

Early Maya Writing at San Bartolo, Guatemala

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The ruins of San Bartolo, Guatemala, contain a sample of Maya hieroglyphic writing dating to the Late Preclassic period (400 BC to 200 AD). The writing appears on preserved painted walls and plaster fragments buried within the pyramidal structure known as “Las Pinturas,” which was constructed in discrete phases over several centuries. Samples of carbonized wood that are closely associated with the writing have calibrated radiocarbon dates of 200 to 300 BC. This early Maya writing implies that a developed Maya writing system was in use centuries earlier than previously thought, approximating a time when we see the earliest scripts elsewhere in Mesoamerica.

Research on the origins of Maya hieroglyphic writing has long been hindered by the paucity of good archaeological contexts and reliable dates for inscribed artifacts and monuments. With a few exceptions, examples of archaic Maya script appear on illicitly excavated objects that can be stylistically dated to no earlier than about 100 BC -100 AD, when writing seems to have been already well-established elsewhere in Mesoamerica. Here we provide new evidence of early Maya writing preserved in the ruins of San Bartolo, Guatemala.

The ruins of San Bartolo, Guatemala (Fig. 1) were identified in 2001 and include early wall paintings buried within a pyramidal structure today known as “Las Pinturas.” These had been partially exposed by illicit digging a few years previously, and subsequent scientific excavations in Room 1 (as that location is now designated) has uncovered most of this important mural, dating to approximately 100 BC (1–4) (figs. S6 to S10). Tunneling deeper into the Las Pinturas structure has since led to the discovery of other buildings with remains of painted decoration that are significantly older than the Room 1 murals.

One example of this earlier painting comes from a block from a dismantled wall of the building that once stood upon the platform of the Sub-V construction phase (Fig. 2). The Room 1 murals were painted on the Sub-I phase of the pyramid, that is to say four construction episodes later than

the Sub-V phase. The approximately 4-m high Sub-V platform extends 28 x 12 m at its base and supported three separate masonry rooms. The 2005 excavations established that its central room was richly decorated and painted with polychrome murals. The surviving doorjamb bears a colorful image of the Maize God, who is a central character in the mythological scenes of the later Room 1 murals (4). The line of script was possibly associated with this religiously themed scenery, but its original placement within the room is uncertain.

We obtained accelerator mass spectrometry (AMS) radiocarbon dates on five charcoal samples from sealed deposits in the three architectural strata (Sub-VI, Sub-V, and Sub-IV) in order to bracket the age of the painted blocks (Fig. 3). The first of these, from within the floor of the Sub-VI platform, the construction phase that was encapsulated by Sub-V construction, provides a maximum uncalibrated radiocarbon date of 2260±40 BP (400 - 200 BC; 2 sigma [95% probability] calibrated range) (fig. S1). A sample from within the floor of Sub-V dates the construction of the room at 2200±60 BP uncalibrated (390 - 80 BC; 2 sigma [95% probability] calibrated range) (fig. S2). The final three samples 2260±40 uncalibrated (400 - 200 BC; 2 sigma [95% probability] calibrated range), 2180±40 uncalibrated (370 - 100 BC; 2 sigma [95% probability] calibrated range) and 2150±40 BP uncalibrated (360 - 60 BC; 2 sigma [95% probability] calibrated range) (figs. S3 to S5) surround the painted blocks and relate contextually to both destruction of the Sub-V painted room and the subsequent construction of the Sub-IV platform above it. Taken in concert, these samples and those analyzed in association with the final two phases of construction, imply that the text was painted between 300 and 200 BC.

The painted block bears a column of ten hieroglyphs (Fig. 4). The text appears to be the end of a longer sequence of signs that continued above. All are painted in a thick black line on white plaster apparently along a subtle pinkish-orange stripe that served as a guideline for the scribe. As with later examples of Maya writing discovered at San Bartolo, its

decipherment remains a challenge (4). Later texts from the Room 1 murals are just partially readable, since sign forms appear considerably different from the familiar elements of later Maya script. The San Bartolo Room 1 paintings date centuries before the first fully legible Maya writing from around 250-300 AD, and the signs of the Sub-V block are older still, containing archaic forms.

The one fully recognizable glyph (pA7) is an early version of the sign read AJAW, a ubiquitous title in Maya texts that means “lord, noble,” or “ruler.” It evidently formed part of a more extended title phase in reference to some person, either historical or mythical. Some signs have qualities that might be vaguely pictorial, such as pA2 with its suggestion of a hand holding a brush or alternatively a sharp bloodletter. Otherwise they are more abstract-looking forms, probably ancestral to components of later Maya script. In their overall appearance the text bears some resemblance to the so-called Epi-Olmec script used by neighboring peoples to the west during the Late Pre-classic and Early Classic periods (5, 6). All examples of that script post-date the San Bartolo block, however, raising the question of what direction any influence may have flowed.

Pre-classic writing from the Maya area is scarce and has been difficult to date accurately. Most other examples are known from stone monuments found in surface or near-surface contexts or from illicitly excavated portable objects. One notable early inscription from El Mirador probably dates to no earlier than 100 BC based on stylistic comparisons (7). Another carved monument with glyphs from El Portón, Guatemala, may date to the first two or three centuries BC, based on a single radio carbon date not in direct association with the stone (8). The newly discovered San Bartolo text can now be firmly dated to the same general period, and its fine preservation offers an unusual look at the form that Maya script assumed in its early history.

The San Bartolo text raises the question of the relationship of Maya writing to other early script traditions in Mesoamerica. In the pre-Classic era, writing systems were firmly established by about 400 BC among complex cultures in what is now Oaxaca and perhaps in the Isthmus of Tehuantepec (9–12), although the dating of its evidence remains debated and controversial (13–15). It now appears that the Maya also participated in the Pre-classic cultures of literacy, and at a significantly earlier date than previously believed.

