

THE ARCHAEOMAGNETIC METHOD AND THE CULTURAL-HISTORICAL DATING OF BRICKS FROM THE CHURCHES OF ESPOO AND KIRKKONUMMI

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The basis for the dating of Finnish medieval churches has traditionally and naturally been the details in architecture, mainly frontal triangulars and vaults. Also the technics of setting the stones in the walls as well as the posts in the openings have been used (Lindberg, 1919; Rinne, 1941; Kronqvist, 1948; Drake, 1967; Gardberg, 1978). Recently the coin dating method has been arriving to Finland (Edgren, 1977; Hiekkänen, 1982; Knapas, 1983; Koivunen, 1979; Sarvas, 1977, 1982; Taavitsainen 1979) though the atmosphere towards it among some historians of architecture is still somewhat reserved. And of course the written sources are used generally in dating though problems in identification of the 'right' church or its phase among documents of different times and types is far from solved (Kronqvist, 1932; Lindberg, 1975; Gardberg, 1979; Gallén, 1978).

Nevertheless it seems to me that the dating construction of the Finnish medieval churches is still incoherent and mainly rests on a few datings regarded as correct and convincing. A little pointedly I would state that the construction is a pyramide standing on its top. If one dating is questioned, then the whole construction is shaking. As a striking example I can mention that the dating of the first vaulting of the cathedral of Turku (Sw. Åbo), the main ecclesiastical building of medieval Finland, has recently been questioned with good grounds. The widely accepted date of the vaulting to the late 13th century has been criticized in *Finskt Museum* 1981 by Antero Sinisalo who — as it seems to me — with rather convincing arguments proposes a new date to the latter half of the 14th century. A whole group of churches and their dating in south-western Finland is closely connected to the dating of the first vaults in Turku cathedral. It is therefore obvious, according to Sinisalo, that also their dating must be consequently changed. The churches listed by Sinisalo are Nousiainen (Sw. Nousis), Vehmaa (Sw. Vemo), Mynämäki (Sw. Virmo), Parainen (Sw. Pargas) and Taivassalo (Sw. Töfsala). I would like to add to this list the churches of Inkoo (Sw. Ingå), Kirkkonummi (Sw. Kyrkslätt) and Porvoo (Sw. Borgå) in the province of Uusimaa and the ruins of the church in Ulvila (Sw. Ulfaby) Liikistö in the province of Satakunta.

The accelerating use of scientific dating methods in archaeology — of which this congress is a living example — has not notably affected the study of medieval buildings in Finland. For example dendrochronology has been widely accepted but starting to use it in practise has met with indifference even on an organisatory level (see Hiekkänen, 1984). The radiocarbon method has, however, been successfully used in the castles of Häme (Päivi Luppi, pers. comm.) and Kastelholm (see Olsson, this publ.).



Fig. 1. The medieval church of Espoo viewed from the South-east. The Southern arm was added in 1821. Archives of the Department of Monuments and Sites, National Board of Antiquities, Helsinki. Photo Pasi Kaarto.

One further method significant in architectural history has since the beginning of the 1980's been experimented in Finland, namely the archeomagnetic method. The underlying theory of the method was described and discussed at this congress by Lauri Pesonen and Matti Leino from the Geological Survey of Finland who initiated and proposed the use of archeomagnetism in Finland. Already at this stage one can notice that the results are promising and I believe that in the future the method will be successful in controlling the convenient datings as well as making them more precise.

The aim of this paper is to present with the help of two churches and some already analyzed bricks from them some possibilities of the archeomagnetic dating method in solving rather difficult dating problems connected with these churches. As I will show, the archeomagnetic dating of the bricks has significance not only in these two cases, but the results may have wide effect to the dating of many other churches in the province of Uusimaa and elsewhere.

The bricks from the church of Espoo (Sw. Esbo, fig. 1) were sampled during the architecture historical and archaeological investigations which I carried out in 1981—82 in connection with the restauration of the church. The results of the investigation will soon be published with the financial support of the parishes of Espoo. The sample analyzed by the archeomagnetic method comprises four groups of bricks (in the following types A—D), viz. wall bricks (A), floor bricks (B), profiled bricks from the dismantled ribs (C) and bricks from the main altar (D).

