

A STONE OBSERVATORY AT BRIC PINARELLA (ITALY)

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An intricate stone building (likely a hut) of unknown age but with a distinct astronomical function is located at Bric Pinarella (Savona, IT), in the Ligurian Apennines (ϕ 44°11'58"N; λ 8°19'56"E; alt. 359m a.s.l.).



FIGURE 1

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The main space of the building has a rectangular plan of about 10 m length and 6 m width. Walls are preserved for up to 2 m above the ground and are built in stones without mortar. No openings such as doors or windows are currently visible in the remains. The roof collapsed long time ago and was probably made of perishable material such as wood

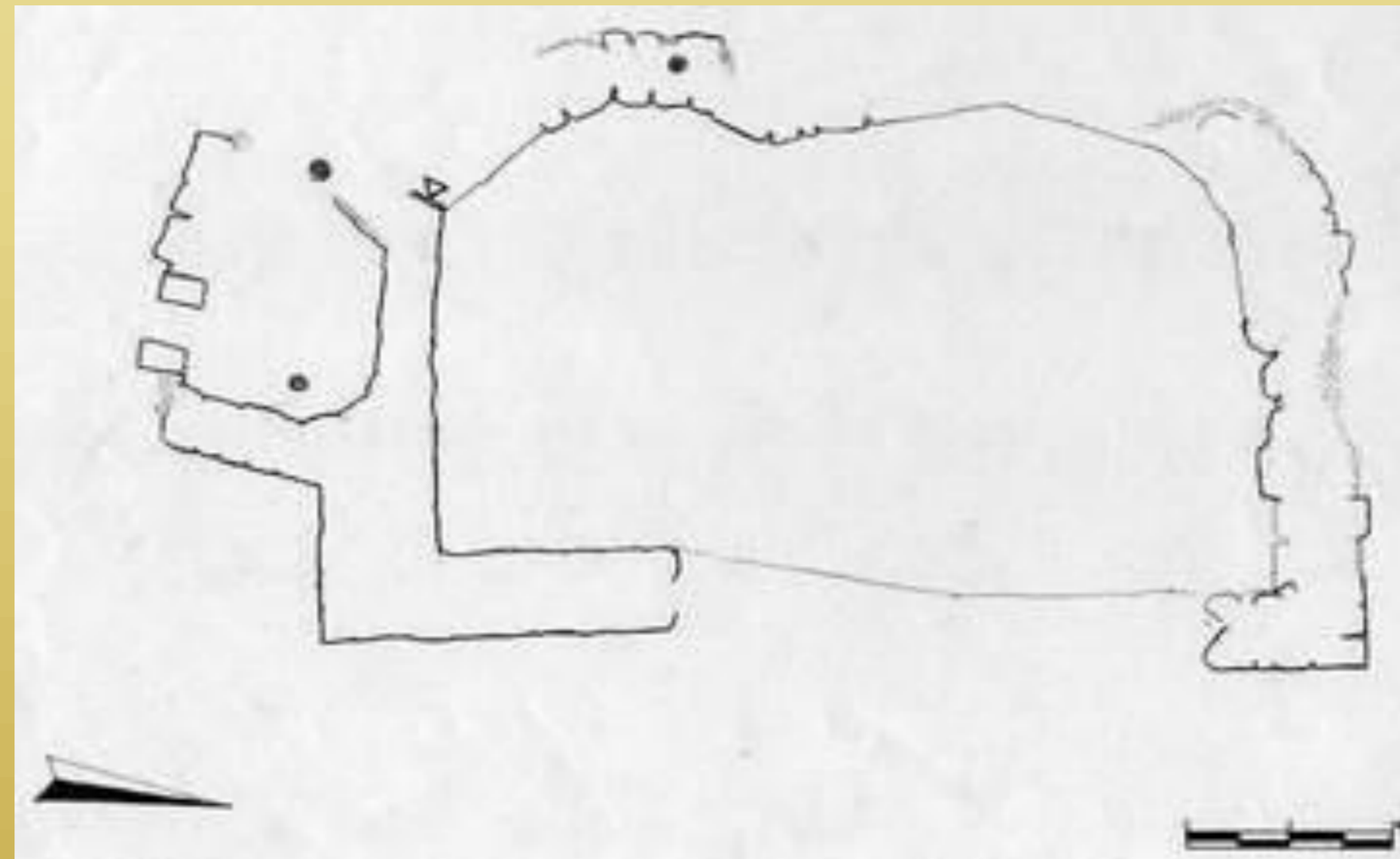


FIGURE 2

Plan of the building at Bric Pinarella. The small arrow pointing toward a short segment in the south wall shows the location of the only stratigraphic relationship observed in whole construction (figure 3). Black dots near the south and west walls provide the locations of the trees. The single line in the east wall is used to suggest the inner alignment of the wall which was covered by the ruins at the time of the survey (drawing by G. Pesce)