References and Notes

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16. Excavations by the Proyecto San Bartolo between 2002 and 2005 have been supported by grants from The National Endowment for the Humanities (Grant RZ-50086); The National Geographic Society, Committee for Research and Exploration (Grant 7065-01, 7222-02, 7393-03, 7601-04, 7721-04); The Foundation for the Advancement of Mesoamerican Studies, Inc. (Grants 01038, 02039); The Peabody Museum, Harvard University; Dumbarton Oaks Research Library and Collections; The American Philosophical Society; The Annenberg Foundation; the International Communities Foundation; Brigham Young University; and most importantly The Reinhart Foundation. We also thank the Guatemalan Ministerio de Cultura y Deportes, Instituto de Antropología e Historia, and Departamento the Monumentos Prehispánicos for their support.

Supporting Online Material

www.sciencemag.org/cgi/content/full/1121745/DC1
Materials and Methods
Figs. S1 to S10
References and Notes

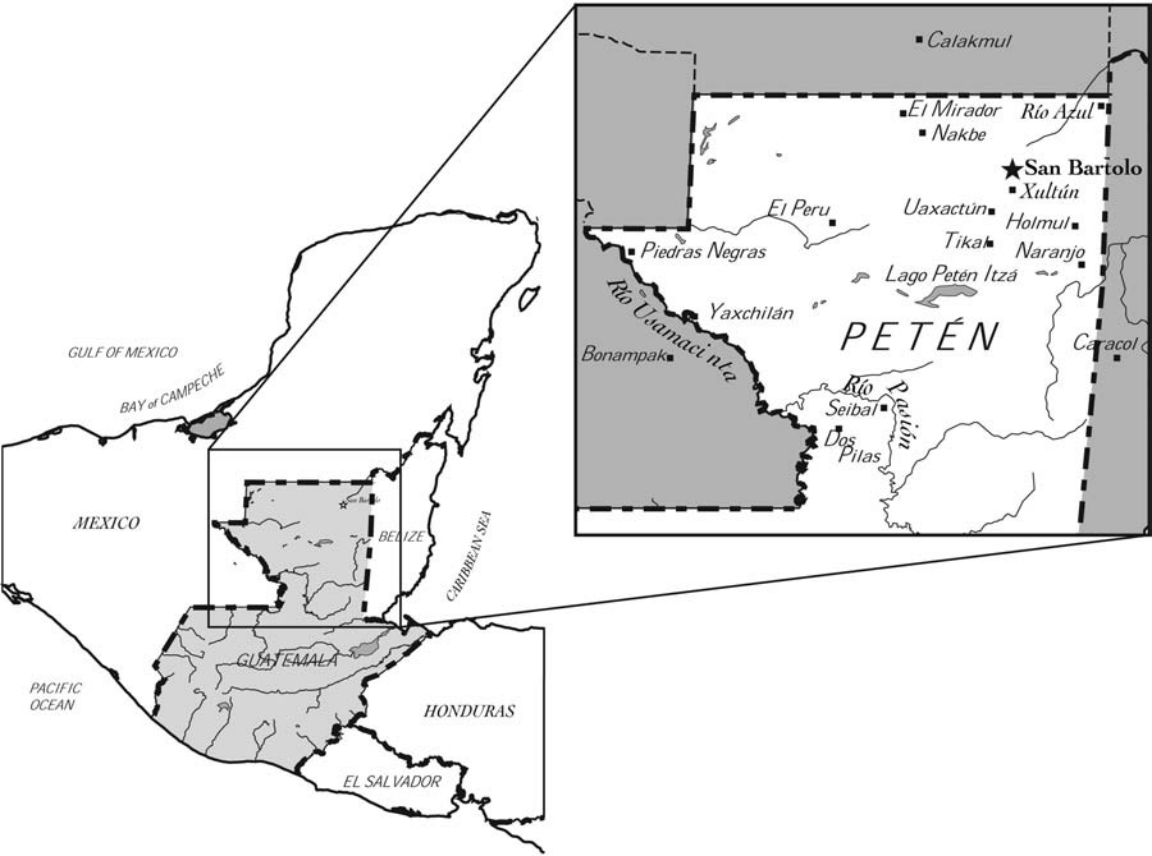
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Fig. 1. Map. San Bartolo in relation other Maya archaeological sites. (drawing by J. Kowan and W. Saturno)

Fig. 2. Glyph Block. The Sub-V painted block in situ (photograph by B. Beltrán)

Fig. 3. Las Pinturas. Architectural profile illustrating AMS radiocarbon dates for the construction sequence of the structure, the location of the Sub-V building phase, the painted glyph block, and the Room 1 mural. Scale in meters.(drawing by J. Kowan and W. Saturno)

Fig. 4. Painted hieroglyphs. Scale drawing of Sub-V painted glyph block. Glyphs assigned preliminary column and row designations. Scale in centimeters. (pA 1–10). (drawing by D. Stuart)



SB-1A-34-19
Blaque du
muia
20-4-05 Boris



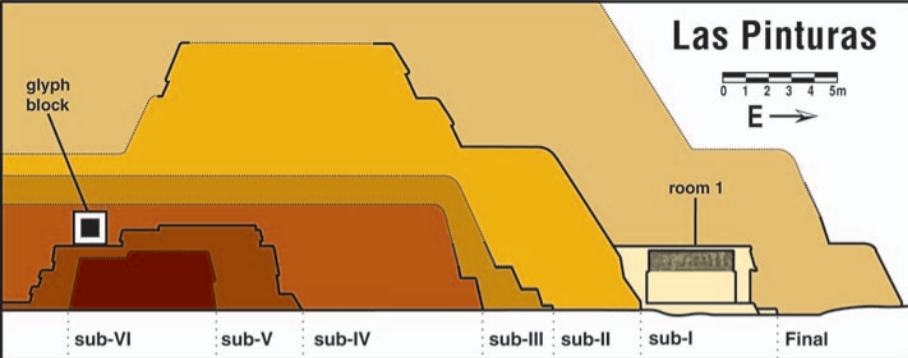
OLYMPIA HOTEL

Las Pinturas



glyph block

room 1



sub-VI

sub-V

sub-IV

sub-III

sub-II

sub-I

Final

Conventional radio carbon age (years BP)