The bricks of type A, wall bricks, belong in this case directly to the time when the building proper was erected. Different opinions of the absolute date of the building have been given. August Ramsay states that the church was already built in the year



Fig. 2. Part of the medieval brick floor in the northern part of the choir of Espoo church, viewed from the west. Note the thick underlying structure. Archives of the Department of Monuments and Sites, National Board of Antiquities, Helsinki. Photo Matti Huuhka.

1458 at the latest when the first minister of the parish (*curatus*) is mentioned (Ramsay, 1924 p. 248; FMU 2989). To connect the first mention of a minister with the building of the stone church is in my opinion rather unsatisfactory. Iikka Kronqvist dates the church to the second half of the 15th century (Kronqvist, 1934 p. 5). Knut Drake, the author of the history of Espoo church, maintains that all the visible parts of the church are from the 1480's or from the beginning of the 1490's (Drake, 1958 p. 26). The basis of the dating seems more or less to be the details in frontal triangles and vaults. The medieval coins found during the archaeological investigations in 1981—82 and analysed by Pekka Sarvas date the building to the 1430's or 1440's (Sarvas, 1982 p. 43). The last mentioned dating is in my opinion the most reliable of all the dating proposals but, in any case, there is so much divergence in dating of the building that an independent dating method is needed.

The next group analyzed archeomagnetically is floor bricks (brick type B). During the excavation a very solid floor laid of floor bricks was found in the choir of the church (fig. 2). Its dating is of course connected with the dating of the building, i.e. it is *post quem* the building. A floor laid of the same kind of bricks as in Espoo was found during the excavations which I carried out in the church of Lempäälä, Satakunta in 1983. In this case the floor was found in the sacristy of the church; preliminary dating is the first half of the 15th century. Bricks of the same type are found also in the so called Bishop's House in Vadstena, Sweden. The building can be dated to the end of the 15th century (Andersson, 1950; Hasselmo, 1982). I have found out that similar type of bricks have been used also in the vaults of the church of Tenhola (Sw. Tenala), Uusimaa. These vaults can be ascribed to a master builder by the name

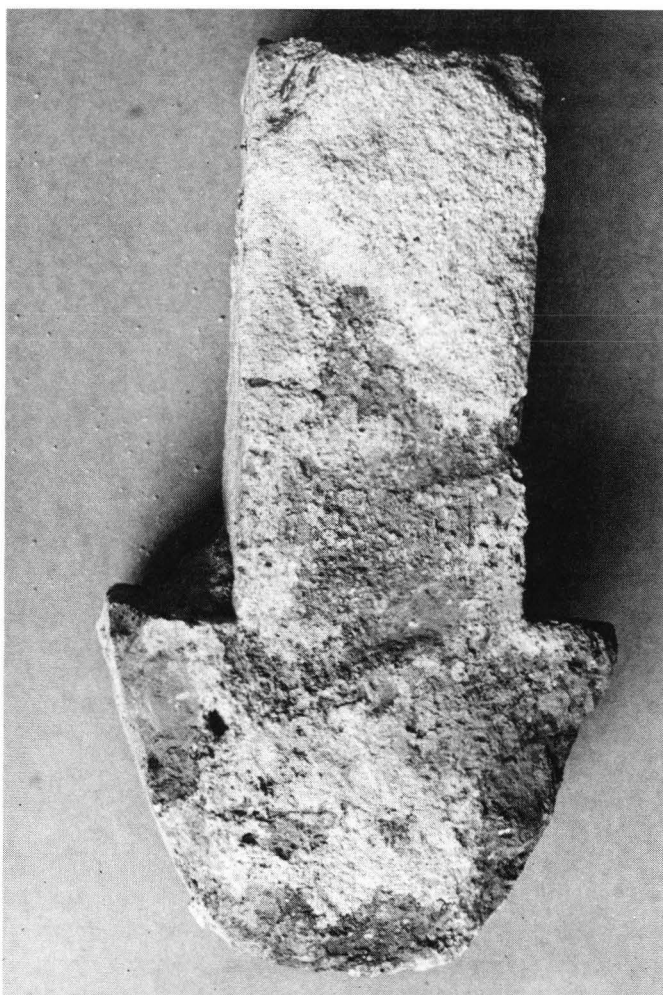


Fig. 3. A profiled rib-brick from the dismantled ribbed vaults of the church of Espoo. Photo Markus Hiekkänen.

