and found himself in charge of a number of unusual projects, including the construction of the bathing machine used by George III to bathe safely in the sea at Weymouth, the organisation of the public funerals of Lord Nelson and William Pitt (1806), and the coronation of George IV (1813). He became architect to Princess Charlotte and designed several ancillary buildings of the Claremont estate. (Claremont is only about 3 miles from Weston Green.) He also contrived the machine used to lower her coffin into the vault of St George's Chapel, Windsor after her tragic death in 1815.

But to come to his bricks: in 1825 he was granted a patent, no. 5284, on a method of constructing chimneys and flues, aimed at solving the problems of builders and architects of the day, when houses, particularly in urban areas, often had ten or more fireplaces on one wall, each requiring a separate flue, typically 9 in by 14 in within and 18-in wall. These chimneys had to snake around the fireplaces of upper floors to end up often in one chimney stack. Small boys were needed to keep them clean and to remove soot from brick ledges - a horrifying thought.

Hiort's patent chimneys had circular channels using special 'bricks', four of which formed a full circle. These were wedge-shaped so that by placing the thick end alternately left and right the channel went straight up, but by keeping the thick end to one side it would gradually bend. The sketch, extracted from drawings attached to the patent specification, may help to explain the scheme. The bricks were glazed on the inside and since the bends were gradual Hiort could claim that his chimneys did not need boys but could be swept by machinery.

The flues were 10 in internal diameter and to accommodate this within an 18 in wall, and to leave some air space (which improved draught, he said), normal bricks but of half normal depth were used in the wall-faces, where the flues were. It was these half bricks which were stamped 'HIORT PATENT', which apart from advertising the name, served to indicate where the flues were and, hopefully, stopped carpenters driving plugs into the wall there.

Hiort had ideas on encouraging good draught by making the chimney pots diamond shaped with the point directed at right-angles to the line of pots, a form of streamlining, and so they were at Weston Green. His scheme needed several types of brick of different shapes and to make these he set up his own works, 'The London, Surrey and Kent Safety Brick Works', at Stangate Old Wharf, Westminster Bridge, Surrey.

Nash, in the extensions and remodelling of Buckingham Palace (1825-30), is supposed to have used these patent chimneys.

Hiort retired from his government job in 1832 and lived in Bath, but returned to promote his schemes in 1847, when he was already 75; but in his autobiography he recognised that his inventions were no longer used.

He died in Kensington in 1861.

The author would be interested to hear of other surviving Hiort chimneys. Information to: Maurice Exwood, F.I.E.R.E., 64 The Green, Ewell, Epsom, Surrey, KT17 3JJ.

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- (Hiort, J.W.) Report of the Aeronomic Association, London, 1852.
- Hiort, J.W. Autobiography, London, 1861.
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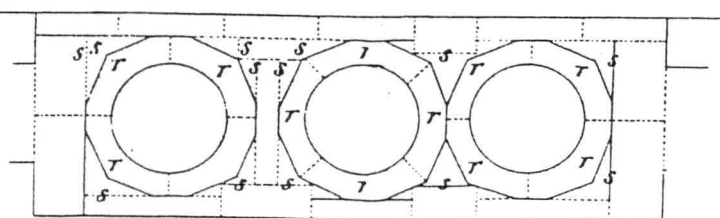
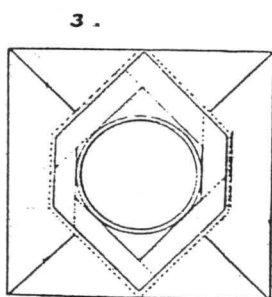
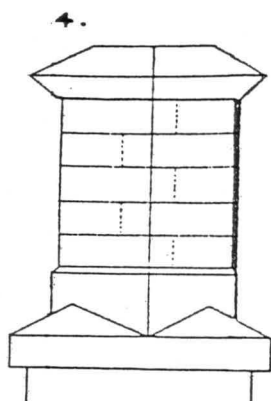


FIG. 2

Some of the drawings accompanying Hiort's patent specification, no 5284 (1825)