2260 ± 40

2200 ± 60

2150 ± 40
2180 ± 40
2260 ± 40

N/A

N/A

2140 ± 40

2070 ± 40
2050 ± 50
2100 ± 40
2050 ± 40

2 Sigma calibrated result (95% probability)

BC 400 – 200

BC 390–80

BC 360 – 280
& BC 240 – 60
BC 370 – 110
BC 400 – 200

N/A

N/A

BC 360 – 290
& BC 230 – 50

BC 190 – AD 20
BC 190 – AD 60
BC 200 – 30
BC 190 – AD 40

pA

1



2



3



4



5



6



7



8



9



10



0 1 2 3 4 5 cm



www.sciencemag.org/cgi/content/full/1121745/DC1

Supporting Online Material for
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A total of 10 radiocarbon samples originating from 5 distinct building phases of the “Las Pinturas” pyramid have been analyzed in order to establish an absolute chronology for its construction sequence. The earliest construction thus far to yield a datable sample carbonized wood from an undisturbed context is the Sub-VI construction phase. The calibrations are calculated using the newest (1998) calibration database with references quoted on the bottom of each figure. Multiple probability ranges may appear in some cases, due to short-term variations in the atmospheric ¹⁴C contents at certain time periods.

CALIBRATION OF RADIOCARBON AGE TO CALENDAR YEARS

(Variables: C13/C12=-26.1;lab. mult=1)

Laboratory number: Beta-206576

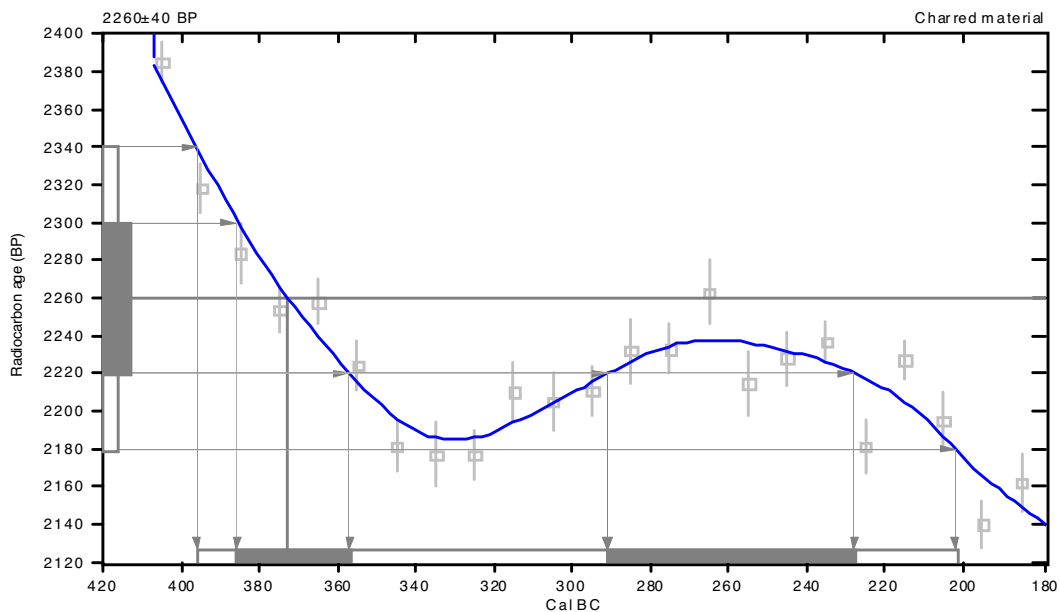
Conventional radiocarbon age: 2260±40 BP

2 Sigma calibrated result: Cal BC 400 to 200 (Cal BP 2350 to 2150)
(95% probability)

Intercept data

Intercept of radiocarbon age
with calibration curve: Cal BC 370 (Cal BP 2320)

1 Sigma calibrated results: Cal BC 390 to 360 (Cal BP 2340 to 2310) and
(68% probability) Cal BC 290 to 230 (Cal BP 2240 to 2180)



References:

- Database used*
INTCAL98
Calibration Database
Editorial Comment
Stuiver, M., van der Plicht, H., 1998, *Radiocarbon* 40(3), pxi-xiii
INTCAL98 Radiocarbon Age Calibration
Stuiver, M., et. al., 1998, *Radiocarbon* 40(3), p1041-1083
Mathematics
A Simplified Approach to Calibrating C14 Dates
Talma, A. S., Vogel, J. C., 1993, *Radiocarbon* 35(2), p317-322

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Figure 1. Calibration curve for Sample SB 1A-32-3 removed from an undisturbed deposit between the floors of the Sub-VI and Sub-VII construction phases.

