

THE RELATION OF THE GEOLOGY OF EAST ANGLIA TO ARCHÆOLOGY.

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The relation between these two sciences in East Anglia was closer and more marked, than it could be in any other part of Great Britain, chiefly because of the peculiar geological conditions which existed in Norfolk and Suffolk, and partly in Essex. Certain formations were met with there which were not found in any part of the United Kingdom, and this had exercised an influence over certain features of ecclesiastical and other architecture, stamping them with a peculiar individuality. In going through our Australian Colonies we might see the evolution of church architecture condensed into little more than a quarter of century, just as a red deer annually reproduced in the increasing number of its tines the evolution of its race. In an Australian bush town the first church would be built chiefly of wood, as was the case with nearly all the Saxon churches in this country. In a few years it would have a roof of corrugated iron; then would come the stone period, replacing the original structure, and perhaps on the identical spot, owing to its having been consecrated. Our early churches, up to shortly before the Norman period were built chiefly of wood, England was a forest-clad country, and wood must have been the chief quarry, except in freestone and limestone districts. Although East Anglia was one of the early settled districts, there must have been considerable difficulty in conveying large quantities of stone inland. Hence we find that in the

districts of Norfolk, Suffolk, and Essex, where the subsoils were boulder clay, the stones for church building were collected on the spot, turned up by the plough, or picked off the ground. The external form of tower, into which they could be most easily worked, would be a round tower, and there were more round tower churches in Suffolk and Norfolk than all the rest of England put together. A modification of these occurred later on, when the upper part was made octagonal, each angle being strengthened by freestone. The highly artistic stone-work of the later Norman period, as well as that of the early English and Decorated styles, were possible, because the Oolitic limestone used for that purpose was worked almost as easily as cheese, when freshly quarried. This was brought over chiefly from Caen, in Normandy, for use in the eastern-most parts of East Anglia. Further west we got more Barnack stone, from the village of that name, in Northamptonshire. The Abbey of Bury S. Edmund's, which was originally a huge wooden structure, was re-built chiefly of this stone, King William forgoing his tolls on this occasion. It was singular how certain kinds of stone had come to be used for special church work. Thus the fonts, altars, slabs, &c., were frequently formed of Purbeck marble, a fresh water limestone crowded with fossil shells, only found at Purbeck. During that great church building epoch, known as the Perpendicular period, the outlying buttresses, clerestoried windows and other elaborate work, demanded a greater use of Oolitic freestone, and this was probably the reason that at that time it was most abundantly used. The later Decorated and Perpendicular churches in districts where the black flints could be obtained directly from the chalk, allowed of those flints being faced and squared, and this led to the lovely flint and panel work seen at its best perfection at Norwich, both in ecclesiastical, municipal, and other buildings. It would have been impossible for the shattered flints, obtained from the boulder clay, where they had originally been deposited by ice-action, to have been worked in this

manner. Accordingly we find them used in all churches down to the Tudor period, just as they were picked up, so that our East Anglian churches were capital geological museums, containing stones, chiefly flint, from all the geological formations between here and Scotland. The early Romans availed themselves of those masses of clayey carbonate of lime, which occur in the London clay, and are known as Septaria. The Roman wall at Colchester is built chiefly of them, so is the keep at Orford Castle, and many of the high-towered churches along the Suffolk and Essex coast have this stone in their composition, especially when the London clay happens to crop out in the district. These Septarian stones are common along the southern parts of the Suffolk coast. The West Rocks off Harwich are formed of them. The Carstone Churches in West Norfolk, the hard Coraline limestone, which only occurs in the neighbourhood of Orford, must have locally affected church architecture; and very hard put to it the church builders must have been in a district where no natural quarries are found, to obtain the materials wherewith to build the grey old churches of our towns and villages, of which East Anglia can boast to possess the most splendid, and well preserved examples. The architects of the ancient Norman castles, as well as those of the best Monasteries of later time, were men who were practical geologists, even if they knew nothing about the theory. It did not astonish them to find shells and fish remains in stones, for these were fully explained in those times by the theory of the Deluge. Modern architects, with all the resources of civilization available to their hands, and with the means of rapidly bringing from any part of the Kingdom, or the world, materials they needed to complete and perfect their work, could not but be surprised at the noble buildings, ecclesiastical and otherwise, visited by this Society during its annual summer rambles, which had been erected under conditions as widely contrasted to those of modern times as it was possible to conceive.