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A REVIEW OF THE VALSEQUILLO, MEXICO EARLY-MAN ARCHAEOLOGICAL SITES (1962-2004)WITH EMPHASIS ON THE GEOLOGICAL INVESTIGATIONS OF HAROLD E. MALDE

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ABSTRACT

Harold E. (Hal) Malde began his study of the geology of the Valsequillo Basin south of the city of Puebla, Mexico in 1964 as a member of the Valsequillo Archaeological Project. Earlier, field reconnaissance by Cynthia Irwin-Williams (Harvard) and Prof. Juan Armenta Camacho (U. Puebla) had located four sites along the north shore of the Valsequillo Reservoir, state of Puebla, where well made stone tools and the remains of extinct Pleistocene mammals occurred together in situ. The artifacts could not be dated directly by ¹⁴C since no datable carbon was preserved.

Malde planned to date the archaeological sites indirectly using geological evidence. This included detailed mapping of much of the basin, then essentially a geological unknown, and attempts to match dated tephra layers (volcanic ash and pumice) in the 8-24 kyr range on nearby La Malinche volcano with those that occurred at the sites. No match was ever found.

Meanwhile, uranium-series dates on a mastodon tooth fragment and a butchered camel pelvis from the El Horno and Hueyatlaco sites gave dates of ca 250 - 350 kyr. Additional excavation at Hueyatlaco in 1973 confirmed the stratigraphy originally reported by the Irwin-Williams group. Zircon fission-track dates from two tephra layers stratigraphically above the artifact-bearing units were roughly similar to those for the tooth and bone (Steen-McIntyre et al., 1981, Quat. Res. 16, 1-17; http:// www.valsequilloclassic.net/nuke/). The unexpected great age for the samples created a deep rift between the project archaeologist and the geologists. Work was suspended for over two decades.

Research at Hueyatlaco began again in 1997. Hal's last visit to the site was in 2004, when at age 80 he filmed the new excavations, assisted in preparing the trench profile, and entered into lively dialogue with the project scientists.

VIEW 1: Photo of Hal

Among Hal Malde's many accomplishments is his contribution to the discipline of geoarchaeology. Perhaps he will be best remembered for his 40-year involvement with the controversial Valsequillo Early Man Sites in the State of Puebla, east-central Mexico.



Harold E. Malde 1923 - 2007

VIEW 2: Location Map

Here's the area of Mexico we will be discussing: The Valsequillo Reservoir, City of Puebla, La Malinche volcano. Other major volcanos are also shown. Mexico City is off the map to the west.



VIEW 3 : Images of Cynthia and Juan

In 1962 Cynthia Irwin-Williams, then a graduate student in anthropology at Harvard, and Professor Juan Armenta Camacho of the University of Puebla surveyed the north shore of the Valsequillo Reservoir south of the city of Puebla for archaeological sites.

Armenta had previously amassed a large collection of Pleistocene animal bones from there — mastodon, mammoth, camel, horse, etc. — some associated with evidence for the presence of Early Man.



Juan Armenta Camacho

Cynthia Irwin-Williams





VIEW 4: Horse iliac bone with cut marks, possibly from butchering operations.

VIEW 5: A bifacial stone tool, a bone tool, a mastodon toe bone encircled by a deep groove. [point out].



VIEW 6: Tetela 1 specimen, photo

A fragment of mastodon pelvis engraved with animal figures. Here is the profile of a cat-like creature, with spears in it.



VIEW 7: Tetela 1 Armenta drawing of individual figures.

Juan's drawings of the individual figures from the piece. Again, the cat-like creature, and below it a double-tusked elephant (some believe it to be a Ryncotherium.)



VIEW 8: Tetela 1 overlay

The Valsequillo region was the place to go for the study of Early Man, but Armenta's finds were almost all surficial, and he was an amateur. What the archaeological establishment required were professionally excavated sites where the bones and stone tools occurred together in situ, that is encased within the sediments and not simply lying on the surface. Cynthia and Juan had teamed up to find such sites.