CALIBRATION OF RADIOCARBON AGE TO CALENDAR YEARS

(Variables: C13/C12=-24.3;lab. mult=1)

Laboratory number: Beta-206577

Conventional radiocarbon age: 2200±60 BP

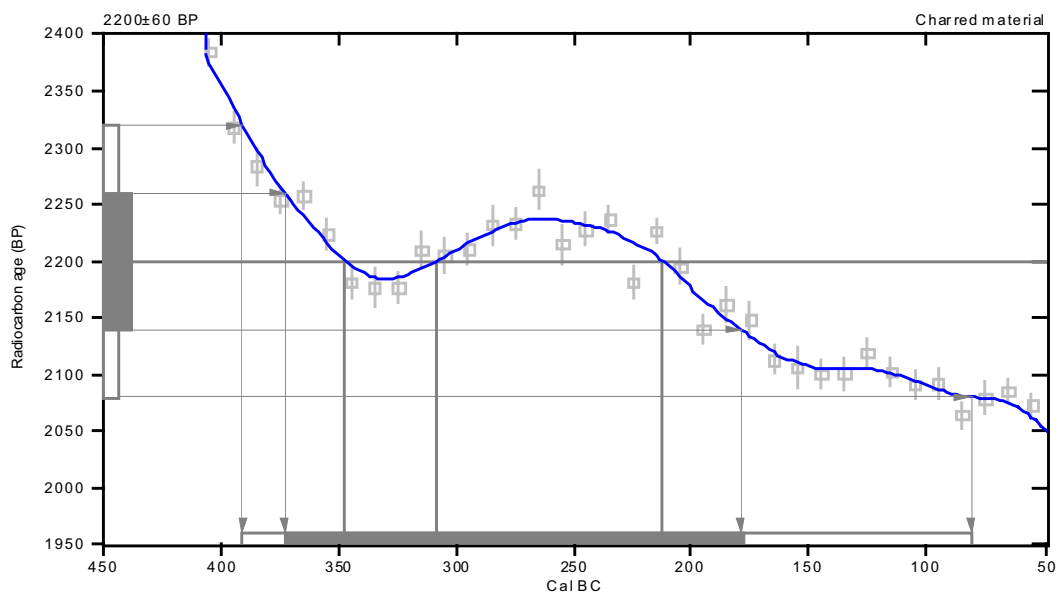
2 Sigma calibrated result: Cal BC 390 to 80 (Cal BP 2340 to 2030)
(95% probability)

Intercept data

Intercepts of radiocarbon age
with calibration curve:

Cal BC 350 (Cal BP 2300) and
Cal BC 310 (Cal BP 2260) and
Cal BC 210 (Cal BP 2160)

1 Sigma calibrated result: Cal BC 370 to 180 (Cal BP 2320 to 2130)
(68% probability)



References:

- Database used
INTCAL98
- Calibration Database
Editorial Comment
Stuiver, M., van der Plicht, H., 1998, Radiocarbon 40(3), pxi-xiii
- INTCAL98 Radiocarbon Age Calibration
Stuiver, M., et. al., 1998, Radiocarbon 40(3), p1041-1083
- Mathematics
A Simplified Approach to Calibrating C14 Dates
Talma, A. S., Vogel, J. C., 1993, Radiocarbon 35(2), p317-322

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Figure 2. Calibration curve for Sample SB 1A-32-7. Removed from an undisturbed deposit within the floor of the Sub-V platform.

CALIBRATION OF RADIOCARBON AGE TO CALENDAR YEARS

(Variables: C13/C12=-24.7;lab. mult=1)

Laboratory number: **Beta-206624**

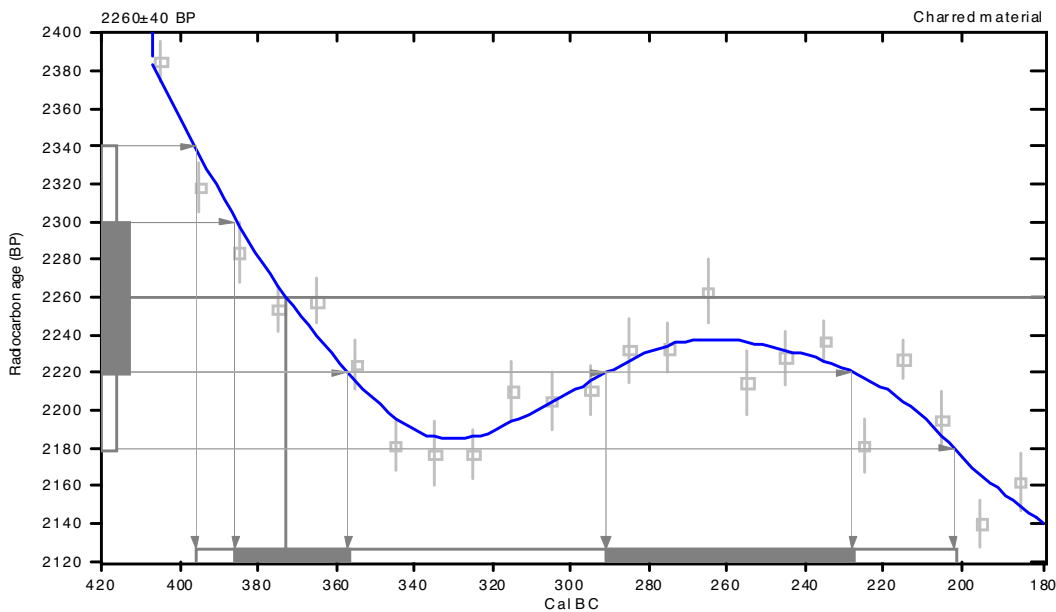
Conventional radiocarbon age: **2260±40 BP**

2 Sigma calibrated result: Cal BC 400 to 200 (Cal BP 2350 to 2150)
(95% probability)

Intercept data

Intercept of radiocarbon age
with calibration curve: Cal BC 370 (Cal BP 2320)

1 Sigma calibrated results: Cal BC 390 to 360 (Cal BP 2340 to 2310) and
(68% probability) Cal BC 290 to 230 (Cal BP 2240 to 2180)



References:

- Database used*
INTCAL98
- Calibration Database*
Editorial Comment
Stuiver, M., van der Plicht, H., 1998, Radiocarbon 40(3), pxi-xii
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Stuiver, M., et. al., 1998, Radiocarbon 40(3), p1041-1083
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Figure 3. Calibration curve for Sample SB 1A-34-10. Removed from an undisturbed deposit amidst the fallen wall stones of the central Sub-V superstructure in direct association with the fallen hieroglyphic and other plain and painted blocks. Likely that it originated with the construction of Sub-V and was redeposited with the destruction of its walls.

