

MORE ON CARBON-14 EVIDENCE AND GOBEKLI TEPE

Dimitrios S. Dendrinios, Ph.D.

Professor Emeritus, University of Kansas,

School of Architecture and Urban Planning, Lawrence, Kansas, USA

In Residence at Ormond Beach, Florida, USA

Contact: cbf-jf@earthlink.net

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Enclosure C, pillar 12 at Gobekli Tepe

Source of photograph: <https://tepetelegrams.wordpress.com/2016/07/15/boars-in-gobekli-tepes-enclosure-c-just-a-story-of-hunters-and-prey/>

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Because someone sought and found a carbon bearing specimen around the basement of the Empire State Building, that is radiocarbon-14 dated to be from the 2nd millennium BC, it will not make that Building or the district of Manhattan and the skyscrapers of New York City 2nd millennium sites and structures.

Abstract

The purpose of this paper is two-fold: first, to provide an elaboration on certain points made at a particular section of the author's paper in reference [1], and in specific on how is Carbon-14 dating related to Neolithic architectural structures, and under what conditions it should and should not be used; and second, to discuss and comment on some relatively recent Carbon-14 related dating evidence associated with Gobekli Tepe, as presented in a paper (found in reference [2]) by a group of archeologists associated with and including the original excavator of Gobekli Tepe, Klaus Schmidt. The objective is to convincingly demonstrate that one would be quite comfortable in supposing that the Pre-pottery Neolithic A/B dates, granted by archeologists to Gobekli Tepe, exclusively based on questionable carbon-14 evidence, must be seriously re-examined and re-evaluated.

Introduction

Two sections comprise this paper: In the first section, some questions are raised and the associated issues are analyzed regarding carbon-14 testing and statistical sampling efforts aimed at dating architectural structures. The analysis goes beyond what is included in ref. [1], although some issues addressed there are further elaborated here. In the second section, a close look into reference [2] is taken, and some particular carbon bearing specimens used for radiocarbon dating associated with Enclosure A at Gobekli Tepe are discussed. At the end, some concluding remarks are made, summarizing the analysis of the first section and the findings of the second section.

Carbon-14 dating and architectural structures

In ref. [1], and in the section titled "Carbon-14 evidence and Neolithic Sites", (p. 5-8), the author: (i) raised a set of points regarding the appropriate conditions that must be met for the use of C-14 in the dating of Neolithic structures; and (ii) made specific suggestions and recommendations regarding certain guidelines that ought to be adopted and strictly followed in the processing of carbon bearing specimens. In this section, some further elaboration is offered on the points related to subject (i) above, as well as some additional points are raised connected to formal statistical sampling that ought to be involved in selecting carbon bearing specimens for radiocarbon dating architectural structures.

As mentioned in ref. [1], fills any type (including backfills) do not date architectonic structures. This is self-evident, and an example was offered on p. 6 of the paper in ref. [1] to demonstrate the validity of the argument. In addition to the irrelevancy of carbon bearing specimens found in the fill inside an architectural structure, carbon bearing specimens found in the soil surrounding the architectural structure's exterior walls also can't be used to date the structure. It is so, because such specimens, either older or younger than the structure itself, could migrate onto the structure's walls over the millennia from the outside due to a host of factors. Complex dynamics in stratigraphy are linked to such migration movements. Moreover, if the original builders of the structure had to dig, carbon bearing specimens outside the wall could be of a different age.

What can be used to potentially date the structure, as it was mentioned in the aforementioned paper, are carbon bearing specimens found directly underneath the structure's base, if and only if such specimens are not contaminated, and evidence can be offered to convincingly conclude that these specimens have not migrated there. The argument critically hinges on the assumption that the structure has been put *in situ* and remained there undisturbed upon being buried in soil.

In addition, it is now asserted that the archeologists must also provide convincing evidence that the original builders of the Neolithic structure **did not dig** down and **did not insert** the structure at a level that already contained that carbon bearing evidence. What this implies is that for that evidence to be admitted, it must be shown by proper and painstakingly carried out stratigraphic analysis that the structure's base was placed where found by the archeologists either at the then ground level; or that the structure was put on a surface **used by the builders and not by prior users**. Only under these strict conditions, and by convincingly establishing pristine origins, are carbon bearing specimens, recovered from directly below the base of a structure, to be admitted into evidence and argued as a legitimate means to date an architectural structure's construction.