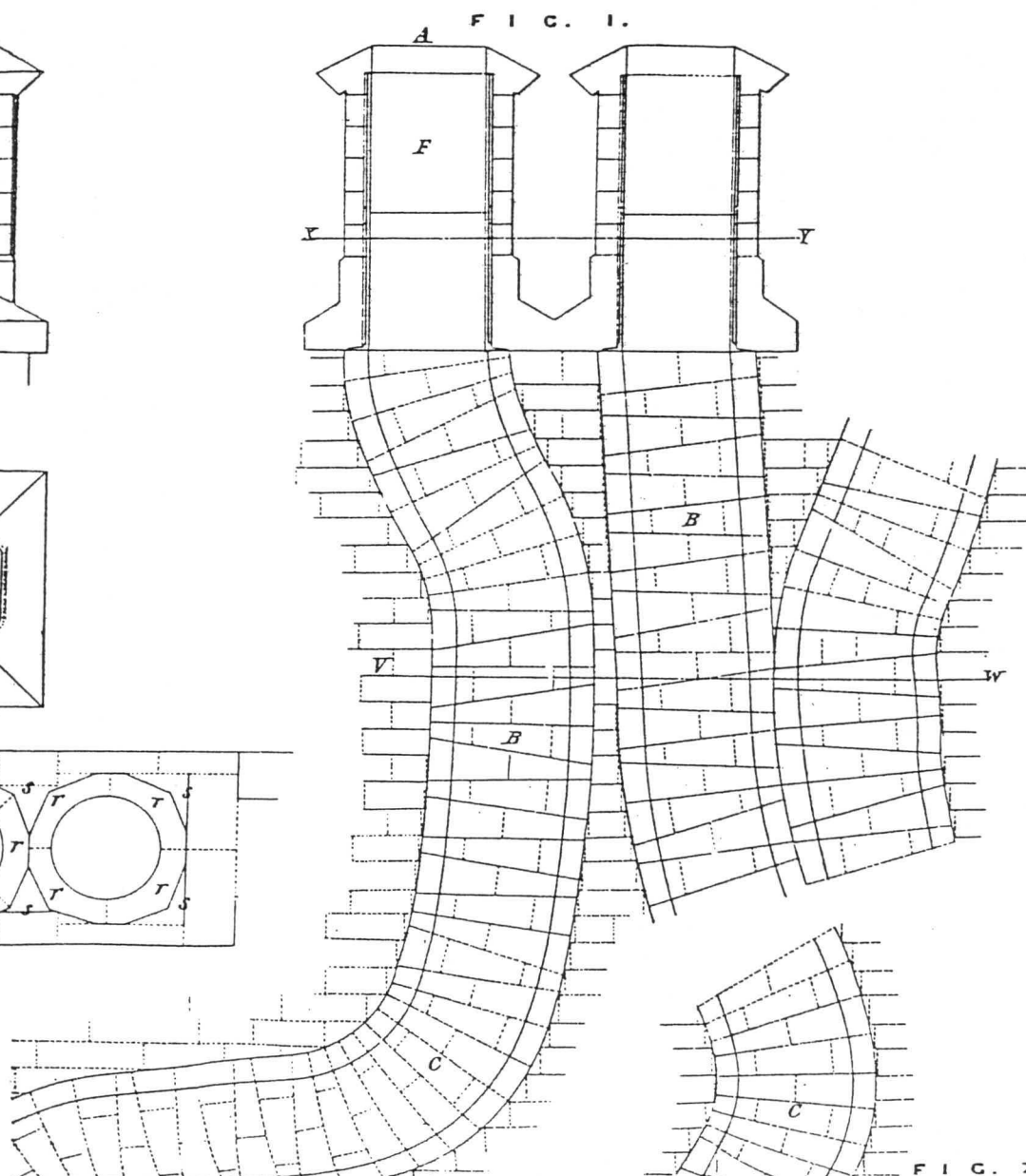


FIG. 7.

