THE DESIGN OF THE ANCIENT SYNAGOGUES IN JUDAEA: HORVAT MA'ON AND HORVAT 'ANIM

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Horvat Ma'on, Synagogue I (Fig. 1)[1]

To discern the original unit of measurement used in the design of the plan of Synagogue I, we divide the inner length of the prayer hall by its inner width:

12.90 m : 8.70 m = 1.483

Inherent in the coefficient 1.483 is the ratio 3:2 = 1.5 which engenders the *hemiolion* (the 3:2 rectangle).[2] Further division of the inner length of the hall by 3 and the inner width by 2 renders the module (M) of the plan:

12.90 m : 3 = 4.30 m 8.70 m : 2 = 4.35 m

The average length of the module is 4.325 m. Next, subdividing by successive whole numbers to obtain the basic unit of measurement gives:

4.325 m : 13 = 0.3326 m
" : 14 = 0.3089 m
" : 15 = 0.2883 m

The value 0.3089 m is identical to the early Byzantine *pous*, found by F.M. Abel engraved below an inscription near Bethlehem.[3] This foot was used in design of churches in Illyricum, Syria and Palaestina, as well as in several synagogues in Galilee.[4]

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1. Z. Ilan - D. Amit, "Horvat Ma'on, Synagogue", in *Excavations and Surveys in Israel 1988/1989*, vol. 7-8, English Edition of Hadashot Arkheologiyot, Archaeological Newsletter of the Israel Antiquities Authority, Numbers 92-93, Jerusalem 1988-89, 6-8; Z. Ilan, *Ancient Synagogues in Israel*, 1991, 308-310 (in Hebrew).

2. D. Milson, "The Design of the Ancient Synagogues in Galilee - v", *LA* 41 (1991) 449-454.

3. F.M. Abel, "Inscription grecque de l'aqueduc de Jérusalem avec la figure du pied byzantin", *RB* 25 (1926) 284-288.

4. D. Chen, "On Planning Synagogues and Churches in Palaestina: A Comparison with Syria and Illyricum", in G.C. Bottini *et al.* (eds.), *Christian Archaeology in the Holy Land*, Jerusalem 1990, 523-533.

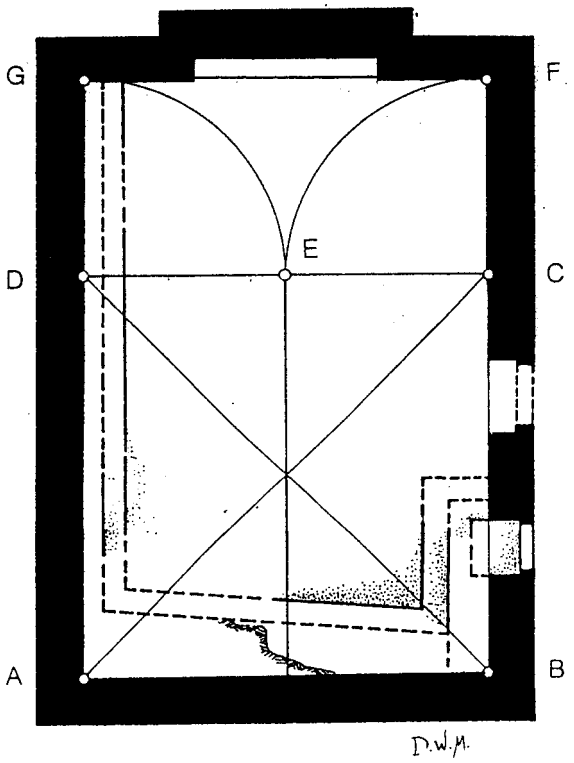

Fig. 1 Horvat Ma'on Synagogue I: geometric diagram of the plan (based on drawing by Ilan).

Calculation of the dimensions of the plan of Synagogue I according to the *pous* of 0.3089 m gives:

Outer length of the building:	48 *podes* = 14.82 m (14.90 m read from the plan).
Outer width of the building:	34 *podes* = 10.50 m (10.50 m published).
Inner length of the naos:	42 *podes* = 12.97 m (12.90 m read from the plan).
Inner width of the naos:	28 *podes* = 8.65 m (8.70 m read from the plan).
Breadth of the walls:	3 *podes* = 0.927 m (0.90 m to 1.00 m published).