Moreover, specimens collected to be used for carbon-14 testing must meet statistical tests of significance within a statistically valid **sampling** process. This Statistics related point must be raised (it was not raised in ref. [1]), as it refers to proper use of Statistics **before** the statistical tests involved in the carbon-14 tests proper are carried out in a laboratory. Inferential Statistics require that a subset (sample) be randomly selected from a set of carbon bearing specimens, no matter their age or location, over which tests of significance are carried out; under such sampling-based tests, the null hypothesis is rejected given standard admissible confidence levels possibly derived from the statistical tests. What this process implies is that a (systematically) randomly selected sample (for example a 4% to 10% subset of the universe of specimens, i.e., of the entire set) is collected to establish how well it represents the age of the universe of the specimens to be subjected to carbon-14 testing; and from that sample, a statement can be made regarding the totality of the evidence (and hence the entire set's true and unbiased ranges of age).

What complicates (considerably) the statistical analysis in the case of architectural structures in Neolithic archeological sites is that carbon bearing specimens are **extremely rare**. Paucity of specimens is overwhelming, especially so regarding specimens located at specific points of the structure which are critical for providing an accurate determination of the structure's age. Spatial disaggregation (i.e., the spatial separation of various components of an architectural structure) from where to collect carbon bearing specimens to be used for radiocarbon dating is critical. As indicated above, a prime location (and quite possibly the **only** location) from which such relevant specimens can be drawn lies directly beneath the base of the structure, and under the strict conditions mentioned (and underlined) earlier. Otherwise, the specimens are irrelevant and the ensued carbon-14 testing related Statistics are vacuous.

Haphazardly locating and cherry-picking carbon bearing specimens, and only those which seem favorable to the archeologists from any specific point of view, and from any convenient to the archeologists' places of the structure (be that the floor, the walls, the orthostats or the pillars)

and at haphazardly placed locations within, around, or on the structure, does not foot the bill. This type of **highly selective** and equally **highly biased** collection of specimens process does not produce statistically valid results and does not constitute an admissible sampling process. *Modicum* of evidence is not grounds to admit any (biased) evidence.

Moreover, the point must be also made that dating carbon bearing specimens obtained from location(s) close to a **single component** of the architectural structure (say an isolated orthostat) **does not** provide a reliable date regarding the time the **entire structure** was built. An orthostat may be the product of a quarried sandstone or limestone contaminated with carbon bearing material from a far earlier (or later) age than the structure. Its porous plastering (if the stone is dressed) may have randomly absorbed carbon bearing material of an age totally unrelated to the time the structure was made, especially when fills are involved that are in direct contact with the stone over prolonged time periods. Hence, in isolation, stones (be them stones used for constructing masonry walls, pillars or orthostats) and any random carbon-14 evidence associated with them are meaningless in terms of supplying evidence on an entire structure's age.

Only in **combination**, and as parts of an ensemble of elements constituting *in toto* an architectonic structure with a distinct architectural style, are individual components of any use in dating the structure. That is, only as forming an encompassing architectural environment (and part of the archeological matrix) they can be employed as time markers for the entire structure.

In summary, as the ref. [1] emphasized, **only structures can date structures**, meaning that: the **known** at the time building materials, methods and techniques commonly used; construction technologies employed then; and decorative Art engraved on various sections of the structure encountered at contemporaneous and varied locations; in combination, all these elements provide reliable indicators in dating a structure's original construction. At the date a specific structure was designed and made, it is expected to have conformed to the known architectural styles and engineering practices as well as Art typology prevailing at that time. All the above-mentioned factors are the only reliable markers to date a structure's Architecture, Engineering and Art with some degree of confidence. **Forms and materials of tools are primarily used to date lithic tools and pottery**; it is inconceivable to argue that **morphology and construction technology can't be used as primary means to date architectural structures**. To delegate that role and authority to highly questionable carbon-14 dating must be inadmissible to architects.

Of course, technological innovation is possible (for tools, pottery, and structures, as well as for Architecture, Engineering and Art) at some archeological sites. And at times, a site may be indeed a statistical outlier. But to so assert, there must be enough observations to statistically test such innovation hypotheses with contemporary (tools, pottery and) structures. Furthermore, an archeological site must be either a source or a sink with regards to innovation, and always part (an element) of a network of interconnected (linked) sites (nodes), and subject to spatial-temporal innovation diffusion processes, as well as enjoying economies (or suffering from diseconomies) of scale. If a sink, then the source(s) must be pointed out; and if a source, then the sinks must be shown by archeologists.

These **sources or sinks must be contemporaneous** to the structure. Isolated cases do not provide any theoretical support to any diffusion (innovator or lagger) related hypothesis. These Economic and Spatial Geography (Central Place Theory and its related dynamics) aspects of Neolithic sites have been extensively discussed by this author in a number (more than 20) of papers dealing with Gobekli Tepe, Carnac, and Stonehenge (among numerous other contexts). See a list of these papers in reference [3, section 8].