CALIBRATION OF RADIOCARBON AGE TO CALENDAR YEARS

(Variables: C13/C12=-25.7;lab. mult=1)

Laboratory number: **Beta-206578**

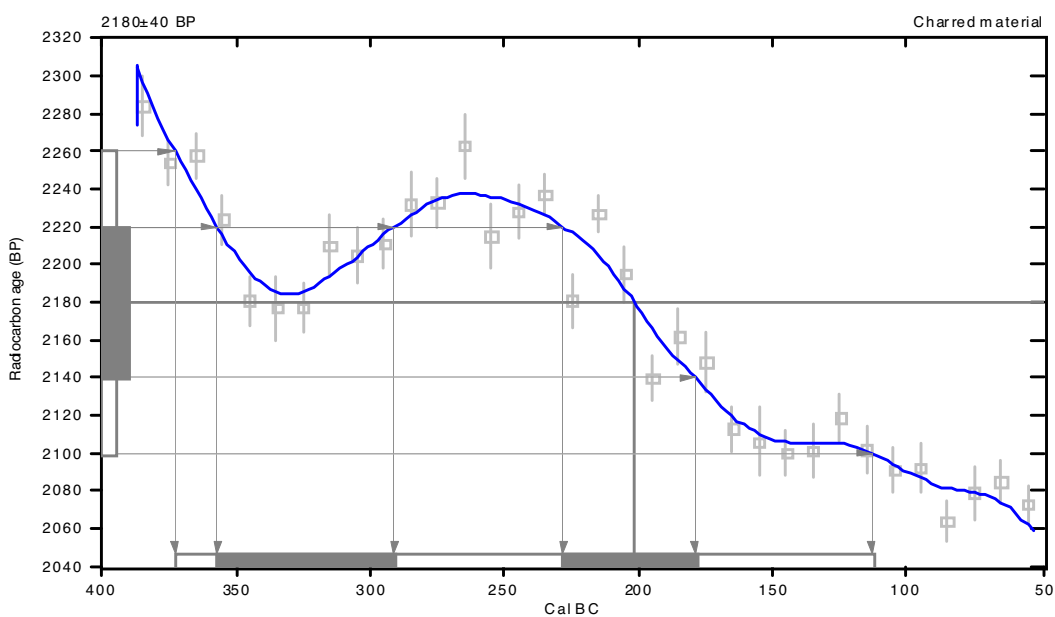
Conventional radiocarbon age: **2180±40 BP**

2 Sigma calibrated result: **Cal BC 370 to 110 (Cal BP 2320 to 2060)**
(95% probability)

Intercept data

Intercept of radiocarbon age
with calibration curve: **Cal BC 200 (Cal BP 2150)**

1 Sigma calibrated results: **Cal BC 360 to 290 (Cal BP 2310 to 2240) and**
(68% probability) **Cal BC 230 to 180 (Cal BP 2180 to 2130)**



References:

- Database used*
INTCAL98
- Calibration Database*
Editorial Comment
Stuiver, M., van der Plicht, H., 1998, *Radiocarbon* 40(3), pxi-xiii
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- Mathematics*
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Talma, A. S., Vogel, J. C., 1993, *Radiocarbon* 35(2), p317-322

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Figure 4. Calibration curve for Sample SB 1A-34-5. Removed from the surface of the third stair of the Sub-V platform associated with Sub-IV construction materials including painted stucco from the dismantled central Sub-V superstructure.

CALIBRATION OF RADIOCARBON AGE TO CALENDAR YEARS

(Variables: C13/C12=-24.5:lab. mult=1)

Laboratory number: **Beta-206575**

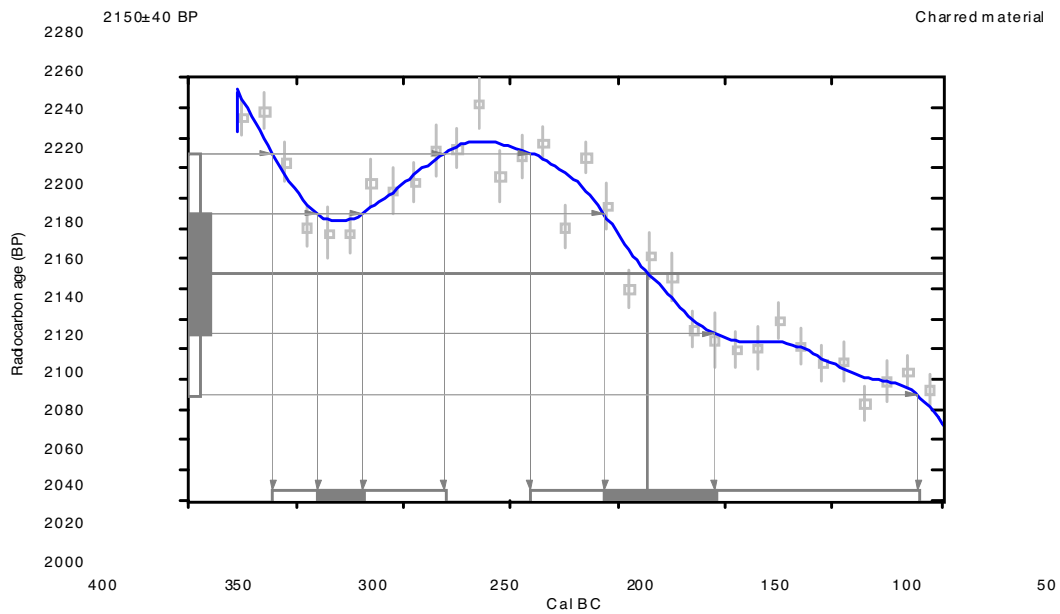
Conventional radiocarbon age: **2150±40 BP**