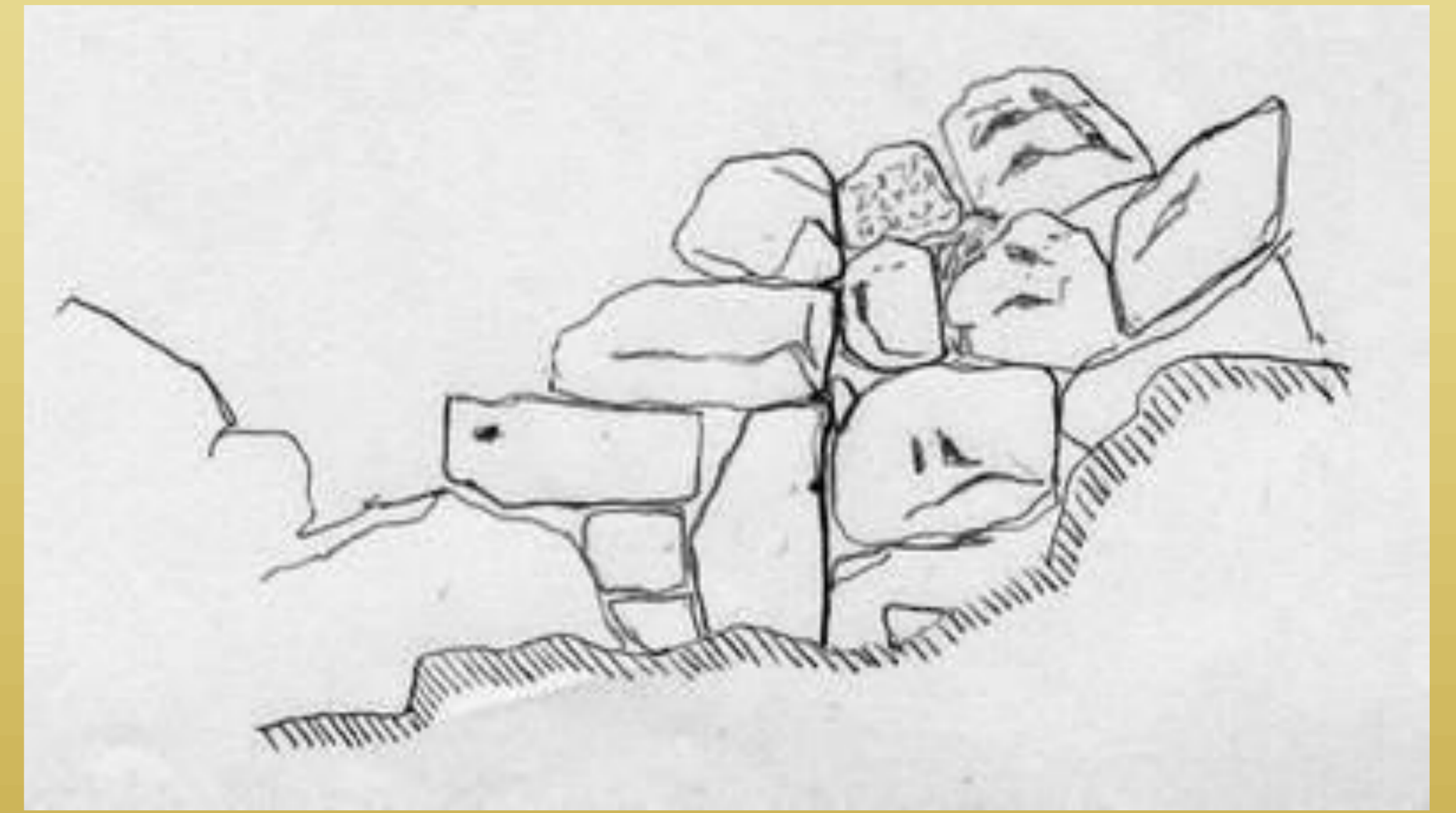


FIGURE 3

Sketch of the inner front of the south wall at the location highlighted by the small arrow in figure 2. The three stones vertically aligned suggest existence of an interruption in the stonework that could be related to an opening (e.g. door) or to cornerstones (sketch by G. Pesce)



FIGURE 6

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About 30 meters away from the building, in an area without vegetation at the edge of the hill, is located a bare horizontal rock from which it is possible to enjoy a full free view of the eastern local horizon (the Mânie plateau), located some kilometres away.



FIGURE 5

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This image was taken at 12h 33m UT+1 and shows that the shadow of the gnomon is parallel to the inner side of the two standing stones. The time at which this image was taken is the time of the local noon on 23rd March 2003 (local const.: 12h 26m 40s; equation of true time on 23rd March 2003: +06m 42s).



FIGURE 4

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Few meters south from the southern wall of the main space, are located two little standing stones, which are 0,5 m apart. Axis passing in between these two standing-stones is not aligned neither is a prolongation of the main axis of the stone building which is rotated compared to it. Because of this and because of the small size of the opening and of the lack of a doorstep, it is difficult to identify these stones as the threshold of the related space. Our measurements proved that the two stones are aligned with the local meridian, with an axis of $360^\circ - 180^\circ$, showing its course. Therefore, they operate like a rough "meridian circle".