VIEW 9: Map with sites

Their joint work in 1962 uncovered four on the north shore of the reservoir: El Mirador, Tecacaxco, Hueyatlaco (the youngest site, and the one with a thick sedimentary section), and El Horno (the oldest of the four, where a mastodon had been dismembered.) The sites could not be dated by ¹⁴C: the bones were permineralized and no datable carbon remained.



VIEW 10: Hal and Cynthia at Hueyatlaco

Interest increased and the Valsequillo Project was formed. Hal Malde joined the group as project geologist in 1964. He is shown here with Cynthia in the Hueyatlaco trenches, discussing an in situ artifact. Hal invited me to join the project in 1966 as their tephrochronologist, their volcanic ash specialist. Our primary goal was to somehow date the archaeologic sites WITHOUT using the ¹⁴C method directly.



Hal Malde and Cynthia Irwin-Williams viewing artifact in situ at Hueyatlaco Archaeologic Site Valsequillo Reservoir Puebla Mexico

VIEW 11: Color view of artifact under discussion

Another view of the tool, resting on edge. The red arrow lies on a bone. Note how meticulous Cynthia was in her excavation and documentation procedures.



VIEW 12: Aerial view of region

In the early 1960s, the Valsequillo Reservoir area was essentially a geologic unknown, a highly eroded stack of sediment containing mappable stream, lake, and mudflow deposits interbedded with hundreds of isolated volcanic outcrops, primarily ash and pumice. An unknown number of buried soils and one or more prominent carbonate horizons added to the interest.



VIEW 13: Hal's colored geologic map

Hal began by having the area flown and photographed. Then, using the aerial photos, he made a base map on which to plot his very detailed geologic map, a small part of which shown here. [Area of the four archaeologic sites.]



VIEW 14: Hal in Xotanacatla

He discovered a series of buried soils on nearby La Malinche volcano that gave ¹⁴C dates in the 8-24k year range. He reasoned that, somewhere in that dated stack we'd find at least one tephra layer that would match a unit at or near the Hueyatlaco site, allowing us to date Hueyatlaco indirectly, by correlation. My job was to find that match.

I couldn't find it. For six years I examined hundreds of tephra samples, most of them collected by Hal. Still no correlation.



VIEW 15: Slide Copy, U-Series Dates, sketches of artifact from each site

Meanwhile, Barney Szabo, a geochemist at the USGS had run uranium-series dates on samples from two of the Valsequillo sites. His dates had us shaking our heads in disbelief: roughly 245 ka for bifacial tools at Hueyatlaco, and greater than 280 ka for unifacial tools at El Horno. We thought his dating methods were faulty.

But then again... his very old dates would explain the lack of correlation between the Malinche and Hueyatlaco area tephra sequences. No correlation was possible because Hueyatlaco was 10-20 times older than the exposed, dated sequence on La Malinche, and any equivalent tephra layer would now lie deeply buried in the flanks of the volcano.



VIEW 16: Hueyatlaco in 1973, Hal's overview

In 1973 Hal and I returned to Hueyatlaco with Roald Fryxell, an expert in microstratigraphy. We needed a closer look at the Hueyatlaco sediments in order to answer a critical question: Were we dealing herewith a highly eroded "layer cake" situation, where the artifact-bearing beds passed beneath (were older than) the tephra-rich bluff sediments directly to the south? If so we could use any dated bluff sediments to give a limiting minimum age for the site. Or, were the artifacts from a much younger "inset channel", nested in older deposits?

We reopened the site, and excavated a cross trench connecting the artifact-bearing beds, down here [lower left, point], with the bluff to the south. The bluff sediments included the metre-thick Hueyatlaco ash, shown in shadow here [point] and the Tetela brown mud pumice at the top, here [point], both of which subsequently were dated.



HUEYATLACO SITE IN 1973 PHOTO BY HAL MALDE

VIEW 17: View of lower trench

A view from the lower trenches. The beds with unifacial tools extend from the lower right up to here; bifacial tools in the buried channel from here to here [half way up the channel deposits, point]. They are, in turn, cut out and overlain by a stack of YOUNGER overbank and lake sediments that continues to the south and forms the base of the exposed bluff sequence. Thus we had a layer cake, not an inset situation, and we could now use the younger tephra units in the bluff to help date the site. We returned to the States, confident of our stratigraphy. Thirty years would pass before Hal Malde would visit the Hueyatlaco site again.