## MATHEMATICAL TILES AND THE GREAT HOUSE: HEIGHT AND PROPORTION

David H. Kennett

It is well known that mathematical tiles (brick-tiles) were applied to a number of great houses by several different architects in the eighteenth century. Robert Adam used them at Garrick's Villa, Hampton, Middlesex, and Sir John Soane employed them at two houses in Hampshire - Sidney Lodge, Hamble, and Cuffnells, Lyndhurst.<sup>1</sup> The architects of two of the houses instanced in this note also used mathematical tiles in other contexts. Henry Holland used them in 1777 at the demolished Sloane Place, Chelsea, and in 1786 at Marine Pavilion, Brighton, before he used them in 1787 at Althorp, Northamptonshire. Samuel Wyatt's work with mathematical tiles in the early 1790s includes Leicester Square Farm, South Creake, and the Steward's House, Longlands, Holkham, both of which are on the extensive Coke estates in north Norfolk.

Althorp is one of the great houses of Northamptonshire.<sup>2</sup> Of Elizabethan origin, and in part at least originally a timber-framed building although with a red brick façade to the main front, this E-plan house was faced with white mathematical tiles for the improvements instituted by the second Earl Spencer in 1787. Part at least of the work was to make the house habitable and weather-proof. However, brick would have served just as well for the timber-framed part. But there do seem to be good reasons why Holland chose to use mathematical tiles. First, by using an artificial cladding to an existing structure, the architect could retain the proportions of the original house without making it excessively wider. To clad a building as large as Althorp would require a brick skin two bricks thick. Secondly, Althorp is an extremely tall house. Mathematical tiles weigh far less than bricks. By treating the existing building as a frame and giving it an artificial skin of mathematical tiles the weight the frame had to bear was much reduced from what would have been the case with bricks.

Apart from his work with mathematical tiles in Norfolk, Samuel Wyatt has been thought to be the architect responsible for the cladding of the now demolished Livermere Park, Great Livermere, Suffolk in 1795-6.<sup>3</sup> The original house was built about 1700, as a very tall structure of three storeys, very much on the lines of the nearby Dalham Hall, Dalham, built in 1704 for Bishop Patrick of Ely. When Livermere Park was sold in 1722, the vendor was the third Duke of Grafton, who also owned Euston Hall, another great house in the vicinity. Baptiste Lee bought Livermere Park and to the original house he added long wings and a curving colonade to subsidiary buildings either side of the front courtyard. Lee's descendant, Nathaniel Lee Acton, was responsible for the alterations in 1795-6. The house acquired various embellishments: giant pilasters, a pediment, and a great bow to the garden. Originally of red brick, it was refaced in white mathematical tiles. Even more than Althorp this is an immensely tall house: the three storeys are of greater than usual height and at least on the main façade well proportioned.

In passing it is worth noting that both of Wyatt's houses on the Holkham estate are very tall. If he was the architect responsible for Livermere, he may have transferred an idea that he had used successfully on earlier buildings.

The third house to be considered here is that known as Cooksditch,



20 East Street, Faversham, Kent.<sup>4</sup> It is not in the same class as those already examined, though it is still a large house. It consists of a central double-pile block with two flanking pavilions to left and right of, and standing forward of, the main block. The central block was probably begun by Stephen Gillow of Faversham before 1784, interestingly in red brick. This was decidedly unfashionable by so late a date, and when the pavilions were added, seemingly by Gillow's widow in the period 1784-98, 'white' bricks were employed. At the same time, probably, the older central block was clad in matching 'white' mathematical tiles. Of course, bricks could have been used for this purpose, probably at no greater expense. Perhaps, then, mathematical tiles were once again adopted in order to keep the proportions of the original build.<sup>5</sup>

#### Notes and References

1. M.Exwood, 'Mathematical Tiles, Great Houses and Great Architects', in M.Exwood, ed., Mathematical Tiles: Notes of Ewell Symposium, 14 November 1981, Ewell, 1982, pp.26-30 and literature therein cited.
2. N.Pevsner, The Buildings of England: Northamptonshire, second ed., revised B.Cherry, Harmondsworth, 1973, pp.78-83.
3. P.Reid in Burke and Savile's Guide to Country Houses, III East Anglia, London, 1981, p.250, with photograph of exterior.
4. I am grateful to T.P.Smith for information on this building. It is illustrated in M.Exwood, 'Mathematical Tiles: a Georgian Masquerade', Period Home, 3, 6, April/May 1983, 28, and is discussed in T.P.Smith, Brick-Tiles (Mathematical Tiles) in the Faversham Area, Faversham Papers, Faversham, forthcoming.
5. Note completed April 1984.