FIGURE 8

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Both, elongated stone and hole, are oriented toward East. Through the hole it is possible to observe the Sunrise at the equinoxes. This image shows the Sunrise on 23rd March 2003 (on 21st and 22nd March the sky was cloudy).

CONCLUSIONS

Thanks to our measurements it has been possible to demonstrate that the two standing-stones and the hollow stone at Bric Pinarella allowed the builders to determine:

- 1) The Sun transit over the local meridian (Sun meridian transit), that is the true (or local, or astronomical) noon.
- 2) The different daily height of the Sun meridian transit during the four seasons.
- 3) The Sunrise at the equinoxes on the local skyline.
- 4) The Sun shift on the local skyline from south to north and vice versa, from the winter to the summer solstice and vice versa.
- 5) The relationship between different daily heights of the Sun at noon and the related sunrise points during the four seasons.
- 6) The daily time lag (50 minutes) of the Moon meridian transit as regards to the daily meridian transit of the stars.
- 7) The difference between the sidereal month (27,32 days) and the synodic month (29,5 days).

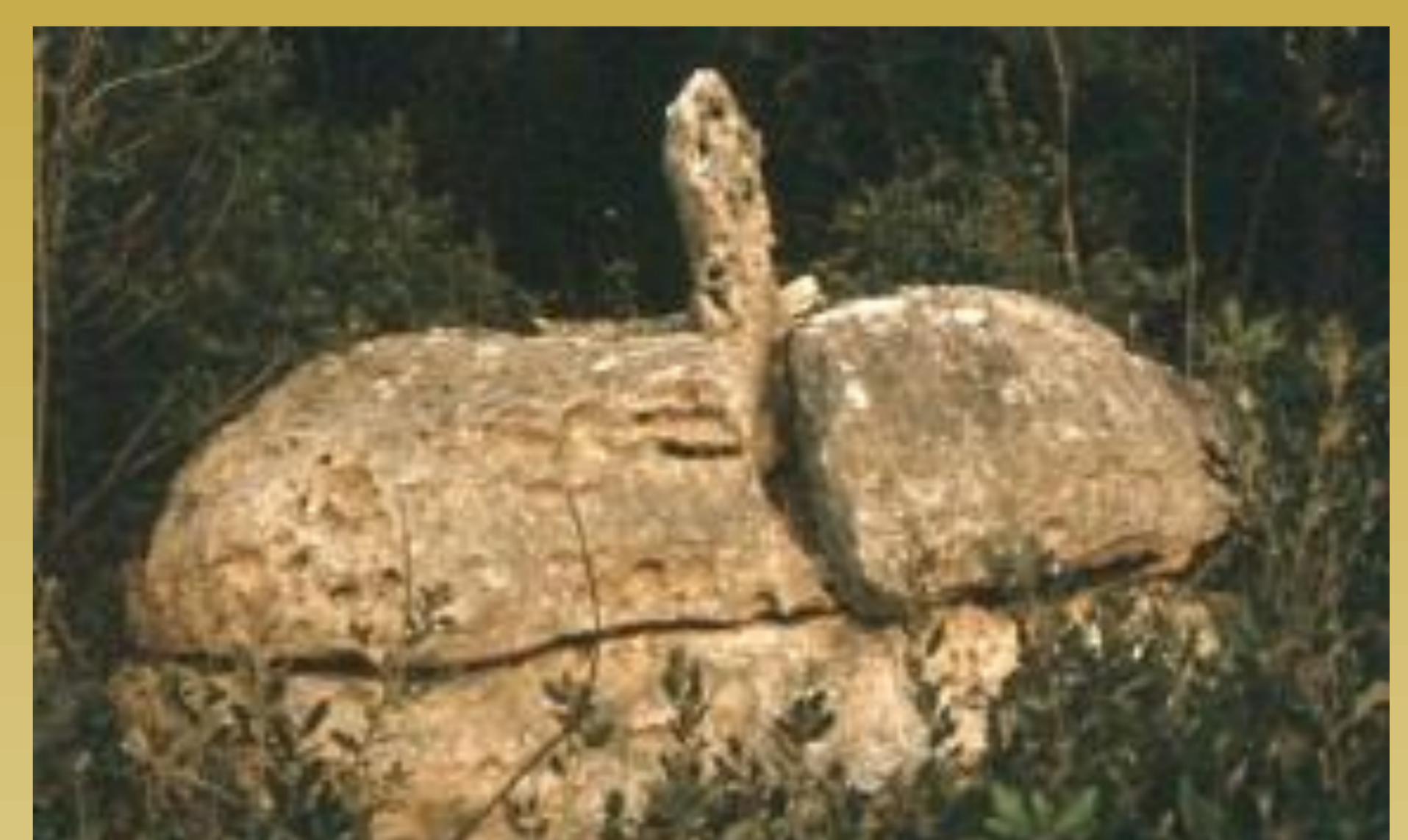


FIGURE 7

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This rock is provided with a natural rift that has been used to vertically insert (with wedges) a naturally elongated stone with a small natural hole in its upper end.