The plan of the Synagogue I at Horvat Ma'on could be designed to any scale by drawing the basic square ABCD. Half the side of this square, DE, when projected aside, engenders the inner contour of the naos, the *hemiolion* ABFG.

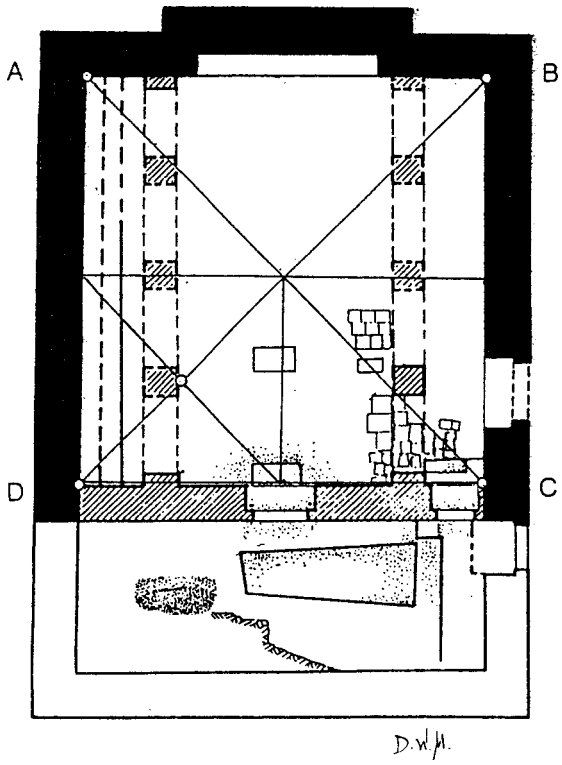

Fig. 2 Horvat Ma'on Synagogue II: geometric diagram of the plan (based on drawing by Ilan).

Horvat Ma'on, Synagogue II (Fig. 2)

Synagogue II at Horvat Ma'on was built upon the walls of the earlier synagogue. Yet, the new building was shortened by 3.5 m. In shape it is a basilical hall with a central nave and two lateral aisles. Two doorways were built in the new southern facade, one leading into the nave, the other to the eastern aisle. Builders of Synagogue II adopted the inner width of the earlier synagogue, 28 *podes*, as the base of the square ABCD which defined the form of the new naos.

The naos of the later synagogue was defined *ad quadratum*, by subdivision of the square ABCD. The clear width of the nave measures 14 *podes* or 4.32 m (4.30 m read from the plan), that is half the inner width of the naos. The clear width of the aisles was set at $4^1/_2$ *podes*, or 1.39 m (1.40 m read from the plan).

Horvat ‘Anim, Synagogue (Fig. 3, 4)[5]

The inner length of the naos of the synagogue at Horvat ‘Anim is the same dimension (12.85 m to 12.90 m) as the inner length of the naos of the Synagogue I at nearby Horvat Ma‘on. We attribute therefore, the same basic unit of measurement as that used at Horvat Ma‘on to the synagogue at Horvat ‘Anim, that is the early Byzantine *pous* of 0.3089 m. Measuring the synagogue at Horvat ‘Anim we noticed that the western wall of the building was rebuilt in antiquity. The trench dug along the inner face of that wall from the north-west corner of the naos, 2.15 m towards south, reveals the face of the original western wall set some 0.35 m further east than the rebuilt wall. This datum, missing in the published report, reduces the original inner width of the naos to 6.45 m, instead of 6.80 m as it measures now. The report does affirm that the portico in front of the eastern wall of the synagogue is not part of the original structure.

Calculation of the dimensions of the synagogue at Horvat ‘Anim according to the *pous* of 0.3089 m renders:

Outer length of the building:	47 *podes* = 14.518 m (14.50 m measured).
Inner length of the naos:	42 *podes* = 12.97 m (12.85 - 12.90 m measured).
Inner width of the naos:	21 *podes* = 6.487 m (6.45 m measured).
Outer width of the main doorway:	4½ *podes* = 1.39 m (1.41 m measured).
– of the secondary doorway:	3 *podes* = 0.927 (0.92 m measured).
Breadth of the walls:	2½ *podes* = 0.772 m (0.80 m measured).