## STRUCTURAL BRICK

David H. Kennett

There are about a hundred churches listed in the gazetteer to Brick Building in England from the Middle Ages to 1550. Almost without exception these are churches where brick is visible on the exterior. It may be a complete church such as St Nicholas', Chignal, more commonly known as Chignal Smealy, Essex; more frequently it is a major element of the church plan which has been reconstructed in brick. Most commonly it is the tower. Essex examples include Castle Hedingham, Downham, Liston, and Rayne. Sometimes it is a porch: three examples from Essex are the north porch of St Mary's, Burnham-on-Crouch; the south porch of St John's, Mount Bures; and the south porch of All Saints', Purleigh. Two churches have a chapel of brick: the north chancel chapel of All Saints', Church Street, West Ham, and the north aisle chapel of St Mary the Virgin, Kelvedon. The chancel was rebuilt in brick at St Andrew's, Althorne. At some churches more than one element has been rebuilt in brick: the tower and the porch at St Andrew's, Sandon; the nave and the south porch at All Saints', Feering; and the tower and the south porch at St John the Baptist, Pebmarsh, are three Essex examples. There are churches such as that dedicated to St

Peter and St Paul at St Osyth, again in Essex, where the arcades are of brick.<sup>1</sup> In all these cases the brick was meant to be seen. This use of brick in churches may be termed 'visible brick'.

In contrast there are other churches where brick has been extensively used but is not visible. Three such churches will be instanced. Doubtless there are others.

Between 1978 and 1982 the interior of the north wall of Holy Trinity church, Loddon, Norfolk<sup>2</sup> was stripped of its plaster and the wall was found to be of brick in an irregular Flemish Bond. Loddon church externally is flint-faced, although some bricks were used as a decorative feature to the voussoirs of the clerestory windows.<sup>3</sup> The south wall of this church is currently still covered in plaster; doubtless removal would reveal that brick was used here also.

Like Loddon, the two Suffolk churches to be noted were originally large buildings with an arcade of seven bays at Covehithe - the same number as at Loddon - and six bays at Walberswick. Both are now reduced: Covehithe to two bays inside the nave, Walberswick to four bays of the south aisle. The remainder of these churches is ruinous.

St Andrew's, Covehithe<sup>4</sup> was the work of an ambitious priest, William of Yarmouth, in the fifteenth century. The church was originally flint-faced but the walls are brick. The bond is irregular and does incorporate stone as rubble walling. There is a vaulted crypt below the chancel. The stairs to this are brick arranged round a newel. The vaulting, which is difficult to see, includes brick in the arches.

The church at Walberswick<sup>5</sup> is also dedicated to St Andrew. There is a tower, begun in 1426 and completed in 1450; and this was followed by the rebuilding of the main body of the church. A nave and chancel with south aisle were begun perhaps at the same time as the tower but not consecrated until 1493. The north aisle was added in the fifteen years following. It was standing by 1507. It is not known who designed the main body of the church, but Richard Russell of Dunwich and Adam Powle of Blythburgh were responsible for the tower. Here there is less evidence of brick as the structural material. The chancel, two eastern bays of the south aisle, and the remaining portions of the north wall of the north aisle show much brick in the walling. The remaining portions of the jambs and voussoirs of the windows of the north side are also of brick.

In each of these cases brick has been used as a structural material but faced so as not to be visible in the finished building. This use could be called 'structural brick'.