»Petrus de Cymitto» (Peter from Kemiö), who vaulted also the cathedral of Turku transforming it to a basilica in the early 1460's (Nordman, 1938 p. 13—14; Gardberg, 1978). In any case, the dating of the bricks of type B vary from the first half of the 15th century to the early 16th century.

The profiled bricks (type C, fig. 3) from dismantled ribs (the enlargement of the church took place in 1821—23) by their shape belong to a common type from the late middle ages in Finland. The dating problem is concentrated here to the origin of the vaulting system of Espoo church (fig. 4). The town church of Porvoo (Sw. Borgå) is considered the earliest one vaulted in the same manner as the Espoo church (Kronqvist, 1948). According to a late tradition it was vaulted by a master builder from Rostock called Carsten Nübuhr around 1450 (Gardberg, 1978 p. 22; Hiekkänen 1981 p. 23). The reliability of this tradition can be argued and an independent dating could cast light not only to Espoo but most churches of the province of Uusimaa and also Finland Proper (for example Perniö Sw. Bjärnä and Laitila Sw. Letala).

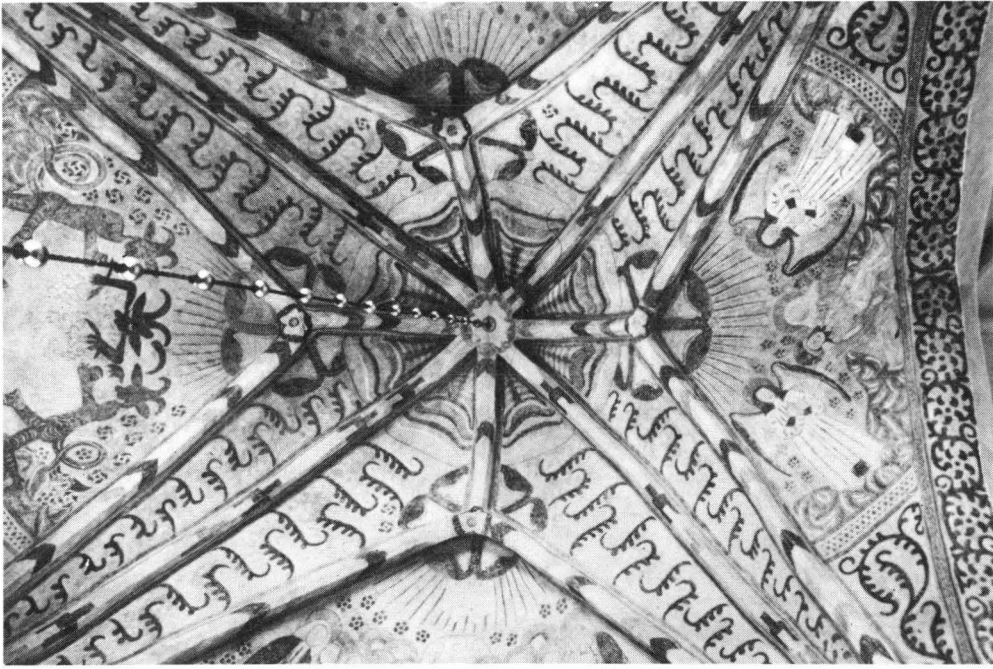


Fig. 4. The westernmost star-ribbed vault of the middle nave of the church of Espoo. Helena Edgren (1981) dates the *al secco* paintings to the early 16th century. Archives of the Department of Monuments and Sites, National Board of Antiquities, Helsinki. Photo K. K. Meinander.