The proportion of the naos of the synagogue is 2:1; in terms of geometry it is the double square ABEF, 42 *podes* by 21 *podes*. Thus, the module is 7 *podes* long. The courtyard in front of the eastern front of the synagogue is also a double square, it measures 42 *podes* by 21 *podes*. The proportion of the double square, used in the design of the Temple in Jerusalem (I Kings 6,7) is rare in synagogue architecture; it has been found so far solely in the naos of the synagogue at Meron in Galilee which measures 92 by 46 Roman *pedes* of 0.2957 m.[6] Furthermore, it is of interest to note that the *naoi* of both synagogues at Horvat Ma‘on and at Horvat ‘Anim are of the same length. This dimension of 42 *podes* appears in Syria too, in the East Church at Burj Haidar, as the inner width. This phenomenon has al-

5. Ilan, *Ancient Synagogues in Israel*, 302-304.

6. D. Chen, “The Design of the Ancient Synagogues in Galilee”, *LA* 28 (1978) 193-202.

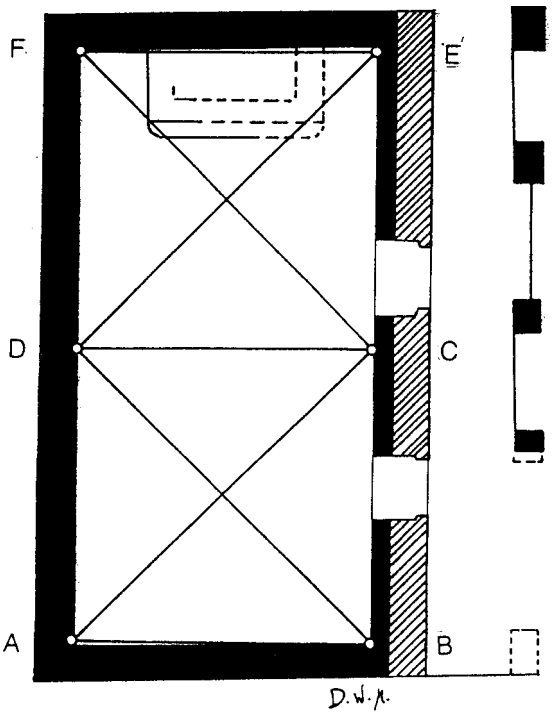

Fig. 3 Horvat 'Anim Synagogue: geometric diagram of the plan (based on drawing by Ilan).

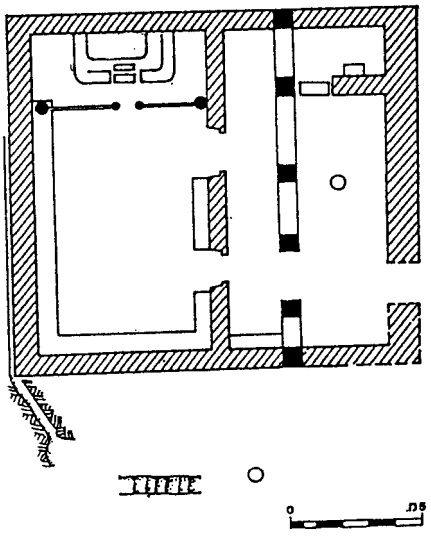

Fig. 4 Horvat 'Anim Synagogue: The plan of the synagogue compound (according to Ilan).

ready been noted in the design of the synagogues at Capernaum and Horvat ‘Ammudim, in the Galilee, as well as the design of churches at Nissana and Rehovot in the Negev.[7] Geometrical design, modular coordination and compatibility of dimensions in synagogues at Horvat Ma‘on, at Horvat ‘Anim, and the design of other synagogues and churches in the region,[8] render further proof that a manual on the design of sacral buildings, Christian and Jewish, freely circulated in *Palaestina.*

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7. Chen, “On Planning Synagogues and Churches”.

8. D. Chen, “The Design of the Ancient Synagogues in Judaea: Masada and Herodium”, *BASOR* 239 (1980) 37-40; “Antike Synagogen in Palaestina: Anlage und Datierung der Synagogue von Horvat Rimmon”, *Judaica* 45 (1989) 57-67; “The Design of the Ancient Synagogues in Judaea: Eshtemoa and Horvat Susiya”, *LA* 42 (1992) 297-303; D. Milson, “Byzantine Architects at Work at Herodium, Palaestina Prima”, *LA* 39 (1989) 207-211.