These are just three instances of large fifteenth-century churches where brick is structural, not visible or decorative. Norfolk and Suffolk have many churches rebuilt in the fifteenth century. These are often flint-faced with much use of flushwork in panels and within arches. When work is done on them, it would be worth examining churches like those at Southwold and Blythburgh, Lavenham and Long Melford, to say nothing of the many in Ipswich, to see how much use has been made of structural brick.<sup>6</sup>

## Appendix: Early Brick in Eastern England

### T. P. Smith

This paper by David Kennett raises important and exciting possibilities for the study of early brick in this country. The east-wise distribution of fifteenth-century (and earlier) brickwork in England is already known, but is based principally on the major buildings - Tattershall Castle, Caister Castle, Wainfleet School, the Guildhall of St Mary and

the Hussey and Rochford Towers at Boston, guildhalls and warehouses in King's Lynn, and so on. At Norwich, Great Yarmouth, and Lynn it was also used, combined with flint or other stone, for the town walls, including such large-scale buildings as the Norwich Cow Tower (all brick) of the very end of the fourteenth century and the Lynn South Gate (brick with stone dressings and later stone front facing) of the mid-fifteenth century. This distribution pattern is enhanced if minor uses are considered: the fourteenth-century vault at Clifton House, Lynn (originally plastered over), the fourteenth-century bone-hole at St Mary-the-Less, Cambridge (vault web on clunch ribs), the rood-stair at Little Wenham, Suffolk, the brick super-arches above the south aisle windows at St Margaret, Lowestoft, Suffolk, and those above some of the windows at St Michael, Beccles, Suffolk (where also are a number of bricks placed haphazardly in the fabric), and so on.

But the 'structural brick' considered in the present paper falls between the two categories: hidden from view as it was, it cannot really be counted as a major use, certainly not as the kind of display use exhibited above all at Tattershall and Herstmonceux and other brick castles or at the manor houses at Rye House, Herts., Faulkbourne Hall, Essex, or Someries Castle, Beds. On the other hand, it is not a minor use like vault webs in bone-holes or super-arches above windows in otherwise stone-built walls. Other examples may certainly be added to the three mentioned by David Kennett: the south-east chapel of St Mary, Horncastle, Lincs., which has limestone dressings to the windows and its red brick fabric rendered and incised to resemble ashlar; so too the north aisle wall of St Nicholas' Chapel, King's Lynn is of rendered brickwork contemporary with the rest of the hall-church which is of stone; the freestanding tower to St Michael, Beccles, Suffolk (a late building of c.1515-47) is of red brick, stone-faced. And the spire of Norwich Cathedral (like the central 'Bell Harry' tower of Canterbury Cathedral) is of brick with stone facing. A late instance of the same thing is the upper part of the west tower of St Mary-the-Great, Cambridge, of 1593-1608. Despite Holy Trinity, Hull in the fourteenth century, and the chancels of Bardney, Lincs. and Herstmonceux, Sussex of the early fifteenth century, the very early ecclesiastical use of brick is not much in evidence. Later, from the second half of the fifteenth century and through the sixteenth century it is found more frequently; David Kennett has cited a number of examples from Essex, and to these could be added a number of others from different parts of East Anglia and Lincolnshire as well as from, say, Kent (which was more tardy in accepting brick than other parts of eastern England): the the Roper Chapel at St Dunstan, Canterbury of c.1524 or the south porch of St Lawrence, Bapchild of c.1533, for example. Perhaps, in the early days, it was felt that brick was not really an appropriate material for churches, despite the impressive precedent and example of the 'Brick Gothic' region of North Europe on both sides of the Baltic from the Low Countries to Byelorussia. Certainly, as is well known, when Henry VI founded Eton College he specifically directed that the walls of the chapel were to contain no 'Bryke', though the other parts of that college are a major use of the material. Moreover, in parts of East Anglia at least flint and stone flush-work was already a display material which, presumably, neither builders nor patrons were happy to abandon even in favour of the newly fashionable brick.

The interesting possibility raised by the present paper is that brick may nevertheless have been used more - perhaps much more - extensively as a structural material in churches than appears from external finishes. What is needed, now, is a watching brief whenever churches in East Anglia or Lincolnshire are undergoing relevant repair work. Can members living in the appropriate areas provide such a service?