VIEW 18: Slide copy, Valsequillo Saga 1973 - 2004

During those 30 years a lot happened.

——Zircon fission-track dates for the younger Hueyatlaco ash and Tetela brown mud pumice roughly agreed with Szabo's U-series dates for the site.

——Fryxell dies in a car crash in 1974, his Hueyatlaco research unfinished.

— Our joint manuscript on the Hueyatlaco stratigraphy, after years of hassle, is finally published in 1981, in *Quaternary Research*.

VALSEQUILLO SAGA 1973-2004

ZIRCON FISSION-TRACK DATES BY CHUCK NAESER Hueyatlaco Ash: 370 ± 200 ka Tetela Brown Mud: 600 ± 340 ka

> FRYXELL DIES IN 1974 WITH HUEYATLACO WORK UNFINISHED

JOINT MANUSCRIPT PUBLISHED IN QUATERNARY RESEARCH (1981)

VIEW 19: Slide Copy, Valsequillo Saga 1973 - 2004 (continued)

 Irwin-Williams dies in 1990, her site reports unfinished. She never forgave us for our old dates.
The Valsequillo data disappear from her files sometime before 1997. VALSEQUILLO DATA DISAPPEAR FROM HER FILES (PRIOR TO 1997) VIEW 20: Slide Copy, Valsequillo Saga, 1973 - 2004 (continued)

——In 1997 a new Valsequillo Project forms, composed of Mexican scientists and their state-side colleagues. This results in new excavations, new dates. Nothing yet in print as far as I know.

------VanLandingham roughly dates the Hueyatlaco site using diatoms. The whole pile of sediment: Sangamon Interglacial age and older (greater than 80 ka). VALSEQUILLO SAGA 1973-2004 — continued —

NEW VALSEQUILLO PROJECT FORMS (1997) MORE EXCAVATION, MORE DATES

VANLANDINGHAM ROUGH-DATES HUEYATLACO USING DIATOMS SANGAMON INTERGLACIAL AGE (OLDER THAN 80KY)

VIEW 21: Slide Copy, The Data Accumulate

Were human-like creatures living in Mexico a very long time ago? Skull evidence suggests so:

——The Dorenberg skull, collected south of Puebla in the late 1800s, was embedded in a Sangamon-age diatomite, making it at least 80 ka years old. A similar diagnostic diatom suite occurs in the bifacial tool levels at Hueyatlaco.

——Undated, permineralized skull fragments from Jalisco collected from Pleistocene sediments give measurements very similar to Old World Homo erectus.

——Bifacial tools, once thought of late development, have been found in sediments from the African Middle Stone Age (250-300 ka) associated with Archaic H. sapiens fossils..

THE DATA ACCUMULATE

THE "DORENBERG SKULL" Found near Puebla (Reichelt 1899) embedded in a Sangamon-age diatomite (>80 ka) Same diagnostic diatoms discovered at Hueyatlaco (VanLandingham 2004)

SKULL FRAGMENTS FROM JALISCO Some are simiar to H. erectus of the Old World (Irish, Davis, Lobdell, & Solórzano 2000)

BIFACIAL TOOLS ARE NOT NECESSARILY YOUNG Tools similar to those at Hueyatlaco occur in the Middle Stone Age of Africa (250-300 ka) with archaic H. sapiens (McBrearty & Brooks 2000; Hardaker 2007)

VIEW 22: McBrearty figure

Here are the African tools. Note the bifacial tools on the left. The right one looks a lot like a prize tool from Hueyatlaco.



VIEW 23: The site in 2004, photo

Hal and I visited Hueyatlaco for the last time in 2004, when the site was again reopened by Mexican scientists and their colleagues.

VIEW 24: Slide copy, Valsequillo Saga 2004

During our visit, Hal, now 80 years old, filmed the progress at the site for philanthropist Marshall Payn, aided Mike Waters in preparing the 2004 stratigraphic trench profile, and entered into lively debate with the scientists working and visiting there.