To conclude this section, it is noted that during the Pre-pottery Neolithic periods A and B (PPNA/B), Natufian Architecture was the only masonry related Architecture known to have been in practice throughout the Levant. Monolithic, megalithic, ornate, dressed, Art bearing structures of the type found at Gobekli Tepe (and in part at Boncuklu Tarla, as well as at Nevali Cori and elsewhere in Anatolia and Upper Levant) are indicative of sites bearing far later types of Architecture, Art and Engineering. The Architecture, Engineering, Art, Geography, Economics, Demography, Climate, Urban Planning, Topography etc., related arguments against Gobekli Tepe being a PPNA/B site have been laid out in a series of papers by this author, cited in ref. [3, section 8] and in particular in ref. [4], [5] and [6]. None of that argumentation will be repeated here.

On some relatively recent Carbon-14 evidence from Gobekli Tepe

The paper to be analyzed and discussed here, found in reference [2], contains two remarkable, very informative and indeed commendable admissions: First, that the carbon bearing evidence (the limited number of specimens) taken to an (unspecified) laboratory for radiocarbon-14 dating presented “difficulties” (introductory section, p. 36). Second, that what the archeologists originally thought (that all Layer III structures of all three Enclosures, Enclosure D, Enclosure C and Enclosure A, were more or less contemporaneous) is no longer so. Instead, they conclude (p. 40, 41) that “the outer ring wall of Enclosure C could be younger than Enclosure D” and also that “Enclosure A seems younger than Enclosures C and D”. In the diagram of p. 39, the reader is shown that limited (one specimen, designated as IGAS 2658) C-14 dating of Enclosure A indicates (according to the authors) an architectural structure possibly as young as the circa 7750 BC period (see Figures 2a and b on p. 39, of ref. [2]).

There are additional revisions mentioned in the paper of ref. [2] that will be discussed in a bit. But the overall reading of the paper seems to indicate an effort to revise some dates associated with certain Gobekli Tepe structures. It provides some guidance to the reader for these structures to be **younger** than originally thought. In that effort, the paper in ref. [2] is a step in the right direction. In reference [2], which contains the collective work of four archeologists, including Klaus Schmidt (the original excavator of Gobekli Tepe, and now deceased) and which was written sometime after 2011, and possibly not much later than 2013, one comes across (as already mentioned, but need repeating since it is so crucial) at the very beginning (the Introduction) an indeed stunning statement. That there are still “difficulties” with the carbon-14 dating of Gobekli Tepe. An example, mentioned in the paper of ref. [2], will be now discuss to make the key point: that (the statistically questionable on numerous grounds, pointed out in the previous section of this paper) carbon-14 dating of architectural structures renders such dating very doubtful.

On p. 40 of ref. [2], the following statement is supplied: “KIA-28407”, a carbon bearing specimen used to radiocarbon-14 date Enclosure A, employed charcoal “from soil extracted beneath a rather large fragment of fallen pillar”. Moreover, the paper adds: “Although this age could mark the time of abandonment of Enclosure A, its origin makes it difficult to determine whether it dates the *burial* of the enclosure at the end of its use-life, a later intentional destruction, or a moment when Enclosure A was already filled and Layer II activities led to the deposition of the pillar fragment”. It is noted that according to the authors of ref. [2], p. 40, the carbon-14 dating of that enclosure is pegged to: 9250 plus or minus 55 C-14 BP; or at 8617-8315 calBP at a confidence level of 95.4%.

In this set of statements, regarding the carbon bearing specimen KIA-28407, the entire credibility of carbon-14 dating is aptly displayed. The authors admit that carbon bearing specimens (in this instance, cherry picked charcoal from a particular location beneath a fallen pillar segment) are “difficult” to determine what exactly they suggest. What the statement fails to mention is that, **in addition** to their concerns, one is in the dark also as to **how** did this charcoal specimen found itself there, stratigraphically, to start with and before the pillar (allegedly) fell on it. That specimen could be the result of a fire from any time period prior to the pillar fragment falling on top. For sure, it doesn’t date the pillar or Enclosure A’s walls. And *a fortiori* it doesn’t date Enclosure A.

All Tables and Diagrams supplied by the authors of the paper in ref. [2] date the (not statistically chosen, through a proper statistical sampling procedures) carbon bearing specimens that the authors collected more or less on an *ad hoc* basis, and decided to then take to an (unnamed) laboratory for carbon-14 dating. They, for sure, do not date the architectural structures involved (Enclosures A, C, D, and their Layers III and II) or any of their components (for instance the pillars).