Notes and References

1. J.Wight, Brick Building in England from the Middle Ages to 1550, London, 1972, pp.247-70; N.Pevsner, The Buildings of England: Essex, Harmondsworth, 1954, passim, for details of individual buildings.
2. N.Pevsner, The Buildings of England: North-West and South Norfolk, Harmondsworth, 1962, p.248; H.M.Cautley, Norfolk Churches, London, 1948, p.217.
3. This is not easy to see from ground level. It is very clear on a photograph taken before 1914, now in the author's possession; publication forthcoming in D.H.Kennett, The Making of East Anglia, Moorland Publishing, 1985.
4. N.Pevsner, The Buildings of England: Suffolk, 2nd ed., revised E.Radcliffe, Harmondsworth, 1974, p.177; H.M.Cautley, Suffolk Churches, 5th ed., Woodbridge, Suffolk, 1982, p.257; N.Scarfe, Suffolk, London, 1960, p.71.
5. Pevsner, op.cit. in n.4, p.472; Cautley, op.cit. in n.4, p.360; Scarfe, op.cit. in n.4, p.169.
6. Note completed 20 January 1984.

A Brick Commemorating King George V. Mr M.Meacham, who has been a bricklayer for thirty years and has an interest in old bricks, has written to the society asking for information about an interesting brick which he found in the garden of a house where he was working. It is a blue engineering brick with an ornamental frog in which are printed the words 'King George V 1910'. Presumably the brick commemorates the coronation of George V in that year, but further information would be welcome if any member can oblige. Replies to: M.Meacham, 15 Chapel Lane, Little Hale, Sleaford, Lincs.

TPS

## BRITISH BRICKS IN NEW ZEALAND

W. J. Harris

Amongst the few sources of information on the early supply of bricks to New Zealand are the advertisements in our first newspapers. Following the arrival of British settlers in 1840, both building bricks and fire-bricks were included in cargo shipments. Small quantities also came from Australia, Europe, and the United States of America. Imported fire-bricks were usually branded. The district name or maker's name, and sometimes both, provide a useful clue to the origin of a particular brick.

Red building bricks made during the period 1840-1860 generally appear to have variations in the shape of the frog as the only means of identification. Some bricks from this period have symbols, such as hearts, crosses, and diamonds, which pre-dated the use of initials as a maker's brand-mark.

cont./



It can be assumed that there were pioneer brickmakers who emigrated here bringing their wooden moulds and other tools of the trade. It is very difficult to determine whether unnamed bricks from old structures are of local or of overseas origin.

Imports of building bricks were soon phased out as hundreds of small kilns were set up to supply local district needs. A few exceptions included mansion-type residences, erected 1880-1900, where architects' specifications required bricks and other materials from England. ENFIELD and GARRATT are thought to be examples of brands imported at this time.

Shortage of suitable fire-clays, and the expertise to manufacture acceptable fire-bricks at a competitive price, were reasons for dependence on overseas supplies until early this century. Scottish fire-bricks were widely used, especially in the construction of kilns at brickworks. GLENBOIG brand, the most common of Scottish makes, is found with a variety of markings. GARTOSH, CUMBERNAULD, and STAR WORKS from the same company are less common. A thumb-print impression, found on all GARTOSH and CUMBERNAULD and on some GLENBOIG bricks, has not been noticed on other Scottish and English makes. Scotland is also represented by the brands of DOUGLAS, FORTH, HEATHFIELD, HURLL, STEIN, and THISTLE. In the Scottish settlement of Dunedin, a builders' supply company were appointed agents for the Garnkirk Fire Clay Company, who exported bricks branded: GARNKIRK PATENT .

Stourbridge was the largest supplier of English fire-bricks. E. BOWEN, B.FISHER & CO., B.GIBBONS JNR., HARRIS & PEARSON, HICKMAN & CO., E.J. & J.PEARSON, RUFFORD, and TROTTER HAINES & CORBETT are among the makers' names sighted.

One larger than normal fire-brick is marked: STEVENSONS PATENT  
SOLE MAKERS  
GIBBONS BROS LD  
DUDLEY

Other English brand names include: ATLAS, BATES, SANKEY, HEDDON, COWEN, CANNINGTON, and STEPHENSON.

The assistance of the Brick Development Association has been a valuable contribution towards tracing the origins of bricks. In response to the query published in Information 31<sup>1</sup> it was gratifying to receive additional help from the Falkirk Museum, Mr K.Gurcke, and Mr M.D.P.Hammond.