The bricks of type D were sampled from the post-medieval main altar of the church. This altar has been previously dated to the year 1655 (Ramsay, 1936 p. 113; Drake, 1958 p. 70); the source for the dating has not been mentioned. However, I have found in the books of accounts of the Espoo Ministry notes from years 1692–95 concerning the wages of the workers and the costs of building material (incl. 340 bricks) for a new altar and a cellar of the church (Account Book 24. 11. 1692, 7. 6. 1694 and 1695 without exact date). An independent dating method would be of help here, too.

The bricks from the church of Kirkkonummi (Sw. Kyrkslätt) were sampled from the earth outside the church by Lauri Pesonen, Matti Leino and myself in 1982 (fig. 5). The sample comprises bricks of two types (E and F). The bricks of type E are characterised by a one-sided rounded extension and type F is semi-circular. Both types belong to the same building period of the church (phase IV) according to Drake (1960 p. 54–58). These bricks and the constructions which they belonged to were dated by Drake to somewhat after the year 1300. The dating was made on the basis of the great resemblance of the bricks of Kirkkonummi with bricks from the first vaults of the cathedral of Turku and also the bricks from the church of St. Henric in Nousiainen (Fig. 5). However, as mentioned earlier, the first vaulting of the Turku cathedral, previously dated to the late 13th century was, according to Sinisalo, (1983 p. 39) carried out after mid-14th century. If this is true, a new date must be given also to the church of Nousiainen. Accordingly, the dating of phase IV in Kirkkonummi must be altered. But the consequences do not restrict to this. Also dating of the churches of Inkoo (Sw. Ingå; see Kronqvist, 1938; Kartano, 1950) and Porvoo (phase I) must be reconsidered,

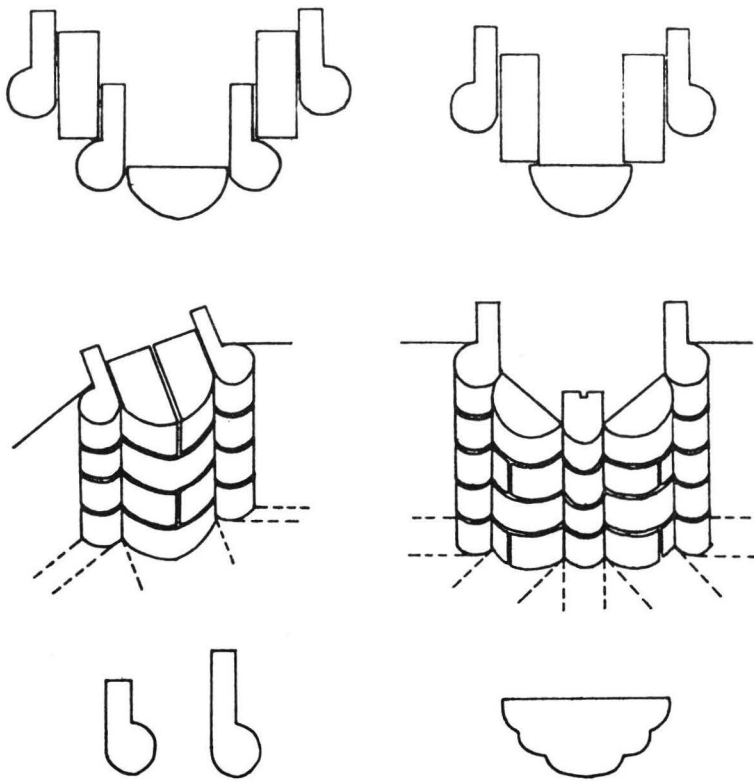


Fig. 5. Profiled bricks from the churches of Turku, Nousiainen and Kirkkonummi. First row, sections of the pilasters in the Turku cathedral. Second row, axonometric projection by Sixten Ringbom of the pilasters of Nousiainen church. Third row, sections of profiled bricks found in Kirkkonummi church in the archaeological excavations of 1956 (after Drake 1960). Same types of bricks were sampled for archaeomagnetic dating outside the church in 1982.

and the dating of these churches has profound significance in the dating of other churches in Finland.

We need a new independent dating method and in my opinion the archeomagnetic method could be one, regardless if it concerns the dating of a whole church or a detail of it.

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