VIEW 25: Hal Malde again, 1968 GSA field trip photo

And Hal's Valsequillo legacy lives on. The Denver Museum of Nature and Science is archiving his papers and images. Josh Feinberg is digitizing Hal's geological maps for the area, readying them for publication. And Hal's last manuscript, concerning the stratigraphic debate at Hueyatlaco and Silvia González' "footprints" site, prepared for the Charles Repenning memorial volume, is moving right along.

Hal Malde. A world-class scientist, strong in his opinions when he believed they were justified by fact, yet ready to listen to the facts and opinions of others. A unique man and a colleague for over 40 years. I'm happy to be able to help honor his memory this morning.





VALSEQUILLO SAGA 2004

BACK AT HUEYATLACO SITE

HAL MALDE: Films Excavation Progress Helps Prepare 2004 Trench Profile Dialogues With Project Scientists

SUGGESTED READINGS

GENERAL BACKGROUND:

Website <http://www.valsequilloclassic.net/nuke/> "Those Involved", plus forums, especially "Valsequillo", "Hueyatlaco", "Questions?", "Waiting to Upload".

ARMENTA CAMACHO, J. 1978, *Vestigios de Labor Humana en Huesos de Animales Extintos de Valsequillo, Puebla, Mexico*, Published privately with aid from the American Philosophical Society and the Mary Street Jenkins Foundation, 125 pp. [See copy of monograph plus English translation under "Juan Armenta" at ">http://www.valsequilloclassic.net/nuke/.]

HARDAKER, C., 2007, *The First American: The Suppressed Story of the People Who Discovered the New World*, New Page Books, a Division of the Career Press, Inc., Franklin Lakes, NJ, 319 pp., ISBN-10: 1-56414-942-0, ISBN-13: 978-156414-942-8).

AFRICAN EVIDENCE

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TRYON, C.A. and S. MCBREARTY, 2006, Tephrostratigraphy of the Bedded Tuff member (Kapthurin Formation, Kenya) and the nature of archaeological change in the later middle Pleistocene, *Quaternary research*, 65, pp. 492-507.

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-----, R. FRYXELL, AND H.E. MALDE, 1981, Geologic Evidence for Age of Deposits at Hueyatlaco Archaeological Site, Valsequillo, Mexico, *Quaternary Research*, v. 16, pp. 1-17

SZABO, B.J., H.E. MALDE, AND C. IRWIN-WILLIAMS, 1969, Dilemma Posed by Uranium-Series Dates on Archaeologically Significant Bones from Valsequillo, Puebla, Mexico, *Earth and Planetary Science Letters*, v. 6, pp. 237-244.

JALISCO SKULLS

IRISH, J.D., S.D. DAVIS, J.E. LOBDELL, and F.A. SOLÓRZANO, 2000, Prehistoric Human Remains from Jalisco, Mexico, *Current Research in the Pleistocene* 17, 2000 pg. 95-96

A quote from the above:

"One Chapala superciliary arch deserves specific mention due to its large size. Studies by Solórzano show the bone resembles that in archaic Homo sapiens at Arago, France. In an unpublished 1990 report, Texas A&M osteologists suggest the brow's thickness and robustness are comparable to those of KNM-ER 3733 (African Homo erectus). Our measurements show the central torus thickness is 13.3, compared with 8.5 mm for KNM-ER 3733; the lateral torus thickness is 11.5 versus 9.0 mm (Rightmire 1998). Thus for the sake of comparison, the brow is more like that of Zhoukoudian Skull XI (Asian Homo erectus), with a central torus thickness of 13.2 +/- mm; lateral torus thickness was not measured (Rightmire 1998). Modern brows are too diminutive to allow these measurements. The brow also shows pneumatization (air pockets) along its length.

"However, to reiterate the findings of the Texas A&M workers, these comparisons do not imply that pre-Homo sapiens were in the Americas."

TETELA 1 ENGRAVING (Cat-like creature, double-tusked "elephant")

See Armenta monograph and English translation under his name, <http://www.valsequilloclassic.net/nuke/>.

National Geographic magazine article, "Search for the First Americans" (September, 1979, v. 156, no. 3, p. 350).