In the same issue, Mr T.P.Smith asks for suggestions on K1 and K2 bricks.<sup>2</sup> I have a poorly made yellow brick of unknown origin and different dimensions, marked K12 in the frog.<sup>3</sup>

Brand marks mentioned in this article are not a complete list of known British markings and further searches and research can be expected greatly to increase the total.

#### Notes and References

1. W.J.Harris, Query 6, BBS Information, 31, November 1983, 27.
2. T.P.Smith, Query 4, BBS Information, 31, November 1983, 26.
3. (See now M.G.Reeder, 'K-Marked Bricks', BBS Information, 32, February 1984, 13-15, where it is shown that the K-marked bricks were manufactured by Knights of Somerleyton, Suffolk. TPS)

## RAT-TRAP BOND AND FLEMISH BOND

David H. Kennett

Rat-trap Bond is known on many buildings in Bedfordshire.<sup>1</sup> Most notably it is found on terraces of cottages at Silver End, Haynes (NGR: TL100 424). These are built two bricks thick with the bricks laid on edge so that the bases of the bricks are seen from the exterior of the building. None of those known to the author have any other bond employed in the primary brickwork.

The present note draws attention to the use of Rat-trap Bond on the back wall of a building, the majority of which is in Flemish Bond. The attractive Wesleyan Chapel at Cardington (NGR: TL093482) was consecrated in 1823. There is a three-bay west front with a central doorway with a porch; the south front to the road (from Cardington to Cople) has a single round-headed window in the centre. To the north of the chapel itself is a schoolroom which overlaps the chapel on the west side. This has a doorway in the south side. The south and west sides of the schoolroom are in Flemish Bond, as is the first two bricks or so of each course of the north side. The rest of the north side is in Rat-trap Bond. There are two straight-headed windows on the north side. These are not demarcated by a change of bond. There is a lower outbuilding at the east end of the schoolroom containing sanitary offices. This too is in Rat-trap Bond.

Though weaker and less weather-resistant than the 'standard' bonds, Rat-trap Bond was cheaper, since, of course, fewer bricks were required to reach a given height of walling. This made it especially suitable for boundary walls - which are non-load-bearing - as opposite St John's Station, Bedford and in a number of places in Hitchin, Herts. Cheapness must be the reason for its use at Cardington, too, for it is relegated to the rear faces, where it would not normally be seen. The building continued to present its 'respectable' (Flemish Bond) face to the world. Certainly at this building there is no reason to think that there was any awareness of the thermal advantages of the cavities which occur in Rat-trap Bond walls.<sup>2</sup>

### Notes and References

1. T.P. Smith, 'Rat-Trap Bond in Bedfordshire', Bedfordshire Magazine, 14, 112, 1975, 344-7. For neighbouring Hertfordshire see: L.E. Perrins, 'Rat Trap Bonded Brickwork in Hertfordshire', Hertfordshire Archaeology, 8, 1980-82, 218-20.
2. Note completed 14 February 1984 following fieldwork 11 February 1984.

A Suffolk Brickmaker's Inventory. Included in 'The Ipswich Probate Inventories, 1583-1631', edited by Michael Reed for the Suffolk Records Society is that of Henry Wiseman, brickstriker, who was appraised on 10 March 1589. As his inventory makes clear, he had been a farmer as well as a brickmaker: his goods included both livestock and six bushels of barley. The specifically brickmaking entries are as follows:

In the yard	£	s.	d.
Item, one old carte with the trayse and halters and one old tumbrell	1	10	0
Item, in brick reddy burnt	2	10	0
Item, in brick unburnt	3	10	0
Item, in blocks iiiij loads	16	0	
Item, in brushe and long loggs, ij loads	6	8	
Item, in pavements burnt	5	0	
Item, in whynns iiiij loads	5	4	

Reference: Suffolk Records Society, 33, 1981, 25-7; quotation from p.27.