**2 Sigma calibrated results: Cal BC 360 to 280 (Cal BP 2310 to 2230) and
(95% probability) Cal BC 240 to 60 (Cal BP 2190 to 2010)**

Intercept data

Intercept of radiocarbon age
with calibration curve: Cal BC 190 (Cal BP 2140)

**1 Sigma calibrated results: Cal BC 340 to 320 (Cal BP 2290 to 2270) and
(68% probability) Cal BC 210 to 160 (Cal BP 2160 to 2100)**



References:

Database used

INTCAL98

Calibration Database

Editorial Comment

Stuiver, M., van der Plicht, H., 1998, *Radiocarbon* 40(5), pXII-XIII

INTCAL98 Radiocarbon Age Calibration

Stuiver, M., et. al., 1998, *Radiocarbon* 40(3), p1041-1083

Mathematics

A Simplified Approach to Calibrating C14 Dates

Talma, A. S., Vogel, J. C., 1993, *Radiocarbon* 35(2), p317-322

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Figure 5. Calibration curve for Sample SB 1A-24-7. Removed from a secondary trash deposit within the Sub-IV construction phase.

CALIBRATION OF RADIOCARBON AGE TO CALENDAR YEARS

(Variables: C13/C12=-25.3;lab. mult=1)

Laboratory number: Beta-193509

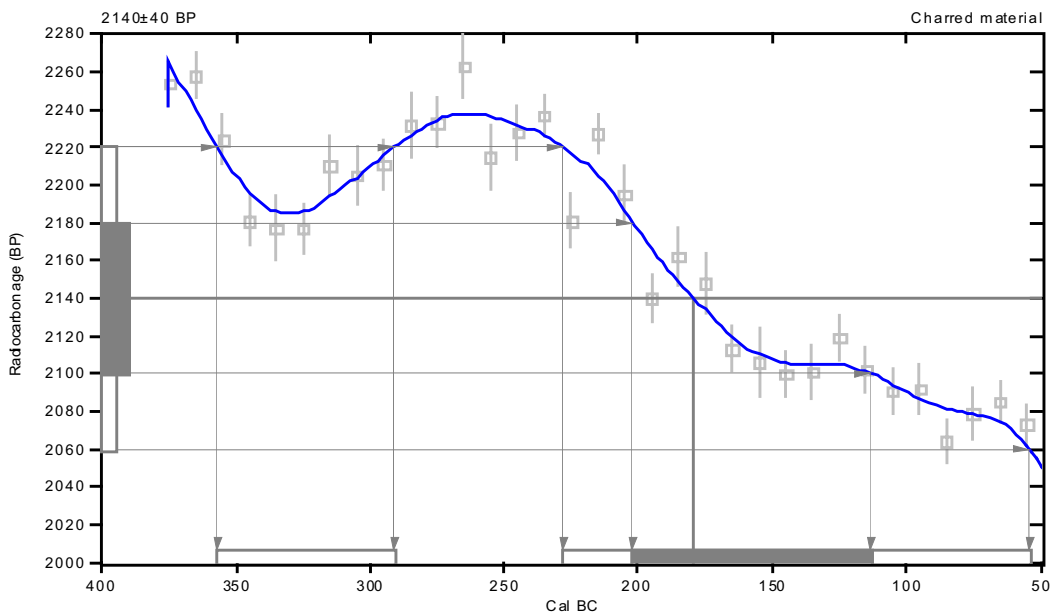
Conventional radiocarbon age: 2140±40 BP

2 Sigma calibrated results: Cal BC 360 to 290 (Cal BP 2310 to 2240) and
(95% probability) Cal BC 230 to 50 (Cal BP 2180 to 2000)

Intercept data

Intercept of radiocarbon age
with calibration curve: Cal BC 180 (Cal BP 2130)

1 Sigma calibrated result: Cal BC 200 to 110 (Cal BP 2150 to 2060)
(68% probability)



References:

- Database used
INTCAL98
- Calibration Database
Editorial Comment
Stuiver, M., van der Plicht, H., 1998, Radiocarbon 40(3), pxi-xiii
- INTCAL98 Radiocarbon Age Calibration
Stuiver, M., et. al., 1998, Radiocarbon 40(3), p1041-1083
- Mathematics
A Simplified Approach to Calibrating C 14 Dates
Talma, A. S., Vogel, J. C., 1993, Radiocarbon 35(2), p317-322

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Figure 6. Calibration curve for Sample SB 1A-11-6. Removed from within the plaster matrix of the Room 1 mural.

CALIBRATION OF RADIOCARBON AGE TO CALENDAR YEARS

(Variables: C13/C12=-23.9;lab.mult=1)

Laboratory number: Beta-193510

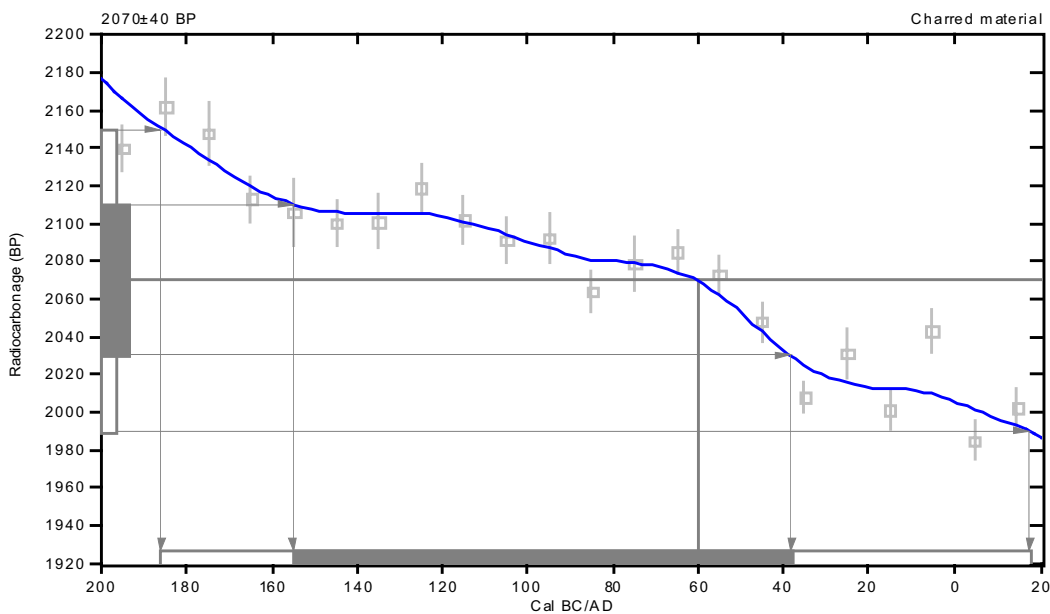
Conventional radiocarbon age: 2070±40 BP