There are a number of issues associated with the archeologists’ narrative regarding Gobekli Tepe that bring up reasonable queries, even among the casual observer; one is the authors’ (of ref. [2], p. 36) admission that there is a gap in the site’s stratigraphy. From an alleged PPNA/B stratigraphy, one jumps into a PPN layer with only agricultural uses and no structures; and then (all of a sudden) there is a stratigraphic gap in the record, until medieval stratigraphy appears. One wonders how is it possible to have an almost eight-millennium-long gap in the record, at a site that was during that time period at the very center of the Upper Levant.

A second major question is the very Architecture of Enclosures D, C, A, and all the rest, when compared to each other at Gobekli Tepe. How is it possible that the most sophisticated, architecturally and engineering advanced and containing the most stunning Artwork of all (excavated thus far) Enclosures (that is, Enclosures D and C, and in particular Enclosure D) are the oldest ones (according to the archeologists in charge of the excavation). In Architecture, as well as in Engineering and the Arts, one expects more architectonically and engineering (as well as artistically) advanced structures to succeed less advanced ones. This is how Evolution usually works. This is an anomaly in the dating of Gobekli Tepe that raises a serious question to which the archeologists need to supply a satisfactory answer. Such an answer has thus far eluded the archeological world.

On page 40, at the last paragraph of the left-hand side column, the authors of ref. [2] make an architectonic assertion: they argue that the “almost square” floor plan in Enclosure A is an “architectural missing link” between the “older circular structures of Layer III and the smaller rectangular complexes of Layer II”. This assertion is indeed highly questionable on numerous grounds. First, and foremost, Layer III Enclosures **are not circular**. They are egg-shaped, **quasi-elliptical**, and this is a very important feature in Neolithic Architecture, see ref. [4] and ref. [5].

Second, the square is not an intermediate step between a rectangle and a circle; it is an evolutionary step following the rectangular shape (which, again in architectonic Evolution, came after the various ellipsoids and possibly after the precise circle). A square is, in Geometry, a far more complex and advanced 2-d shape than a simple rectangle. In schools and in classes on Geometry, pupils are taught first the rectangle and its properties, and then the square and its properties, and for good reason. In Neolithic Architecture, and in its Evolution, quasi-elliptical shapes preceded egg-shaped (elliptical) enclosures which preceded stone (approximate) circles; irregular rectangles preceded somewhat regular rectangles, which preceded squares, and all in approximations; see ref. [6] and ref. [7] and associated references found also in ref. [3]. Of course, these geometric shapes do not have sharply delineated temporal borders; at (fuzzy) transition points, these shapes do overlap to an extent. In ref. [6] and [7] the author has examined in some detail these transition points and the Architecture and its Evolution during the Early Neolithic.

The fundamental question lingers, since Klaus Schmidt brought to the World’s attention Gobekli Tepe. Is this site really what is claimed to be, a PPNA/B site, or a far later one? The Artwork shown on pillar 12, at Enclosure C (see the photograph at the paper’s cover page), as well all Artwork of Enclosures D and C, are not tenth millennium BC Art, on numerous grounds, no matter what the (questionable) carbon-14 evidence, and the archeological establishment, may suggest.

Conclusions

A major conclusion is reached from the analysis presented here: that carbon bearing specimens used thus far for radiocarbon dating architectonic structures (at Gobekli Tepe and elsewhere) are in general not appropriate. Only under extremely rare and strictly defined and adhere to (on architectural as well as statistical grounds) conditions can it be asserted that they offer solid grounds on which to base and place legitimate claims on dating structures. Outside such strictly enforced conditions, *ad hoc* collected, in effect cherry-picked, carbon bearing specimens are not to be used for dating anything else than themselves; certainly not architectural structures.

In ref. [1]. This author discussed **dating inflation** in Archeology, and its politics among many other factors in it. “Dating inflation” might contribute to selling books, TV shows, and motion pictures; it is commercially quite appealing, but it doesn’t contribute to the Science of Archeology. On the other hand, this author also has discussed in numerous papers the “quantum superposition of states” aspect (see relevant papers cited in ref. [3], section 8) of theories and viewpoints on (among other things) archeological issues. Hence, the author understands why this phenomenon called “Gobekli Tepe” exists and why it thrives among the popular press(es) and social media.

Acknowledgment. The author wishes to thank academia.edu staff for bringing the paper in ref. [2] to his attention (about a month ago).

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