DHK

British Bricks in New Zealand? I should appreciate advice whether any of the following brands of bricks are known to be British. British bricks are known to have been exported to New Zealand after the arrival of British settlers in 1840 (see above: 'British Bricks in New Zealand', pp.16-17):

<u>Brand</u>	<u>Colour</u>	<u>Size</u>	<u>Comments</u>
NEWBOLD WL	Cream	Standard	Fire brick
IFB	Pale brown/speckled speckled	9 by 4½ by 3 in.	Fire brick
SUPER AXE	Pale brown/ speckled	9 by 4½ by 3 in.	Fire brick
FURN AXE	Cream	9 by 4½ by 3 in.	Fire brick
S.GLEW MAKER	Cream	9 by 4¼ by 2¾ in.	Moulded facing brick

Replies to 4a Cannon Hill Crescent, Christchurch 8, New Zealand (or as suitable contributions to Information, TPS).

W.J.Harris

A Change of Address Will members please note that C.H.Blowers (formerly of 'Meadowcroft', Hall Park, Great Barton, Bury St Edmunds, Suffolk) has moved and now has the following address for all correspondence: 'Derry Down', Maple Drive, Derrington, Stafford ST18 9NE.

TPS

Stock Bricks of Swale In recent years a number of publications have dealt with the North Kent brickmaking industry, which was at its peak in the late nineteenth century and has declined steadily from that time down to our own day. First was Frank Willmott's Bricks and Brickies (Rainham, 1972), a nicely illustrated account which drew on the author's personal experiences in the brickyards. This was followed by Richard-Hugh Perks' George Bargebrick Esquire (Rainham, 1981), a study of the brick and cement industries centring on the life of George Smeed (the George 'Bargebrick' of the title) and again well illustrated. The Dartford area has been studied by Adrian Herbert in his 'Bricks and Brickfields of Dartford', Dartford Historical and Antiquarian Society News-Letter, 21, 1984, 23-34. Also this year the Sittingbourne Society has published Stock Bricks of Swale by Sydney

James Twist (Sittingbourne, 1984) in the same format as his earlier Murston Village and Parish: a History (Sittingbourne, 1981). The latter had already given information on the brickfields of Murston - they were, in fact, the mainstay of the village community for many years - but in the present booklet attention is widened to the whole area south of the Swale - the stretch of water which separates the Isle of Sheppey from the mainland - and includes Sittingbourne and Faversham as well as Murston and other smaller settlements such as Oare. Like Frank Willmott, Sydney Twist draws on his own experiences, and those of his forebears, in the brickfields of the area. After outlining the technology of Stock Brickmaking, Mr Twist goes on to outline the history and development of the industry, including the use of female and child labour in the yards. The industry developed rapidly with the housing and railway booms of the late nineteenth century and offered a relatively cheap but good quality brick. The cheapness was due to the fact that fuel was included within the bricks themselves; it was obtained from the waste from domestic fires in London, and a symbiotic relationship thus grew up with the capital: the 'roughstuff' was delivered to the brickyards by barge and the bricks taken to the metropolis by the same means. The brickyards, therefore, were typically situated close to the numerous small creeks along the Swale. The housing of the brickmakers is also considered, and a number of yards are described, partly from the author's own reminiscences.

The duplicated format presumably does not permit photographic reproductions, but some line drawings would have been a useful supplement to Etta Van Dyck's admirably clear cover design. Some maps too would have been helpful - even to one who is fairly familiar with the area through a search for brick-tiles. The text, however, is well presented and organised - apart from a déjà vu on the matter of brickmakers' houses. The personal notes are of value in their own right, particularly to those of us whose approach is necessarily 'academic' - which is to say, lacking in that first-hand experience that only a brickmaker can have. This booklet is a useful contribution to the study of the North Kent industry and indeed to the history of English brickmaking generally.

Copies may be obtained from the Fleur de Lys Heritage Centre, Preston Street, Faversham, Kent at 60p 'over the counter' or at 90p by post.

TPS

Brick-Running in Chicago! I am grateful to David Kennett for drawing my attention to a report in The Guardian during August concerning the theft of bricks from standing buildings in Chicago. For environmental reasons there are now no brickyards operating in the city, and there is thus a ready market in old bricks. Many are obtained from buildings of historical or architectural value - and stolen extremely rapidly. They are used not only in Chicago but also elsewhere, many being shipped down the Mississippi. Chicago is the best documented case, but bricks are also being stolen from standing buildings at St Louis. The authorities of both cities are studying what can be done to prevent the thieving.

TPS