2 Sigma calibrated result: Cal BC 190 to Cal AD 20 (Cal BP 2140 to 1930)
(95% probability)

Intercept data

Intercept of radiocarbon age
with calibration curve: Cal BC 60 (Cal BP 2100)

1 Sigma calibrated result: Cal BC 160 to 40 (Cal BP 2100 to 1990)
(68% probability)



References:

- Database used
INTCAL98
- Calibration Database
Editorial Comment
Stuiver, M., van der Plicht, H., 1998, Radiocarbon 40(3), pxi-xiii
- INTCAL98 Radiocarbon Age Calibration
Stuiver, M., et. al., 1998, Radiocarbon 40(3), p1041-1083
- Mathematics
A Simplified Approach to Calibrating C 14 Dates
Talma, A. S., Vogel, J. C., 1993, Radiocarbon 35(2), p317-322

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Figure 7. Calibration curve for Sample SB 1A-21-1-8. Removed from a deposit of charred material upon the floor at the base of the west wall of Room 1 at its North-South centerline. Associated with a large carbon stain and plaster deformation that were the result of burning during the room's use and/or termination.

CALIBRATION OF RADIOCARBON AGE TO CALENDAR YEARS

(Variables: C13/C12=-24.4;lab.mult=1)

Laboratory number: Beta-193512

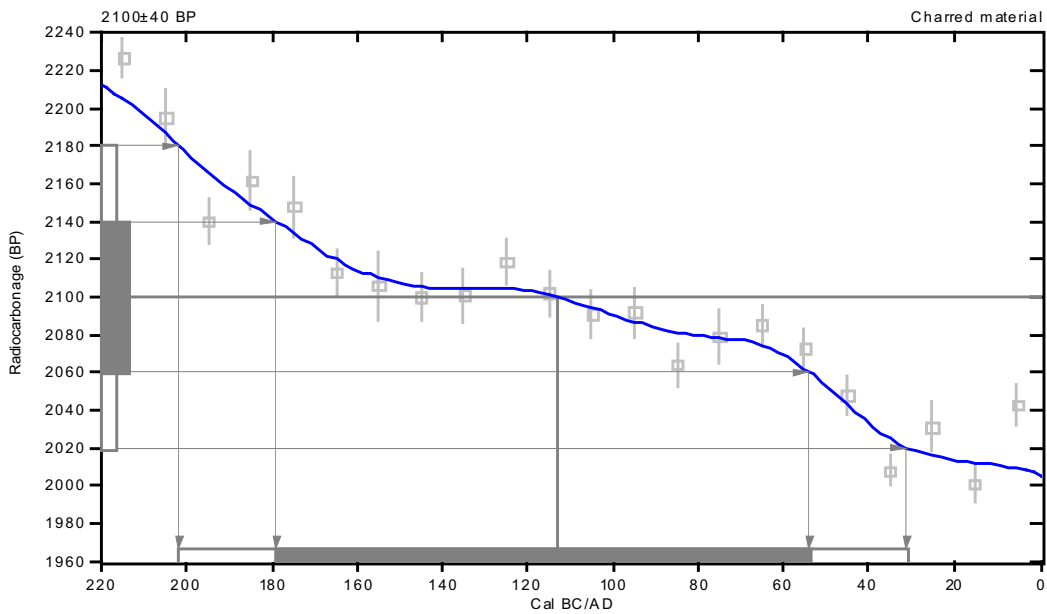
Conventional radiocarbon age: 2100±40 BP

2 Sigma calibrated result: Cal BC 200 to 30 (Cal BP 2150 to 1980)
(95% probability)

Intercept data

Intercept of radiocarbon age
with calibration curve: Cal BC 110 (Cal BP 2060)

1 Sigma calibrated result: Cal BC 180 to 50 (Cal BP 2130 to 2000)
(68% probability)



References:

- Database used
INTCAL98
- Calibration Database
Editorial Comment
Stuiver, M., van der Plicht, H., 1998, Radiocarbon 40(3), pxi-xiii
- INTCAL98 Radiocarbon Age Calibration
Stuiver, M., et. al., 1998, Radiocarbon 40(3), p1041-1083
- Mathematics
A Simplified Approach to Calibrating C 14 Dates
Talma, A. S., Vogel, J. C., 1993, Radiocarbon 35(2), p317-322

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Figure 8. Calibration curve for Sample SB 1A-17-6. Removed from a secondary trash deposit with the Final phase construction.

CALIBRATION OF RADIOCARBON AGE TO CALENDAR YEARS

(Variables: C13/C12=-25.1;lab. mult=1)

Laboratory number: Beta-193513

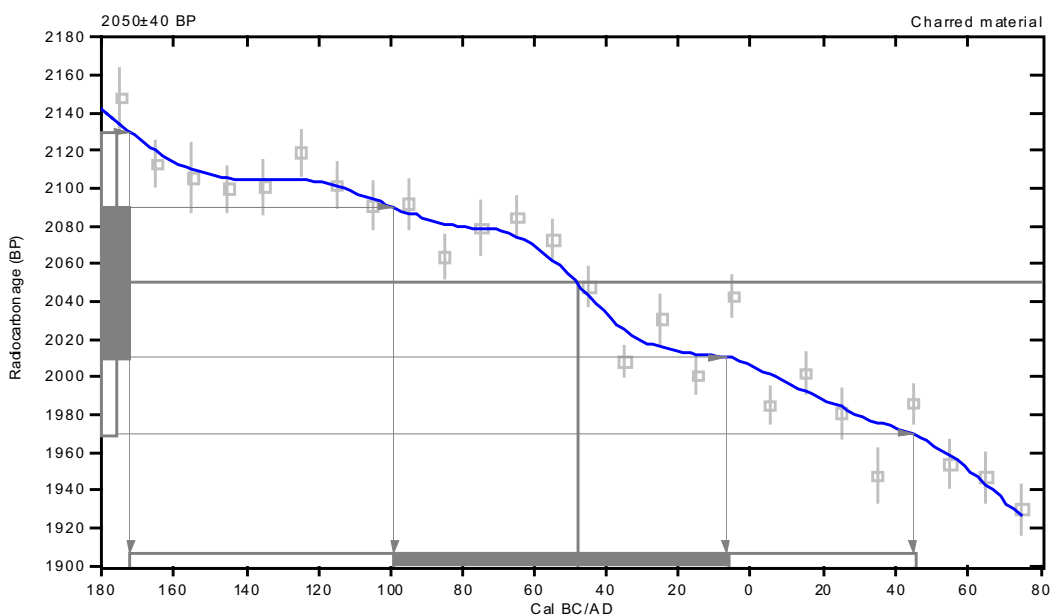
Conventional radiocarbon age: 2050±40 BP

2 Sigma calibrated result: Cal BC 170 to Cal AD 40 (Cal BP 2120 to 1900)
(95% probability)

Intercept data

Intercept of radiocarbon age
with calibration curve: Cal BC 50 (Cal BP 2000)

1 Sigma calibrated result: Cal BC 100 to 10 (Cal BP 2050 to 1960)
(68% probability)



References:

- Database used
INTCAL98
Calibration Database
Editorial Comment
Stuiver, M., van der Plicht, H., 1998, Radiocarbon 40(3), pxi-xiii
- INTCAL 98 Radiocarbon Age Calibration
Stuiver, M., et. al., 1998, Radiocarbon 40(3), p1041-1083
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A Simplified Approach to Calibrating C 14 Dates
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Figure 9. Calibration curve for Sample SB 1A-17-6-1. Removed from a secondary trash deposit with the Final phase construction.

CALIBRATION OF RADIOCARBON AGE TO CALENDAR YEARS

(Variables: C13/C12=-25.3;lab. mult=1)

Laboratory number: Beta-193511

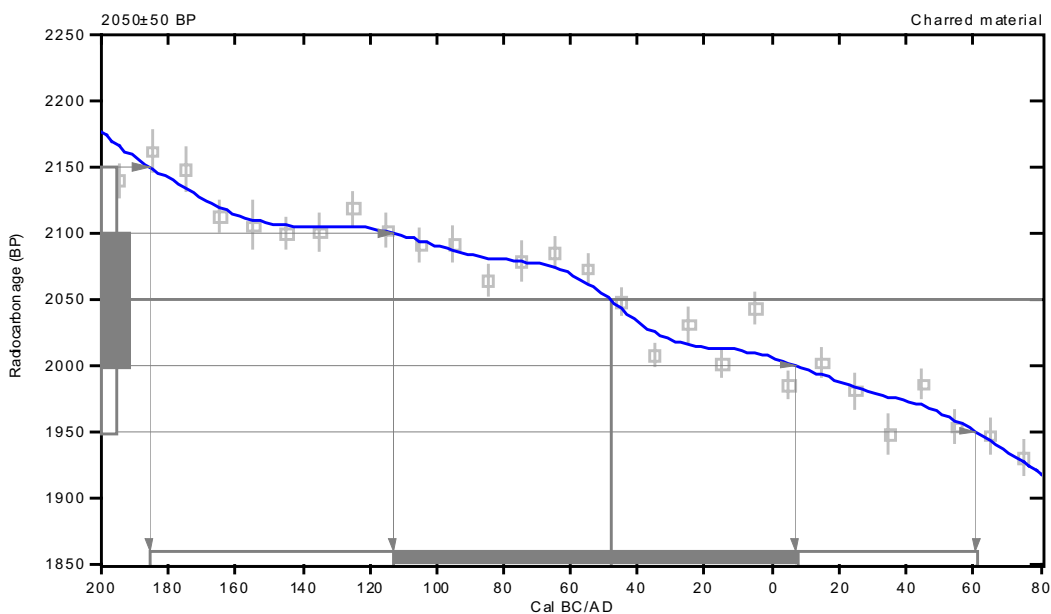
Conventional radiocarbon age: 2050±50 BP

2 Sigma calibrated result: Cal BC 190 to Cal AD 60 (Cal BP 2140 to 1890)
(95% probability)

Intercept data

Intercept of radiocarbon age
with calibration curve: Cal BC 50 (Cal BP 2000)

1 Sigma calibrated result: Cal BC 110 to Cal AD 10 (Cal BP 2060 to 1940)
(68% probability)



References:

- Database used
INTCAL98
- Calibration Database
Editorial Comment
Stuiver, M., van der Plicht, H., 1998, Radiocarbon 40(3), pxi-xiii
- INTCAL 98 Radiocarbon Age Calibration
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Figure 10. Calibration curve for Sample SB 1A-11-6-1. Removed from the Final phase construction material within Room 1.